

# COLLECTED REPRINTS.

## FOURTH SERIES.

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ON THE CLASSIFICATION OF THE TICS OR HABIT  
MOVEMENTS.\*

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Linnæus "who found botany a chaos, and left it a cosmos," is said to have had the courage to write a treatise on the *Genera Morborum*. While the present condition of the classification of disease can hardly be called chaotic, yet order and system are necessarily lacking in the absence of a fuller knowledge than we now possess of the mutual relations of various disorders. There are, indeed, insuperable difficulties in the way of any broad systematic arrangement upon a basis either etiological or anatomical. Meanwhile, we jog along in an aimless fashion, ticketing the maladies according to their seeming similarity, adding daily to the existing complexity, and waiting for some twentieth century Linnæus with a genius for classification.

Nowhere is the confusion more evident than in the classification of diseases of the nervous system, particularly in the disorders characterized by abnormal movements. Even in an affection so well studied as chorea, it is very difficult to make a classification that will meet with universal approval. How can it be otherwise? We are by no means unanimous, either as to the nature of chorea minor, or as to the relations of other motor affections to it; for example, of the chronic progressive chorea of Huntingdon, which is regarded by most writers, and I think correctly, as separate and distinct from Sydenham's chorea; while Charcot and his pupils hold that it is only a variety.

Important studies have been made of late years upon the group of muscular disorders which have been described as

\* Read before the American Pediatric Society. Montreal, May 25, 1896.

pseudo-choreas or habit spasms, and, in extending to them the name of Tic, the Salpêtrière school has developed a nomenclature and division somewhat confusing to Anglo-American ears. With our notions of the word tic applied to either the mimic spasm of the facial nerve—tic non-douloureux, or to neuralgia of the trigeminus—tic douloureux, it is a novel extension to hear such phrases as *la nèvrose tiqueuse, la maladie des tics convulsif, ticquer, tic psychique* and *tics coördonnés*. With the exception of Dana, recent authors of works on diseases of the nervous system, have not adopted either the nomenclature or the division recognized by the Salpêtrière school. It has certainly advantages, particularly in enabling us to separate a number of the spasmodic affections of children from chorea minor. The disadvantage lies in the use of a name already attached to two well-known and totally different affections, the spasm of the facial nerve and the neuralgia of the trigeminus. Still there need be no confusion in reality. The facial tic, like the spinal accessory and the hypoglossus spasms, differs entirely from the habit spasm, in as much as the convulsive seizures are situated within the domain of a definite nerve, and there is generally some lesion, central or peripheral.

The employment of the word with a significance different from that to which we are accustomed, is compensated for by the advantage of placing under it a group of allied affections which pass insensibly into one another, from a simple, habitual, conscious spasm of the facial muscles, to complex coördinated movements with marked psychical features, or to habit phenomena purely psychical. The distinguishing factor in the entire group is the habit or repetition, whether of motion or of idea, which, while influenced or controlled to some extent by the will, occurs in response to a sort of impulsion in the case of muscular movements, and in the case of imperative ideas as a sort of obsession.

The following is the classification of the tics adopted by recent French writers.\*

1. Simple tic or habit spasm. These are the common cases of spasmodic movement, chiefly of the facial muscles, which are, to a certain extent, under the control of the will. In very many of these cases the affection seems to begin as a childish trick.

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\* See particularly Noir *Étude sur les Tics*. Paris, 1893.

The muscles of the face and of the neck are most commonly involved, then those of the shoulder girdle and arms, less frequently those of the legs. The cases are very often confounded with chorea minor, from which they are distinguished by the much greater brusqueness of the movements, which have a lightning-like rapidity. They are also more or less systematic, limited to certain muscle groups, as of the face and neck, or of the shoulder girdle muscles and platysma, or the muscles of the thigh. In many of the cases there are sources of irritation, such as adenoids or errors of refraction, relief of which may be followed rapidly by cure. In addition to these localized forms, here may be also grouped as a generalized tic or habit spasm, those interesting cases in which there are sudden electric-like jerkings of the muscles of the trunk and extremities, making the patient start for an instant, but which pass away with great rapidity. Both children and adults are affected, and Hensch described the condition as electric chorea—not a very suitable name, since this has been applied to the totally different affection known as Dubini's disease, met with in Lombardy. The condition may persist for many years, and in my monograph, *On Chorea and Choreiform Affections*, I have recorded several interesting cases. These habit spasms, whether local or general, often resist all methods of treatment, and, while never dangerous, are extremely annoying and a source of great worry to the unfortunate subjects. They should not be confounded with chorea, nor should that term be applied to them, but they are best designated either by the term habit spasm or simple tic.

2. Tics with super-added psychical phenomena, *Maladie de la Tic Convulsif* or Gilles de la Tourette's Disease. The study of these cases by Gilles de la Tourette, and by others of Charcot's pupils, really led to the extension of our knowledge on the subject of these curious affections. In this form, in addition to the ordinary motor disturbances of simple tic or habit spasm, there are explosive utterances and cries, and imperative ideas. Of these the anomalies of expression are the most interesting. There may be simply explosive exclamations, which are most frequent, or obscene words may be spoken, usually at the time of the movement—the so-called coprolalia; or a word heard is repeated a number of times, or some one word is said over and over again, for which habit the term echolalia has been invented. In other instances actions are mimicked—echokinesia, and it seems

probable that the jumping disease of Maine, the Latah of the Malays, and the Myriachit of Siberia, all of which affections are characterized by this condition of *echomatism*, come really under the category of the *tic convulsif* of Gilles de la Tourette. But the most interesting, as well as the most distressing feature of this variety of tic is the remarkable mental state, usually some form of obsession or imperative idea. They are very varied; many of them are the modifications of the various *phobias*, for which so many names have been invented, agoraphobia, topophobia, claustrophobia, haphophobia, etc. Or there may be the curious conditions of onomatomania, or of arithmomania, or in other instances the mental state is that of *folie du doute* or the *délire du toucher*; interesting cases of these I have given in the monograph already referred to.

3. Complex, coördinated tics. By far the best account of these is given in the exhaustive article on Tics by Noir, writing from Bourneville's clinic. Many are forms of habit movements which differ, however, from the simple tic in the more complex character of the action performed, which may be one of everyday life, but which is repeated without obvious cause, and which, in most instances, can be controlled by an effort of the will. Some of the more complex movements do not differ at all from ordinary tricks, or the complex movements may occur in connection with ordinary habit spasm, as in a child who always before taking anything in the hand, first smelt and then blew upon it; or a boy with facial tic, who had the habit of biting the middle finger, and at the same time pressing the point of the nose with the index finger. Some such tricks in children as head-nodding, head-swaying and head-banging, come in this category. In feeble-minded children one sees a very extended series of these complex coördinated movements, of which a very excellent account has been given by Noir, particularly the balancing, the jumping, the rotation of the head and the rhythmical beating of the head or of the chest with the fist. The movements are usually rhythmical in character. Sometimes a series of actions is performed from time to time in orderly sequence, such as stooping from the chair, lying prone upon the floor, raising the hands above the head, etc.

And, lastly in this group, come most appropriately those extraordinary bizarre movements, which may be repeated from time to time for a series of years, sometimes in association with

explosive utterances, or with imperative ideas, as the extraordinary case of pendulum spasm reported some years ago by Mitchell.

4. Tic psychique. An imperative idea is the psychical equivalent of, and has an origin similar to, the motor tic. The *idée fixe* impelling the victim to touch a certain object, or causing him to be haunted by a dread of the use of certain words, or making him count so many numbers before he can do a certain act, is the counterpart of the irresistible musculation which leads to the constant repetition of one of the many acts which we have been considering. The two processes are as we have seen, often though not necessarily associated, and in some of the subjects of imperative ideas the motor features are marked. In any of the cases the psychic tic is as harmless as are the slighter forms of the motor variety. Dr. Hack Tuke has called attention in a valuable paper to the trifling character of a large number of the imperative ideas. They may be present for years without delusions, recurring automatically, often proving a source of worry, but rarely becoming more serious than other of the many every-day ideas which from habit we entertain.

The following works may be consulted: Gilles de la Tourette's *Archives de Neurologie*, 1885; Guinon, *Dict. Encyclopedique, Article Tic*, 1887; Charcot, *Leçons du Mardi*, 1887-88, 1888-89; and in his last lectures, 1893, edited by Guinon; Noir, *Étude sur les Tic*, 1893; D. Hack Tuke, *Brain, Part Second*, 1894; Dana, *Text-book of Nervous Diseases, Second Edition*, 1894; Osler, *Chorea and Choreiform Affections*, 1894.

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ON CERTAIN FEATURES IN THE PROGNOSIS OF PNEUMONIA.

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THE higher the mortality the more difficult is it to estimate in any disease the value of the various elements of prognosis. Pneumonia is certainly the most fatal of the acute infections of adults in temperate climates. No other disease kills from one-fourth to one-third of all persons attacked. Very elaborate statistics have been collected showing the death-rate of the disease. These have been grouped together by Wells,<sup>1</sup> of Chicago, in one of his excellent papers on pneumonia. Of 233,730 cases the mortality was 18.1 per cent.

Unfortunately it is chiefly from hospitals that we have to gather our facts. S. H. Dickson, whose essay on "Pneumonia" is a storehouse of valuable information, comments on "the remarkable equality of this proportional mortality in peace and all comfort, in hospitals of wealthy communities, in the field of destructive war, and in hospitals and barracks the emphatic seats of destitution, privation, exposure, and neglect."

A few years ago I collected the statistics of mortality from some of the leading hospitals of this country. In the Montreal General Hospital the death-rate was 20.4 per cent.; at the Charité Hospital, New Orleans, 38 per cent.; at the Pennsylvania Hospital, Philadelphia, 29.1 per cent.; at the Boston City Hospital, 29.1 per cent.; at the Massachusetts General Hospital, 25 per cent. These figures are very much the same as those in the large English hospitals, given recently by Dr. Leech.<sup>2</sup> Thus at St. Thomas's for eleven years the mortality was 20 per cent.; at St. Bartholomew's Hospital for fifteen years the mortality was 18.6 per cent.; at the Edinburgh Royal Infirmary, 27.1 per cent.; at the Manchester Royal Infirmary, 28.8 per cent.

Of the first 124 cases of croupous pneumonia admitted to or developing in the Johns Hopkins Hospital, 37 died, a mortality of 29.8 per cent.

The mortality in private practice, though high, does not reach the figures which I have just given. The only large statistics available on this point are those in the "Report of the Collective Investigation Committee of the British Medical Association," which was drawn chiefly

<sup>1</sup> Journal of the American Medical Association, 1892.

<sup>2</sup> Medical Chronicle, September, 1894.

from private practice. The mortality was only 12 per cent. I wish there could be a collective investigation on this point from the practices of eight or ten of the leading family physicians in New York, Philadelphia, Boston, and Baltimore. I feel sure that the figures in adults would show a very high death-rate. It would scarcely be fair to ask consultants to speak of their figures, as they see only the more severe forms. I should say the mortality among the cases which I see with physicians is at least 50 per cent.

Among the circumstances influencing the prognosis some are general, as age, race, and habits; others special, as the degree of involvement of the lung, the fever, complications, etc.

Age is a very important factor. As Sturges remarks, the old are likely to die, the young to recover. Series of cases are quoted in Wells's paper in which the mortality in children has ranged from 1.9 to only 3.3 per cent. On the other hand, above sixty years of age the death-rate is very high, reaching 50 to 60, or even 80 per cent. So fatal is it that to die of pneumonia in this country is said to be the natural end of elderly people.

The disease appears to be much more fatal in the negro than in the white. The very high rate of mortality from the disease in the South is stated to be due to this cause, but of the first 124 cases at the Johns Hopkins Hospital 23 were in colored patients, with 6 deaths, a mortality of 26 per cent., against 101 whites, with 31 deaths, a mortality of 30.6 per cent.

Previous habits of life and the condition of bodily health at the time of the attack form the most important factors in the prognosis of pneumonia. In analyzing a series of fatal cases one is very much impressed with the number of cases in which the organs show signs of degeneration. In 25 of my 100 autopsies at the Montreal General Hospital the kidneys showed extensive interstitial changes. Individuals debilitated from sickness or poor food, hard drinkers, and that large class of hospital patients, composed of robust-looking laborers between the ages of forty-five and sixty, whose organs show signs of wear and tear, and who have by excesses in alcohol weakened the reserve power, fall an easy prey to the disease. Very few fatal cases occur in robust, healthy adults. Some of the statistics given by army surgeons show better than any others the low mortality from pneumonia in healthy picked men. The death-rate in the German army in over 40,000 cases was only 3.6 per cent.

Apart from certain complications the fatal event in pneumonia may result from a gradual toxæmia, or from mechanical interference with the respiration and circulation.

The toxæmia is the important element in the disorder, to which in the majority of cases the degree of pyrexia and the consolidation are

entirely subsidiary. The poisonous features may develop early and cause from the outset severe cerebral symptoms, and they are not necessarily proportionate to the degree of lung involved. There may be severe and fatal toxæmia with consolidation of only one-half a lobe, while a patient with complete solidification of one lobe or of a whole lung may from beginning to close of the attack have no delirium. Many of the cases which show the most profound toxæmia present variations from the typical picture; thus there may be no cough, no expectoration, very slight fever, and no leucocytosis. In the following cases the clinical features were rather those of a profound intoxication than of any local disorder:

*Pneumonia beginning with very acute delirium simulating insanity.*  
November 7th, 8.15 P.M., I was sent for to see E. H., aged twenty-eight years, a large, able-bodied man, who had been brought by his family from Pittsburg, Pa., where he had been in the West Penn Hospital for eight days. He had been in Chicago at the World's Fair and had seemed quite well. He left Chicago on Monday evening, October 30th. On the train he was noticed to be behaving strangely, and had delusions that there were numerous train-robbers, and that there were a number of persons following him. His conduct disturbed the passengers so much that at Pittsburg he was taken in a patrol-wagon to the West Penn Hospital. There he became actively delirious and was placed in a strait-jacket, after having made a futile attempt to cut his throat. He was evidently very ill, though he had no cough, and there was not much fever, though he complained a good deal of pain in the side. His relatives removed him yesterday. He stood the journey well. When I saw him he seemed rational; respirations were very hurried, 55 to the minute. The color was bad; the pulse was 120, and feeble. He had just been carried up and was in a condition of a good deal of excitement. He told a very pitiful story of his capture, as he called it, at Pittsburg, and how the people had conspired to put him in the hospital. The temperature was 99.5°. It really seemed as if the condition was some form of acute insanity, which opinion was strengthened, of course, by the fact that on a former occasion he had had some slight mental aberration. He begged me not to examine the chest, as he was quite exhausted.

8th. The patient had a fairly good night; morning temperature was 100.2°, pulse 128; the finger-tips a little cyanosed. Examination of the chest revealed to my surprise almost complete consolidation of the left lung, with dry, intense tubular breathing. The only resonance was in the infraclavicular region, where the note was Skodaic in character. He was very much quieter, the delirium had entirely disappeared, and he took his medicine and food well. He complained of a great deal of pain, and he had a quarter of a grain of morphine at night. He was given whiskey and Dover's powder.

9th. The patient seemed to be doing fairly well. There was no delirium. The temperature in the morning was a little over 100°, and in the evening 101.2°, the first time that it had registered above 101°. The lung was completely consolidated to the top; intense blowing breathing everywhere. He had no cough, and no expectoration. The pulse was a little

more rapid in the evening, 130; respirations at 60. The tongue was not dry, and in the evening he expressed himself as feeling more comfortable.

10th. This morning, at 8.15, the temperature was 99.5°; the pulse 118, and of rather better volume. He had dozed at intervals through the night, but not having as much sleep as he wished, and he still complained of a good deal of pain. He seemed, however, quite rational. He had taken his food very well. There was no cough. The color of the lips was good; that of the finger-nails a little livid. Respirations 60 per minute. He had not taken the ammonia during the night, and he was ordered full doses of strychnine. His condition, on the whole, though still critical, seemed more comfortable, and he said that the pain was much less. About eleven o'clock he became a little more delirious, the nurse was called, and he was found perspiring profusely, and had become very cyanosed. The respirations became more rapid, he became unconscious, and within a little more than an hour from the onset of the serious symptoms death took place.

*Toxic pneumonia, without cough, expectoration, or high fever.* Mr. G., aged about sixty-six years, seen February 8, 1894, with Dr. Alan P. Smith. The patient was a very vigorous, healthy man, who, during the winter, had been somewhat overworked. On the evening of February 3d he attended a concert at the Peabody Institute, which was rather long, and he complained a good deal of being tired. On Sunday, February 4th, he did not take his breakfast as usual, and toward the middle of the day he had a chill, not, however, of long duration or of great severity. He complained of a good deal of pain in the back and aching in the joints and in the legs, so that it was regarded as possibly a case of influenza. He had no cough, no shortness of breath, and the fever was very moderate. He had pain across the lower part of the back, which was exaggerated on deep inspiration.

On Tuesday and Wednesday he was weak and prostrated, complaining a good deal of the muscular pains. The temperature was not above 100.5°; the pulse was good; there was neither cough nor expectoration. The lungs were examined, but no changes were found. He seemed, however, very ill, and he had occasionally a little wandering.

On the morning of Thursday, the 8th, Dr. Smith discovered dulness at the base of the right lung. Throughout the day he became much worse, more delirious, and the pulse feebler. When I saw him late in the afternoon the pulse was 132, the beats irregular in volume and intermittent. The heart-sounds were clear, but had a somewhat foetal rhythm. The skin was moist and he was sweating profusely. The tongue was dry. He had been wandering a good deal, but he talked to me rationally. The lungs were clear in front; behind over the middle of the scapula there was flatness which extended as far as the posterior axillary fold, with tubular breathing and numerous râles. There were no râles at the base of the other lung, and the respirations were only 28. There was not, nor had there been, any respiratory distress.

The abdomen was not distended, the spleen not enlarged. There had been from the start neither cough, nor expectoration, nor had there been any special dyspnoea. The patient had had an objection to stimulants, but he was ordered at once whiskey and brandy in full doses, ammonia, and for twenty-four hours moderate doses of digitalis.

Throughout the night his condition improved materially and on the morning of the 9th the pulse was 98, regular, full, and of fair tension.

He had had some delirium, but seemed altogether better, and he had taken his nourishment and stimulants well. The temperature was  $100.5^{\circ}$ . In the evening he did not seem quite so well; the temperature rose to  $101.8^{\circ}$ , the highest point it had reached; the pulse was more rapid; he had had more delirium; the tongue was dry; and he looked badly; still no cough, no expectoration. The consolidation had extended a little further into the axilla.

10th. Patient had a bad night, and had refused to take his food. The pulse had again become very rapid and irregular, and he seemed much more prostrated. Dr. Smith stayed the night with him, as he would only take the medicines from him. The pulse this morning is better, 116, of good volume, but occasionally drops a beat. He is rather drowsy, the respirations are 32, tongue dry, and he looks like a man in a condition of profound toxæmia. He sank gradually and died in the evening.

These two cases illustrate a type of pneumonia in which the general toxic symptoms overshadow entirely the local and more usual features of the disorder. These severer types are seen particularly in the epidemic form and in old people, and the toxæmia may be out of all proportion to the local disease.

Probably, too, the sudden and unexpected death in pneumonia may be attributed to the action of the specific toxins on the heart-centres, rather than on the muscular substance of the organ itself. This seems more reasonable than the former idea that it was the action of the high fever upon the myocardium. These cases are by no means uncommon, and one has always to be on the lookout. I have notes of three cases which I have seen within the past few years. In the first, massive pneumonia with great obscuration of the physical signs, owing to blocking of the bronchial tubes, death occurred quite unexpectedly on the sixth day; in the second, death occurred suddenly on the fourth day; and in the third case the patient died in collapse on the third day.

*Massive pneumonia; death on the sixth day.* Benjamin M., aged thirty-eight years, colored, hod-carrier, was admitted December 14, 1894, complaining of pain in the right side of the chest and cough.

He had been strong and well, with the exception of rheumatism at twenty-five years; he had a chancre in 1884.

On December 5th he caught cold, but kept at work for the two following days; on Monday, the 10th, he had a headache, and while still in bed was seized with severe pain in the right chest, followed almost immediately by a severe chill. The pain, which was sharp and stabbing, grew steadily worse and was aggravated by coughing. The expectoration was profuse. He had been in bed since the onset of the pain.

On admission the temperature was  $104^{\circ}$ , the pulse 130, the respirations 40. He was a large, powerfully built man, propped up in bed on his back; respirations shallow; no marked cyanosis. The mind was clear. Pulse was full, bounding, and slightly dirotic; the tension was low. The expiration was interrupted by a slight jerking

cough. The percussion-sound on the right side of the chest in front was clear to the fourth rib; below this and over the left back it was dull. There was a distinct friction-rub heard in the right axilla and at the base. The breathing was nowhere typically tubular, but in the infrascapular space behind there was modified bronchial breathing. After coughing a few moist râles were heard. Tactile fremitus was present; the voice-sounds were nasal. The other lung was clear. The leucocytes were 10,200 per c.cm. The sputum was viscid, slightly rusty.

15th. The temperature kept uniformly between 103° and 104°; he was delirious; the pulse was about 120, respirations 48 to 50. The cough was very frequent and distressing. There was a tympanitic note at the right apex, shading into dulness, which extended over the whole of the rest of the lung. The friction-rub was loud in the axilla, where the respiration was distinctly tubular. At the base the breathing was feeble, and distinct tubular breath-sounds could be heard, except at one small spot just below the angle of the scapula. On the left side the breath-sounds were clear, with the exception of a few fine râles at the end of inspiration. The patient seemed to be doing very well. The leucocytes sank on the 15th to 6000 per c.cm. There was albumin in the urine in considerable amount, and a large number of granular casts.

On the morning of the 16th, at 8 o'clock, there were urgent dyspnoea, great rapidity of the heart's action, and liquid râles everywhere over the left lung and in front upper lobe of the right lung. He sank and died in a few hours.

*Abstract of Autopsy* (No. 602). Anatomical diagnosis: massive pneumonia affecting right lung; occlusion of bronchus (by fibrinous plug) going to the lower lobe; acute serofibrinous pleurisy; fresh patch of pneumonia in left lung; general pneumococcus-infection.

The right lung, with the exception of the anterior edge, extending backward a quarter of extent of the entire lung and the apex, was consolidated. The solidified portions were granular, reddish; the apex much oedematous. The main bronchus going to the lower lobe of the lung was filled with a fibrinous plug which completely obliterated the lumen. The pleura was covered with a fibrinous exudate.

In the left lung there was a small area of consolidation in the lower lobe. There was no endocarditis. The heart-flesh was friable. The kidneys looked a little swollen and the cortices were coarse. Cultures from the organs and from the blood of the heart showed colonies of the micrococcus lanceolatus.

In the following case death occurred suddenly on the fourth day:

*Lobar pneumonia; sudden death on fourth day.* A. P., aged twenty-two years, colored, driver, admitted May 21, 1894, complaining of cough.

The family and personal history was very good.

Three weeks ago he was struck on the back of the ear with a glass bottle. The wound bled profusely. A week later he had fever and headache, and was cupped on the back of the neck.

He was seen at the dispensary two days ago, at which time he had no fever, and the examination was negative.

Yesterday, the 20th, about 6 p.m., he had a shaking chill, followed by fever and a sharp pain in the left side. The pain was very severe through the night, and was much worse when he drew a deep breath. He had a cough with blood-tinged expectoration.

The temperature on admission was  $103^{\circ}$  and rose at 2 P.M. to  $104^{\circ}$ ; the respirations were 56 and shallow; the pulse 128, soft, full, and regular.

The examination showed dulness in the lower lobe of the left lung, with distant but not distinctly tubular breathing. The heart-sounds were clear. The sputum was rusty and contained numerous diplococci. There were albumin in the urine and a few granular and hyaline casts. The leucocytes on the 21st were 50,000. He was ordered ice poultices and Dover's powder at night.

22d. The temperature had been remarkably uniform, scarcely varying half a degree from  $104^{\circ}$ . The signs of consolidation in the lower lobe of the left lung were more marked. The heart-sounds were clear; the first a little reduplicated, and the second pulmonic was accentuated. There was a soft, systolic murmur in the pulmonary area. The spleen was not palpable. The urine was a little smoky, and a few blood-cells were seen, but no tube-casts. The sputum was mucopurulent. The leucocytes were 20,000 per c.cm.

On the 23d the temperature had risen nearly to  $105^{\circ}$ ; the pulse was 116, regular. At the time of the morning visit he seemed doing very well. On the evening before, he had an attack of hiccough and had been very restless. The mind was clear, and there did not appear to be any extension of the local condition. I noted, however, that Skoda's resonance was very marked at the apex in front. He had been taking small quantities of whiskey and aromatic spirits of ammonia. In the evening, without any warning, or without any special aggravation of his symptoms, the nurse noticed that he was gasping for breath, and in a few moments he died before the house-physician could be summoned.

*Abstract of Autopsy* (No. 521). Anatomical diagnosis: croupous pneumonia; acute nephritis; fatty degeneration of heart-muscle.

The left lung was voluminous; the pleura of the lower lobe was covered with fibrin. The lower lobe was consolidated throughout, finely granular, and on section grayish-red in color. The upper lobe was also consolidated, particularly in the anterior half.

The right lung was voluminous; the upper and lower lobes emphysematous. The lower lobe is slightly granular, on section red, and in a condition of beginning hepatization. The heart-muscle showed microscopically much fat. The kidneys were swollen, mottled on the surface, and microscopically showed signs of acute nephritis.

Quite serious collapse-symptoms may occur early in the disease, even within twenty-four hours. The following is one of the most striking cases I have seen, in which the patient had three attacks of cardiac syncope, the last of which proved fatal on the third day of the disease. I give the notes just as I dictated them to my secretary on returning from the consultation:

*Pneumonia; fatal collapse on the third day.* June 27, 1893, 12.45 A.M., I saw, with Dr. King, Mrs. S., aged forty-four years, a healthy, well-nourished woman, who had a severe chill on Saturday night, 24th, and who since has had signs of pneumonia at the right base, with high fever, reaching at times to  $106^{\circ}$ . There has been no albumin in the urine, the respirations have not been above 48, she has had very little cough, and her general symptoms have not been alarming; but on three occasions she has had serious collapse-symptoms, the

first on Sunday night, which lasted for only a short time, the second early this morning, at about 3.30, and the other about an hour ago. I found her in the following condition:

She lay on her back with the eyes open and fixed; the pupils small, and did not react well to light. The color of the face was fairly good; the lips red, not cyanotic. She did not reply to questions and seemed completely oblivious to her surroundings. The respirations were hurried, 40 to the minute. The appearance was rather that of a nervous or hysterical attack than of severe collapse. At first she did not look very ill, except that the sockets of the eyes were rather dark and a little sunken. The face, however, was not at all pinched. The pulse was 132, small, and easily compressible; when first felt it was quite regular. She had just been given a hypodermic injection of a drachm of brandy, and she was ordered hypodermics at once of ether and strychnine. I remained about half an hour, during which time she changed remarkably. The unconsciousness persisted; she moved the mouth somewhat, and it twitched a little. The limbs were motionless. The heart-sounds at first were perfectly clear and distinct, without murmur. Gradually they became feebler; the pulse rose to 140, was small, and beats were occasionally dropped. The color of the hands was at first good, the nails alone perhaps a little cyanosed. Gradually there was a suffusion of the fingers and then of the hands, and within less than half an hour after I saw her the pulse could not be felt at the wrist, and the heart-sounds were extremely feeble—only just audible. The respirations did not materially increase, but they became a little noisy, and her face changed somewhat in expression. It really looked as if the end was imminent.

P. S.—It was; she died at 2.30 P.M.

Mechanical interference with respiration or circulation is a very much less frequent cause of death. The interference may be the gradual exclusion of the air, by the filling up of the follicles, or the capillaries in extensive territories may be compressed. These factors occur together, and the depressing element of great loss of blood-serum, upon which Bollinger lays stress, must also be taken into account.

Very large areas of the breathing-surface may be cut off without seriously disturbing the cardio-respiratory mechanism. In no way is this more strikingly shown than by the condition of the patient after the crisis. On one day with a lung consolidated from apex to base, the respirations at 60 to 65, the pulse 120, and the temperature between 104° and 105°, the patient may seem in a truly desperate condition, and it would appear rational to attribute the urgent dyspnoea and the slight cyanosis to the mechanical interference with the interchange of gases in the lungs. But on the following day the dyspnoea and the cyanosis may have disappeared, the temperature is normal, and the pulse-rate greatly lessened, and yet the physical condition of the lungs remains unchanged. We witness no more striking phenomenon than this in the whole range of clinical work, and its lesson is of prime importance in this very question, showing that the fever and the toxins rather than

the solid exudate are the essential agents in causing the cardio-respiratory symptoms.

Of course, there are cases in which the exit of air is gradually and effectually shut off by progressive consolidation until ultimately a point is reached in which the patient is simply smothered, and literally dies from want of breath. It is difficult to say how much breathing-area is needed to maintain life. That a man can get along with very little, if the removal takes place gradually, is shown by cases of progressive tuberculosis of the lungs. In pneumonia recovery is not infrequently seen after consolidation of one lung; rarely after consolidation of one lung with one lobe of the other. One occasionally meets with cases in which both lungs are almost completely solidified. In Case 49 of my series of autopsies the left lung, with the exception of the anterior border, was in a state of uniform red hepatization; while the right was in a state of gray hepatization, with the exception of a still smaller portion of the anterior margin. In these cases the dyspnoea is usually urgent and distressing, and the cyanosis early and pronounced; while the cerebral features of the disease may be completely absent. But even here we must be on our guard against a too mechanical conception of the process. While theoretically we may suppose great obstruction to the pulmonary circulation to exist in consequence of the compression of the alveolar capillaries by the exudate, it has been shown by the well-known experiments of Welch that it is exceedingly difficult to raise the blood-pressure in the pulmonary artery by cutting off territories of the circulation in reality much more extensive than are ever involved in pneumonia.

As I have already mentioned, in speaking of the remarkable phenomena associated with the crisis, additional factors must be considered, namely, the weakening influence of the fever on the heart-muscle and the depressing effect of the toxins on the cardio-respiratory centres. This explains in part, too, why we do not get such satisfactory results from venesection in pneumonia as in similar conditions of dilatation of the heart with cyanosis, in emphysema, arteriosclerosis, and valvular disease. While it is rare in the one to see even copious venesection followed by relief, in the others the good effects are often most striking.

The toxæmia outweighs all other elements in the prognosis of pneumonia; to it (in a gradual failure of strength or more rarely in a sudden death, as in the cases here given) is due in great part the terrible mortality from this common disease, and unhappily against it we have as yet no reliable measures at our disposal.

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## Clinical Lecture.

### MITRAL STENOSIS—SUDDEN DEATH—BALL THROMBUS IN THE LEFT AURICLE.

(Clinical Remarks, Johns Hopkins Hospital, Jan. 13th, 1896.)

BY

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Sudden death in mitral stenosis is very much less frequent than in aortic valve disease, and the cause which carried off the little girl of whose case I shall speak to-day is among the rarest of the complications of chronic valve lesions. I will ask Mr. Day, the Clinical Clerk in Ward G., to first read an abstract of the history.

"Mabel M., aged 20, was admitted Dec. 15th, complaining of swelling of the legs and shortness of breath. She knows nothing of her family history.

*Personal history.* She had diphtheria and scarlet fever when nine years of age. She had a discharge from the ears when she was about thirteen, and ever since has had "catarrh of the head," as she calls it. She began to menstruate at her thirteenth year. She was always well and strong, but for a year or more she had been short of breath on exertion. For the past two years she had been employed in a book-bindingery, where part of her occupation was working a machine with her feet.

*Present illness.* About two months ago, while wearing a pair of tight shoes, she noticed a swelling beginning at the shoe tops. This gradually ascended to her hips. Then the back began to ache, and there was slight swelling in the lower part of the spine. On close inquiry she confesses that she has been for a long time short of breath on any such exertion as climbing the stairs or walking fast, and she has sometimes felt faint. The dyspnœa has been growing worse for the past few months, and in walking a square she would have to stop and rest. Lately she has had headache, and on waking in the morning the eyes are puffy. She has had loss of appetite and the bowels are irregular.

*Present condition.* Patient does not look more than fourteen or fifteen years of age. She is well nourished, has a rather high colour, the cheeks are red, and the lips a little cyanotic. The facies is distinctly luetic—saddle nose, projecting forehead. There is cloudiness

of the right cornea, and the upper central incisors are somewhat peg-shaped.

"Inspection of the chest showed a heart impulse in the fourth and fifth interspaces, the maximum in the fifth, 11 cm., from the mid-sternal line. The relative dulness was at the upper border of the third rib. On palpation there was a thrill at the apex, which varied a good deal in intensity. On auscultation the first sound was very snapping at the apex, and preceded by a rough, harsh, pre-systolic murmur, and there was a soft blowing systolic murmur passing towards the axilla. The first sound had a very sharp valvular character. The pre-systolic murmur was lost at the mid-axilla. There was a good deal of echoing over a limited area in the fifth space. In the second and third left intercostal spaces the second sound was very much accentuated. The second aortic sound was relatively feeble.

"The liver was enlarged, and could be felt 6 cm., below the ribs in the mid-sternal line. The legs were a good deal swollen. The urine contained a small quantity of albumin and a few hyaline casts."

During her stay in hospital she improved somewhat; the dropsy disappeared, the heart's action became slower, and she became very much more comfortable, though she still had the flushed suffused facies.

I saw her on Jan. 7th, and she seemed very well. The pulse was regular, and the heart's action seemed quite natural. At 4.30 A.M., on the 8th the nurse found her very cyanotic; she gave a gasp or two and died in a few moments.

Let me first call your attention to this drawing, which was made by Mr. Broedel, of the heart in situ, in which you see that almost the entire exposed portion was made up of the right auricle and ventricle; only a small portion of the apex of the left ventricle is apparent. It was noted particularly, too, that the auricular appendix of the left auricle was not visible. The heart, as you see, presents the usual anatomical features associated with an extreme grade of mitral stenosis. The mitral valve segments are thickened and adherent, the chordæ tendineæ greatly shortened, and the orifice just admits the tip of my index finger. There is no fresh endocarditis. The left ventricle is relatively small, the right ventricle very large, and the walls greatly hypertrophied. The right auricle, too, is a very capacious chamber with relatively thick walls. The left auricle is also very large, the endocardium very opaque, and the walls greatly thickened.

The most remarkable feature in the case is this firm ball-thrombus, which lay loose in the left auricle, occupying the funnel-shaped space leading to the mitral orifice. It is ovoid, measuring about 3 cm., in

length and at one end is roughened, indicating an area of attachment. Beyond the venous engorgement of the viscera there were no other features of special interest. There were no lesions of congenital syphilis.

There can be but little doubt, I think, that the sudden death in this case was due to the dislodgement of the thrombus and the plugging by it of the narrowed mitral orifice, so that she really died of embolism of the left auriculo-ventricular orifice.

I call to mind another instance of sudden death due to embolism of one of the cardiac orifices. In a child aged three and a half years, (whose case I reported in the *Journal of Anatomy and Physiology*, 1880,) there was a striated myo-sarcoma of the left kidney, which had extended into the renal vein and inferior vena cava; portions of the sarcomatous thrombus had become detached, and a mass 2.5 by 1.2 cm., had plugged the tricuspid orifice, and a mass the size of a hazel-nut the orifice of the pulmonary artery.

These free thrombi in the cardiac chambers are very rare. The only other case I have met with, which is reported in Vol. II., of the *Johns Hopkins Hospital Reports*, occurred in a woman, aged 55, with mitral stenosis, who died in the Montreal General Hospital. In her case the death was not sudden. The thrombus was the size of a small egg, 3.5 by 2.5 cm. In the article referred to I have dealt briefly with the forms of cardiac thrombi, and particularly with the cases which had been reported up to that date, only five in number. I have not looked over the literature recently, and no doubt many additional cases have since been added.

I will refresh your memory by enumerating the various forms of thrombi met with in the heart chambers.

1. Globular thrombi, with sub-trabecular ramifications, which are common in the auricular appendices and in the apices of the ventricles in cases of extreme dilatation.

2. Mural thrombi, usually laminated, which occur in the dilated auricles, particularly their appendices, in the ventricles in cases of fibrous myocarditis, and in aneurism of the heart.

3. The pedunculated polyp-like thrombus—a very rare form—met with usually in the auricles.

4. The ball-thrombus, free in the auricle, which constitutes the rarest form of cardiac thrombus.

In all probability in this case the ball-thrombus had previously been attached in the auricular appendix, and sudden death followed its dislodgement.

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*THE DIAGNOSIS OF MALARIAL FEVER.*<sup>1</sup>

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AMONG a multitude of points of great interest in malarial fever the following may be emphasized:

1. It was the disease best known to the old Greek and Roman physicians, some of whom gave very clear clinical pictures of the chief varieties.
2. It remains, after two hundred years, the only acute infectious disease for which we have a positive specific.
3. It is the most important known disease due to protozoan parasites.
4. North of Mason and Dixon's line physicians are prone to diagnose malaria for other diseases; south of the line they are more prone to diagnose other diseases for malaria; in both regions it is a source of greater errors in vital statistics than any other affection.

It is not my intention to bore you with any detailed account of the hematozoon malariae, but I would remind you that there are three well recognized varieties. (1) The tertian organism, which matures in forty-eight hours and produces quotidian paroxysms if two groups are present, tertian if there be only one. This is the common parasite of the simple intermittents of the spring and early autumn. (2) The quartan parasite, which has a cycle of develop-

<sup>1</sup> Read before the Medical Society of the County of New York, February 22, 1897.

ment of seventy-two hours, and, if only one group of organisms is present, causes the regular quartan intermittent; if two or more groups are present, the paroxysms may be daily or every other day. The quartan parasite is a rare form. There have been only about fifteen cases among 1000 examined at my clinic. (3) The parasite of the irregular malarial fevers (estivo-autumnal form)—the remittent, continued, and pernicious types. This variety is smaller, less easily recognized, is not so abundant in the peripheral circulation, and, in the pernicious forms, may have curious seats of election, as in the brain or intestines. It is further characterized by the development of the crescents, a distinctive and characteristic form of great moment in diagnosis.

The recognition of the invariable association of these parasites with all forms of malarial fevers, of their etiological relation to the disease, and of their importance in diagnosis, has resulted from the labors of Laveran, and of his followers in Italy, and in this country. I cannot forbear a word of warm commendation of the way in which our Italian colleagues have persistently followed, and with such success, the many problems connected with the life history of the parasite. Anyone who wishes to keep abreast of the world's work on malaria must know the Italian literature. Much remains to be worked out—the relations of these varieties to each other, the significance of the crescents and of the flagellate form, the life history outside the body, and the mode of infection. Is it a facultative parasite? Is it possible that in infected districts persons may harbor it and show no symptoms, as is the case with the filaria and

the anchylostoma? How long may it lie *perdu*, so to speak, in the body?—surely questions enough to satisfy the cravings of the younger generation of workers.

A word before I pass on to the subject in hand. To obtain a correct knowledge of the forms of the malarial parasite requires months of careful study, with plenty of material. There have been papers published in this country and in India which bear ample evidence that the authors have approached the problem without due technical preparation. Two educational points are particularly to be noted: the changes which the red corpuscles undergo on a slide after twenty-four hours on the warm stage, and the irregular forms of vacuoles which are not infrequent in the red corpuscles in some fevers, particularly scarlet fever and measles. I would urge particularly as a *sine qua non* in all doubtful cases, and especially in supposed mixed infections, as with malaria and typhoid fever, that cover slip specimens of the blood be preserved, which, if necessary, could be submitted to the judgment of an acknowledged expert.

The recognition of malaria is fortunately in a large majority of all cases a very easy matter. The subject for discussion may be indicated under three headings: 1. The diagnosis of the regular malarial intermittent fevers. 2. The diagnosis of the irregular remittent and pernicious forms. 3. The spurious malaria of the Health Boards.

#### 1. THE SIMPLE INTERMITTENTS.

The tertian infection, the only common one in this country, is characterized by a paroxysm developing

at the end of forty-eight hours, if a single group of parasites is present; at the end of twenty-four hours, if two groups exist, one of which matures every day. There are three features by which an ague can be recognized:

(a) The character of the febrile paroxysms. Take any large series of carefully recorded temperature charts, such as have been made in my wards during the past seven years,<sup>1</sup> and it is found that the duration of the pyrexia from the rise above 99° F. to the fall to normal is from eleven to twelve hours, rarely shorter, still more rarely longer.

(b) The blood shows the hematozoa in all stages of development. Practically they are never absent in uncinchonized individuals. There is no leucocytosis.

(c) The administration of quinin checks the further development of paroxysms and causes a rapid disappearance of the parasites.

During last year I saw in private, or there were brought to my wards, cases with intermittent paroxysms of fever believed to be due to malaria, but which subsequently proved to be the following conditions: abscess of the liver, tuberculosis, influenza, gonorrhoea, endocarditis, otitis media, gall-stone fever, post-partum anemia, typhoid fever, and septicemia. There are other affections, such as syphilis and many obscure septic infections, with which recurring chills may be associated. There are also remarkable cases of cryptogenetic septicemia with daily chills—cases

<sup>1</sup> See the Monograph by Thayer and Hewetson, "Johns Hopkins Hospital Reports," vol. v., and Dr. Thayer's article in vol. i. of the recently issued "American System of Medicine," by Loomis and Thompson.

in which tuberculosis and malaria can be almost positively excluded. Dreschfeld of Manchester has described a form of this as idiopathic intermittent fever of pyemic character. It must be confessed that the regularity of the chills, often of a quotidian or tertian type, and the obscurity of the cause, make the disguise very complete. The three points just referred to suffice, as a rule, to clear up the diagnosis. The length of the paroxysm in septic cases is rarely so long and not so fixed in recurring attacks. Shorter periods of pyrexia, six to eight hours, are the rule; occasionally they are longer, eighteen to twenty-four hours. This point, together with the presence of a leucocytosis, the great increase in the blood plates, the absence of the hematozoa, and the resistance to quinin, serve to exclude malarial infection. To one or two of these conditions I may refer briefly.

It is not sufficiently recognized in the profession, particularly in malarious regions, that pulmonary tuberculosis very frequently sets in with chills and fever. In Baltimore I not infrequently see cases in which the patient has been treated persistently with quinin, until the aggravation of the cough, or the occurrence of hemoptysis has aroused the suspicion that the lungs were affected.

Abscess of the liver is almost always at first treated for malaria. The recurring chills and fever, and the sallow tint, lead, not unnaturally, to this mistake, which is made even in regions in the North which are quite free from paludism.

Another condition of the liver is a common source of error, namely, gall-stone fever. I do not refer to the chill during the passage of the gall stone, nor to

the recurring chills in the pyemia of suppurative cholangitis, but to the recurring paroxysms of intermittent fever for months or even for years in connection with the lodgment of a stone in the common duct.

#### II. THE IRREGULAR MALARIAL FEVERS.

In reality the chief difficulty in the diagnosis of malaria is in the recognition of the remittent fevers which simulate typhoid, of certain pernicious types with special localization, and of certain chronic infections. Every year we have a few cases of malarial remittents which are at first mistaken for typhoid fever and tubed. I show you here a chart of the last case of this kind.

The patient, Edward Reip, aged twenty-one, was admitted October 2d, complaining of headache and pains through the body. He had had malaria five years ago; otherwise there was nothing of special moment in his history. On the 29th of September, three days before his admission, he had a wetting, and on the following morning awoke with a violent headache, and felt so badly that he worked with difficulty. He stopped work the day before admission. He felt cold, but had no chill. He had lost his appetite. There was no nausea and no vomiting.

When admitted his temperature was  $105^{\circ}$  F., face was slightly flushed, the tongue furred and white. The examination was negative with the exception of the spleen, which was enlarged and slightly tender. The patient looked very ill, and his temperature on the evening of admission rose to  $106^{\circ}$  F., and he was given a tub bath. For seven days this patient was treated for typhoid fever, and during this time he had thirty-two tubs. He had no chills, no sweats; the tongue was furred, the cheeks flushed, lips red; the

spleen was readily palpable. The blood was examined by the house physician each day, sometimes twice a day, with negative results. On October 9th Dr. Thayer found in the peripheral blood a number of actively moving ameboid bodies. On the evening of the 9th he was given ten grains of quinin hypodermically, and then five grains every four hours. His temperature fell gradually and reached normal three days after beginning the administration of quinin. In this patient the anemia did not develop until after the end of the first week of the disease.

I mention this case in detail because it illustrates a very important point in the clinical history of these cases, namely, that in certain forms of infection with the organism of the irregular malarial fever the parasites are at first very scanty in the peripheral blood, and may be, in fact, overlooked for some days.

With us it has been very much more common to mistake malaria for typhoid fever than typhoid fever for malaria. The following are the important points of differentiation:

*First. The mode of onset.*—In malarial remittent fever there is not the initial period of malaise and ill-health; the onset is more sudden; chills are much more frequent. They are not, however, always present, as in the case of which I have just spoken. On the other hand, chills at the onset of typhoid fever are not very uncommon. Of 79 cases treated during the sixth year of hospital work, in which this point was inquired about particularly, there were 13 in which the disease began with shaking chills. Epistaxis is rare in malaria.

*Second. The fever,* which presents three points of great importance in the differentiation.

(a) The slow, step-like ascent to the fastigium is not met with in malaria. The rise is abrupt, and on the first or second day the temperature may reach  $104^{\circ}$  or  $105^{\circ}$  F. You will see in the chart passing around that the temperature on the third day in that patient reached nearly  $106^{\circ}$  F. in itself almost enough to exclude typhoid fever.

(b) The malarial remittents never have the remarkable continuous type of fever which we see in typhoid after the fastigium is reached. No other disease, except pneumonia, presents the same persistent pyrexia, with perhaps not more than a degree or a degree and a half of diurnal variation. This is characteristic particularly of the second week of the disease, or from the fifth to the twelfth day. In the estivo-autumnal infections the remissions are, as a rule, marked—two, three, and even four degrees.

(c) In the later stages, say in the third week, when in typhoid fever there are wider excursions and marked remissions, the pyrexia in the remittent fever becomes much more broken, is apt to be more intermittent in character, and the temperature may even be subnormal for several hours of each day.

*Third. The general appearance of the patient.*—Walking through a ward containing malarial intermittent cases and typhoid fever patients one can usually pick out readily those with the former disease. The early anemia and sallowness are very characteristic. This is not the case with malarial remittent fever. During the first week the aspect may be typically typhoidal, the expression dull and heavy, and the cheeks flushed. Marked anemia and the sallow tint

may not develop until the patient has been under observation for a week or more.

*Fourth.*—The gastro-intestinal, bronchitic, and nervous features offer less valuable criteria of differentiation. Herpes on the lips, when present, is important because of the great rarity in typhoid fever and the great frequency in malaria. The tongue in remittent fever is usually more coated, pasty, and white early in the disease. Bronchitis is common in both. Mental hebitude and delirium, while more common in typhoid fever, are not at all infrequent in the severer types of the estivo-autumnal fever.

*Fifth. The examination of the blood.*—The very first slide looked at may give the diagnosis. In other instances repeated examinations may be necessary, and the case to which I have referred is not at all unique in our experience. The paucity of the organisms in the peripheral circulation is very unfortunate just in these cases, as it may leave the diagnosis in doubt for several days. A systematic examination of the blood in any estivo-autumnal form is sure to be rewarded by the detection of perfectly distinctive forms, if not of the intracellular, of the characteristic crescents. Widal's test, too, will prove of great use. You will note in the chart passing around that it was not present on October 8th, the eighth day of the patient's illness, and the day before the organisms were found in the blood, and this, with the irregular temperature, made us renew our efforts to discover the parasite.

*Sixth.*—Quinin has no influence on typhoid fever. Properly administered, it checks the malarial remittent fever in from two to four days.

There are other points of differentiation, but these are the most important.

In connection with this question there arise two important points for discussion: How far, in paludal regions, does typhoid fever present malarial aspects? It is the rooted and grounded belief of a very large section of the physicians of this country that typhoid fever very often presents "malarial features." The phrase is on their lips constantly. Failure to recognize the extraordinarily protean character of the disease is in the main responsible for this delusion, behind which lies a sort of feeling that a fever with malarial aspects is less apt to be serious. So far as my personal experience is concerned, typhoid fever is a singularly fixed disease in its composite picture, as taken, say, in centuries of cases. I saw the disease for ten years in Montreal, the General Hospital of which offered a very rich field for its study. The cases which came under my care during five years at the University and Blockley Hospitals in Philadelphia presented no essential changes. Many of the cases came from regions infected with malaria. During the seven years and nine months in which the Johns Hopkins Hospital has been opened, there have been in my wards more than five hundred cases of typhoid fever. A considerable number of these came from the outlying districts of the city, in which malaria is very prevalent, and from which our cases of that disease come. Any one may judge from the studies on typhoid fever, issued in Reports of the Johns Hopkins Hospital, Vols. IV. and V., that the disease presents no variations from the universally recognized

picture of the disease. We know nothing of typhoid fever with malarial features; on the other hand, we know a good deal, as you may judge from the chart, of malaria with typhoid features.

How often do combined infections occur with the hematozoa and Eberth's bacillus? Very seldom; much less frequently than with the pneumococcus and with the ameba coli. Among the 1000 cases of malaria and the 500 cases of typhoid fever which have been at my clinic, almost every one of which has had a blood examination, there has been but one doubtful case of double infection. So far as I know, Dr. Gilman Thompson's cases are the only satisfactory ones observed in this country. The subject is one deserving of careful study. We have been in the habit of making blood examinations in all of our typhoid cases, and as the double infection is usually with the tertian organism, I can speak with some measure of positiveness as to the accuracy of our results. I would ask particularly that in doubtful cases cover-slips be kept for expert examination. This is not a matter to be left in the hands of the inexperienced house physician. In other double infections quinin causes the hematozoa to disappear within a few days, and the case proceeds without showing signs of special influence, and this was the case, I believe, with Dr. Thompson's patients.

Certain symptoms, particularly chills and sweats, are prone to deceive the physician who has not learned to recognize them as not infrequent events in typhoid fever, associated with complications or with septic infection.<sup>1</sup>

<sup>1</sup> "Chills in Typhoid Fever," *University Medical Magazine*, November, 1895.

I need scarcely here refer to other forms of irregular malarial fever—the more pernicious types. They are not very common with us, though in the autumn we have to be on guard constantly to avoid mistakes, and we have, as a rule, one or two fatal cases a year.

### III. SPURIOUS MALARIA.

What is spurious malaria? I do not know. One form of it is a serious and very fatal disease, killing, according to the last United States Census Report, in New York as many persons as does typhoid fever, in Brooklyn about one-third as many more. I suspect the Eberth bacillus, not the plasmodium malaria, is responsible for the major part of these cases. Other maladies, a motley host, from headache to biliousness, from keratitis to chilblains, are attributed to "a touch of malaria." Any slight ailment with a periodic tendency, any dubious trouble for which a diagnosis is not forthcoming, is put in the same category. While I do not deny that in regions where malaria is endemic, and everybody comes under its influence, many obscure troubles follow in its train, I claim that the disease in the temperate regions of this country is well defined and easily recognizable, that north of the Chesapeake the fatal forms have become so rare that no health board should take a death certificate signed "malaria" without investigation, and, lastly, that the widespread belief in an occult influence of the disease, in masked forms, and in the modification by it of other affections, has no rational basis of support.

It is just eleven years since I began the study of malarial fever in the Blockley Hospital, Philadel-

phia—a skeptic as to the value of Laveran's work, to which attention was called in this country by Surgeon-General Sternberg and Dr. Councilman. I soon became convinced of its truth, and the results of my study of seventy cases was published in 1887. Since that time, at certain seasons, I have had almost daily opportunity to see malarial fever, and I have of late years been fortunate in having as my associate Dr. Thayer, who has made a special study of the disease, and in Baltimore has kept us in touch with the progress of knowledge in this department. A widened experience has only served to strengthen the conviction that in the practical diagnosis of the infectious diseases, the discovery of the hematozoa of malaria by Laveran takes rank with the finding of the tuberculosis bacillus by Köch.

THE FUNCTIONS OF A STATE FACULTY.

BY

WM. OSLER, M. D.

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PRESIDENT'S ADDRESS

DELIVERED BEFORE THE MEDICAL AND CHIRURGICAL  
FACULTY OF MARYLAND.

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## PRESIDENT'S ADDRESS.

### THE FUNCTIONS OF A STATE FACULTY.

By WM. OSLER, M. D.

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It would be interesting to know the reasons which induced the incorporators in 1798 to call this organization a Faculty, an unusual yet at the same time a most appropriate designation. So far as I know, there is in English speaking lands only one other society which bears this name, the Faculty of Physicians and Surgeons of Glasgow. Time out of mind the term has been applied to the body of practitioners at large. At present its use is confined almost exclusively to indicate a body of men concerned in teaching. The Glasgow society to which I refer is a licensing body, while its use in our own body illustrates the older and more general meaning of the term.

Originally the Medical and Chirurgical Faculty had a dual function, in the language of the act of incorporation, "for the promoting and disseminating medical and surgical knowledge throughout the State," and "to prevent citizens from risking their lives in the hands of ignorant practitioners or pretenders to the healing art." In transferring the licensing function to a separate board, this Faculty has followed the good example of other States, but while we now exercise no direct authority in this matter, it is essential that our relations with the Board should be of a most intimate character. The change has been in every way a gain, since in an independent body of medical examiners chosen from the profession at large, our interests

and the welfare of the public are infinitely safer than in the hands of tender medical school professors, or of mere registering boards of the respective shores of this State, the duty of which consisted in a hasty inspection of more hastily conferred diplomas. The report which will be made from the State Board will speak of certain matters requiring early settlement, more particularly our protection and the protection of the public against unlicensed practitioners. It is most important that we render the Board willing and loyal support in its efforts, and in every way assist it in promoting any legislation which may make it more representative, and which will promote increased stringency in the examination.

The promotion and dissemination of medical knowledge throughout the State remains our important function. Physicians as a rule have less appreciation of the value of organization than the members of other professions. In large cities weakness results from the breaking into cliques and coteries, the interests of which take precedence over others of wider and more public character. Jealousies and misunderstandings are not unknown, and there is a baneful individualism—every man for himself—a centrifugalizing influence against which this Faculty is and has been the only enduring protest.

No class of men needs friction so much as physicians; no class gets less. The daily round of a busy practitioner tends to develop an egoism of a most intense kind, to which there is no antidote. The few set-backs are forgotten, the mistakes are often buried, and ten years of successful work tend to make a man touchy, dogmatic, intolerant of correction, and abominably self-centred. To this mental attitude the medical society is the best corrective, and a man misses a good part of his education who does not get knocked about a bit by his colleagues in discussions and criticisms. The programme in your hands is evidence that the Faculty is fulfilling its function in promoting and disseminating medical and chirurgical knowledge throughout the State.

I would call your attention to the thoroughly representative character of the subjects for discussion in their different

bearings: Peritonitis, upon which we all need information; Rabies, which has been brought in such a painful manner to the attention of the public; and the Care of the Dependent Insane in this State, on which last subject the Faculty should speak in no uncertain tones. It is pleasant to be able to announce the great success of our last semi-annual meeting. Not only was the attendance large, but the papers were most practical, and the educational aspects of certain subjects were carefully presented. In enthusiasm and hospitality the members of the Washington County Medical Society have set the pace for other sections of the State.

These are days of unification and consolidation, and the question has been raised by several members whether the usefulness of the Faculty would not be enormously increased by uniting as sections of the Faculty the various medical societies at present in existence in the city, organizing them as Medical, Surgical, Obstetrical and Gynaecological, Neurological, and possibly Ophthalmological and Otological sections. It would add strength to the Faculty and dignity to the various sections. It would make the State organization comparable with the Academy of Medicine in New York and the College of Physicians in Philadelphia. The county members could often participate in the monthly or fortnightly meetings of the different sections, and in that way maintain a more close relationship with the Faculty than is at present possible. The financial aspect could be, I think, readily arranged, but into details it is not necessary here to enter, and I mention the subject only that it may ferment in your minds.

Not only does this Faculty weld into one homogeneous mass the diverse, even discordant, elements which necessarily make up the profession, but through it we possess an organic connection with "the great and good who are gone." Through it, and through it alone, are knit together the generations of physicians who have here labored and striven, and then passed to their rest. Of the altruistic instincts veneration is not the most highly developed at the present day; but I hold strongly with the statement

that it is the sign of a dry age when the great men of the past are held in light esteem. I would like to read you a short paragraph describing the men who made this Faculty in its early days. It is from the memorial address of Dr. Wilmott Hall at the meeting in 1811.

“To classical erudition the most liberal and profound, they united the stores of medical learning with which the ancients or moderns had enriched the science of physick, or of which the schools of America or Europe could boast. In the academies consecrated to literature or medicine, either at home or abroad, they had given convincing evidences of their research, industry and talents; while they bore honorable testimony that the intellectual claims of their native State were inferior to no portion of the old or the new world. As physicians they enjoyed that respect and confidence which is the pleasing and voluntary tribute of intelligence to virtue and worth, which the successful application of the principles of our science so generally receives from the discerning and grateful. As men, they were governed in their intercourse with society by all those refined and enlightened sentiments which generally arise from the study of the sciences and liberal arts; from expanded and comprehensive views of the sublime laws and order of nature, and from a just sense of those moral obligations which bind man to his fellow-man.”

As these walls show, our predecessors have done something to keep active a function of this Faculty which is of the greatest moment, viz., the preservation in its archives, on its shelves, and on its walls the memorials of the days that are no more, and of the men who served faithfully the profession of their choice. We owe them much, and a heavy debt remains unpaid. Handsome portraits of Upton Scott, the first President, and of his successors should grace these walls; the list of incorporators, 'tis a long one, from Gustavus Brown, of St. Mary's County, to George Lynn, of Alleghany County, should live in brass in our hall. Then the men who made strong impress in their day should receive recognition at our hands, and it should be an act of filial piety year by year to add a portrait, a bust or a tablet. Wiesenthal and Buchanan, Potter and Davidge,

Godman and Jamieson, Chew and Power, are names which in honoring we should ourselves be honored. And there are notable men, transient teachers here, who have passed on to other fields; the learned Duglison, the scholarly Gibson, the erratic Pattison and the philosophical Bartlett have strong claims upon us, and many others of whom time fails me to tell. Are their memorials not written in Quinan's Annals and in Cordell's History? Would that the Faculty had been as faithful in its trust of this heritage as have these two devoted students of the Medical History of this city!

Unlike other State organizations, this Faculty has in its library an important educational function. It was a singularly judicious action on the part of the men who controlled this institution (in the thirties), to begin a collection of books. They knew the true gauge of a profession's standing, not the number of its schools, not the length of the roll of students, not the material wealth of the physicians; these are as dross and slag, chaff and dust, in estimating the true worth of a profession. Books are tools, doctors are craftsmen, and so truly as one can measure the development of any particular handicraft by the variety and complexity of its tools, so we have no better means of judging the intelligence of a profession than by its general collection of books. A physician who does not use books and journals, who does not need a library, who does not read one or two of the best weeklies and monthlies, soon sinks to the level of the cross-counter prescriber, and not alone in practice, but in those mercenary feelings and habits which characterize a trade.

But to maintain a modern medical library is a very serious undertaking. So extensive has the literature become that even well endowed institutions find it impossible to meet the incessant demands in all departments. The Faculty has the nucleus of an excellent collection, and through the kindness of our friends we have been enabled this year to add a long list of most valuable journals and many complete sets. Within a few years this most valuable section of the library should be greatly enlarged. The true worker does not want text-books; he looks to

journal literature and monographs, and the extraordinary development of all special departments makes the work of a Library Committee very difficult unless it has a rich appropriation. In a year or two we should be able to give the committee at least double the present allowance.

There are several ways in which we can all help. Bring in new members; every additional annual subscription adds so much to the library. You can join the Book and Journal Club, which is, as you know, a voluntary organization among members of the Faculty. This year, as Dr. Harry Friedenwald's report will show, we have more than one hundred members, and the club has subscribed to more journals for the library than the Library Committee. This is an excellent way of helping ourselves. The club should next year have at least two hundred members, and present \$1,000 worth of new books and journals. And lastly, many of you can help by filling out our imperfect sets of native and foreign journals. Will not one or two of our gynæcological brethren take the trouble to look into the defects in the journals in their department? A little money spent quietly in this way will lighten their pockets and their hearts. There are gaping gaps which our surgeons might bridge over. A little personal interest on the part of the members will be much appreciated.

I envy Charles Frick the good fortune to go down to the future generations in this Faculty with his name linked to an important section of our library. Posthumously and by proxy, as it were, thus to carry on, though dead, the work he was interested in while living, is the nearest approach a man can make to cheating the great enemy, and in Charles Frick's case it is in a measure a compensation for the untimeliness of his taking off. It is proposed to make the Frick Library the strictly medical section, in contradistinction to general surgery, and obstetrics and gynæcology. How suitable it would be to connect also these departments with other names of men who have won sufficient recognition. Than this there is no more appropriate way to perpetuate an honored name in our ranks. The College of Physicians of Philadelphia has set a good example in the Samuel Lewis and the S. D. Gross Libraries,

which are so successfully kept up—the one in general medicine, the other in surgery.

*Pour encourager les autres*, I would like to refer to the splendid bequests which Nicholas Senn has made to the profession of Chicago. Many years ago he purchased the library of Prof. Baum, of Göttingen, containing some 16,000 volumes and pamphlets, and this he presented to the Newberry Library for the use of the physicians of Chicago, and now, this year he has bought the splendid scientific library of the late Prof. Du Bois Reymond.

Increased privileges and facilities bring necessarily increased responsibilities, of which the future holds for us a goodly store. Two years will bring around the centennial of the founding of the Faculty, an occasion which should be made memorable in a very special way. There is, as you know, a small indebtedness on account of this building, a mere bagatelle to the profession of a city of half a million. This must be met, and certainly the centennial celebration of this organization is an epoch important enough to demand a larger effort, for which the payment of the small debt will prove useful training. The Executive Committee has a plan, which it will bring before the members at an early date, asking them to subscribe varying sums for the years 1897, 1898 and 1899, to pay off our mortgage. A few may be relied upon to give \$200 a year for the three years; from a larger number we hope for \$100; others will give \$50; some \$25; and a larger number \$10. We hope not only to pay off the debt, but to leave a balance.

May I say a word on the art of giving? The essence is contained in the well-known sentence, "Let every man do according as he is disposed in his heart, not grudgingly or of necessity." Subscriptions to a cause which is for the benefit of the entire profession should truly be given as a man is disposed in his heart, not in his pocket, and assuredly not of necessity, but as a duty, even as a privilege, and as a pleasure. Some of us, the younger men, cannot give. The days of travail and distress are not yet over, and to give would be wrong. It is sufficient for such to have the wish to give; the elder brothers will bear your

share; only be sure to foster those generous impulses, which are apt to be intense in direct proportion to the emptiness of the purse.

Upon a second group we must chiefly depend—the men of moderate incomes, who have a balance, however small, at the end of the year. To devote a fraction of this to the needs of the profession by which they have lived is, on the lowest motives, good policy, on the highest, a delightful privilege.

Beyond a modest competency the sensible doctor does not aspire, but in the profession of every State there is a third group, composed of a few men, who, dry-nursed by us, sometimes by the public, have become prosperous, perhaps wealthy. Freely they have received, freely they should give. It must be acknowledged, however, that the admonition of Sir Thomas Browne, "should your riches increase, let your mind keep pace with them," is not always regarded by the men of this group. We have seen a good deal in the papers about the large fortunes left by doctors who have died in the past few years; but it has not been a pleasant feature to note, with scarcely an exception, either an entire neglect or a very beggarly remembrance of the profession in which these men had at any rate laid the foundation of their large fortunes.

The sum required is not large, and we may confidently hope that the committee who will have it in charge will within a few weeks obtain promises more than sufficient to meet it. If we make this little effort ourselves, we can try in the centennial year to obtain a proper endowment for the Faculty from our friends among the citizens. We shall need a larger hall, more in keeping with the rank and work of the profession of this city—quarters as complete as our brethren enjoy in Philadelphia and New York. And an endowment yielding a few thousand dollars annually is absolutely essential for the proper development of the library. I would offer as a suggestion that a Committee on Finance be appointed to take charge of this matter. It would be well subsequently to have a permanent Finance Committee.

And lastly, I would call the attention of the members to the fact that we are working under a somewhat antiquated and very much patched up set of by-laws. If you will turn to the last year's transactions you will find between five and six pages of resolutions, amendments, etc., affecting the Constitution, from 1885 to 1896 (inclusive). There are also anomalies in the Constitution which might be amended; thus the examining boards for the Eastern and Western Shores, respectively, have no longer any vital status in our organization since the licence is no longer granted by the Faculty. They might be replaced by a committee for the examination of the credentials of candidates for membership. I would suggest that a committee take charge of this whole matter, to report next year on the necessary changes, and give notice of motion for any alterations in the Constitution which are deemed advisable; then in 1899, our centennial year, the Constitution, By-laws, etc., could be all clearly and definitely presented for discussion and adoption.

In conclusion, may I paraphrase those noble words of Aristotle, in which he laid down the duty of the citizen to the state, as also peculiarly appropriate in defining the obligations of the doctor to his calling. No physician has a right to consider himself as belonging to himself; but all ought to regard themselves as belonging to the profession, inasmuch as each is a part of the profession; and care for the part naturally looks to care for the whole.

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A CLINICAL LECTURE  
ON  
THE BALL-VALVE GALL-STONE IN  
THE COMMON DUCT.

Delivered at the Johns Hopkins Hospital on January 22nd, 1897.

BY WILLIAM OSLER, M. D., F. R. C. P.,  
*Professor of Medicine at the Johns Hopkins University.*

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GENTLEMEN,—I will begin this lecture by showing you two interesting specimens. The first consists of the stomach, duodenum, and liver. Even from a distance you can see a nodular projection beneath the mucosa of the duodenum. On closer inspection this is seen to correspond to the papilla biliaria, the orifice of which lies a little to the side of the most prominent part of the projection. This nodular body is a hard, firm mass which can be moved up and down, and as I make it appear at the orifice of the duct you see that it is a rounded, dark gall-stone much too large to escape. On moving it up and down it cannot be passed out of the duodenal portion of the duct, but in this it has considerable play. On examining from the side of the duct the stone is seen to lie in a greatly distended diverticulum of Vater. The common duct is of about the size of my index finger, and the main hepatic ducts are also dilated. The cystic duct is wide, and the gall-bladder is perhaps a little enlarged. It did not at the time of the necropsy contain any stones. The dilated bile-ducts and the gall-bladder contained bile-stained mucus. There was neither

erosion nor ulceration in the bile passages. I have kept this specimen carefully for nearly ten years, and have frequently demonstrated it to classes of students. The history of the case is very instructive, particularly in connexion with the patient whom you will see in a few minutes.

In September, 1887, when I took charge of certain of the medical wards in the Philadelphia Hospital, there was a woman, aged forty years. It was the third or fourth time she had been admitted, each time with chills, fever, and jaundice. The attacks had recurred on and off for two years, during which period she had not passed two months without some tinge of icterus. The case had excited a good deal of attention, and I remember that in 1886 Dr. Bruen brought to me some of her blood to examine for the malarial parasites. The diagnosis of abscess of the liver had been made on several occasions, and the liver had been twice aspirated. When she first came under my care she was up and about in the ward, and showed only the slightest lemon tint of the skin and of the conjunctivæ. The stools were dark coloured. The liver appeared to be a little enlarged; the gall-bladder could not be felt. Early in October she had an attack of violent pain with vomiting and a moderately severe rigor, after which the temperature rose to nearly  $104^{\circ}$  F., with sweating, the entire paroxysm lasting for more than twelve hours. The following day she was much more jaundiced, the urine was very dark in colour, and the stools were putty-like. The liver was sensitive on pressure; the gall-bladder could not be felt. The jaundice deepened for three or four days and then gradually became less marked. Throughout the winter at intervals of a few weeks she had four or five attacks of a similar character. I lectured upon the case as one of Charcot's hepatic intermittent fever, due probably to a gall-stone lodged in the common duct, to which opinion I was led from the study of cases which I had seen in Montreal. Early in February I asked Dr. White to see the patient, and she consented to an operation. Perihepatitis was found at the margin of the liver, the gall-bladder was

not enlarged, and no gall-stones could be felt in the gall-bladder or in the duct. Three days subsequently she died from peritonitis.

Naturally I was much chagrined at the negative result of the operation. A necropsy was refused, and the friends removed the body to the country, but a personal interview enabled me to procure an examination, and I was allowed to remove the organs which you see before you for careful dissection. This patient had had for a period of nearly two and a half years attacks of jaundice with chills and fever—a very characteristic picture of the intermittent hepatic fever which Charcot and others have so fully described.

The second specimen is an almost exact counterpart. Projecting from beneath the mucous membrane of the duodenum close to the papilla biliaria is a nodular body of the size of an almond which can be pushed down to the orifice of the duct, when it is seen to be an oval gall-stone lying in the diverticulum of Vater, in which it has a certain degree of mobility. At the necropsy in this case it was very interesting indeed to note that on firm pressure on the gall-bladder bile could be forced past the stone into the duodenum. Both cystic and the common ducts are dilated to about the size of the little finger. The gall-bladder is of the size of a small pear. There is no other gall-stone. The contents of the common and cystic ducts were thin, yellow bile containing some dark granular matter. The colon was adherent to the gall-bladder and to the under surface of the liver. The liver weighed 1570 grammes; the surface was a little roughened. The cut section was bile-stained and showed moderate dilatation of the smaller ducts. The consistence of the organ was increased. It may be mentioned also in connexion with the case that there was a chronic diffuse nephritis. The further details of the necropsy, which is No. 758 in the Johns Hopkins Hospital Records, do not concern us. The history of this case has not quite the same interest as the other, but it presents identical features.

The patient was a man, aged sixty years, who was admitted to the hospital on Dec. 22nd, 1895. I had seen him on Nov. 23rd previously and had learned that he had been ill for rather more than three months with recurring attacks of slight jaundice and paroxysmal pain in the right side, which were sometimes accompanied by chills and fever. When I saw him he was slightly jaundiced, there was much irritability of the stomach, the liver was not enlarged, and the gall-bladder could not be felt. The condition had varied very much from time to time, being sometimes better and sometimes worse. He had had numerous attacks of chills and fever, following which the jaundice would become more intense. He had been actively treated for malaria. He grew progressively weaker, and when admitted to the hospital on Dec. 22nd he was very feeble and apathetic. He had a sallow, slightly jaundiced colour, with distinctly jaundiced conjunctivæ. The pulse was 106; he had no fever. His temperature at 4 A. M. on the 23rd was normal. He shortly afterwards had a chill, and by noon his temperature had risen to nearly 103° F. He had a great deal of pain in the right side of sufficient severity to require morphia. Sweating followed the fever, and the patient seemed to be somewhat more jaundiced. There was a small amount of albumin in the urine with granular casts and a distinct reaction for bile pigment. He became much more prostrated after this attack, had a good deal of pain at intervals, and was drowsy and apathetic. On the night of the 30th he had a severe attack of general convulsive twitching, and a slight rise in the temperature with ephidrosis occurred on the 31st. On Jan. 2nd he had Cheyne-Stokes respiration, became unconscious, and died on Jan. 4th. In this case the attacks of pain and intermittent paroxysms of fever enabled me to make a very positive diagnosis of a gall-stone in the common duct.

The consideration of these two cases and the inspection of the specimens will enable you to appreciate better the symptoms presented by the case which I will now ask to have

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brought into the lecture-room. The history of this patient, as taken by Dr. Gwyn, is as follows:—

A married woman, aged twenty-eight years, was admitted to the hospital on Nov. 28th, 1896, complaining of pain in the epigastrium. She had been a very healthy woman and had had two children. In July, 1894, she had a miscarriage. The first attack of her present trouble (in September, 1894) came on with vomiting, headache, and pain in the abdomen. The skin at this time was very sallow, but she did not think she became jaundiced. The urine was of a dark colour. She had distinct chills, severe and shaking. After an illness of three weeks she recovered and remained quite well until June, 1895. In this second attack she had nausea and vomiting, itching of the skin, jaundice, chills and fever, and pain in the epigastrium. It lasted about four weeks. The third attack was in September, 1895. She had, however, no paroxysm of pain, but she had chills at intervals, and there was slight tinging of the whites of the eyes. Recurring attacks of chills and fever persisted until Christmas. The fourth attack came on in March, 1896. It began with nausea, vomiting, and pain in the epigastrium and under the right costal margin passing back to the right shoulder. She became very jaundiced and had much itching of the skin. The pain was much more intense than in any previous attack, and she had to have morphia. She had recurring chills and fever, and the jaundice persisted for nearly three months. The fifth attack, for which the patient came to the hospital, began on Sept. 1st with nausea, occasional vomiting, headache, itching of the skin, deep-coloured urine, and slight tinging of the conjunctivæ. She had no pain in this attack, but frequent chills recurred until a week before admission to the hospital. The jaundice had been very slight. The chills had been the same in all the attacks. They came on every few days, sometimes quite regularly every other day, lasting fifteen or twenty minutes, and were followed by high fever and occasional sweating. On admission the patient was found to be a well-

nourished, healthy-looking woman. The skin was a little sallow, not distinctly jaundiced, and the conjunctivæ were slightly tinged. There was nothing abnormal on examination of the chest. The abdomen was a little full, tympanitic, with no areas of abnormal resistance. The liver dulness began at the sixth rib in the nipple-line and barely reached the costal margin. The edge of the liver could not be felt. There was no tenderness on deep pressure in the epigastric region. The gall-bladder was not palpable. The spleen could not be felt. On Nov. 30th the yellow colour of the skin was more marked, and there was bile reaction in the urine. The stools were light in colour. On Dec. 4th there was a little tenderness in the right hypochondriac region, and the patient had had slight pain in this region on the previous day. She remained in hospital until Dec. 6th. She had no chills, and the temperature was under 100° F. The jaundice had almost disappeared and she had gained in weight. She felt well until the day before Christmas, when she became nauseated and was sick at her stomach. On Christmas eve she had a violent chill with high fever and pain of such severity in the region of the liver as to require a hypodermic injection of morphia. The jaundice was intensified the following day and increased considerably. She returned to-day (Jan. 22nd, 1897) to report upon her condition. You see that she is a healthy-looking woman, well nourished, and were it not for the very slight jaundice persisting nothing special would be noted about her. The abdomen is full, a little large, and the panniculus is well preserved. Palpation in the liver region is negative. There is no pain on deep pressure. The edge of the liver cannot be felt, and the gall-bladder is not palpable. Within two years and four months this patient has had at least six attacks of pain in the region of the liver, with chills, fever, and jaundice. The latter has been a variable symptom, sometimes very intense, but if we may judge from her condition on admission on Nov. 28th, 1896, even in the intervals the jaundice does not entirely disappear.

You notice the remarkable similarity in the history of these three cases: jaundice, usually of slight grade but increasing at times in intensity, attacks of pain in the region of the liver, and paroxysms of intermittent fever. The duration of the illness in the first case was two years and a half, in the second between four and five months, and in the woman you have just seen two years and four months. I have no hesitation in making the diagnosis of ball-valve stone in the common duct in the case before you, but before I proceed to speak fully of this condition and of its symptomatology, let me refer for a moment to two anatomical points of special interest in connexion with cholelithiasis.

We do not know what starts a stone on its migrations. In a large proportion of all cases so long as the calculi remain in the gall-bladder they do little or no harm. This statement is borne out by the frequency with which gall-stones are found post mortem in persons who have presented no symptoms whatever and whose gall-bladders show little or no change. Once started, a stone has two main obstacles to overcome. The cystic duct is not a simple tubular structure, but has a very remarkable reduplication of its mucosa known as the Heisterian valve. If you attempt to pass a probe or a pair of probe-pointed scissors into the cystic duct you will find that the point is interrupted by valvular folds which sometimes encircle the entire tube and are very much like the *valvulae conniventes*. Sometimes the arrangement is that of a spiral valve. In other cases there is no symmetry whatever, and the valves may have the free edges directed upwards towards the gall-bladder, or downwards towards the common duct. Both at the neck of the gall-bladder and at the junction of the cystic with the hepatic duct the folds may be unusually prominent. No possible arrangement could be more unfavourable for the passage of a gall-stone; a small one may get lodged beneath the valvular folds, indeed I have seen one tucked in beneath the strong fold sometimes present at the neck of the gall-bladder. Biliary colic is probably an expres-

sion of the difficulties a stone has in passing through the valvular folds in the cystic duct. Once in the common duct a stone of medium size has little or no difficulty until it reaches the duodenal portion, the anatomical relations of which may for a moment engage our attention. The bile and pancreatic ducts open by an orifice which is smaller than the lumen of the conjoint ducts, and the opening is usually on a prominent papilla on the mucosa of the duodenum. Between the point of junction of the two ducts and the orifice in the papilla biliaria there is a dilatation, the diverticulum or ampulla of Vater. In this part of the duct the ball-valve stone often lodges. The intermittent filling of the gall-bladder almost assumes the existence of a sphincter choledochi, yet no mention is made of such a structure in the text-books (Quain or Henle). Oddi<sup>1</sup> has demonstrated this sphincter in different animals and in man, and Dr. L. F. Barker has been kind enough to prepare for me several specimens by his method which show the fibres very clearly. Doyon<sup>2</sup> claims to have determined the biliary reflex—the afferent fibres pass in the vagus, and the efferent in the splanchnic—and states that stimulation of the central end of the vagus causes contraction of the gall-bladder and at the same time relaxation of the sphincter choledochi. Upon the importance of this sphincter choledochi in the history of gall-stones very little stress has been laid, except by Leichtenstern in his recent section on Diseases of the Bile Passages in Penzoldt and Stintzing's "Handbuch."<sup>3</sup> He states that sometimes macroscopically, as well as microscopically, hypertrophy of this sphincter can be seen in old cases of gall-stone impaction. To another point he refers (of great importance in connexion with the condition of the gall-bladder in these cases)—viz., that the physiological filling of the gall-bladder with bile is a function of

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<sup>1</sup> Di una Speciale Disposizione a Sfintere Allo Sbocco del Coledoco, Perugia, 1887.

<sup>2</sup> Archives de Physiologie, January, 1894.

<sup>3</sup> Band 4, 1896.

this sphincter. It is in this duodenal portion that the typical ball-valve stone is most frequently found, as in the two specimens which I have demonstrated to you, though it may lie loose in the duct. Let me call to your remembrance the fact that pressure on the gall-bladder in the second specimen could make the bile flow past the obstructing stone. My attention was first called to this condition many years ago, and in a lecture which I published in 1881,<sup>1</sup> on *Some of the Effects of Chronic Impaction of Gall-stones*, I remarked "that a gall-stone may remain permanently lodged in the *pars intestinalis* and yet not be impacted. In such instances it may still permit the passage of bile past it, or it may act as a ball valve, only permitting of the flow when the distension behind has reached a certain point." In several cases the stone in the *diverticulum of Vater* was so placed that it could be moved up and down to act as a sort of ball valve; and clinically I had had an opportunity of studying two cases (Nos. 11 and 12 of those reported in the lecture) in which the remarkable train of symptoms seemed best explained by this ball-valve action of a stone in the common duct. Subsequently, in a paper on *Fever of Hepatic Origin*,<sup>2</sup> particularly the intermittent pyrexia associated with gall-stones, I called attention especially to the importance of recognising a group of cases of obstruction of the common duct characterised by the following symptoms: "First, jaundice of varying intensity, deepening after each paroxysm, and which may persist for months or even for years; second, ague-like paroxysms characterised by chill, fever, and sweating, after which the jaundice usually becomes more intense; and, third, at the time of the paroxysms pains in the region of the liver, with gastric disturbance." In this paper I considered at length the question of the hepatic intermittent fever which the French physicians, particularly Charcot, had so carefully described, and emphasised the following points:

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<sup>1</sup> *Medical Times and Gazette*, July 31st, 1881.

<sup>2</sup> *Johns Hopkins Hospital Reports*, vol. ii., 1890.

that recovery might follow even, as shown by the cases, after duration of the chills and fever and jaundice for several years; that this condition could be differentiated from suppurative cholangitis; and that the symptoms were probably caused by the ball-valve action of the stone. I added the following statement: "In all of these cases the obstruction is not complete, as shown by the presence of bile in the stools for long periods at a time. The association of the chills and fever with intensification of the jaundice must be more than accidental. The two must be correlated in some way, in all probability through a transient impaction of the stone in the duct. Such a condition might induce the chill, either through reflex irritation, as held by Murchison, or by preventing the escape from the bile passages of toxic ingredients—ferments produced by the action of micro-organisms—which are absorbed into the blood instead of escaping freely into the bowel. The impaction is probably overcome by a gradual increase in the *vis a tergo* until the duct is stretched to a point which permits the calculus to fall back into a wider portion. The pressure may reach such a grade that the stone is forced out, as happened in Case 2, and very likely in the other cases in which recovery followed." In both editions of my "Text-book of Medicine" I recognised the possibility of diagnosing the presence of the stone in the common duct and of differentiating the catarrhal from the suppurative cholangitis. I had seen many cases which seemed to bear out these statements, and had been in the habit in my classes and at meetings of societies of speaking of the ball-valve action of certain gall-stones. Not having seen my papers, Christian Fenger of Chicago, in the February and March numbers of the *American Journal of the Medical Sciences*, 1896, made the statement that "neither Courvoisier nor any other author seems to have observed the ball-valve action of floating stones in the common duct."

*Symptoms.*—What are the symptoms of gall-stones in the common duct? They are very variable. There may be none;

it may be dilated and full of stones so arranged that the bile can flow past them without much, if any, obstruction. I have twice seen a single small stone in the common duct which had apparently caused no disturbance. No one has laid down more clearly the symptoms of stone in the common duct than Naunyn:<sup>1</sup> “(1) The continuous or occasional presence of bile in the fæces; (2) distinct variations in the intensity of the jaundice; (3) normal size or only slight enlargement of the liver; (4) absence of distension of the gall-bladder; (5) enlargement of the spleen; (6) absence of ascites; (7) presence of febrile disturbance; and (8) duration of the jaundice for more than a year.” Now what I wish to bring out in connexion with the case you have just seen is the probable association of the intermittent features—pain, rigors, fever, and jaundice—with the ball-valve action of a stone in the common duct or its diverticulum—a view which offers a reasonable explanation of the remarkable phenomena of the case. This patient when you saw her in the ward looked a well-nourished, healthy woman with only the slightest trace of jaundice, chiefly noticeable in the conjunctivæ. Some of you may remember that I predicted another attack as very probable within a few months. In these protracted intervals I take it the gall-stone lies loose in the duct or its ampulla, and the pressure is sufficient to force the bile past it, though the persistence of the slight jaundice for weeks or months shows that the flow is not quite free. The onset of the paroxysms may be due to an acute infection with swelling of the mucosa about the stone and transient complete blocking of the duct, or the stone may be jammed tightly against the orifice of the duct. Impaction would account for the pain and the jaundice; the intermittent paroxysms of fever are probably due, as I suggested in the extract read a few minutes ago, to the absorption by the blood of the toxins produced by the micro-organisms which

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<sup>1</sup> Klinik der Cholelithiasis, and New Sydenham Society's edition, 1896, p. 107.

in the intervals of impaction pass into the bowel. The impaction is followed, of course, by stasis of the bile, a condition very favourable to the growth of the micro-organisms. I have recently had occasion to discuss with you the question of infection of the bile passages in a case of typhoid fever with colic and jaundice. Various organisms may be present without doing damage. Thus typhoid bacilli were present in the bile passages of seven persons who died from typhoid fever (seven of fourteen examined) not one of whom had during life given any signs of liver trouble. A stone in the common duct with stasis of the bile and catarrhal cholangitis favours the growth of organisms, which are always seeking entrance—in healthy persons in vain—at the portals of the ducts. Unfortunately in the necropsy upon the case from which the second specimen was obtained, though cultures were made from many parts—as is the custom in the post-mortem room—which were sterile, there is no specific note in the report about the bile passages. Infective cholangitis is present in all these cases, and to it the febrile phenomena are due. The large experience which we are daily receiving from the surgeons should very soon give us positive data as to the varieties of micro-organisms associated with this condition. To one point I would here direct your particular attention—viz., that this infective cholangitis may persist for years without causing suppuration in the ducts or ulceration of their walls. A knowledge of this fact has a very direct bearing on the prognosis and diagnosis of these cases.

*Diagnosis.*—The diagnosis of a stone in the common duct may often be made with reasonable probability, and while the rules laid down by Naunyn could not be bettered I am anxious to go further and to urge the possibility of recognising as a special variety the ball-valve stone. The group of symptoms to which I have referred (and which were shown so graphically in the case of the patient whom you have just seen as well as in those from which the specimens were taken) have not been sufficiently recognised by authors, and when

recognised have been too often misinterpreted. Let me again recall them. They are chronic jaundice, rarely deep, varying in intensity, at times almost or entirely disappearing to deepen invariably after a paroxysm (the icterus may be of maximum grade and associated with intolerable itching); pain, often a constant sense of discomfort, sometimes only an obscure gastric distress, and at others agonising, griping, and like ordinary liver colic; fever, occurring in paroxysms, usually preceded by a chill and followed by sweats, but there may be pyrexia alone; the chills may be quotidian or tertian in type or they may recur for weeks in succession on the same day; the spleen usually enlarges during the febrile paroxysms. Though persisting for months or even for years, the general health may be little, if at all, impaired, and in the intervals between the paroxysms a person may be able to work as usual. The cases are usually diagnosed as chronic malaria, abscess of the liver, or suppuration of the bile passages.

The regularity of the chills and the slight jaundice naturally suggest malaria. In almost every one of my cases the diagnosis of malaria had been made and the patient had been dosed with quinine for weeks or months. In Case 7, a man, aged sixty-four years, who had had jaundice with the intermittent fever, &c., for eleven months, was treated by a well-known Carlsbad physician for malaria, which opinion was concurred in by at least half a dozen physicians in Europe and in this country. The mistake is a very natural one, particularly if the patient has not very intense jaundice. The paroxysm is almost identical in its features with that of simple intermittent malarial fever. The periodicity may be striking, the chills recurring like a tertian or a quartan fever. The good condition in the interval, the absence of great enlargement of the liver or of enlargement of the gall-bladder, and the presence of enlarged spleen are all points which strongly suggest malarial fever. On the other hand, the absence of plasmodia in the blood, the occurrence of pain at the onset of the paroxysm, and the deepening of the jaun-

dice, which is usually of a grade more intense and quite different from the slight sub-icteroid hue of chronic malaria, should be sufficient to differentiate a case. Cases of simple intermittent fever do not resist the action of quinine. Chronic paludism also as a rule is associated with much more pronounced enlargement of the spleen.

Abscess of the liver can usually be excluded by the absence of tenderness and enlargement, local or general, the variable character of the jaundice, the good condition of the patient in the intervals of the paroxysms, the very chronic course in many cases, and the absence of progressive deterioration of health and strength. In the case from which the first specimen was taken the diagnosis of abscess of the liver had been made by several physicians, and exploratory punctures had been made on two or three occasions. Her general condition at the end of two years' illness seemed to me to exclude abscess.

As regards suppurative cholangitis, infective processes in the bile passages are very prone to end in pus formation, an only too common sequence of chronic impaction of stone in the common duct. I show you here a coloured drawing of a case of this sort in which you see the stone in the ampulla of Vater; the ducts were enormously dilated, even to the surface of the liver; the gall-bladder was greatly enlarged, full of pus, and the walls ulcerated. Now a majority of writers have regarded the hepatic intermittent fever as an indication, not simply of infective, but of suppurative cholangitis. In the present case, though the condition has persisted for more than two years, purulent inflammation of the bile-ducts can be positively excluded. When this serious complication is present the symptoms are those of pyæmia of a severe grade. Among the points to be considered are the following: (1) increased tenderness in the hepatic region with possibly enlargement of the gall-bladder, as this is a more common event in suppurative cholangitis than in simple obstruction of the duct; (2) the more frequent return of the paroxysms and, in some instances,

the irregularly remittent character of the fever; (3) the jaundice is not so intense in suppurative cholangitis, and we do not see the remarkable deepening in colour after the paroxysms; and (4) the general condition of the patient in the intervals is very different in the two conditions. When suppuration exists there are rarely the prolonged periods of apyrexia, the freedom from distress, and the general betterment which are so well illustrated in the case before you. And, lastly, the time element comes in as an important aid in diagnosis. As I mentioned a few moments ago, the good condition when she was in the ward of the patient in the present case was quite inconsistent with the idea of a purulent inflammation in the bile-ducts.

The ball-valve action is more likely to occur with a single stone, but the group of intermittent symptoms are not necessarily present. I have reported a case of a man, aged seventy years, who had been jaundiced for several years, but who had not had, so far as could be gathered, attacks of chills and fever. There was a gall-stone in the diverticulum of Vater which could not be pushed into the common duct. There was not, however, complete obstruction, as on squeezing the duct bile-stained mucus flowed from the orifice. A second stone of the size of an olive lay free in the common duct. I cannot speak positively about the clinical features of this case, which I did not see during life. The common duct may be full of calculi and, as is well known, there may be no suspicion of any trouble during life; the bile may flow, as water does in a rocky stream, between the stones. On the other hand, these cases of multiple calculi in the common duct may present marked intermittency in the symptoms. One of the first cases admitted to this hospital was a man, aged sixty-eight years, who had had jaundice of great intensity of three years duration, during which time he had scarcely passed three weeks without a chill of great severity. He died from cholæmia two days after admission. The common duct was distended into a sac and filled with gall-stones. The gall-bladder was

shrunken to a small sac tightly contracted around several gall-stones. There was a small ulceration between the duodenum and the common duct. The walls of the ducts were thickened, not ulcerated, and the contents were a viscid, yellowish, non-purulent material. There was an acute ulcerative endocarditis in this case. Other causes of chronic jaundice do not, so far as I know, give this clinical picture. In the pressure of a new growth, as from the pancreas, the jaundice is deeper, more enduring, as a rule, and there are not these singular intermittent features; pain is not so constant a symptom; infection of the bile passages is less frequent; there are often signs of secondary disease; the gall-bladder is enlarged (Courvoisier's rule) and palpable; there is progressive deterioration of health and strength; and, lastly, there are sometimes the special features of pancreatic diseases—fatty stools, &c.

The presence of the ball-valve stone in the diverticulum of Vater gives a possible clue to the absence of enlargement of the gall-bladder in these cases of obstruction from stone, a point to which a good deal of attention has been paid recently. This interesting observation we owe to Courvoisier, and it is of a good deal of diagnostic significance. Ecklin<sup>1</sup> has recently reviewed the question, and finds that of 172 cases of obstruction of the common duct by calculus in 34 the gall-bladder was normal, in 110 it was contracted, and in 28 it was dilated. Of 139 cases of occlusion of the common duct from other causes the gall-bladder was normal in 9, shrunken in 9, and dilated in 121. It seems quite possible that this absence of dilatation in obstruction by stone is associated with the disturbance in the normal reflex of the sphincter choledochi, an important function of which is, as Leichtenstern states, filling of the gall-bladder.

*Prognosis.*—What is the outlook in these cases? Let me give you briefly my personal experience.

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<sup>1</sup> Annales Suisses des Sciences Médicales, Series iv., Part 3.

CASE 1.—This was that of a woman, aged thirty years, in whom for eight months there were recurring attacks of pain with ague-like paroxysms and intensification of the jaundice. The gall-stone passed and the patient recovered.

CASE 2.—A woman, aged fifty-five years, from July, 1897, until August, 1882, had jaundice of varying intensity with recurring attacks of pain and intermittent fever. This case was one of unusual severity. Recovery was complete. The patient was in good health in 1888 when last heard from.

CASE 3.—A woman, aged forty years, had variable jaundice of two and a half years' duration; there were recurring attacks of intermittent fever with pain; an operation was performed, death ensued, and post-mortem a ball-valve stone was found in the diverticulum of Vater.

CASE 4.—A man, aged seventy years, had had jaundice of varying intensity for eleven months; there were repeated paroxysms of pain and intermittent fever; death followed from cholæmia.

CASE 5.—A woman, aged forty-six years, had been under observation for three years with attacks of pain and intermittent fever with intensification of the jaundice. The patient has been lost sight of.

CASE 6.—A woman, aged twenty-three years, suffered from jaundice of ten months' duration varying in intensity; there were paroxysms of hepatic intermittent fever, but the patient recovered.<sup>1</sup>

CASE 7.—This was that of a man, aged sixty-four years, who had had jaundice for two and a half years (May, 1890, to November, 1892), with recurring chills and fever with intensification of the jaundice; there was very little pain but great loss of weight. The patient has been in perfect health up to date (January, 1897) since recovery.

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<sup>1</sup>These cases have been reported in full in an article on Hepatic Intermittent Fever, Johns Hopkins Hospital Reports, vol. ii.

CASE 8.—A man, aged forty-four years, suffered from intermittent jaundice of many years' (fifteen?) duration; there were innumerable attacks of chills and fever recurring at intervals of from six weeks to six months. Several attacks occurred while under observation in 1892. The patient recovered and has been in perfect health since the spring of 1892.

CASE 9.—A man, aged sixty years, had jaundice varying in intensity for nearly six months; there were recurring attacks of pain with chills and fever; death occurred from cholæmia.

CASE 10.—A woman, aged twenty-eight years, for two and a half years has had intermittent attacks of jaundice with chills and fever. Her general health has been well maintained. This patient is the one now under observation.

Recovery followed spontaneously in five cases (in one after an indefinite period of years, in one after three years, in one after two and a half years, and in two cases after eight and ten months respectively), two died from cholæmia, one case was operated on and died, and one was lost sight of. The dangers are suppurative cholangitis, perforation of the duct, diffuse hepatitis, and remotely the development of cancer.

What shall we advise in the present case? The patient's life has been miserable for more than two years; all sorts of measures have been employed and the Pharmacopœia has been exhausted. The two remedies which are in vogue at present—phosphate of soda in large doses and olive oil—have been tried in vain. The medicinal treatment of gall-stones is a chapter in our therapeutics the leaves of which are best turned very rapidly. The man who believes he can dissolve gall-stones will probably tell you that he can abort an attack of pneumonia and that he can cure locomotor ataxia. So soon as they give serious trouble their removal by operation is the only rational method of treatment. When they are in the gall-bladder the operation in skilled hands has a minimum of risk. Kehr's recent statistics give one hundred and twenty-seven cholecystotomies with only one death. The question is a

very different one in the common duct cases. The operation is much more severe, the risks infinitely greater, and the results, even in the best hands, not nearly so good. Kehr has, however, had thirty cases with only two deaths—a remarkable record. In the present case the attacks are recurring with greater intensity and greater frequency, the bile passages have stood the irritation long enough, and I have urged her strongly to submit to an operation at an early date.

A knowledge of the significance of the group of symptoms to which I have called your attention will suggest to surgeons the advisability of seeking the obstruction in the terminal portion of the duct. In the specimens before you the stones lie in reality within the duodenum, projecting beneath its mucosa, and would be more accessible through an incision in the gut than by a choledochotomy.

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# NURSE AND PATIENT

BY

WILLIAM OSLER, M. D.



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#### NOTE

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This address did double duty—first at the Commencement Exercises of the Philadelphia Hospital Training School, February, 1897, and again on June 3rd, at the Sixth Annual Commencement of the Johns Hopkins Hospital Training School for Nurses.



## NURSE AND PATIENT

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**T**HE trained nurse as a factor in life may be regarded from many points of view—philanthropic, social, personal, professional and domestic. To her virtues we have been exceeding kind—tongues have dropped manna in their description. To her faults—well let us be blind, since this is neither the place nor the time to expose them. I would rather call your attention to a few problems connected with her of interest to us collectively,—and individually, too, since who can tell the day of her coming.

Is she an added blessing or an added horror in our beginning civilization? Speaking from the point of view of a sick man, I take my stand firmly on the latter view, for several reasons. No man with any self-respect cares to be taken off guard, in *mufti*, so to speak. Sickness dims the eye, pales

the cheek, roughens the chin, and makes a man a scare-crow, not fit to be seen by his wife, to say nothing of a strange woman all in white or blue or gray. Moreover she will take such unwarrantable liberties with a fellow, particularly if she catches him with fever; *then* her special virtues could be depicted by King Lemuel alone. So far as she is concerned you are again in swathing bands, and in her hands you are, as of yore, a helpless lump of human clay. She will stop at nothing, and between baths and spongings and feeding and temperature-taking you are ready to cry with Job the cry of every sick man—"Cease *then*, and let me alone." For generations has not this been his immemorial privilege, a privilege with vested rights as a deep-seated animal instinct—to turn his face toward the wall, to sicken in peace, and, if he so wishes, to die undisturbed? All this the trained nurse has, alas! made impossible. And more, too. The tender mother, the loving wife, the devoted sister, the faithful friend, and the old servant who ministered to his wants and carried out the doctor's instructions so far as were consistent with the sick man's wishes—all, all are gone, these old familiar faces; and now you reign supreme, and have added to every illness a domestic complication of which our fathers knew nothing. You have upturned an inalienable right in displacing those whom I have just mentioned.

*NURSE AND PATIENT*

You are intruders, innovators, and usurpers, dislocating, as you do, from their tenderest and most loving duties these mothers, wives and sisters. Seriously, you but lightly reckon the pangs which your advent may cause. The handing over to a stranger the care of a life precious beyond all computation may be one of the greatest earthly trials. Not a little of all that is most sacred is sacrificed to your greater skill and methodical ways. In the complicated fabric of modern society both our nursing and our charity appear to be better done second-hand, though at the cost in the one case as in the other of many Beatitudes, links of that golden chain, of which the poet sings, let down from heaven to earth.

Except in the warped judgment of the sick man, for which I have the warmest sympathy, but no respect, you are regarded as an added blessing, with, of course, certain limitations. Certainly you have made the practice of medicine easier to the physician; you are more than the equivalent of the old two hourly doses to a fever patient; and as the public grows in intelligence you should save in many instances the entire apothecary's bill. In his chapter on Instinct, in the *Origin of the Species*, Darwin gives a graphic account of the marvellous care-taking capacity of the little *Formica fusca*—a slave ant. One of these "introduced into a company of her masters who were helpless and

actually dying for lack of assistance, instantly set to work, fed and saved the survivors, made some cells, and tended the larvae and put all to rights." *Put all to rights!* How often have I thought of this expression and of this incident when at your word I have seen order and quiet replace chaos and confusion, not alone in the sick-room, but in the household.

As a rule, a messenger of joy and happiness, the trained nurse may become an incarnate tragedy. A protracted illness, an attractive Mrs. Ebb-Smith as nurse, and a weak husband—and all husbands are weak—make fit elements for a domestic tragedy which would be far more common were your principles less fixed.

While thus a source of real terror to a wife, you may become a more enduring misery to a husband. In our hurried progress the weak-nerved sisters have suffered sorely, and that deep mysterious undercurrent of the emotions, which flows along silently in each one of us, is apt to break out in the rapids, eddies and whirls of hysteria or neurasthenia. Of one of these unfortunates, by a finely measured sympathy and a wise combination of affection with firmness, you gain the full confidence, and become to her a rock of defence, to which she clings, and without which she feels again adrift. You become essential in her life, a fixture in the family, and at times a dark shadow

between husband and wife. As one poor victim expressed it, "She owns my wife body and soul, and, so far as I am concerned, she has become the equivalent of her disease." Sometimes there develops that occult attraction between women, only to be explained by the theory of Aristophanes as to the origin of the race; but usually it grows out of the natural leaning of the weak upon the strong, and in the nurse the wife may find that "stern strength and promise of control" for which in the husband she looked in vain.

To measure finely and nicely your sympathy in these cases is a very delicate operation. The individual temperament controls the situation, and the more mobile of you will have a hard lesson to learn in subduing your emotions. It is essential, however, and never let your outward action demonstrate the native act and figure of your heart. You are lost irrevocably, should you so far give the reins to your feelings as to "ope the sacred source of sympathetic tears." Do enter upon your duties with a becoming sense of your frailties. Women can fool men always, women only sometimes, and it may be the lot of any one of you to be such a castaway as the nurse of whom I was told a few weeks ago. The patient was one of those Alphonse Plessis-like creatures whom everybody had to love, and for whom the primrose path of dalliance had ended in a rigid rest cure.

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After three weary months she was sent to a quiet place in the mountains with the more sedate of the two nurses who had been with her. Miss Blank had had a good training and a large experience, and was a New England woman of the very best type. Alas! hers the greater fall! An accomplishment of this siren, which had produced serious symptoms, was excessive cigarette smoking, and Dr. —— had strictly forbidden tobacco. Three weeks later, my informant paid a visit to the secluded resort, and to his dismay found patient and nurse on the veranda enjoying the choicest brand of Egyptian cigarette!

While not the recipient of all the wretched secrets of life, as are the parson and the doctor, you will frequently be in households the miseries of which cannot be hid, all the cupboards of which are open to you, and you become the involuntary possessor of the most sacred confidences, known perhaps to no other soul. Nowadays that part of the Hippocratic oath which enjoins secrecy as to the things seen and heard among the sick, should be administered to you at graduation.

Printed in your remembrance, written as headlines on the tablets of your chatelaines, I would have two maxims: "I will keep my mouth as it were with a bridle," and "If thou hast heard a word let it die with thee." Taciturnity, a discreet silence, is a virtue little cultivated in these garru-

lous days when the chatter of the bander-log is everywhere about us, when, as some one has remarked, speech has taken the place of thought. As an inherited trait it is perhaps an infirmity, but the kind to which I refer is an acquired faculty of infinite value. Sir Thomas Browne drew the distinction nicely when he said, "Think not silence the wisdom of fools, but, if rightly timed, the honour of wise men, who have not the infirmity but the virtue of taciturnity,"—the talent for silence Carlyle calls it.

Things medical and gruesome have a singular attraction for many people, and in the easy days of convalescence a facile-tongued nurse may be led on to tell of 'moving incidents' in ward or theatre, and once untied, that unruly member is not apt to cease wagging with the simple narration of events. To talk of diseases is a sort of Arabian Nights entertainment to which no discreet nurse will lend her talents.

With the growth of one abominable practice in recent days I am not certain you have anything to do, though I have heard your name mentioned in connection with it. I refer to the habit of openly discussing ailments which should never be mentioned. Doubtless it is in a measure the result of the disgusting publicity in which we live, and to the pernicious habit of allowing the filth of the gutters as purveyed in the newspapers to pollute

the stream of our daily lives. This open talk about personal maladies is an atrocious breach of good manners. Not a month ago I heard two women, both tailor-made, who sat opposite to me in a street-car, compare notes on their infirmities in Fulvian accents audible to everyone. I have heard a young woman at a dinner table relate experiences which her mother would have blushed to have told to the family physician. Everything nowadays is proclaimed from the house-tops, among them our little bodily woes and worries. This is a sad lapse from the good old practice of our grandfathers, of which George Sand writes, "People knew how to live and die in those days, and kept their infirmities out of sight. You might have the gout, but you must walk about all the same without making grimaces. It was a point of good breeding to hide one's suffering." We doctors are great sinners in this matter, and among ourselves and with the laity are much too fond of 'talking shop.'

To another danger I may refer, now that I have waxed bold. With the fullest kind of training you cannot escape from the perils of half-knowledge, of pseudo-science, that most fatal and common of mental states. In your daily work you involuntarily catch the accents and learn the language of science, often without a clear conception of its meaning. \*I turned incidentally one day to a very

fine example of the nurse learned and asked in a humble tone what the surgeon, whom I had failed to meet, had thought of the case, and she promptly replied that "he thought there were features suggestive of an intra-canalicular myxoma;" and when I looked anxious and queried, "had she happened to hear if he thought it had an epiblastic or mesoblastic origin?" this daughter of Eve never flinched; "mesoblastic, I believe," was her answer. She would have handed sponges—I mean gauze—with the same *sang froid* at a Waterloo.

It must be very difficult to resist the fascination of a desire to know more, much more, of the deeper depths of the things you see and hear, and often this ignorance must be very tantalizing, but it is more wholesome than an assurance which rests on a thin veneer of knowledge.

A friend, a distinguished surgeon, has written, in the Lady Priestley vein, an essay on "The Fall of the Trained Nurse," which, so far, he has very wisely refrained from publishing, but he has permitted me to make one extract for your delectation. "A fifth common declension is into the bonds of marriage. The facility with which these modern Vestals fall into this commonplace condition is a commentary, shall I not say rather an illustration, of the inconsistency so notorious in the sex. The Association of Superintendents has in hand, I believe, a Collective Investigation dealing with this

question, and we shall shortly have accurate figures as to the percentage of lady superintendents, of head-nurses, or graduates and of pupils who have bartered away their heritage for a hoop of gold."

I am almost ashamed to quote this rude paragraph, but I am glad to do so to be able to enter a warm protest against such sentiments. Marriage is the natural end of the trained nurse. So truly as a young man married is a young man marred, is a woman unmarried, in a certain sense, a woman undone. Ideals, a career, ambition, touched though they be with the zeal of St. Theresa, all vanish before "the blind bow-boy's butt shaft." Are you to be blamed and scoffed at for so doing? Contrariwise, you are to be praised, with but this caution—which I insert at the special request of Miss Nutting—that you abstain from philandering during your period of training, and, as much as in you lies, spare your fellow workers, the physicians and surgeons of the staff. The trained nurse is a modern representative, not of the Roman Vestal, but of the female guardian in Plato's republic—a choice selection from the very best women of the community, who know the laws of health, and whose sympathies have been deepened by contact with the best and worst of men. The experiences of hospital and private work, while they may not make her a Martha, enhance her value in many ways as a life-companion, and it is a cause, not for

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reproach, but for congratulation, that she has not acquired immunity from that most ancient of all diseases—that malady of which the Rose of Sharon sang so plaintively, that sickness “to be stayed not with flagons nor comforted with apples.”

A luxury, let us say, in her private capacity, in public the trained nurse has become one of the great blessings of humanity, taking a place beside the physician and the priest, and not inferior to either in her mission. Not that her calling here is in any way new. Time out of mind she has made one of a trinity. Kindly heads have always been ready to devise means for allaying suffering; tender hearts, surcharged with the miseries of this ‘battered caravanserai,’ have ever been ready to speak to the sufferer of a way of peace, and loving hands have ever ministered to those in sorrow, need and sickness. Nursing as an art to be cultivated, as a profession to be followed, is modern; nursing as a practice originated in the dim past, when some mother among the cave-dwellers cooled the forehead of her sick child with water from the brook, or first yielded to the prompting to leave a well-covered bone and a handful of meal by the side of a wounded man left in the hurried flight before an enemy. As a profession, a vocation, nursing has already reached in this country a high development. Graduates are numerous, the directories are full, and in many places there is over-crowding,

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and a serious complaint that even very capable women find it hard to get employment. This will correct itself in time, as the existing conditions adjust the supply and demand.

A majority of the applicants to our schools are women who seek in nursing a vocation in which they can gain a livelihood in a womanly way; but there is another aspect of the question which may now be seriously taken up in this country. There is a gradually accumulating surplus of women who will not or who cannot fulfil the highest duties for which Nature has designed them. I do not know at what age one dare call a woman a spinster. I will put it, perhaps rashly, at twenty-five. Now, at that critical period a woman who has not to work for her living, who is without urgent domestic ties, is very apt to become a dangerous element unless her energies and emotions are diverted in a proper channel. One skilled in hearts can perhaps read in her face the old, old story; or she calls to mind that tender verse of Sappho:

As the sweet-apple blushes on the end of the  
bough, the very end of the bough, which the  
gatherers overlooked, nay overlooked not but could  
not reach.

But left alone, with splendid capacities for good, she is too apt to fritter away a precious life in an

aimless round of social duties, or in spasmodic efforts at Church work. Such a woman needs a vocation, a calling which will satisfy her heart, and she should be able to find it in nursing without entering a regular school or working in ecclesiastical harness.

An organized nursing guild, similar to the German Deaconesses, could undertake the care of large or small institutions, without the establishment of training schools in the ordinary sense of the term. Such a guild might be entirely secular, with St. James, the Apostle of practical religion, as the patron. It would be of special advantage to smaller hospitals, particularly to those unattached to Medical Schools, and it would obviate the existing anomaly of scores of training schools, in which the pupils cannot get an education in any way commensurate with the importance of the profession. In the period of their training, the members of the Nursing Guild could be transferred from one institution to another until their education was complete. Such an organization would be of inestimable service in connection with District Nursing. The noble work of Theodore Fliedner should be repeated at an early day in this country. The Kaiserwerth Deaconesses have shown the world the way. I doubt if we have progressed in secularism far enough successfully to establish such guilds apart from church organizations. The

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Religion of Humanity is thin stuff for women, whose souls ask for something more substantial upon which to feed.

There is no higher mission in this life than nursing God's poor. In so doing a woman may not reach the ideals of her soul; she may fall far short of the ideals of her head, but she will go far to satiate those longings of the heart from which no woman can escape. Romola, the student, helping her blind father, and full of the pride of learning, we admire; Romola, the devotee, carrying in her withered heart woman's heaviest disappointment, we pity; Romola, the nurse, doing noble deeds amid the pestilence, rescuing those who were ready to perish, we love.

On the stepping-stones of our dead selves we rise to higher things, and in the inner life the serene heights are reached only when we die unto those selfish habits and feelings which absorb so much of our lives. To each one of us at some time, I suppose, has come the blessed impulse to break away from all such ties and follow cherished ideals. Too often it is but a flash of youth, which darkens down with the growing years. Though the dream may never be realized, the impulse will not have been wholly in vain if it enables us to look with sympathy upon the more successful efforts of others. In Institutions the corroding effect of routine can be withstood only

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by maintaining high ideals of work; but these become the sounding brass and tinkling cymbals without corresponding sound practice. In some of us the ceaseless panorama of suffering tends to dull that fine edge of sympathy with which we started. A great corporation cannot have a very fervent charity; the very conditions of its existence limit the exercise. Against this benumbing influence, we physicians and nurses, the immediate agents of the Trust, have but one enduring corrective—the practice towards patients of the Golden Rule of Humanity as announced by Confucius: “What you do not like when done to yourself, do not do to others,”—so familiar to us in its positive form as the great Christian counsel of perfection, in which alone are embraced both the law and the prophets.

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## INFLUENCE OF LOUIS ON AMERICAN MEDICINE.\*

BY WILLIAM OSLER, M. D.

Harvey and Sydenham, types of the scientific and the practical physician, though contemporaries, were uninfluenced, so far as we know, by the other's work or method. Harvey had little reputation as a practical physician, and Sydenham cared little for theories or experiment. Modern scientific medicine, in which these two great types meet, had its rise in France in the early days of this century. True, there had lived and worked in England the greatest anatomist and medical thinker of modern times; but John Hunter, to whose broad vision disease was but one of the processes of nature to be studied, was as a voice crying in the wilderness to the speculative, theoretical physicians of his day.

Bichat's *Anatomie Générale* laid the foundation of the positive or modern method of the study of medicine, in which theory and reasoning were replaced by observation and analysis. Laennec, with the stethoscope, and with an accurate study of disease at the bedside and in the post-mortem room, almost created clinical medicine as we know it to-day.

The study of fevers occupied the attention of all the great physicians of the time. Fever—what it was, how it should be treated. What a vast literature exists between Sydenham and Broussais! What a desolate sea of theory and speculation!

No one had been more influenced by Bichat's brilliant teachings than Broussais, who ruled supreme in the medical world of Paris in the early decades of this century. A strong believer in careful observations at the bedside and in the post-mortem room, he was led into hopeless error in attributing

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\*Read before the Stillé Society of the Medical Department of the University of Pennsylvania.

fevers and many other disorders to irritation in the stomach and intestines—his gastro-enteritis.

Writing in the American Medical Recorder, July, 1821, an American student, Dr. F. J. Didier, says of the Paris professors of that date, "They were always talking of Hippocrates, Galen, Celsus, etc., as if not a particle had been added to the stock of knowledge since their time." And again, "The doctrines of John Brown, mixed up with the remnants of humoral pathology, form the basis of the present system."

The same mixture prevailed early in the fourth decade, as you may see from Broussais' Pathology, the American edition of which was issued in 1832, and from Jackson's (Samuel) Principles of Medicine, published in the same year.

Upon this scene, when Broussais was at the height of his fame, came Louis. He, with his friends Andral and Chomel, were very important factors in substituting finally in the study of medicine, for speculation and theory, observation and method.

The chief facts in Louis' life may be thus briefly stated. He was born in 1787 at Aï. He began the study of law, but abandoned it for that of medicine. He seems not to have been of a very strong constitution, as he did not pass the inspection for military service. He began the study of medicine at Rheims, and completed his course in Paris, where he graduated in 1813, in the twenty-seventh year of his age. While waiting at home, hesitating what he should do, M. le comte de Saint-Priest, who occupied an official position in Russia, happened to stay for a few hours in the town of Aï to see Louis' family, and it was suggested that the young physician should accompany him to Russia. He consented and in St. Petersburg obtained a diploma to practice. For three years he seems to have had no settled abode, but wandered about with his friend, who was Governor of one of the provinces. He then settled in Odessa, where he remained for four years and practiced with great success. In the last year of his stay in Odessa he was very much disturbed by the high rate of mortality in children with diphtheria, and this appears to have determined him to abandon for a time the practice of medicine and to devote himself to study. With this object in view he returned to Paris and for six months attended the

practice at the Children's Hospital. Among the younger physicians in Paris he found an old fellow-pupil, Chomel, physician to La Charité, who offered him opportunities for work in his wards. Louis at this time was thirty-four years of age. Here for six years uninterruptedly he set himself to work to study disease in the wards and in the post-mortem room. At first he appears to have occupied the position simply as a voluntary assistant and friend of Chomel, but subsequently he became his *chef-de-clinique*, and during this period he occupied a room in the entresol of the hospital. He was a voluminous note-taker and collected in this time an enormous number of important facts.

This remarkable feature in Louis' life has scarcely been dwelt upon sufficiently. I know of no other parallel instance in the history of medicine. It is worth while reading the brief extract from Dr. Cowan's introduction to his translation of the work on Phthisis. "He entered the hospital of La Charité as a *clinical clerk*, under his friend, Professor Chomel. For nearly *seven years*, including the flower of his bodily and mental powers (from the age of thirty-three to forty), he consecrated the whole of his time and talents to *rigorous, impartial observation*. All private practice was relinquished, and he allowed no considerations of personal emolument to interfere with the resolution he had formed. For some time his extreme minuteness of inquiry and accuracy of description were the subjects of sneering and ridicule, and *cui bono?* was not infrequently and tauntingly asked. The absence of any immediate result seemed for a time to justify their contempt of a method involving too much labor and personal sacrifice to be generally popular or easily imitated; and M. Louis himself, at moments, almost yielded to the increasing difficulties of the task he had undertaken. No sooner, however, were his facts sufficiently numerous to admit of numerical analysis than all doubt and hesitation were dissipated, and the conviction that the path he was pursuing could alone conduct him to the discovery of truth became the animating motive for future perseverance. Many of the results to which he arrived soon attracted general attention, and among those who had formerly derided his method while they admired his zeal, he found many to applaud and a few to imitate. From this moment may be dated the

presence of that strong impression of the necessity of exact observation by which the school of Paris has been since so distinguished, and which is now gradually pervading the medical institutions of the continent and our own country; it is undoubtedly to the author of the present volume that we ought to ascribe the practical revival of that system, which had for ages been verbally recognized but never before rigorously exemplified."

The following works appeared as a direct result of his studies during these six years:\*

"In 1823, a memoir on perforation of the small intestines, in acute diseases; a second, on croup in the adult; a third, on the communications between the right and left cavities of the heart (*Archives de médecine*).

"In 1824, two memoirs on the pathological anatomy of the mucous membrane of the stomach; another on pericarditis.

"In 1826, a memoir on abscess of the liver; another on the condition of the spinal marrow in Pott's disease; a third on sudden and unforeseen deaths; a fourth upon slow but anticipated deaths, but which anatomy will not explain; a fifth on the treatment of tænia by the Darbon potion (*Archives de médecine*).

"In 1825, his *Anatomical Researches, etc.*, on Phthisis (1 vol. 8vo); reprinted with many additions in 1843.

"In 1828, *Researches on the Typhoid Affection or Fever* (2 vols. 8vo); reprinted with many additions in 1841."

Louis introduced what is known as the Numerical Method, a plan which we use every day, though the phrase is not now very often on our lips. The guiding motto of his life was "*Ars medica tota in observationibus*," in carefully observing facts, carefully collating them, carefully analyzing them. To get an accurate knowledge of any disease it is necessary to study a large series of cases and to go into all the particulars—the conditions under which it is met, the subjects specially liable, the various symptoms, the pathological changes, the effects of drugs. This method, so simple, so self-evident, we owe largely to Louis, in whose hands it proved an invaluable

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\**Brief Memories of Louis and some of his Contemporaries.* H. I. Bowditch, Boston, 1872.

instrument of research. He remarks in one place that the edifice of medicine reposes entirely upon facts, and that truth cannot be elicited but from those which have been well and completely observed.

American medicine felt the influence of Louis through two channels, his books and his pupils. Let us speak first of the former. No French writer of the century has had such a large audience in this country; all of his important works were translated and widely read. The work on phthisis, the first important outcome of five years' hard work at La Charité in Chomel's wards, was published in 1825. Much had already been done by physicians of the French school on this subject. Bayle's important *Recherches* had been issued in 1810, and Laennec had revolutionized the study of phthisis by the publication of his treatise on auscultation. I cannot enter into any detailed analysis of the work, but it is one which I can commend to your notice as still of great value, particularly as a model of careful observation. The work was based upon the study of 123 cases observed in Chomel's clinic. The lesions observed at autopsy are first described under the different organs, with great accuracy and detail, and then summarized, following which is an elaborate description of the symptomatology. I do not know of any single work on pulmonary tuberculosis which can be studied with greater profit to-day by the young physician. The fifty years which have elapsed since its publication, and the changes which have taken place in our ideas of tuberculosis, diminish naught from the value of his careful anatomical and clinical presentation of the subject.

In 1829 appeared his second great work, *Anatomical, Pathological and Therapeutical Researches upon the disease known under the name of gastro-enterite, putrid, adynamic, ataxic, typhoid fever, etc., compared with the most common acute diseases*. It was based upon 138 observations made between 1822 and 1827. He analyzed and determined the lesions found in fifty patients who had died of the typhus fever, and compared these with alterations found in other acute diseases. Altogether for this work he states that he analyzed the changes in the viscera of 133 subjects and the symptoms of nearly 900. In his introduction to this work he quotes a sentence from

Rousseau which is always to be kept in mind: "I know that truth lies in the facts, and not in the mind that judges of them, and that the less I introduce what is merely my own into the deductions I make from them, the more certain I shall be of approaching the truth." This work was translated by Dr. H. I. Bowditch in 1836. At the time of Louis' observations, although differences were recognized between the various forms of continued fevers, the profession had no accurate knowledge of the subject. It so happened that at this period the disease prevailing at Paris known as typhus was almost entirely what we now call typhoid fever, so that the anatomical lesions found by Louis in his fifty autopsies were chiefly in the intestines; in all the Peyer's glands were diseased. His method was to analyze carefully the appearances found in the different organs in the series of fever cases, and compare them with patients who had died of other acute diseases; thus of course the contrast was striking in the very matter of involvement of Peyer's glands, which were more or less seriously changed in structure in all of the patients with the fever, while in the persons dead of other acute diseases the elliptical patches had no special redness or softening.

The symptomatology was also given in great detail, and the same painstaking comparisons were instituted between the subjects of the typhoid affection and those of other acute diseases. Louis' work convinced a majority of the members of the Paris school that the essential lesions in continued fevers were in the intestines, and Louis himself appears not to have had any idea whatever that the disease which he was studying was in any way different from the disease prevailing in other parts of Europe and which we now know as typhus fever.

The next important memoir, the essay on Blood-letting, had a very potent influence on professional opinion in this country. It appeared in Paris in 1835 and was translated by G. C. Putnam, with an introduction and appendix by Dr. James Jackson. As this learned physician remarks in his preface, "If anything may be regarded as settled in the treatment of disease, it is that blood-letting is useful in the class of diseases called inflammatory, and especially in inflammations of the thoracic viscera." When one reads the reports of the treatment by bleeding up to about the year 1840, one is

almost forced to ask the question, are the diseases the same? or surely the patients must have possessed much more powerful constitutions than those which we are called upon to treat at the end of the century.

At the time of Louis' return to Paris, under the influence of Broussais' doctrine of irritation, local and general blood-letting was practised more extensively than at any previous period in the history of medicine. As an interesting illustration it may be mentioned that the trade in France and Spain in leeches had developed to proportions which assumed really those of a national industry, and even in this country I believe one of the medical societies offered a prize for the best demonstration of the practical method of cultivating leeches for medicinal purposes.

It must have been a terrible shock to Broussais and his adherents when Louis attacked the subject of blood-letting in pneumonia with his numerical method. For this purpose he analyzed 78 cases, 28 of which proved fatal, and in a second series 29 cases with 4 deaths. Among his conclusions were that pneumonitis is never arrested at once by blood-letting, and that the supposed happy effect on the progress of the disease was very much less than was commonly believed. Incidentally he remarks with reference to the practice of blistering which was in vogue at the time, that he had rejected the practice after the treatment of 140 cases of pleurisy without losing a case. I would refer you particularly to Putnam's translation of this article, which you can obtain in any of the libraries, not only for Louis' work, but for the excellent introduction by Dr. Jackson on the value of the numerical method in medicine, and also for the appendices, analyzing the pneumonia cases of the Massachusetts General Hospital from 1824 to 1834 (inclusive).

To American students one of Louis' most valuable works is his *Research on the Yellow Fever in 1828*. On the 1st of November, 1828, Louis, with Chervin and Trousseau, left for Gibraltar, where the disease prevailed. They made a very careful study of the symptoms and morbid anatomy, and on their return to Paris made a report to the Academy of Medicine, but the work remained in manuscript until Dr. Geo. C. Shattuck translated it into English and it was published by

the Massachusetts Medical Society as Vol. X of their Library of Practical Medicine. The work did not appear in French until 1844. It is chiefly valuable as a very accurate and careful record of a series of cases studied clinically and anatomically.

Powerful as was the effect of Louis' writings on American medicine, it cannot compare with the influence which he exerted through his pupils, who "caught his clear accents, learned his great language, made him their model." Of the great triumvirate of the French school of the fourth decade, Louis possessed a singular power of attracting hard-working, capable men, and this in spite of the fact that his rivals and friends, Chomel and Andral, possessed more brilliant gifts of a certain kind. As a writer in the *Lancet* said (1872, II), "Year by year fresh bands of students came to imbibe from his lips the instruction which their predecessors had abandoned with reluctance, till his academic progeny knew no distinction of race or even color, but coalesced into a noble band of enthusiasts in the cause of medicine, of science and of humanity." In this academic progeny Louis' American pupils take a very unusual position. Among the thousands in the profession of this country who have during this century sought light and learning in the older lands, the group of young men who studied in Paris, between 1830 and 1840, had no predecessors and have had no successors. Partly because the time was ripe and they were active agents in bringing the new art and science to the New World, partly owing to inherent capabilities, etc., but not a little because the brightest minds among them fell under the influence of Louis—they more than any others gave an impetus, which it still feels, to the scientific study of medicine in the United States.

There had been, of course, in Paris many students from this country prior to 1830, but they do not form a school, recognizable to us at present. One name comes to my mind, that of the Rhode Island philosopher, Elisha Bartlett, a peripatetic of the peripatetics, in the days when men moved from city to city, like the Sophists of ancient Greece. I do not know whether when in Paris in 1828 he came personally under Louis' influence—probably not, as Louis spent part of that

year in Spain—but he brought back recent French methods, with Gallic lucidity and a keen appreciation of the value of the numerical method. His well known work on Typhus and Typhoid Fever, issued in 1842, is in itself a lasting witness to the intelligence and progressive character of the younger teachers of that day. With a clear separation of Typhus, Typhoid, the Periodic and Yellow Fevers, it had at the date of its publication no counterpart in European literature, and is in remarkable contrast to the chaotic treatises of Armstrong, Fordyce, Tweedie, Southwood Smith and others.

Without attempting to give a complete list, the following were among the American students in Paris between 1830 and 1840:

From Boston, James Jackson, Jr., H. I. Bowditch, Oliver Wendell Holmes, Geo. C. Shattuck, Jr., John D. Fisher, J. C. Warren (then past middle age), and J. Mason Warren.

From New York, John A. Swett, Abraham Dubois, Alonzo Clark, Charles L. Mitchell, Charles D. Smith, Valentine Mott, Sr., and John T. Metcalf.

From Philadelphia, Geo. W. Norris, W. W. Gerhard, Casper W. Pennock, Thomas Stewardson, Alfred Stillé, Thomas D. Muter, J. Campbell Stewart, Charles Bell Gibson, John B. Biddle, David H. Tucker, Meredith Clymer, Wm. P. Johnston, W. S. W. Rushenberger, Edward Peace, William Pepper, Sr.

From Baltimore, William Power.

From the South, Peter C. Gaillard, Gibbs, and Peyre Porcher of Charleston; J. L. Cabell, L. S. Joynes, Selden and Randolph of Virginia.

“And many more whose names on earth are dark”—men of the stamp of Dr. Bassett of Alabama, who felt the strong impulsion to know the best that the world offered, every one of whom has left a deep and enduring impression in his sphere of work.

It would be impossible to tell in detail how Louis' students brought back his spirit and his methods to their daily work, and of the revolution which they gradually effected in the study and in the treatment of disease. I can best, perhaps, fulfill my object by referring somewhat fully to two of the most distinguished among them, James Jackson, Jr., and W. W. Gerhard.

James Jackson, Jr., is the young Marcellus among the physicians of this country, "the young Marcellus, young, but great and good." I do not know in our profession of a man who died so young who has left so touching a memory. He was the son of Dr. James Jackson, of Harvard, one of the most distinguished of New England's physicians, a man to whom our generation owes a heavy debt, since he, with Jacob Bigelow, was mainly instrumental in bringing about more rational ideas on the treatment of disease. Of Louis' pupils from this side of the water, young Jackson seems to have been his special favorite. After taking the B. A. degree at Cambridge in 1828, Jackson attended the medical lectures at Harvard, and in the spring of 1831 went to Paris, where he remained until the summer of 1832. Returning home in 1833, he graduated in medicine at Harvard in 1834. In the two years and a half of his studies in this country before going abroad he had had exceptional opportunities with his father at the Massachusetts General Hospital, and showed his early industry and ability by taking one of the Boylston Prize Essays before the completion of his second year of study.

In Paris he attended the practice of La Pitié and St. Louis. He soon became devoted to Louis, and by him was utilized to the full in the cholera epidemic in 1832. Two letters from Louis to James Jackson, Sr., show how important he thought a prolonged period of study was for a young man. He says: "I pointed out to him (James Jackson, Jr.) the advantage it would be for science and for himself if he would devote several years exclusively to the observation of diseases. I now retain the same opinion and am strengthened in it; for the more I become acquainted with, and the more I notice him applying himself to observation, the more I am persuaded that he is fitted to render real service to science, to promote its progress. I find that he would be well pleased to follow for a certain period the vocation for which nature has fitted him; but he has stated to me that there are many difficulties which would prevent his devoting himself exclusively to observation for several years. But can these difficulties be insurmountable?"

And again: "Let us suppose that he should pass four more years without engaging in the practice of medicine, what

a mass of positive knowledge will he have acquired! How many important results will he have been able to publish to the world during that period! After that he must necessarily become one of the bright lights of his country; others will resort to him for instruction, and he will be able to impart it with distinguished honor to himself. If all things be duly weighed, it will appear that he will soon redeem the four years, which men of superficial views will believe him to have lost." In another letter, the following year, just before young Jackson's departure from Paris, he refers again to this question and urges Dr. Jackson to allow his son to devote himself exclusively to observation for several years in Boston. The extract from this letter is worth quoting. "Think for a moment, sir, of the situation in which we physicians are placed. We have no legislative chambers to enact laws for us. We are our own lawgivers; or rather we must discover the laws on which our profession rests. We must *discover* them and not invent them; for the laws of nature are not to be invented. And who is to discover these laws? Who should be a diligent observer of nature for this purpose, if not the son of a physician, who has himself experienced the difficulties of the observation of disease, who knows how few minds are fitted for it, and how few have at once the talents and inclination requisite for the task? The inclination especially, for this requires that the observer should possess a thorough regard for truth, and a certain elevation of mind, or rather of character, which we rarely meet with. All this is united in your son. You ought—for in my opinion it is a duty—you ought to consecrate him for a few years to science. This, sir, is my conviction, and I hope it will be yours also. I know very well that every one will not be of the same opinion; but what matters it, if it be yours?—if you look upon a physician, as I do, as holding a sacred office, which demands greater sacrifices than are to be made in any other profession."

Young Jackson's letter to his father, just as he was quitting Paris, indicates on what affectionate terms he had lived with Louis. "In two hours I am out of Paris. I will not attempt to describe to you the agony it gives me to quit Louis. He is my second father, and God knows that is a name I of all men cannot use lightly. I may not persuade you to look upon

him with my eyes exactly as a scientific man; but in your heart he must have the share of a brother; for he almost shares my affection with you. From one upon whom I had no claims but those which my life and mind and habits gave me, I have experienced a care, an affection which I never could dare expect from any but my dear father, and which I shall ever feel to be the most honorable and truly worthy prize of my life."

He seems to have inspired the same tender feelings in all his American students. In the *Memoir* of Dr. Bowditch, to which I have already referred, he speaks of Louis' fatherly kindness to him during a prolonged attack of rheumatic fever lasting for many weeks.

Young Jackson was one of the founders, in 1832, of the Society for Medical Observation, which consisted of the ablest of the students of Louis, Chomel and Andral. During his stay in Paris he made an important study of cholera, which was published in this country in 1832. It was most timely, as it gave the profession here a very clear and accurate description of the disease, of which up to that time they had had no experience. Jackson's name, too, will always be associated with the studies upon emphysema, and he is the discoverer of the prolonged expiration in early pulmonary tuberculosis.

Returning to Boston in the autumn of 1833, he spent the winter preparing for his degree and elaborating the notes which he had taken in Paris. In March he fell ill with a dysentery, which proved fatal on the 27th of the month, in the twenty-fifth year of his age. I know of no young man in the profession who had given pledges of such exceptional eminence. His influence in extending Louis' methods and views throughout New England was chiefly through his father, who, though a man approaching his sixtieth year, became an ardent follower of Louis and the numerical method.

In Oliver Wendell Holmes' recently issued Biography you will find a delightful description of life at the Medical School of Paris at this period. He bears witness to the good effect which Jackson's warm friendship with Louis had had in promoting the interests of American students. I may conclude with a quotation from Dr. Jackson's, Sr., memoir: "At the suggestion and request of one of my most judicious brethren I shall

add that my son's influence on the profession here, in the short time he was with us, was of a very salutary description. This gentleman states that my son not only caused others, who had not yet read the works of M. Louis, to study them with care, but that he induced among the rising members of the profession in our own city the habits of thorough observation of the phenomena of disease in the living and in the dead, which he had learned from the same great pathologist. He also taught us much in respect to the physical signs of disease in the thorax, with which we were imperfectly acquainted before; at least I may say this was true as to myself. Indeed I ought to say more, for he aided me very much in regard to the diagnosis of the more obscure diseases of that region, derived from the combination of the physical and rational signs. On emphysema of the lungs he threw, for me, quite a new light."

Wm. W. Gerhard was the most distinguished of the American pupils in Paris between 1830 and 1840. When you call to mind the men whom I have mentioned, this may seem a strong statement, but I feel certain that could we take their suffrages they would accord him the place of merit in consequence of the character of his work. Dr. Gerhard was born in Philadelphia, in 1809, and was graduated from the University of Pennsylvania in 1831. Early in the year he went to Paris and attached himself to Louis at La Pitié. In one of his letters\* to his brother, dated January 18, 1832, he says: "Dr. Louis is delivering an interesting clinic at La Pitié; he is a remarkable man, very different from the physicians of England or America, and remarkable even at Paris by the strict mathematical accuracy with which he arrives at his results; he is not a brilliant man, not of the same grade of intellect as his colleague at La Pitié, Andral." In another letter he gives an account of his day's work. "The morning from seven to ten is occupied with the visit and clinic at the hospital; there are several distinct clinics now in actual progress; each of them has its advantages. I shall vary my attendance at the different hospitals and select those lecturers

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\* I am indebted to members of Dr. Gerhard's family for the letters from which these extracts are taken.

who are of real merit. At this moment we are following Piorry at the Salpêtrière, a very distant hospital, two or three miles from our lodgings; his patients are all old women, and not interesting. My object in following his course is to obtain some interesting information on the best mode of investigating the diseases of the chest. M. Piorry has devoted special attention to this subject. From Salpêtrière we hurry to La Pitié; we hear a surgical lecture, reach home to breakfast, and then to the school of medicine. The lectures at the school, with a private course of anatomy during the hour of intermission, fill up the remainder of the day until four. Fortunately a private clinic at La Charité introduces me to a set of very interesting cases, especially on pectoral cases. Dr. Dagneau has a class who pay him ten francs a month and enjoy the privilege of examining the patients much more conveniently than is practicable during the morning visit in the midst of a crowd of students. We dine at five-thirty and then lectures again until eight o'clock. Imagine the facilities, the delightful advantage of acquiring positive information, and what is at least as important, of learning the mode of obtaining these positive results. We see and hear the men who are so well known to us in America, learn to form a correct estimate of their relative worth—in short, one of the most striking advantages of a medical visit to Europe is to acquire the sort of liberal professional feeling which is rarely secured by the continued intercourse with the same men, and the unpleasant medical politics which divide the profession in America."

Evidently Broussais made no special impression on Dr. Gerhard. He says, "Broussais is the best known, his reputation is universal, and the benefits he has conferred on medicine are immense, but unfortunately he is a wretched lecturer. His own opinions are given in the most awkward, clumsy manner; the manner and style of lecturing are coarse and vulgar."

In another letter of February 3, 1832, he tells how he induced Louis to give them private instruction. To his brother he writes: "I must write you at least a few days before the excitement has passed off: can you imagine how fortunate I am—*devinez si vous pouvez*—two or three days ago, Jackson, Pennock and myself were talking of hospitals and morbid

anatomy, when the idea occurred of attempting the study of pathology in a particular manner. It was this: to obtain the specimens and study them, the authors in our hand, exactly and carefully comparing authorities with the subject before us. We addressed ourselves to two of the *internes* at La Pitié attached to the *salles* of Louis and Andral, and they agree to procure all facilities in their power and communicate their own information for the compensation of 60 francs from each of us; we accordingly visit La Pitié on three afternoons of the week and examine the parts at the hospital, afterwards carrying home such portions as require minute investigation. Our first success in this opening of new sources of instruction emboldened us to attempt something of higher importance. We were all desirous of studying auscultation, of studying it in such a manner as to be sure of our ground on our return, and to be capable of appreciating the advantages of the art. Louis' public instructions were valuable, but his private lessons upon a subject demanding minute and patient inquiry we knew would be infinitely more so. I therefore in the name of my friends addressed him a polite note, accompanied by a handsome pecuniary offer; we did this with little hopes of success, but happily for us he accepted our proposition, and next week we are his private pupils at La Pitié. We are, I believe, the first who have made this arrangement with M. Louis, and you may estimate its importance when I tell you that he is considered in excellence of diagnosis the successor of Laennec. Our advantages for the study of pathology and the diagnosis of diseases of the chest are now superior; they are indeed the very best in the world, and our eagerness to embrace them will, I hope, render them of real utility; of course they involve an additional expenditure of 400 or 500 fr., but I should be happy to shorten my stay at Paris a month to improve the remainder of my time in this manner, if such were necessary for me. Pennock and myself are very happy to have become intimate with Jackson; he has superior talents, and his excellent education, conducted by his father, unquestionably the first physician in America, has cultivated his mind and developed an ardent attachment to medicine."

Few American students have occupied their time abroad to greater purpose than Dr. Gerhard. He appears to have

been an indefatigable worker, and the papers which he published based upon material collected in Paris are among the most important which we have from his pen. Thus with Pennock he described Asiatic cholera in 1832. Devoting himself particularly to the study of diseases of children, he issued a very interesting paper on small-pox, and two papers of very special value, the first on tuberculous meningitis and the other upon pneumonia in children. Both of these papers mark a distinct point in our knowledge of these two diseases. He is usually accorded the credit of the first accurate clinical study of tuberculous meningitis.

Late in the year 1833 he returned to Philadelphia, and at his suggestion his friends had secured him the appointment as resident physician at the Pennsylvania Hospital, which he took early in 1834. This step indicated how carefully he had weighed the important influence in Louis' career of the years of quiet work at La Charité. At the Pennsylvania Hospital he had an opportunity to study the common continued fever of the country, and determined that it was identical, clinically and anatomically, with the typhoid fever of Louis, and characterized by a special lesion in the glands of Peyer. I do not know exactly how long he remained resident physician at the Pennsylvania Hospital, but he was soon after appointed one of the physicians at Blockley, and here in 1836 he was able to carry out his most important piece of work. The general opinion prevailed that the fever which Louis described and which had the lesions in the small bowel was only a modification of the ordinary typhus fever which at that time prevailed so extensively, particularly in Great Britain and Ireland. In London, Edinburgh and Dublin the intestinal lesions were regarded as only accidental, and not indicative of a special affection. Dr. Gerhard knew the typhoid fever of Louis well, and had had an opportunity of studying it again at the Pennsylvania Hospital, so that when the epidemic of typhus fever developed in 1836 he was in a very good position to make an accurate study of the disease. Two hundred and fourteen cases were observed, and as a result of his study he declared positively that the typhus fever, which was similar to the disease which he had also seen in Edinburgh, was a different affection altogether from the typhoid fever with

intestinal lesions. These observations, you must remember, were made in 1836, at a time when the greatest confusion existed as to the forms of fever. It took a great many years in Great Britain before the duality of the prevalent fever was recognized, but owing to the influence of Gerhard's paper, and to the accurate knowledge of fever brought to this country by Louis' pupils, the differentiation of the two diseases was here quickly recognized, since, as already mentioned, Bartlett in 1842 considered them apart.

Gerhard's work influenced his Paris friends greatly, and this was strengthened by the papers read before the Society for Medical Observation by Geo. C. Shattuck and Alfred Stillé, of whom the former had had opportunities of studying typhus fever in Great Britain, while the latter had been one of Gerhard's house physicians in the typhus epidemic at Blockley. Shattuck's paper is published in the *Medical Examiner* for 1840. I have always regretted that Dr. Stillé's paper has never appeared in print. He was kind enough to let me see it, and, as I have mentioned elsewhere, the differential points between typhus and typhoid fever are nowhere more clearly laid down.

The University of Pennsylvania early took advantage of Gerhard's training and utilized him as clinical lecturer at the Philadelphia Hospital. He soon acquired a special reputation in diseases of the heart and lungs. In 1842 appeared the first edition of his work on *Diseases of the Chest*, which ran through four editions, and is still a valuable work of reference. One of his fellow-students in Paris, Stewardson, has given a very pleasing picture of him as a clinical teacher: "As a clinical teacher he was remarkably successful and exerted a powerful and commanding influence. Without any pretension to eloquence, he nevertheless riveted the attention of his hearers and stimulated their enthusiasm. Himself deeply interested in his subject, he communicated this interest to his audience by the sheer force of truth. Students saw that truth was his object, not display; the advancement of science, and not the gratification of personal feelings, whether of vanity or ambition; in short, that in his mind, a deep interest in his subject and a thorough conscientiousness in the pursuit of it were the overmastering motives. In an easy and conversational

style he presented to his hearers a graphic portraiture of the case before them, bringing into relief its most important symptoms; impressing upon their minds the most striking features in its history; pointing out, by a few clear and practical expressions, the bearing of any particular fact upon interesting medical questions, but avoiding long and labored arguments, or general disquisitions upon the nature of diseased action. He neither stimulated the fancy by the flowers of rhetoric, nor amused the intellect with episodes upon theoretical questions, but confined himself to drawing such practical conclusions as were clearly deducible from the facts presented. No man of his day enjoyed so high a reputation as a clinical teacher, and not only did he succeed in an eminent degree in arousing the enthusiasm of students and putting them in sympathy with himself, by infusing into them his own ardor in his favorite study; but he produced an influence upon the profession here which is felt still, which has fostered the establishment of clinical teaching among us, and done much to give it that rank which it now occupies here as a branch of medical instruction."

Of the work of Louis' other students in this country time would fail me to tell—of the influence of Bowditch, Holmes and Shattuck in Boston, of Swett, Clark and others in New York, of Pennock, Stewardson, Stillé in Philadelphia, and of Power in Baltimore. To them all we owe a heavy debt of gratitude. They brought from Paris enthusiasm, faith in the future, faith in the profession of their choice, accurate methods and a loyal love of truth. Endowed with the spirit and zeal of their master, they carried his great message to the New World; and more than this, touched with those finer qualities which made Louis so lovable, they have become bright ideals for all future generations of American students.

There remain, so far as I know, three only of the Paris students of whom I have spoken, John T. Metcalf, Meredith Clymer, and your honored patron, Alfred Stillé. They, too, must soon go the way of all the earth; but among the consolations of old age what greater solace can they feel than that the lives of the men whose fathers and grandfathers they taught are still made better by their presence.

# British Medicine in Greater Britain

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THE ADDRESS IN MEDICINE  
AT THE  
BRITISH MEDICAL ASSOCIATION  
MONTREAL MEETING

BY  
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## BRITISH MEDICINE IN GREATER BRITAIN.

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To trace successfully the evolution of any one of the learned professions would require the hand of a master—of one who, like Darwin, combined the capacity for patient observation with philosophic vision. In the case of medicine the difficulties are enormously increased by the extraordinary development which belongs to the history of the present century. The rate of progress has been too rapid for us to appreciate, and we stand bewildered and, as it were, in a state of intellectual giddiness, when we attempt to obtain a broad, comprehensive view of the subject. In a safer 'middle flight' I propose to dwell on certain of the factors which have moulded the profession in English-speaking lands beyond the narrow seas—of British medicine in Greater Britain. Even for this lesser task (though my affiliations are wide and my sympathies deep) I recognize the limitations of my fitness, and am not unaware that in my ignorance I shall overlook much which might have rendered less sketchy a sketch necessarily imperfect.

Evolution advances by such slow and imperceptible degrees that to those who are part of it the finger of time scarcely seems to move. Even the great epochs are seldom apparent to the participators. During the last century neither the colonists nor the mother country appreciated the thrilling interest of the long-fought duel for the possession of this continent. The acts and scenes of the drama, to them detached, isolated and independent, now glide like dissolving views into each other, and in the vitascope of history we can see the true sequence of events. That we can meet here to-day, Britons on British soil, in a French province, is one of the far-off results of that struggle. This was but a prelude to the other great event of the eighteenth century: the revolt of the colonies and the founding of a second great English-speaking nation—in the words of Bishop Berkeley's prophecy, "Time's noblest offspring."

Surely a unique spectacle that a century later descendants of the actors of these two great dramas should meet in an English city in

New France! Here, the American may forget Yorktown in Louisbourg, the Englishman Bunker Hill in Quebec, and the Frenchman both Louisbourg and Quebec in Chateauguay; while we Canadians, English and French, in a forgiving spirit, overlooking your unseemly quarrels, are only too happy to welcome you to our country—this land on which and for which you have so often fought.

Once, and only once, before in the history of the world could such a gathering as this have taken place. Divided though the Greeks were, a Hellenic sentiment of extraordinary strength united them in certain assemblies and festivals. No great flight of imagination is required to picture a notable representation of our profession in the fifth century B.C. meeting in such a colonial town as Agrigentum, under the presidency of Empedocles. Delegates from the mother cities, brilliant predecessors of Hippocrates of the stamp of Damocedes and Herodicus, delegates from the sister colonies of Syracuse and other Sicilian towns, from neighboring Italy, from far distant Massilia, and from still more distant Panticapæum and Istria. And in such an assemblage there would have been men capable of discussing problems of life and mind more brilliantly than in many subsequent periods, in proportion as the pre-Hippocratic philosophers in things medical had thought more deeply than many of those who came after them.

We English are the modern Greeks, and we alone have colonised as they did, as free peoples. There have been other great colonial empires, Phœnician, Roman, Spanish, Dutch and French, but in civil liberty and intellectual freedom Magna Græcia and Greater Britain stand alone. The parallel so often drawn between them is of particular interest with reference to the similarity between the Greek settlements in Sicily and the English plantations on the Atlantic coast. Indeed, Freeman says: "I can never think of America without something suggesting Sicily, or of Sicily without something suggesting America." I wish to use the parallel only to emphasise two points, one of difference and one of resemblance. The Greek colonist took Greece with him. Hellas had no geographical bounds, "Massilla and Olbia were cities of Hellas in as full sense as Athens or Sparta." While the emigrant Britons changed their sky, not their character, in crossing the great sea, yet the home-stayers had never the same feeling toward the plantations as the Greeks had towards the colonial cities of Magna Græcia. If, as has been shrewdly surmised, Professor Seely was Herodotus reincarnate, how grieved the spirit of the father of history must have been to say of Englishmen, "nor have we even now ceased to think of ourselves as simply a race inhabiting an island

off the northern coast of the Continent of Europe." The assumption of gracious superiority which, unless carefully cloaked, smacks just a little of our national arrogance, is apt to jar on sensitive colonial nerves. With the expansion of the Empire, and the supplanting of a national by an imperial spirit this will become impossible. That this sentiment never prevailed in Hellas, as it did later in the Roman Empire, was due largely to the fact that in literature, in science and in art, the colonial cities of Greece early over-shadowed the mother cities. It may be because the settlements of greater Britain were things of slower growth that it took several generations and several bitter trials to teach a lesson the Greeks never had to learn.

The Greek spirit was the leaven of the old world, the workings of which no nationality could resist; thrice it saved western civilisation, for it had the magic power of leading captivity captive and making even captive conquerors the missionaries of her culture. What modern medicine owes to it will appear later. "The love of science, the love of art, the love of freedom—vitality correlated to each other, and brought into organic union," were the essential attributes of the Greek genius (Butcher). While we cannot claim for the Anglo-Saxon race all of these distinctions it has in a high degree that one which in practical life is the most valuable, and which has been the most precious gift of the race to the world—the love of freedom,

"Of freedom in her regal seat  
Of England."

It would carry me too far afield to discuss the differences between the native Briton and his children scattered so widely up and down the earth. In Canada, South Africa, Australia and New Zealand, types of the Anglo-Saxon race are developing which will differ as much from each other, and from the English, as the American does to-day from the original stock; but amid these differences can everywhere be seen those race-qualities which have made us what we are—'courage, national integrity, steady good sense, and energy in work.' At a future meeting of the Association, perhaps in Australia, a professional Sir Charles Dilke with a firm grasp of the subject may deal with the medical problems of Greater Britain in a manner worthy of the address in medicine. My task, as I mentioned at the outset, is much less ambitious.

Could some one with full knowledge patiently analyse the characteristics of British medicine he would find certain national traits, sufficiently distinct for recognition. Three centuries cannot accomplish very much (and that period has only just passed since the revival of medicine in England), but the local conditions of isolation, which

have been singularly favourable to the development of special peculiarities in the national character, have not been without effect in the medical profession. I cannot do more than touch upon a few features, which may be useful as indicating the sources of influence upon Great Britain in the past, and which may perhaps be suggestive as to lines of progress in the future.

Above the fire place in Sir Henry Acland's study are three pannelled portraits of Linaere, Sydenham and Harvey; the scroll upon them reads *Littera, Praxis, Scientia*. To this great triumvirate, as to the fountain heads, we may trace the streams of inspiration which have made British medicine what it is to-day.

Linaere, the type of the literary physician, must ever hold a unique place in the annals of our profession. To him was due in great measure the revival of Greek thought in the 16th century in England; and in the last Harveian oration Dr. Payne has pointed out his importance as a forerunner of Harvey. He made Greek methods available; through him the art of Hippocrates and the science of Galen became once more the subject of careful, first-hand study. Linaere, as Dr. Payne remarks, "was possessed from his youth till his death by the enthusiasm of learning. He was an idealist devoted to objects which the world thought of little use." Pains-taking, accurate, critical, hypercritical perhaps, he remains to-day the chief literary representative of British medicine. Neither in Britain nor in Greater Britain have we maintained the place in the world of letters created for us by Linaere's noble start. It is true that in no generation since has the profession lacked a man who might stand unabashed in the temple at Delos; but judged by the fruits of learning scholars of his type have been more common in France and Germany. Nor is it to our credit that so little provision is made for the encouragement of these studies. For years the reputation of Great Britain in this matter was sustained almost alone by the great Dee-side scholar, the surgeon of Banchory, Francis Adams,—the interpreter of Hippocrates to English students. In this century he and Greenhill have well maintained the traditions of Linaere. Their work, and that of a few of our contemporaries, among whom Ogle must be specially mentioned, has kept us in touch with the ancients. But by the neglect of the study of the humanities, which has been far too general, the profession loses a very precious quality.

While in critical scholarship and in accurate historical studies, British medicine must take a second place, the influence of Linaere exerted through the Royal College of Physicians and the old Universities, has given to the humanities an important part in education, so that they

have moulded a larger section of the profession than in any other country. A physician may possess the science of Harvey and the art of Sydenham, and yet there may be lacking in him these finer qualities of heart and head which count for so much in life. Pasture is not everything and that indefinable, though well understood, something which we know as breeding, is not always an accompaniment of great professional skill. Medicine is seen at its best in men whose faculties have had the highest and most harmonious culture. The Lathams, the Watsons, the Pagets, the Jenners, and the Gairdners have influenced the profession less by their special work than by exemplifying those graces of life and refinements of heart which make up character. And the men of this stamp in Greater Britain have left the most enduring mark,—Beaumont, Bovell and Hodder in Toronto; Holmes, Campbell and Howard in this city; the Warrens, the Jacksons, the Bigelows, the Bowditches, and the Shattucks in Boston; Bard, Hossack, Francis, Clark, and Flint of New York; Morgan, Shippen, Redman, Rush, Coxe, the elder Wood, the elder Pepper, and the elder Mitchell of Philadelphia—Brahmins all, in the language of the greatest Brahmin among them, Oliver Wendell Holmes,—these and men like unto them have been the leaven which has raised our profession above the dead level of a business.

The *litteræ humaniores*, represented by Linaere, revived Greek methods; but the Faculty during the sixteenth and at the beginning of the seventeenth centuries was in a slough of ignorance and self-conceit, and not to be aroused even by Moses and the prophets in the form of Hippocrates and the fathers of medicine. In the pictures referred to, Sydenham is placed between Linaere and Harvey; but science preceded practice, and Harvey's great Lumleian lectures were delivered before Sydenham was born. Linaere has been well called, by Payne, Harvey's intellectual grandfather. "The discovery of the circulation of the blood was the climax of that movement which began a century and a half before with the revival of Greek medical classics, and especially of Galen."—(Payne.) Harvey returned to Greek methods and became the founder of modern experimental physiology and the great glory of British scientific medicine. The demonstration of the circulation of the blood remains in every detail a model research. I shall not repeat the oft-told tale of Harvey's great and enduring influence, but I must refer to one feature which, until lately, has been also a special characteristic of his direct successors in Great Britain. Harvey was a practitioner and a hospital physician. There are gossiping statements by Aubrey to the effect that "he fell mightily in his practice" after the publication of the *De*

*motu cordis*, and that his "therapeutic way" was not admired; but to these his practical success is the best answer. It is remarkable that a large proportion of all the physiological work of Great Britain has been done by men who have become successful hospital physicians or surgeons. I was much impressed by a conversation with Professor Ludwig in 1884. Speaking of the state of English physiology, he lamented the lapse of a favourite English pupil from science to practice; but, he added, "while sorry for him, I am glad for the profession in England." He held that the clinical physicians of that country had received a very positive impress from the work of their early years in physiology and the natural sciences. I was surprised at the list of names which he cited; among them I remember Bowman, Paget, Savory and Lister. Ludwig attributed this feature in part to the independent character of the schools in England, to the absence of the University element so important in medical life in Germany, but, above all, to the practical character of the English mind, the better men preferring an active life in practice to a secluded laboratory career.

Theydides it was who said of the Greeks that they possessed "the power of thinking before they acted, and of acting, too." The same is true in a high degree of the English race. To know just what has to be done, then to do it, comprises the whole philosophy of practical life. Sydenham—*Anglia lumen*, as he has been well called, is the model practical physician of modern times. Linaere led Harvey back to Galen, Sydenham to Hippocrates. The one took Greek science, the other not so much Greek medicine as Greek methods, particularly intellectual fearlessness, and a certain knack of looking at things. Sydenham broke with authority and went to nature. It is an extraordinary fact that he could have been so emancipated from dogmas and theories of all sorts. He laid down the fundamental proposition, and acted upon it, that "all diseases should be described as objects of natural history." To do him justice we must remember, as Dr. John Brown says, "in the midst of what a mass of errors and prejudices, of theories actively mischevous, he was placed, at a time when the mania of hypothesis was at its height, and when the practical part of his art was overrun and stultified by vile and silly nostrums." Sydenham led us back to Hippocrates, I would that we could be led oftener to Sydenham! How necessary to bear in mind what he says about the method of the study of medicine. "In writing therefore, such a natural history of diseases, every merely philosophical hypothesis should be set aside, and the manifest and natural phenomena, however minute, should be noted with the utmost exactness. The useful-

ness of this procedure cannot be easily overrated, as compared with the subtle inquires and trifling notions of modern writers, for can there be a shorter, or indeed any other way of coming at the morbid causes, or discovering the curative indications than by a certain perception of the peculiar symptoms? By these steps and helps it was that the father of physic, the great Hippocrates, came to excel, his theory being no more than an exact description or view of Nature. He found that Nature alone often terminates diseases, and works a cure with a few simple medicines, and often enough with no medicines at all." Well indeed has a recent writer remarked "Sydenham is unlike every previous teacher of the principles and practice of medicine in the modern world." He, not Linaere or Harvey, is the model British physician in whom were concentrated all those practical instincts upon which we lay such stress in the Anglo-Saxon character.

The Greek faculty which we possess of thinking and acting has enabled us, in spite of many disadvantages, to take the lion's share in the great practical advances in medicine. Three among the greatest scientific movements of the century have come from Germany and France. Bichât, Lænnec and Louis laid the foundation of modern clinical medicine; Virchow and his pupils of scientific pathology; while Pasteur and Koch have revolutionized the study of the causes of disease; and yet, the modern history of the art of medicine could almost be written in its fullness from the records of the Anglo-Saxon race. We can claim every practical advance of the very first rank—vaccination, anæsthesia, preventive medicine and antisepticsurgery, the "captain jewels in the coronet" of the profession, beside which can be placed no others of equal lustre.

One other lesson of Sydenham's life needs careful conning. The English Hippocrates, as I said, broke with authority. His motto was

"Thou Nature art my Goddess; to thy law  
"My services are bound."

Undue reverence for authority as such, a serene satisfaction with the *status quo* and a fatuous objection to change have often retarded the progress of medicine. In every generation, in every country, there have been, and ever will be, *laudatores temporis acti*, in the bad sense of that phrase, not a few of them men in high places, who have lent the weight of a complacent conservatism to bolster up an ineffectual attempt to stay the progress of new ideas. Every innovator from Harvey to Lister has been made to feel its force. The recently issued life of Thomas Wakley is a running commentary on this spirit, against the pricks of which he kicked so hard and so

effectually. But there are signs of a great change. The old universities and the colleges, once the chief offenders, have been emancipated, and remain no longer, as Gibbon found them, steeped in port and prejudice. The value of authority *per se* has lessened enormously and we of Greater Britain have perhaps suffered as the pendulum has swung to the other extreme. Practice loves authority, as announced in "the general and perpetual voice of men." Science must ever hold with Epicharmus that a judicious distrust and wise scepticism are the sinews of the understanding. And yet the very foundations of belief in almost everything relating to our art rest upon authority. The practitioner cannot always be the judge; the responsibility must often rest with the teachers and investigators, who can only learn in the lessons of history the terrible significance of the word. The fetters of a thousand years in the treatment of fever were shattered by Sydenham, shattered only to be riveted anew. How hard was the battle in this century against the entrenched and stubborn foe! Listen to the eloquent pleadings of Stokes, pleading as did Sydenham, against authority, and against the bleedings, the purgings and sweatings of fifty years ago. "Though his hair be grey and his authority high, he is but a child in knowledge and his reputation an error. On a level with a child, so far as correct appreciation of the great truths of medicine is concerned, he is very different in other respects, his powers of doing mischief are greater; he is far more dangerous. Oh! that men would stoop to learn, or at least cease to destroy." The potency of human authority among the powers that be, was never better drawn than by the judicious Hooker in his section on this subject. "And this not only with 'the simpler sort,' but the learned and wiser we are, the more such arguments in some cases prevail with us. The reason why the simpler sort are moved with authority is the conscience of their own ignorance; whereby it cometh to pass that having learned men in admiration, they rather feared to dislike them than know wherefore they should allow and follow their judgments. Contrariwise with them that are skilful authority is much more strong and forcible; because they only are able to discern how just cause there is why to some men's authority so much should be attributed. For which cause the name of Hippocrates (no doubt) were more effectual to persuade even such men as Galen himself than to move a silly empiric."<sup>1</sup>

Sydenham was called "a man of many doubts" and therein lay the secret of his great strength.

Passing now to the main question of the development of this

<sup>1</sup> *Ecclesiastical Polity*. Book ii., vii. 2.

British medicine in Greater Britain, I must at once acknowledge the impossibility of doing justice to it. I can only indicate a few points of importance, and I must confine my remarks chiefly to the American part of Greater Britain. We may recognize three distinct periods corresponding to three distinct waves of influence, the first from the early immigration to about 1820, the second from about 1820 to 1860, and the third from about 1860 to the present time.

The colonial settlements were contemporaneous with the revival of medicine in England. Fellow-students of Harvey at Cambridge might have sailed in the *Mayflower* and the *Arbella*. The more carefully planned expeditions usually enlisted the services of a well trained physician, and the early records, particularly of the New England colonies, contain many interesting references to these college-bred men. Giles Firman, who settled in Boston in 1632, a Cambridge-man, seems to have been the first to give instruction in medicine in the new world. The parsons of that day had often a smattering of physic, and illustrated what Cotton Mather called an "angelical conjunction." He says: "Ever since the days of Luke, the Evangelist, skill in *Physick* has been frequently professed and practised by Persons whose more declared Business was the study of Divinity," Firman himself, finding physic 'but a meane helpe,' took orders. These English physicians in the New England colonies were scholarly, able men. Roger Chillingworth, in Hawthorne's *Scarlet Letter*, has depicted them in a sketch of his own life: "Made up of earnest, studious, thoughtful, quiet years, bestowed faithfully for the increase of knowledge, faithfully, too, for the advancement of human welfare,—men, thoughtful for others, caring little for themselves, kind, just, true, and of constant if not warm affections,"—a singularly truthful picture of the old colonial physician.

Until the establishment of medical schools, (University of Pennsylvania, 1763; King's College (afterwards Columbia) 1767; Harvard, 1782,) the supply of physicians for the colonies came from Great Britain, supplemented by men trained under the old apprentice system, and of colonists who went to Edinburgh, Leyden and London for their medical education. This latter group had a most powerful effect in moulding professional life in the pre-revolutionary period. They were men who had enjoyed not alone the instruction but often the intimate friendship of the great English and European physicians. Morgan, Rush, Shippen, Bard, Wistar, Hossack and others had received an education comprising all that was best in the period, and had acquired the added culture which can only come from travel and wide acquaintance with the world. Morgan, the founder of the medi-

cal school of the University of Pennsylvania, was away seven years, and before returning had taken his seat as a corresponding member of the French Academy of Surgery, besides having been elected a Fellow of the Royal Society. The War of Independence interrupted temporarily the stream of students, but not the friendship which existed between Cullen and Fothergill and their old pupils in America. The correspondence of these two warm friends of the colonies testifies to the strong professional intimacy which existed at the time between the leaders of the profession in the old and new worlds.

But neither Boerhaave, Cullen nor Fothergill stamped colonial medicine as did the great Scotchman, John Hunter. Long, weary centuries separated Harvey from Galen; not a century elapsed from the death of the great physiologist to the advent of the man in whose phenomenal personality may be seen all the distinctive traits of modern medicine, and the range of whose mighty intellect has had few, if any, equals since Aristotle. Hunter's influence on the profession of this continent, so deep and enduring, was exerted in three ways. In the first place, his career as an army surgeon, and his writings on subjects of special interest to military men, carried his work and ways into innumerable campaigns in the long French wars and in the War of Independence. Hunter's works were reprinted in America as early as 1791 and 1793. In the second place, Hunter had a number of most distinguished students from the colonies, among whom were two who became teachers of wide reputation. William Shippen, the first Professor of Anatomy in the University of Pennsylvania, lived with Hunter on terms of the greatest intimacy. He brought back his methods of teaching and some measure of his spirit. With the exception of Hewson and Home, Hunter had no more distinguished pupil than Philip Syng Physick, who was his house surgeon at St. George's Hospital, and his devoted friend. For more than a generation Physick had no surgical compeer in America, and enjoyed a reputation equalled by no one save Rush. He taught Hunterian methods in the largest medical school in the country, and the work of his nephew (Dorsey) on Surgery is very largely Hunter modified by Physick. But in a third and much more potent way the great master influenced the profession of this continent. Hunter was a naturalist to whom pathological processes were only a small part of a stupendous whole, governed by law, but which could never be understood until the facts had been accumulated, tabulated and systematized. By his example, by his prodigious industry and by his suggestive experiments he led men again into the old paths of

Aristotle, Galen and Harvey. He made all thinking physicians naturalists, and he lent a dignity to the study of organic life, and re-established a close union between medicine and the natural sciences. Both in Britain and Greater Britain he laid the foundation of the great collections and museums, particularly those connected with the medical schools. The Wistar-Horner and the Warren museums originated with men who had been greatly influenced by Hunter. He was, moreover, the intellectual father of that interesting group of men on this side of the Atlantic who, while practising as physicians, devoted much time and labour to the study of Natural History. In the latter part of the last century and during the first thirty years of this, the successful practitioner was very often a naturalist. I wish that time permitted me to do justice to the long list of men who have been devoted naturalists and who have made contributions of great value. Benjamin Smith Barton, David Hossack, Jacob Bigelow, Richard Harlan, John D. Godman, Samuel George Morton, John Collins Warren, Samuel L. Mitchell, J. Aiken Meigs and many others have left the records of their industry in their valuable works and in the Transactions of the various societies and academies. In Canada, many of our best naturalists have been physicians, and collections in this city testify to the industry of Holmes and McCullough.

I was regretting the *humanities* a few minutes ago, and now I have to mourn the almost complete severance of medicine from the old natural history. To a man the most delightful recollections of whose student life are the Saturdays spent with a preceptor who had a Hunterian appetite for specimens—anything from a trilobite to an acarus—to such a one across the present brilliant outlook comes the shadow of the thought that the conditions of progress will make impossible again such careers as those of William Kitchen Parker and William Carmichael McIntosh.

Until about 1820 the English profession of this continent knew little else than British medicine. After this date in the United States the ties of professional union with the old country became relaxed, owing in great part to the increase in the number of home schools, and in part to the development of American literature. To 1820 one hundred and fourteen native medical books of all kinds had been issued from the press, and one hundred and thirty-one reprints and translations, the former English, the latter, few in number, and almost exclusively French (Billings).

Turning for a few minutes to the condition of the profession in Canada during this period, I regret that I cannot speak of the many interesting questions relating to the French colonies. With the

earliest settlers physicians had come, and among the Jesuits, in their devoted missions, there are records of *donnés* (laymen attached to the service), who were members of the profession. One of these, René Goupil, suffered martyrdom at the hands of the Iroquois.<sup>1</sup>

Between the fall of Quebec in 1759 and 1820, the English population had increased by the settlement of Upper Canada, chiefly by United Empire loyalists from the United States, and after the war of 1812 by settlers from the old country. The physicians in the sparsely settled districts were either young men who sought their fortunes in the new colony or were army surgeons, who had remained after the revolutionary war or the war of 1812. The military element gave for some years a very distinctive stamp to the profession. These surgeons were men of energy and ability, who had seen much service, and were accustomed to order, discipline and regulations. Sabine, in his "History of the Loyalists," refers to the Tory proclivities of the doctors, but says that they were not so much disturbed as the lawyers and clergymen. Still a good many of them left their homes for conscience sake, and Canniff, in his "History of the Profession in Upper Canada," gives a list of those known to have been among the United Empire Loyalists.

The character of the men who controlled the profession of the new colony is well shown by the proceedings of the Medical Board which was organized in 1819. Drs. Macaulay and Widmer, both army surgeons, were the chief members. The latter, who has well been termed the father of the profession in Upper Canada, a man of the very highest character, did more than anyone else to promote the progress of the profession; and throughout his long career his efforts were always directed in the proper channels. In looking through Canniff's most valuable work one is much impressed by the sterling worth and mettle of these old army surgeons who in the early days formed the larger part of the profession. The minutes of the Medical Board indicate with what military discipline the candidates were examined, and the percentage of rejections has probably never been higher in the history of the province than it was in the first twenty years of the existence of the Board.

One picture on the canvas of those early days lingers in the memory, illustrating all the most attractive features of a race which has done much to make this country what it is to-day. Widmer was the type of the dignified old army surgeon, scrupulously punctilious and in every detail regardful of the proprieties of life. 'Tiger' Dunlop may be taken as the very incarnation of that restless roving spirit

<sup>1</sup> Parkman. Jesuits in North America.

which has driven the Scotch broadcast upon the world. After fighting with the Connaught Rangers in the war of 1812, campaigning in India, clearing the Sangur of tigers—hence his soubriquet 'Tiger,' lecturing on Medical Jurisprudence in Edinburgh, writing for Blackwood, editing the *British Press* and the *Telescope*, introducing Beek's Medical Jurisprudence to English readers, and figuring as director and promoter of various companies, this extraordinary character appears in the young colony as 'Warden of the Black Forest' in the employ of the Canada Company. His life in the backwoods at Gairbraid, his *Noctes Ambrosianae Canadensis*, his famous 'Twelve apostles' as he called his mahogany liquor stand (each bottle a full quart), his active political life, his remarkable household, his many eccentricities—are they not all pourtrayed to the life in the recently issued *In the days of the Canada Company?*

Turning now to the second period, we may remark in passing that the 19th century did not open very auspiciously for British medicine. Hunter had left no successor, and powerful as had been his influence it was too weak to stem the tide of abstract speculation, with which Cullen, Brown and others flooded the profession. No more sterile period exists than the early decades of this century. Willan (a great naturalist in skin diseases) with a few others saved it from utter oblivion. The methods of Hippocrates, of Sydenham, and of Hunter had not yet been made available in every day work.

The awakening came in France, and such an awakening! It can be compared with nothing but the renaissance in the 16th and 17th centuries, which gave us Vesalius and Harvey. "Citizen" Bichât and Broussais led the way, but Lænnec really created clinical medicine as we know it to-day. The discovery of auscultation was only an incident, of vast moment it is true, in a systematic study of the correlation of symptoms with anatomical changes. Louis, Andral and Chomel, extended the reputation of the French school which was maintained to the full until the sixth decade, when the brilliant Trousseau ended for a time a long line of Paris teachers, whose audience had been world wide. The revival of medicine in Great Britain was directly due to the French. Bright and Addison, Graves and Stokes, Forbes and Marshall Hall, Latham and Bennett were profoundly affected by the new movement. In the United States Anglian influence did not wane until after 1820. Translations of the works of Bichât appeared as early as 1802, and there were reprints in subsequent years, but it was not until 1823 that the first translation (a reprint of Forbes' edition) of Lænnec was issued. Broussais' works became very popular in translations after 1830, and in the journals from this time on

the change of allegiance became very evident. But men rather than books diverted the trend of professional thought. After 1825, American students no longer went to Edinburgh and London, but to Paris, and we can say that between 1830 and 1860, every teacher and writer of note passed under the Gallic yoke. The translations of Louis' works and the extraordinary success of his American pupils, a band of the ablest young men the country had ever seen, added force to the movement. And yet this was a period in which American medical literature was made up largely of pirated English books, and the systems, encyclopedias and libraries, chiefly reprints, testify to the zeal of the publishers. Stokes, Graves, Watson, Todd, Bennett and Williams, furnished Anglican pap to the sucklings, as well as strong meat to the full grown. In spite of the powerful French influence the text books of the schools were almost exclusively English.

In Canada the period from 1820 to 1860 saw the establishment of the English universities and medical schools. In Montreal the agencies at work were wholly Scotch. The McGill Medical School was organized by Scotchmen, and from its inception has followed closely Edinburgh methods. The Paris influence, less personal, was exerted chiefly through English and Scotch channels. The Upper Canada schools were organized by men with English affiliations, and the traditions of Guys, St. Bartholomew's, St. Thomas's, St. George's, and of the London Hospital, rather than those of Edinburgh, have prevailed in Toronto and Kingston.

The local French influence on British medicine in Canada has been very slight. In the early decades of the century, when the cities were smaller, and the intercourse between the French and English somewhat closer, the reciprocal action was more marked. At that period English methods became somewhat the vogue among the French; several very prominent French Canadians were Edinburgh graduates. Attempts were made in the medical journals to have communications in both languages, but the fusion of the two sections of the profession was no more feasible than the fusion of the two nationalities, and the development has progressed along separate lines.

The third period dates from about 1860 when the influence of German medicine began to be felt. The rise of the Vienna school was for a long time the only visible result in Germany of the French renaissance. Skoda, the German Lænnec and Rokitansky, the German Morgagni, influenced English and American thought between 1840 and 1860, but it was not until after the last date that Teutonic medicine began to be felt as a vitalizing power, chiefly through the energy of Virchow. After the translation of the "Cellu-

lar Pathology" by Chance (1860) the way lay clear and open to every young student who desired inspiration. There had been great men in Berlin before Virchow, but he made the town on the Spree a Mecca for the faithful of all lands. From this period we can date the rise of German influence on the profession of this continent. It came partly through the study of pathological histology, under the stimulus given by Virchow, and partly through the development of the specialities, particularly diseases of the eye, of the skin and of the larynx. The singularly attractive courses of Hebra, the organization on a large scale in Vienna of a system of graduate teaching designed especially for foreigners and the remarkable expansion of the German laboratories combined to divert the stream of students from France. The change of allegiance was a deserved tribute to the splendid organization of the German universities, to the untiring zeal and energy of their professors and to their single-minded devotion to science for its own sake.

In certain aspects the Australasian Settlements present the most interesting problems of Greater Britain. More homogeneous, thoroughly British, isolated, distant, they must work out their destiny with a less stringent environment than, for example, surrounds the English in Canada. The traditions are more uniform and of whatever character have filtered through British channels. The professional population of native-trained men is as yet small, and the proportion of graduates and licentiates from the English, Scotch and Irish colleges and boards guarantees a dominance of Old Country ideas. What the maturity will show cannot be predicted, but the vigorous infancy is full of crescent promise. On looking over the files of Australian and New Zealand journals, one is impressed with the monotonous similarity of the diseases in the antipodes to those of Great Britain and of this continent. Except in the matter of parasitic affections and snake-bites, the nosology presents few distinctive qualities. The proceedings of the four Interecolonial Congresses indicate a high level of professional thought. In two points Australia has not progressed as other parts of Greater Britain. The satisfactory regulation of practice, so early settled in Canada, has been beset with many difficulties. Both in the United States and in Australia the absence of the military element, which was so strong in Canada, may in part at least account for the great difference which has prevailed in this matter of the state licence. The other relates to the question of ethics, to which one really does not care to refer, were it not absolutely forced upon the attention in reading the journals. Elsewhere professional squabbles, always so unseemly and distressing, are

happily becoming very rare, and in Great Britain, and on this side of the water, we try at any rate 'to wash our dirty linen at home.' In the large Australian cities, differences and dissensions seem lamentably common. Surely they must be fomented by the atrocious system of elections to the hospitals, which plunges the entire profession every third or fourth year into the throes of a contest, in which the candidates have to solicit the suffrages of from 2,000 to 4,000 voters! Well, indeed, might Dr. Batchelor, say, in his address at the fourth Inter-colonial Congress: "It is a scandal that in any British community, much less in a community which takes pride in a progressive spirit, such a pernicious system should survive for an hour."

Of India, of "Vishnu-land," what can one say in a few minutes? Three thoughts at once claim recognition. Here in the dim dawn of history, with the great Aryan people, was the intellectual cradle of the world. To the Hindoos we owe a debt which we can at any rate acknowledge; and even in medicine, many of our traditions and practices may be traced to them, as may be gathered from that most interesting *History of Aryan Medical Science*, by the Thakore Saheb of Gondal.

Quickly there arises the memory of the men who have done so much for British medicine in that great empire. Far from their homes, far from congenial surroundings, and far from the stimulus of scientific influences, Annesley, Balingall, Twining, Morehead, Waring, Parkes, Cunningham, Lewis, Vandyke Carter, and many others, have upheld the traditions of Harvey and of Sydenham. On the great epidemic diseases how impoverished would our literature be in the absence of their contributions! But then there comes the thought of 'the petty done, the undone vast,' when one considers the remarkable opportunities for study which India has presented. Where else in the world is there such a field for observation in cholera, leprosy, dysentery, the plague, typhoid fever, malaria and in a host of other less important maladies. And what has the British Government done towards the scientific investigation of the diseases of India? Until recently little or nothing, and the proposal to found an institute for the scientific study of disease has actually come from the native chiefs! The work of Dr. Hankin and of Professor Haffkine, and the not unmixed evil of the brisk epidemic of plague in Bombay, may arouse the officials to a consciousness of their shortcomings. While sanitary progress has been great as shown in a reduction of the mortality from 69 per mille before 1857 to 15 per mille at present, many problems are still urgent, as may be gathered from reading Dr. Harvey's Presidential address and the proceedings of the Indian Medical congress.

That typhoid fever can be called the "scourge of India" and that the incidence of the disease should remain so high among the troops point to serious sanitary defects as yet unremedied. As to the prevalence of venereal disease among the soldiers—an admission of nearly 500 per mille tells its own tale.

On reading the journals and discussions one gets the impression that matters are not as they should be in India. There seems to be an absence of proper standards of authority. Had there been in each presidency during the past twenty years thoroughly equipped government laboratories in charge of able men, well trained in modern methods, the contributions to our knowledge of epidemic diseases might have been epoch-making, and at any rate we should have been spared the crudeness which is evident in the work (particularly in that upon malaria) of some zealous but badly trained men.

In estimating the progress of medicine in the countries comprising Greater Britain, the future rather than the present should be in our minds. The strides which have been taken during the past twenty years are a strong warrant that we have entered upon a period of exceptional development. When I see what has been accomplished in this city in the short space of time since I left, I can scarcely credit my eyes: the reality exceeds the utmost desire of my dreams. The awakening of the profession in the United States to a consciousness of its responsibilities and opportunities has caused unparalleled changes, which have given an impetus to medical education and to higher lines of medical work which has already borne a rich harvest. Within two hundred years who can say where the intellectual centre of the Anglo-Saxon race will be? The Mother Country herself has only become an intellectual nation of the first rank within a period altogether too short to justify a prediction that she has reached the zenith. She will probably reverse the history of Hellas, in which the mental superiority was at first with the colonies. At the end of the next century, ardent old-world students may come to this side 'as o'er a brook,' seeking inspiration from great masters, perhaps in this very city; or the current may turn towards the schools of the great nations of the south. Under new and previously unknown conditions, the Africander, the Australian or the New Zealander may reach a development before which even 'the glory that was Greece' may pale. Visionary as this may appear, it is not one whit more improbable to-day than would have been a prophecy made in 1797 that such a gathering as the present would be possible within a century on the banks of the St. Lawrence.

Meanwhile, to the throbbing vitality of modern medicine the two

great meetings held this month, in lands so widely distant, bear eloquent testimony. Free, cosmopolitan, no longer hampered by the dogmas of schools, we may feel a just pride in a profession almost totally emancipated from the bondage of error and prejudice. Distinctions of race, nationality, colour and creed are unknown within the portals of the temple of Æsculapius. Dare we dream that this harmony and cohesion so rapidly developing in medicine, obliterating the strongest lines of division, knowing no tie of loyalty but loyalty to truth—dare we hope, I say, that in the wider range of human affairs a similar solidarity might ultimately be reached? Who can say that the forges of Time will weld no links between man and man stronger than those of religion or of country? Some Son of Beor, touched with prophetic vision, piercing the clouds which now veil the eternal sunshine of the mountain top—some spectator of all time and all existence (to use Plato's expression)—might see in this gathering of men of one blood and one tongue a gleam of hope for the future, of hope at least that the great race so dominant on the earth to-day may progress in the bonds of peace—a faint glimmer perhaps of the larger hope of humanity, of that day when "the common sense of most shall hold a fretful 'world' in awe." There remains for us, Greater Britons of whatsoever land, the bounden duty to cherish the best traditions of our fathers, and particularly of the men who gave to British medicine its most distinctive features, of the men, too, who found for us the light and liberty of Greek thought—Linaere, Harvey and Sydenham, those ancient founts of inspiration and models for all time in Literature, Science and Practice.

## HEPATIC COMPLICATIONS OF TYPHOID FEVER.

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CONSIDERING the close connection between the liver and the intestines, and the liability of this organ to be involved in ulceration of the bowel, it is surprising that hepatic complications are not more common in typhoid fever. Long series of cases may be treated without a symptom pointing to implication of the liver, or, indeed, without a single sign indicating enlargement of the organ or disturbance of its function. I propose in the following paper to deal somewhat systematically with the complications which arise in the course of enteric fever. The subject has recently attracted a good deal of attention, particularly with reference to the frequency of infection of the bile passages and its association with gall stones and suppurative cholecystitis. I shall take up the question under the following headings:— (1) The focal necroses; (2) Jaundice in the course of the disease; (3) Abscess; (4) Affections of the bile passages.

I. FOCAL NECROSES.—A few lines must be devoted to this question, though it has, so far as we know, no clinical significance. The subject has been dealt with quite fully by Dr. Walter Reed, of the United States Army, in a study from the Johns Hopkins Pathological Laboratory, which appeared in the second series in our "Studies in Typhoid Fever," in volume v. of the *Hospital Reports*. These little bodies, known as the lymphoid nodules, were described by Friedreich and E. Wagner, and have since been very carefully studied by a number of observers. The literature is very fully given in Dr. Reed's paper. Macroscopically they appear as small, greyish, opaque areas, sometimes just on the limit of visibility, at

others appearing quite distinctly on the cut surface. Reed states that they cannot always be distinguished with the naked eye. Microscopically the size of these areas varies from a spot involving only a few liver cells, to a region involving the half, or even the whole of a lobule. These nodules represent foci of necrosis of the liver cells. The clumps of typhoid bacilli appear to bear no definite relation to them. Sometimes in the necrotic area there are many polynuclear leucocytes, which almost give the appearance, as Handford states, of a small miliary abscess, or of lymphoid nodules. The foci are subsequently replaced by well-defined areas of connective tissue, which Reed was able to demonstrate in a woman who had died twenty-five years subsequent to the attack of typhoid fever. Necrotic areas can be produced experimentally by the injection of cultures of the typhoid bacillus into the mesenteric vein, and in the human subject they are probably caused by the toxalbumins of the disease, similar to those which develop in diphtheria. So far as we know, these focal necroses cause no symptoms, though it is quite possible that a widespread involvement of the liver lobules might cause an icterus gravis, which occasionally develops in typhoid fever, or, subsequently in their fibrous transformation, lead to cirrhosis.

II. JAUNDICE.—The extreme rarity of this symptom in typhoid fever may be gathered from the fact that, among the first 500 cases forming the basis of this report treated in my wards at the Johns Hopkins Hospital, there was not a single instance.

This has been the experience of most writers on the subject. Murchison, with his enormous experience, states that he "met with jaundice in three cases of enteric fever, all of which were fatal, although in two the jaundice had disappeared before death. In two of the cases there was an autopsy, and in both the liver was small and its secreting cells loaded with oil."<sup>1</sup> Griesinger noted ten cases among 600 patients with typhoid fever, and Liebermeister twenty-six in 1420 cases. These figures are sufficient to show the extreme rarity of this symptom.

The cases of jaundice in typhoid fever may be grouped in four categories—(1) Catarrhal; (2) toxic; (3) those associated with abscess; and (4) those associated with gall stones and cholangitis.

It is surprising indeed that catarrhal jaundice does not occur more commonly in this disease. Griesinger states that it is the form which develops early, is quite slight and transitory, and has no influence on the course of the disease. I have never seen an instance at the onset of the fever, but the following is a very good illustration of jaundice at the onset of a relapse, following a protracted attack of nausea and vomiting:—

CASE I.—*Severe gastric symptoms; jaundice at the onset of a*

<sup>1</sup> "On Continued Fevers," 3rd edition, p. 565.

*relapse.*—Mr. A., *æt.* 30, seen November 9, 1895, with Dr. Reiche. The patient had been ill for five weeks with typhoid fever of moderate severity. On 1st, 2nd, and 3rd November the temperature had been normal, and the patient seemed to be doing well. The stomach had been quiet, and he had been taking a little extra food. On the 4th, 5th, and 6th he had a little more fever, was restless, had a great deal of nausea, and at intervals vomiting. On the 7th and 8th these symptoms persisted, and on the former date he became jaundiced. He had constant nausea, a great deal of gagging, with the expectoration of much clear liquid, and after taking food he had actual vomiting.

*Present condition.*—The patient looks thin. The skin is jaundiced, the conjunctivæ stained. The tongue is heavily furred and white. He has a small basin by his side, and every few minutes he gags and brings up a clear, frothy liquid. He has also vomited several times to-day. The temperature this evening is 103°; pulse 120, small in volume. The abdomen is soft, nowhere tender; the liver is not enlarged. Deep pressure just in front of the tenth rib causes him to wince. The urine was very much bile-stained. The patient was ordered oxalate of cerium and small quantities of liquid nourishment.

On the 10th and 11th the vomiting persisted, and the jaundice became much more intense. On the 12th and 13th he was a great deal better. He retained his food, and the distressing gagging had stopped. The temperature range was from 102° to 103°·5. The pulse was rapid, and he was still excessively nervous.

On the 16th and 17th the temperature was lower, and he had profuse sweats. The abdominal symptoms were slight; the stools, which during the jaundice were quite clay-coloured, by the 20th were again bile-stained, and at this date the jaundice had almost disappeared. The temperature on the evening of the 22nd was only 100°; general condition excellent.

Severe toxic jaundice is exceedingly rare in typhoid fever. The most carefully studied case I know of is that reported by Sabourin.<sup>1</sup> A man, *æt.* 29, who had always enjoyed good health, was admitted to Prof. Jaccoud's service in about the third week of typhoid fever. He had very intense icterus, great prostration and delirium, and with these symptoms frequent epistaxis and hæmorrhages from the intestines. The liver at the autopsy was reduced in size, soft, and in a condition corresponding microscopically to acute yellow atrophy.

In the following case the jaundice developed at the end of the second week with much delirium, and the patient died in a condition of toxæmia, with low temperature.

*CASE 2.*—*Severe attack; jaundice at the end of the second week; much delirium; low temperature; nystagmus; death on the sixteenth day.*—*8th April 1894.*—I saw to-day, with Dr. Martinet, A. B., *æt.* 35, a healthy man, who had been attacked two weeks before with typhoid fever, all the symptoms of which had been very well marked. This was the fifteenth day of the fever. The temperature had been high, ranging

<sup>1</sup> *Rev. de méd.*, Paris, 1882.

between 104° and 105°. The rash was well developed and the spleen enlarged. The general symptoms were of only moderate severity. He had very slight diarrhoea.

For four days the patient has had a falling temperature, and yesterday morning, 7th April, it reached 98°; last evening it was 98°; this morning it was 97°·2. With this the general symptoms have been very much worse. He has been delirious; the abdomen has been distended, and jaundice developed on the evening of the 6th. This morning the patient is delirious, unconscious, and the jaundice is of considerable intensity. The eyes are open, and they are jerked in a quick way from side to side, looking like exaggerated nystagmus. The tongue is dry, the abdomen distended, not tender. The liver dulness is not obliterated. The heart sounds are clear. The pulse is 120, full, not dicrotic, and I noted particularly that it was of fairly good volume. On returning home, in the note I made of the case I added that, though he looked so ill, and though the meteorism, jaundice, and low temperature, with the delirium, were unfavourable, yet the pulse-volume was remarkably good. Death took place at three in the afternoon. There was no autopsy.

Jaundice would appear to be more common in the tropics. Alexander Jamieson,<sup>1</sup> in an admirable discussion of typhoid fever as met with in China, cites nine cases in which deep jaundice occurred. Of these, four died. He thinks it is more fatal the earlier it develops.

III. ABSCESS.—1. *Suppurative pylophlebitis*.—This is an excessively rare sequence of the disease. I have seen one instance of it which is given in full in my "Pathological Report, No. 1," from the Montreal General Hospital. I will give here a brief extract:—

A man, *æt.* 37, had an attack of typhoid fever three months before, from which he had not recovered. He had empyema and septic symptoms. So far as I could learn, there were no symptoms pointing to any trouble in the liver. He succumbed to an attack of acute peritonitis. The peritoneum contained 80 oz. of turbid fluid, and was intensely inflamed, particularly about the appendix vermiformis, the caecal end of which was obliterated, while the wall presented an oval perforation. There were 54 oz. of pus in the left pleura; both lungs presented numerous miliary tubercles. The mesentery was greatly enlarged and thickened, and fluctuated like a sac of pus. After incision and washing, it appeared riddled by communicating cavities, some of which could be traced in direct connection with mesenteric veins. The liver was enlarged, and presented, on section, numerous abscesses which were in direct connection with the suppurating portal vein. Outside the liver the vein was represented by an elongated abscess with thick, irregular walls. The splenic vein ended abruptly on the wall of the suppurating vessel, being closed by a thrombus. The branches of the portal vein in the liver were found to be full of pus, in some cream-coloured, in others tinged with bile. The main branch passing to the

<sup>1</sup> *China Imp. Customs Med. Rep.*, Shanghai, 57th issue, 1891.

right lobe, at about an inch and a half from the fissure, widened into two large sinuses. The gall bladder contained 3 oz. of pus. At the upper part of the opening of the cystic duct there was an irregular, wide sinus leading toward the portal fissure, and along it a probe could be passed for nearly an inch and a half, terminating close to the dilated and suppurating branches of the portal vein.

Lannois<sup>1</sup> has reported an interesting case of pylephlebitis following typhoid fever, in which the Eberth's bacillus was found in the pus. He gives a reference to a number of other cases in the literature.

In a paper by Ernst Romberg,<sup>2</sup> of the Leipzig Clinic, of eighty-eight fatal cases among 677, there was only one instance of abscess of the liver (suppurative pylephlebitis).

A man, *æt.* 34, with well-developed typhoid fever, was admitted 14th August. There seemed nothing special in the case until 7th September, when he had a chill. On the 8th there was slight jaundice, which increased on the 10th and 12th. There was enlargement of the liver. The patient died on the 15th. There were healing ulcers in the ileum. There was a diffuse, suppurating phlegmon in the mesentery. The liver was enlarged, and showed very extensive suppurating pylephlebitis.

This case resembles the one I have reported, inasmuch as it had the suppuration in the mesentery. Romberg refers to several others in the literature.

2. *Solitary abscess.*—This is very much more rare than pylephlebitis. In nearly one hundred autopsies in the disease I have not seen an instance. In their monograph<sup>3</sup> Bertrand and Fontan refer very briefly to this association, and state that it is relatively more frequent in the typhoid fever of the tropics.

In China, Jamieson,<sup>4</sup> in reporting a number of cases of enteric fever with dysentery, mentions a case of liver abscess. It did not seem to me altogether clear, on reading his report, whether the case was one of typhoid fever, or whether it was not an unusually severe and protracted instance of dysentery. The colon was much ulcerated, and an ulcer had perforated the cæcum. The note on the small bowel was, "The lower end of the ileum was sown with circular ulcers in the midst of infiltrated areas, some of which had not broken down, corresponding to Peyer's patches."

The enormous Munich statistics of 2000 post-mortems in typhoid fever give twelve cases.<sup>5</sup> Other large statistics quoted are those of Dopfer, who in 927 cases of typhoid fever found abscess of the liver in ten cases.<sup>6</sup> (Probably these cases are included in the other Munich statistics.)

3. *Suppurative cholangitis.*—Apart from the gall bladder complications, which will be considered separately, abscess of the liver

<sup>1</sup> *Rev. de méd.*, Paris, 1895.

<sup>2</sup> *Berl. klin. Wchnschr.*, March 1890.

<sup>3</sup> "L'Hépatite suppurée," Paris, 1895.

<sup>4</sup> *Loc. cit.*

<sup>5</sup> *München, med. Wchnschr.*, 1891, Nos. 3 and 4.

<sup>6</sup> *Ibid.*, 1888.

may be due to suppurative cholangitis. The cases are very rare. Klebs has reported one in his "Handbuch der pathologische Anatomie," in which the bile passages within the liver were dilated into large cylindrical cavities, containing necrotic yellowish material. The common duct showed no trace of any change.

4. *Secondary to the complications of typhoid fever.*—Rombert refers to an interesting group of cases in which the abscess is secondary to some of the inflammatory sequelæ of the disease. He quotes a case from Louis, in which liver abscess followed abscess of the right parotid; a case from Chvostek, in which two large liver abscesses were found in connection with perichondritis of the larynx in typhoid fever; and two cases in which the abscess followed peripheral bone lesions in the disease.

IV. AFFECTIONS OF THE BILE PASSAGES.—Much more common are the complications and sequelæ of the bile passages in typhoid fever. The subject may be discussed under three headings, namely, The incidence of typhoid bacilli in the gall bladder in the bodies of persons dead of typhoid fever; The occurrence of acute cholecystitis and cholangitis during and after typhoid fever; and The relation of typhoid fever to gall stones.

(a) *The incidence of typhoid bacilli in the gall bladder in typhoid fever.*—Blachstein<sup>1</sup> in 1891, working in Welch's laboratory, found that after inoculation in rabbits the Eberth bacillus lived in the bile passages for a considerable period of time, in one case for fifteen and a half weeks. He showed also the great frequency of the infection of the bile passages with the colon bacillus.

It had been shown by Netter,<sup>2</sup> Letienne,<sup>3</sup> and others, that the bile passages were quite frequently the seat of growth of micro-organisms; thus in twenty-four of forty-two cases, examined by the latter author, micro-organisms were present, of which the most common were the *Staphylococcus albus* and the *Bacterium coli commune*.

Experimentally, too, Gilbert<sup>4</sup> has produced cholecystitis and cholangitis by the direct injection of typhoid bacilli into the bile passages, and in two dogs has produced also secondary endocarditis.

Dupré<sup>5</sup> found pure cultures of typhoid bacilli in two cases of typhoid fever; one dead during the fever, the other following an operation for gall stones six months after recovery from an attack of enteric fever.

A number of careful studies have been made upon the frequency of infection of the bile passages in typhoid fever. Dr. Flexner has very kindly given me the results of the examinations which have

<sup>1</sup> *Johns Hopkins Hosp. Bull.*, Baltimore, 1891, vol. ii.

<sup>2</sup> *Progrès méd.*, Paris, 1886.

<sup>3</sup> *Arch. de méd. expér. et d'anat. path.*, Paris, 1891.

<sup>4</sup> *Compt. rend. Soc. de biol.*, Paris, 1893-1894.

<sup>5</sup> "Les infections biliaires," 1891.

been made in the Pathological Laboratory of the Johns Hopkins Hospital. Cultures were made in fourteen cases from the gall bladders of persons dead of the disease. Typhoid bacilli were present in seven instances. In five cases other organisms were found; in three the *Bacillus coli communis*; in one the *Streptococcus pyogenes*; in one the *Proteus*. In one case the nature of the organism was not fully determined. In looking over the histories of the seven fatal cases, from the gall bladders of which the typhoid bacilli were isolated, there were no hepatic symptoms, so that the infection was latent.

Other observers have found the typhoid bacilli much more frequently. Chiari's<sup>1</sup> studies have been perhaps the most important. He examined twenty-two cases, and found the typhoid bacilli in nineteen. In most instances the bacilli in the gall bladder were in large numbers. He gives very full details of the observations, and what is very interesting, too, the stage at which the examination was made. Thus, of two cases in the stage of infiltration, in only one did the gall bladder contain Eberth's bacillus; of seven cases in the stage of necrosis, five gave positive results; of six cases in the stage of ulceration, the gall bladder in all contained the bacilli; of four cases in the stage of healing, all were positive; of three cases of relapse, in two the results were positive. In ten of the cases the gall bladder showed more or less signs of inflammation, and in three there were areas of necrosis in the mucosa. In one case only was the whole thickness of the wall involved and the peritoneal covering. Chiari suggests that possibly in some cases the relapse may be due directly to the bacillus in the bile passages. Thus he thinks that a very abundant meal, by causing an unusual flow of bile into the bowel, might, in a case with numerous bacilli in the gall bladder, cause a reinfection of the lymph elements in the intestine.

Gilbert and Girode<sup>2</sup> state that in a case of typhoid fever they found the gall bladder full of mucus and pus, and the mucous membrane inflamed. Cultures showed the presence of the typhoid bacillus.

Chantemesse<sup>3</sup> mentions the case of a woman who had typhoid fever eight months previously, without any jaundice, but with a somewhat tardy convalescence. She was seized with hepatic colic, icterus, and fever. The gall bladder, which was removed during life, showed the presence of gall stones with living typhoid bacilli.

(b) *Cholecystitis and cholangitis as complications and sequelæ of typhoid fever.*—From what has been said in the previous section, it is very evident that the bacilli may be in the gall bladder in numbers, and for a long period of time, without exciting any

<sup>1</sup> *Prag. med. Wchenschr.*, 1893; and *Ztschr. f. Hyg.*, Leipzig, Bd. xv.

<sup>2</sup> *Semaine méd.*, Paris, 1890, tome x. p. 481.

<sup>3</sup> "Traité de médecine," tome i. p. 764.

inflammation. Chiari's observations would warrant the conclusion that cholecystitis without any actual symptoms was by no means an uncommon event in the disease. In reality, systematic writers have for a long time recognised the importance, both clinically and anatomically, of the gall-bladder complications of the disease. It is sufficient for the purpose to quote from Murchison's well-known work:<sup>1</sup> "The lining membrane of the gall bladder is very liable to become inflamed in enteric fever, without producing any marked symptoms during life." He gives numerous references, and describes catarrhal, purulent, diphtheritic, and ulcerative forms with perforation. Under the complications and sequelae he mentions a case in his own practice of perforating ulcer of the gall bladder, and refers to other instances in the literature.

Of late years the subject has attracted rather more attention, and I may mention a few of the more important papers. Holscher,<sup>2</sup> in an analysis of 2000 cases of fatal typhoid fever, states that in five there were diphtheritic processes in the gall bladder with separation of the mucous membrane, and suppuration. In one case there were perforation and peritonitis. I have already referred to the case of Chantemesse, in which, eight months after the typhoid fever, the patient had acute cholecystitis, and typhoid bacilli were found in the gall bladder, which was removed during life. The question has assumed very practical aspects now that surgeons are called in early in these acute abdominal complications. Williams and Shields<sup>3</sup> report an exceedingly interesting case, in which a woman, *æt.* 31, in the sixth week of typhoid fever, was seized with symptoms of perforative peritonitis. Laparotomy was performed, and the gall bladder was found adherent, the walls thickened, and near the neck was a perforation in an ulcer, through which fluid was escaping into the peritoneum. There was suppurative cholecystitis without stones. The patient recovered.

A case of much interest is reported by H. B. Anderson,<sup>4</sup> of Toronto—

A man, *æt.* 67, was admitted to the Toronto General Hospital, 16th September 1895. He had been ill in Detroit in July, with fever, chills, vomiting, and diarrhoea. He left Detroit before he had fully recovered, and was admitted to the hospital in Toronto on the above-mentioned date. Malaria had been suspected, but Dr. Anderson failed to find the plasmodia. There was a marked leucocytosis. There was intense pain on the right side of the abdomen and over the hepatic region, which, with a localised swelling beneath the ribs opposite the ninth costal cartilage, made the diagnosis of abscess of the liver very probable. The local symptoms subsided, but later there was general abdominal pain, with great aggravation of the symptoms, and he died 26th September, the eleventh day after entering the hospital.

<sup>1</sup> "Continued Fevers," third edition, p. 634.

<sup>2</sup> *München. med. Wochenschr.*, 1891.

<sup>3</sup> *Lancet*, London, 1895, vol. i.

<sup>4</sup> *Canada Lancet*, 1896.

The autopsy showed a general peritonitis; ulceration of Peyer's patches at the lower end of the ileum; acute cholecystitis, with ulceration of the mucosa, and in one place perforation of the gall bladder. A bacillus was found in the gall bladder, but whether the typhoid or the *Bacillus coli communis* was not satisfactorily determined.

A very instructive case is reported by Dr. Alexieff, of Moscow. I am indebted to the author for a copy of his paper, and to my colleague, Dr. Thayer, for its translation.

The patient, a child *æt.* 5, had, during November 1895, enlarged glands on the left side of the neck, which suppurated, and on the 18th were incised. Subsequently she developed very well-marked symptoms of typhoid fever—rose spots, enlarged spleen, delirium, tenderness in the ileo-cæcal region, and high fever. During the third week in December there was marked pain in the right side of the abdomen, and a pear-shaped tumour was felt below the costal margin. There was fremitus felt between the 18th and 20th. Between the 20th and 22nd the patient complained a great deal of abdominal pain, and became much excited. The abdomen was much distended and very tender; there was no jaundice. The tumour formerly made out could not be detected.

A diagnosis of cholecystitis was made and an operation was performed. The intestines were found adherent to the gall bladder, which contained pus, and had apparently perforated, as there was pus outside of it in the adherent tissues. It was packed and drained. The cultures were very carefully and thoroughly made, and the author concludes that the organism found was the *Bacillus typhi abdominalis*.

The child improved very rapidly, and the first week in February the temperature was normal. After the 15th, however, she had fever and a slight relapse.

The author believes that between 21st and 22nd December, when the patient had such extreme abdominal pain and collapse, that the gall bladder had ruptured. He regards the lymphadenitis as a separate affair altogether.

It is worth noting that the child's mother was ill at the time with typhoid fever, and died during a relapse.

At a meeting of the Royal Medical and Surgical Society, 26th January 1897, Dr. Francis Hawkins read a paper on "Jaundice and Perforation of the Gall Bladder in Typhoid Fever."<sup>1</sup>

He reports the case of a girl, *æt.* 18, who, during an attack of typhoid fever, had pain in the abdomen, particularly in the right epigastric and hypochondriac regions, with vomiting and increase of the fever. On the following day the conjunctiva and skin of the upper part of the body were jaundiced, and bile was found in the urine. The jaundice became more marked and the pain more severe, and there was exquisite tenderness in the region of the gall bladder. The jaundice persisted till death, lasting for three weeks. There were pulmonary complications, of which she died. The gall bladder was adherent to the peritoneum, and

<sup>1</sup> *Lancet*, London, 1897, January 30.

around the adhesion there was a small area of peritonitis. The anterior wall of the bladder showed a perforation. The contents of the gall bladder were purulent, and there was a gall stone lying free in it. There was typical typhoid ulceration in the intestine.

The following cases have come under my observation within the past two years:—

CASE I.—*Typhoid fever; pyrexia of exactly twenty-seven days' duration; attack of colic, probably from gall stones, during convalescence; good health for nearly seven months; acute suppurative cholecystitis; perforation of gall bladder; operation; recovery.*—Miss J., æt. 29, a nurse, was admitted to Ward C, 22d April 1895, on the fourth or fifth day of typhoid fever. She had a very characteristic attack, with numerous rose spots. She had no serious symptoms, though the fever was high, ranging during the first ten days between 103° and 105°. She took exactly one hundred baths, and on 18th May the temperature for the first time touched normal.

On 22d May she had an attack of sudden, severe pain in the right hypochondriac region; the temperature rose to 102°, without a chill, and she had fever for thirty-six hours. There was no jaundice. Some time after she left the hospital, on 21st June, she had a severe attack of pain in the same region, of great intensity. It also was not followed by jaundice. Each of these attacks was of great severity, and required morphine. She had never previously suffered from similar attacks. She went home for the summer, and had two other attacks, each lasting about eighteen hours. There was no jaundice, and she felt well and gained in weight and strength. She returned to her duties at the hospital in October, and seemed to be doing very well. On the morning of 23rd December she went on duty, feeling in excellent health. At 11 A.M. she had a feeling of distress in the epigastrium, and at noon, when she went off duty, she vomited. She returned to work at 3 P.M., and at 5 P.M. she vomited again, and an attack of pain came on in the right iliac fossa, very sharp and severe. When seen by Dr. Thayer at 11.45 P.M., she was in a great deal of pain; temperature was 101°. The pain came on in paroxysms, lasting for a minute or more. The abdomen was flat, but over the entire right side there were muscular rigidity and a great deal of tenderness. The pain was localised in a small area close to McBurney's point. Any palpation in that region was very painful. Pressure on the left side of the abdomen caused a dragging sensation and pain between the navel and the anterior-superior spine of the ileum. The bowels had been moved by injection during the day. She had a hypodermic injection of morphine, and she had a very good night, except for recurring attacks of cramp-like pains. The highest temperature reached was 102°·4.

At 9.15 A.M. on 24th December the attacks of pain were still recurring, with intervals of comparative ease. I saw her early this morning, and it was impossible to make a satisfactory examination. There was no abdominal distension, but a great deal of tenderness over the whole of the right side, which had increased a great deal. She was seen by Dr. Halsted, who concurred in the diagnosis of appendicitis.

She became very much worse through the day. She had vomiting, and the tenderness was very much more marked, and the general condition was evidently becoming more serious.

Dr. Halsted operated at six in the evening. An incision was made for appendicitis. There were a few old bands of adhesion seen about the cæcum, but the appendix was not found, and it was evident that the seat of the trouble was not here. Just above the cæcum the omentum was seen, adherent to the ascending and hepatic flexure of the colon. In it was a small opening, from which a thin yellow material flowed. At first this was thought to be perforation of the intestine in an old typhoid ulcer, but, on enlarging, the opening was found in the gall bladder to which the omentum was adherent, and in the adhesions between the liver and colon there were several small pockets containing purulent, yellowish material. The gall bladder was enlarged and very tense; 100 c.c. of a clear fluid were removed, after which flowed out about 30 c.c. of thick, purulent matter. The cystic and common ducts were explored, and it was thought that a stone was felt in the cystic duct, but on account of the depth of the duct and the numerous adhesions, and the difficulty of preventing infection of the peritoneal cavity, the gall bladder was packed with gauze and the opening about it closed.

The patient did very well. On 1st February, upon introducing a probe into the sinus, a stone was felt, which gradually came out. She was discharged 19th February, and has remained well ever since.

CASE 2.—*Severe typhoid fever; protracted convalescence; pain in region of gall bladder; jaundice; chills; phlegmonous cholecystitis; laparotomy; death.*—On 5th November 1894 I saw, with Dr. Booker, Mrs. A., æt. 37, married, who was in about the end of the third week of a very severe attack of typhoid fever. She was a very stout woman, and the symptoms had been severe: high fever, much prostration, and pronounced nervous symptoms. The attack was very protracted, and she was in bed for between nine and ten weeks. I did not see her again until called in consultation in the private ward of the Johns Hopkins Hospital by Dr. Bloodgood, a day or two after her admission on 28th January 1895.

On 7th January she had been attacked suddenly with severe pain in the epigastrium, passing round the right side to the back. She had no chill. The pain continued with severe exacerbations, and on the fifth day after the onset she became jaundiced. There was no positive history of fever, and she does not know whether she felt very hot. The bowels were loose and she had no vomiting. She was in bed, with more or less pain at intervals and with jaundice, without much change in her condition until 21st January, when she had a severe chill.

On the 27th the temperature rose to nearly 105°, and she had nausea and vomiting. On the morning of the 28th the temperature was 103°·2.

On admission the patient looked very ill, and she had vomiting, much thirst, dry tongue, pulse 124, and the temperature at eight in the evening was 103°·8. She was very stout, and deeply jaundiced. The abdomen was distended and so tender that it was impossible to make a satisfactory examination. The condition was very serious, and Dr. Halsted performed laparotomy on the 29th.

The surgical note states that on opening the abdomen the liver was seen to be enlarged, the gall bladder projected below the right margin, and on its anterior wall a rupture was seen through which bile and purulent matter were oozing. The wall of the gall bladder in the neighbourhood was quite necrotic. The gall bladder was incised, and drained and packed.

Cultures were made from the contents of the gall bladder, and the colon bacillus was found. The colonies were worked over with the greatest care with reference to the differentiation of the typhoid from the colon bacillus.

The temperature fell after the operation, and became normal on 1st February. She did very well for ten or twelve days; then she began to have nausea and vomiting, with marked reduction in the amount of the urine. There was no change in the jaundice, and she sank and died on 21st February.

CASE 3.—*Characteristic typhoid fever in November and December, 1895; readmitted 30th November 1896, in a febrile attack of about eight days' duration, of indefinite character; readmitted 5th March 1897, with high fever and great pain in the right side; development of jaundice; double parotitis; recovery.*—J. L., *et.* 24, admitted 5th March 1897, complaining of fever and pain in the right side. He had been in the hospital from 25th November 1895 to 1st January 1896, with a continued fever, enlargement of the spleen, furred tongue, and several suggestive rose spots. During this time the patient took twenty baths; the temperature fell to normal on 5th December, and he made a perfectly satisfactory convalescence. He had no jaundice and no signs of any trouble in the liver.

He was readmitted 30th November 1896, complaining of headache and weakness. His illness began about ten days before, with slight abdominal pain and loss of appetite. During the evening of the 28th he had a shaking chill, which lasted twenty minutes. This morning, the 30th, he had a severe chill, lasting half an hour.

The patient was a well-nourished, healthy-looking man, with high colour. The abdomen looked natural, no distension; the edge of the spleen could be just felt below the border; there was slight rigidity of the right rectus muscle and tenderness in the right iliac fossa on deep pressure. There were a couple of suspicious spots on his abdomen. During the next few days a blotchy erythema appeared very like urticaria, and very well-marked dermatographia. There was no leucocytosis. His temperature was not high, having reached 103° on the day of admission, and then fell gradually and reached normal on 6th December. He had no further chills. He convalesced very rapidly. Widal's agglutination test was marked, but he had had typhoid fever in November 1895. He was discharged on the 15th. The diagnosis was doubtful. There was nothing suggestive of liver trouble; he had no jaundice, but there was slight tenderness on the right side on deep pressure.

He was readmitted 5th March 1897, complaining of chills and fever. He had remained perfectly well until 3rd March. At noon, on leaving work, he had a shaking chill, followed by a high fever and sweating. He worked the next day (4th March) until 10 A.M., when he had to give up work on account of severe headache and pain in the back. He had

no further chill. He thinks he has had fever since the onset of the chills. The bowels have been constipated; he has had no vomiting and no sore throat.

On admission the patient looked very well, though the face was flushed and the eyes somewhat bloodshot. His general nutrition was excellent. He was a very powerfully-built man; the lips and mucous membrane were very red; the tongue was brown in the centre and white at the sides; the breath was heavy. The temperature was 103°, and rose at midnight to 105°·5. The pulse was 120, very full, and dicrotic. There were no rose spots; no changes to be found in the thorax or abdomen. The edge of the spleen could be felt. The leucocytes were 4400 per c.mm.

On the 6th, Dr. Thayer noted that the hepatic flatness was at the sixth rib, and extended to one finger's-breadth below the costal margin. There was well-marked tenderness in the right hypochondrium, on deep pressure. He winced at once on the slightest touch beneath the costal margin. The most tender point appeared to be just at the region of the gall bladder. The temperature on the 6th was steadily between 103° and 104°. This morning the patient vomited a greenish, bile-stained fluid. He has a very flushed, congested appearance. The complexion, too, was a little muddy; the conjunctivæ looked a little suspicious, as though a little jaundiced. A very careful examination was made of the blood, but no malarial parasites were found.

On the 7th the temperature was lower, ranging between 102° and 103°. The tenderness was still very marked.

On the 8th the temperature was lower, in the neighbourhood of 100°. The eyes were less injected, and the conjunctivæ were a little yellow. He vomited this morning a greenish-yellow material. There is still a great deal of tenderness over the liver. To-day, for the first time, there is bile reaction in the urine; there has been a small quantity of albumin from the outset.

*9th March.*—Patient's temperature normal. Tenderness still very marked; no swelling; no increase in the area of liver dulness. Widal's test yields no reaction. Cultures made from the blood were negative.

*10th March.*—The patient is to-day distinctly jaundiced; the conjunctivæ are quite yellow, and the skin of the trunk has a subicteroid hue. He has not nearly so much pain on deep pressure in the region of the gall bladder.

*11th March.*—Temperature normal. To-day there are several slight hæmorrhages in the conjunctivæ. The jaundice is quite marked. He complains to-day of a little soreness in both parotid regions, and cannot open his mouth well.

*12th March.*—Temperature rose to-day to 101°. Both parotids are a little swollen and sore. He is still jaundiced; no change in the general condition.

On the 13th and 14th the temperature was between 101° and 102° F.; both parotid regions greatly swollen. The tissues of the face and neck are infiltrated; the eyelids are oedematous; the skin over the most prominent portions of the glands is red, and there is a brawny hardness on palpation. The orifices of Steno's ducts are swollen, and muco-pus can be squeezed out from them.

On the morning of the 15th the temperature was 103°. The patient's friends removed him.

Dr. Block kindly saw this patient after removal to his home, and reports that there were abscesses in both parotid glands, with much swelling and redness of skin; incisions were made on the 20th. The patient stated that he felt much better. No jaundice, very little tenderness; temperature, 100°; slight purulent discharge from ears; no rupture into mouth or pharynx. No tenderness over liver, gall bladder, or any of the abdominal regions.

*25th March.*—No change in condition since last note, except that there is less purulent discharge. Patient feels well.

The patient returned to the ward for examination on 31st March. He had no fever; both parotid regions were still swollen and indurated, and showed behind the ears the healing scars of the incisions. There was purulent discharge from both ears. He had lost a great deal in weight. The abdomen was soft, very easily palpated, and there was no tenderness in the region of the liver. The gall bladder could not be felt.

The first attack in November 1896, and the second in March 1897, were both doubtless due to cholecystitis—certainly the latter. Parotitis is a not infrequent sequel of acute inflammatory conditions in the abdomen, as pointed out by Stephen Paget.

(c) *Typhoid fever and gall stones.*—Bernheim, of Nancy, seems to have been the first to suggest the possibility of a causal relationship between typhoid fever and gall stones. He states that he has three or four times seen attacks of colic in the course of typhoid fever in patients who had not before presented any similar troubles, and he asks whether it is not possible that the typhoid fever causes an alteration or a stagnation in the bile which predisposes to lithiasis in susceptible persons, or the typhoidal gastro-intestinal catarrh may be propagated along the biliary passages. Dufourt<sup>1</sup> has noted the existence of a previous typhoid fever in nineteen subjects of gall stones. None of these had had any signs previous to the attack. In twelve the first colic occurred in less than six months after the fever. Twice the attack occurred within two months, six times in three months, three times in the fourth month, and once in the fifth.

I have given the cases which came under our observation. In Case 1 the patient had an attack of hepatic colic during convalescence and shortly after, and then remained perfectly well for nearly eleven months, when she had acute cholecystitis; perforation of the gall bladder and gall stones were found. In Case 2 the patient had an acute pain and symptoms of gall stones at the onset, but it proved to be an acute suppurative cholecystitis. In Cases 3 and 4 it was not determined whether gall stones were present. It is always worth while in the subjects of gallstone colic to inquire particularly with reference to the previous attacks

<sup>1</sup> *Rev. de méd.*, Paris, 1893, p. 13.

of fever. In the following case the colic and jaundice developed within four weeks after convalescence:—

CASE 4.—G. W. R., *æt.* 26 (*Hosp. No.* 9331), was admitted 4th March 1894, with pains in the abdomen. Eight weeks before, he had been laid up in Pittsburg for four weeks with typhoid fever. During convalescence he had a severe attack of abdominal pain, similar to the present one, with much tenderness in the right hypochondrium. The jaundice, which came on two days after the attack, gradually disappeared, and the patient remained perfectly well until 1st March, when he again had an attack of severe abdominal pain, without chills or fever. This was followed by jaundice, which has continued, and for which he seeks relief.

He was a well-nourished, healthy-looking man, with jaundice of moderate grade. There was no enlargement of the liver. There was much tenderness beneath the right costal border and slight increase in the area of splenic dulness; the border was not palpable. The urine was high-coloured, and contained bile pigment. The stools were white, and they were carefully strained for several days for gall stones without finding any.

Patient was discharged, much improved, on 12th March.

The infection of the bile passages with the typhoid bacillus may, as we have seen, be perfectly harmless—that is to say, the gall bladder may show no signs even of catarrh. In other instances intense cholecystitis may be excited; while in a third group the so-called lithogenous catarrh may develop from the irritation of the bacilli, leading to the formation of gall stones. Of course it is quite possible that a patient with gall stones—and we know the percentage of those who have them is very large—may be attacked with typhoid fever, and the presence of the calculi in the gall bladder may favour the settlement and growth of the bacilli, and it may not always be possible to determine which had taken place first.

I recently saw in the surgical wards with Dr. Cushing a remarkable case, which illustrates a third possibility, namely, that the typhoid bacilli may, under certain circumstances, like the pneumococcus, be present without exciting the specific lesions of the disease.

CASE 5.—*Gall stones; acute cholecystitis; typhoid bacilli cultivated from the gall bladder; no previous history of typhoid fever.* (Through the kindness of my colleague, Professor Halsted, and of Dr. Cushing, who took the notes and made the cultures, I am enabled to refer to this remarkable case, which has a direct bearing on the subject in hand.)—Mrs. C., *æt.* 26, from Virginia, was admitted to the surgical ward 5th March 1897, complaining of abdominal pain under the right ribs.

*Personal history.*—She had had the usual diseases of childhood. With the exception of an attack of pneumonia, ten years ago, she has been a very vigorous, healthy woman. She has had no fever. She has been married five years; one stillborn child; one living child, two years

old. She has been subject since childhood to indigestion and to prolonged attacks of constipation. About three years ago, and once each succeeding year, she has had attacks of vomiting, usually in the morning after eating heartily the night before. She is evidently a very careless eater, taking six cups of coffee a day, and is very fond of all sorts of salads and pickles. A year ago she had what the doctor called an attack of gravel. She had painful micturition, but no colic.

*Present illness.*—On 1st March, five days ago, after an enormous meal of beefsteak and gravy, the patient was seized at 4 P.M. with a mild pain in the right hypochondriac region. This continued until next morning, when she vomited both her breakfast and the dinner of the previous day. The quantity, she thinks, brought up was very large, at least two quarts. Soon after the pain became severe, and required morphine for its relief. Ever since the pain has been more or less constant under the right ribs; it is not paroxysmal, and does not radiate. She describes it as a soreness rather than as an actual pain. There has been no vomiting since the first attack; no jaundice. The physician who brought the patient to the hospital states that during these attacks she had fever, the highest temperature  $102^{\circ}$ , on the third day of the attack.

The physical examination showed a dark-complexioned, large, well-nourished, well-developed woman, without jaundice. Pulse was regular, 90; temperature,  $101^{\circ}$  F. The abdomen was full, tympanitic, and there was slight tenderness in the right hypochondrium, rigidity of the right rectus muscle, and on deep pressure an indistinct tumefaction below the costal margin. The edge of the liver could not be felt; the spleen was not palpable.

On 6th March, the day after admission, the indefinite mass, on deep palpation, was still present. The temperature was between  $101^{\circ}$  and  $102^{\circ}$ . During the next few days she improved; the temperature fell on the 7th to  $99^{\circ}$ . She had had her bowels freely moved, and on the 9th she was more comfortable than she had been since the attack. There was no rigidity, and the soft, movable mass could be felt deeply in the right hypochondriac region. It was slightly tender on the deepest pressure. The urine contained no albumin and no bile pigment. The patient got up, and felt so well that she was anxious to go home. The right kidney could be readily palpated between the two hands. The mass at the right costal margin could be also felt readily, and was believed to be the gall bladder.

Dr. Halsted operated 16th March, and found a large gall bladder extending below the margin of the liver. When opened there was no bile, but a turbid, brownish, mucoid material, with fifteen large green-faceted stones, varying in size from a pea to a cherry. One of the largest of the stones was removed from the orifice of the cystic duct. The patient did very well until about 20th March, when there were signs of pneumonia of the right lower lobe. This, however, cleared up in a few days, and she made a rapid recovery by 13th April. She had a good deal of pain, and there was still a slight sinus with a little discharge.

The most interesting feature of this case relates to the bacteriological report, which will be published in full by Dr. Cushing. It is sufficient

here to say that the cover-slips showed a few bacilli, and cultures showed a bacillus which presented morphological and cultural properties identical with that of Eberth's bacillus. What was also to be noted particularly was, that the patient's blood gave the Widal reaction to the organism and also to another culture of typhoid bacillus.

The case, which so far as I know is unique in literature, will be published in full by Dr. Cushing, with the necessary details about the cultures.

# INTERNAL MEDICINE AS A VOCATION

AN ADDRESS

BEFORE THE SECTION ON GENERAL MEDICINE AT THE NEW YORK  
ACADEMY OF MEDICINE, OCTOBER 19TH, 1897

BY

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## ADDRESS.

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IT was with the greatest pleasure that I accepted an invitation to say a few words before this section of the Academy on the importance of internal medicine as a vocation. I wish there were another term to designate the wide field of medical practice which remains after the separation of surgery, midwifery, and gynecology. In itself it is not a specialty, but embraces at least half a dozen, and so its cultivators cannot be called specialists, but bear without reproach the good old name physician, in contradistinction to general practitioners, surgeons, obstetricians, and gynecologists. I have heard the fear expressed that in this country the sphere of the physician proper is becoming more and more restricted, and perhaps this is true; but I maintain (and I hope to convince you) that the opportunities are still great, and that the harvest is truly plenteous, while the laborers, though not few, are scarcely sufficient to meet the demand.

At the outset I would like to emphasize the fact that the student of internal medicine cannot be a specialist. The manifestations of almost any one of the important diseases in the course of a few years will "box the compass" of the specialties. Typhoid fever, for example, will not only go the rounds of those embraced in medicine proper, but will carry its student far afield in morbid psychology, and sometimes teach him, perhaps at the cost of the patient, a little surgery. So, too, with syphilis, which after the first few

weeks I claim as a medical affection. I often tell my students that it is the only disease which they require to study thoroughly. Know syphilis in all its manifestations and relations, and what remains to be learned will not stretch the pia mater of a megaloccephalic senior student.

Each generation has to grow its own consultants. Hos-sack, Samuel Mitchell, Swett, Alonzo Clark, Austin Flint, Fordyce Barker, and Alfred Loomis, served their day in this city, and then passed on into silence. Their works remain; but enough of a great physician's experience dies with him to justify the saying "there is no wisdom in the grave." The author of "Rab and His Friends" has a couple of paragraphs on this point which are worth quoting: "Much that made such a man what the community, to their highest profit, found him to be, dies with him. His inborn gifts, and much of what was most valuable in his experience, were necessarily incommunicable to others; this depending much on his forgetting the process by which, in particular cases, he made up his mind, and its minute successive steps . . . , but mainly, we believe, because no man can explain directly to another man *how* he does any one practical thing, the doing of which he himself has accomplished not at once or by imitation, or by teaching, but by repeated personal trials, by missing much before ultimately hitting."

Wherewithal shall a young man prepare himself, should the ambition arise in him to follow in the footsteps of such a teacher as, let us say, the late Austin Flint—the young man just starting, and who will from 1915 to 1940 stand in relation to the profession of this city and this country as did Dr. Flint between 1861 and the time of his death. We will assume that he starts with equivalent advantages, though this is taking a great deal for granted, since Austin Flint had a strong hereditary bias toward medicine, and early in life fell under the influence of remarkable men whose teachings molded his thought to the very end. We must not forget that Dr. Flint was a New Englander, and

of the same type of mind as his great teachers—James Jackson and Jacob Bigelow.

Our future consultant has just left the hospital, where, for the first time realizing the possibilities of his profession, he has had his ambition fired. Shall he go abroad? It is not necessary. The man whom we have chosen as his exemplar did not, but found his opportunities in country practice, and in Buffalo and Louisville, then frontier towns, and had a national reputation before he reached New York. But would it be useful to him? Undoubtedly. He will have a broader foundation on which to build, and a year or two in the laboratories and clinics of the great European cities will be most helpful. To walk the wards of Guy's or St. Bartholomew's, to see the work at the St. Louis and at the Salpêtrière, to have put in a few quiet months of study at one of the German university towns will store the young man's mind with priceless treasures. I assume that he has a mind. I am not heedless of the truth of Shakespeare's sharp taunt,

How much the fool that hath been sent to Rome,  
Exceeds the fool that hath been kept at home.

At any rate, whether he goes abroad or not, let him early escape from the besetting sin of the young physician, *Chauvinism*, that intolerant attitude of mind which brooks no regard for anything outside his own circle and his own school. If he cannot go abroad let him spend part of his short vacations in seeing how it fares with the brethren in his own country. Even a New Yorker could learn something in the Massachusetts General and the Boston City Hospitals. A trip to Philadelphia would be most helpful; there is much to stimulate the mind at the old Pennsylvania Hospital and at the University, and he would be none the worse for a few weeks spent still farther south on the banks of the Chesapeake. The all-important matter is to get breadth of view as early as possible, and this is difficult without travel.

Poll the successful consulting physicians of this country to-day, and you will find they have been evolved either from general practice or from laboratory and clinical work; many of the most prominent having risen from the ranks of general practitioners. I once heard an eminent consultant rise in wrath because some one had made a remark reflecting upon this class. He declared that no single part of his professional experience had been of such value. But I wish to speak here of the training of men who start with the object of becoming pure physicians. From the vantage ground of more than forty years of hard work, Sir Andrew Clark told me that he had striven ten years for bread, ten years for bread and butter, and twenty years for cakes and ale; and this is really a very good partition of the life of the student of internal medicine, of some at least, since all do not reach the last stage.

It is high time we had our young Lydgate started.<sup>1</sup> If he has shown any signs of *nous* during his student and hospital days a dispensary assistantship should be available; anything should be acceptable which brings him into contact with patients. By all means, if possible, let him be a pluralist, and—as he values his future life—let him not get early entangled in the meshes of specialism. Once established as a clinical assistant he can begin his education, and nowadays this is a very complicated matter. There are three lines of work which he may follow, all of the most intense interest, all of the greatest value to him—chemistry, physiology, and morbid anatomy. Professional chemists look askance at physiological chemistry, and physiological chemists criticize pretty sharply the work of some clinical chemists, but there can be no doubt of the value to the physician of a very thorough training in methods and ways

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<sup>1</sup>This well-drawn character in George Eliot's "Middlemarch" may be studied with advantage by the physician; one of the most important lessons to be gathered from it is—marry the right woman!

of organic chemistry. We sorely want, in this country, men of this line of training, and the outlook for them has never before been so bright. If at the start he has not had a good chemical training, the other lines should be more closely followed.

Physiology, which for him will mean very largely experimental therapeutics and experimental pathology, will open a wider view and render possible a deeper grasp of the problems of disease. To Traube and men of his stamp, the physiological clinicians, this generation owes much more than to the chemical or *post-mortem*-room group. The training is more difficult to get, and nowadays when physiology is cultivated as a specialty few physicians will graduate into clinical medicine directly from the laboratory. On the other hand, the opportunities for work are now more numerous, and the training which a young fellow gets in a laboratory controlled by a pure physiologist will help to give that scientific impress, which is only enduring when early received. A thorough chemical training and a complete equipment in methods of experimental research are less often met with in the clinical physician than a good practical knowledge of morbid anatomy; and, if our prospective consultant has to limit his work, chemistry and physiology should yield to the claims of the dead-house. In this dry-bread period he should see autopsies daily, if possible. Successful knowledge of the infinite variations of disease can only be obtained by a prolonged study of morbid anatomy. Of special value in training the physician in diagnosis, it also enables him to correct his mistakes, and, if he reads its lessons aright, it may serve to keep him humble.

This is, of course, a very full programme, but in ten years a bright man with what Sydenham calls "the ancient and serious diligence of Hippocrates" will pick up a very fair education, and will be fit to pass from the dispensary to the wards. If he cannot go abroad after his hospital term, let it be an incentive to save money, and with the first

§600 let him take a summer semester in Germany, working quietly at one of the smaller places. Another year spend three months or longer in Paris. Lay schemes in advance, and it is surprising how often the circumstances fit in with them. How shall he live meanwhile? On crumbs—on pickings obtained from men in the cakes-and-ale stage (who always can put paying work into the hands of young men), and on fees from classes, journal work, private instruction, and from work in the schools. Any sort of medical practice should be taken, but with caution—too much of it early may prove a good man's ruin. He cannot expect to do more than just eke out a living. He must put his emotions on ice; there must be no "Amaryllis in the shade," and he must beware the tangles of "Nœra's hair." Success during the first ten years means endurance and perseverance; all things come to him who has learned to labor and wait, who bides his time "ohne hast, aber ohne rast," whose talent develops "in der Stille," in the quiet fruitful years of unselfish devoted work. A few words in addition about this dry-bread decade. He should stick closely to the dispensaries. A first-class reputation may be built up in them. Bryon Bramwell's "Atlas of Medicine" largely represents his work while an assistant physician to the Royal Infirmary, Edinburgh. Many of the best-known men in London serve ten, fifteen, or even twenty years in the out-patient departments before getting wards. Lauder Brunton has only recently obtained his full physicianship at St. Bartholomew's after a service of more than twenty years in the out-patient department. During this period let him not lose the substance of ultimate success in grasping at the shadow of present opportunity. Time is now his money, and he must not barter away too much of it in profitless work—profitless so far as his education is concerned, though it may mean ready cash. Too many quiz classes or too much journal work has ruined many a promising clinical physician. While the Pythagorean silence of nearly seven years, which the great

Louis followed (and broke to burst into a full-blown reputation) cannot be enjoined, the young physician should be careful what and how he writes. Let him take heed to his education, and his reputation will take care of itself, and in a development under the guidance of seniors he will find plenty of material for papers before medical societies and for publication in scientific journals.

I would like to add here a few words on the question of clinical instruction, as with the great prospective increase of it in our schools there will be many chances of employment for young physicians who wish to follow medicine proper as a vocation. To-day this serious problem confronts the professors in many of our schools—how to teach practical medicine to the large classes; how to give them protracted and systematic ward instruction? I know of no teacher in the country who controls enough clinical material for the instruction of classes of say 200 men during the third and fourth years. It seems to me there are two plans open to the schools: The first is to utilize dispensaries for clinical instruction much more than is at present the rule. For this purpose a teaching-room for a class of twenty-five or thirty students immediately adjoining the dispensary is essential. For instruction in physical diagnosis, for the objective teaching of disease, and for the instruction of students in the use of their senses, such an arrangement is invaluable. There are hundreds of dispensaries in which this plan is feasible, and in which the material now is not properly worked up because of the lack of this very stimulus. In the second place, I feel sure that ultimately, we shall develop a system of extra-mural teaching similar to that which has been so successful in Edinburgh; and this will give employment to a large number of the younger men. At any large university school of medicine there might be four or five extra-mural teachers of medicine, selected from men who could show that they were fully qualified to teach, and that they had a sufficient number of beds at their command, with proper

equipment for clinical work. At Edinburgh there are eight extra-mural teachers of medicine whose courses qualify the student to present himself for examination either before the Royal Colleges or the University. If we ever are to give our third and fourth year students protracted and complete courses in physical diagnosis and clinical medicine, extending throughout the session, and not in classes of a brief period of six weeks' duration, I am confident that the number of men engaged in teaching must be greatly increased.

Ten years' hard work tells with colleagues and friends in the profession, and with enlarged clinical facilities the physician enters upon the second, or bread-and-butter period. This, to most men, is the great trial, since the risks are greater, and many now drop out of the race, wearied at the length of the way and drift into specialism or general practice. The physician develops more slowly than the surgeon, and success comes later. There are surgeons at forty years in full practice and at the very top of the wave, a time at which the physician is only preparing to reap the harvest of years of patient toil. The surgeon must have hands, and better, young hands. He should have a head, too, but this does not seem so essential to success, and he cannot have an old head with young hands. At the end of twenty years, when about forty-five, our Lydgate should have a first-class reputation in the profession, and a large circle of friends and students. He will probably have precious little capital in the bank, but a very large accumulation of interest-bearing funds in his brain-pan. He has gathered a stock of special knowledge which his friends in the profession appreciate, and they begin to seek his counsel in doubtful cases, and gradually learn to lean upon him in times of trial. He may awake some day, perhaps, quite suddenly, to find that twenty years of quiet work, done for the love of it, has a very solid value.

The environment of a large city is not necessary to the growth of a good clinical physician. Even in small towns

a man can, if he has it in him, become well versed in methods of work, and with the assistance of an occasional visit to some medical centre he can become an expert diagnostician and reach a position of dignity and worth in the community in which he lives. I wish to plead particularly for the wasted opportunities in the smaller hospitals of our large cities, and in those of more moderate size. There are in this State a score or more of hospitals with from thirty to fifty medical beds, offering splendid material for good men on which to build reputations. Take, for example, the town of Thelma, which I know well, to which young Rondibilis, a recent resident at the Hôtel Dieu, has just gone. He wrote asking me for a letter of advice, from which I take the liberty of extracting one or two paragraphs:

"Your training warrants a high aim. Say to those who ask, that you intend to practice medicine only, and will not take surgical or midwifery cases. X. has promised that you may help in the dispensary, and as you can count blood and percuss a chest you will be useful to him in the wards, which, by the way, he now rarely visits. Be careful with the house physicians, and if you teach them anything do it gently, and never crow when you are right. The crow of the young rooster before his spurs are on always jars and antagonizes. Get your own little clinical laboratory in order. Old Dr. Rolando will be sure to visit you, and bear with him as he tells you how he can tell casts from the ascending limb of the loop of Henle. He was once as you are now, a modern, but he crawled up the bank twenty years ago; the stream has left him there, but he does not know it. He means to impress you; be civil and show him the new Nissl-stain preparations, and you will have him as a warm friend. His good heart has kept him with a large general practice, and he can throw *post-mortems* in your way, and may send for you to sit up with his rich patients. If Y. asks you to help in the teaching, jump at the chance. The school is not what you might wish, but the men are in

earnest, and a clinical microscopy-class or a voluntary ward-class, with Y's. cases, will put you on the first rung of the ladder. Yes, join both the city and the county society, and never miss a meeting. Keep your mouth shut, too, for a few years, particularly in discussions.

"Foote's (Philadelphia) is the catalogue to which I referred. Let the old men read new books; you read the journals and the old books. Study Lænnec this winter; Forbes' 'Translation' can be cheaply obtained, but it will help to keep up your French to read it in the original. The old Sydenham Society editions of the Greek writers and of Sydenham are easily got and are really very helpful. As a teacher you can never get *orientiert* without a knowledge of the Fathers, ancient and modern. And do not forget, above all things, the famous advice to Backmore, to whom, when he first began the study of physic, and asked what books he should read, Sydenham replied, 'Don Quixote,' meaning thereby, as I take it, that the only book of physic suitable for permanent reading is the book of Nature."

A young fellow with staying powers who avoids entanglements, may look forward in twenty years to a good consultation practice in any town of 40,000 to 50,000 inhabitants. Some such man, perhaps, in a town far distant, taking care of his education, and not of his bank book, may be the Austin Flint of New York in 1930.

"Many are called, but few are chosen," and of the many who start out with high aims, few see the goal. Even when reached the final period of "cakes and ale" has serious drawbacks. There are two groups of consultants, the intra- and the extra-professional; the one gets work through his colleagues, the other, having outgrown the narrow limits of professional reputation, is at the mercy of the *profanum vulgus*. Then for him "farewell the tranquil mind, farewell content." His life becomes an incessant struggle, and between the attempt to carry on an exhausting and irksome practice, and to keep abreast with young fellows still

in the bread-and-butter stage, the consultant at this period is worthy of our sincerest sympathy.

One thing may save him. It was the wish of Walter Savage Landor always to walk with Epicurus on the right hand and Epictetus on the left, and I would urge the clinical physician, as he travels farther from the East, to look well to his companions—to see that they are not of his own age and generation. He must walk with the “boys,” else he is lost, irrevocably lost; not all at once, but by easy grades, and every one perceives his ruin before he, “good, easy man,” is aware of it. I would not have him a basil plant, to feed on the brains of the bright young fellows who follow the great wheel uphill, but to keep his mind receptive, plastic, and impressionable he must travel with the men who are doing the work of the world, the men between the ages of twenty-five and forty.

In the life of every successful physician there comes the temptation to toy with the Delilah of the press—daily and otherwise. There are times when she may be courted with satisfaction, but beware! sooner or later she is sure to play the harlot, and has left many a man shorn of his strength, *viz.*, the confidence of his professional brethren. Not altogether with justice have some notable members of our profession labored under the accusation of pandering too much to the public. When a man reaches the climacteric, and has long passed beyond the professional stage of his reputation, we who are still “in the ring” must exercise a good deal of charity, and discount largely the *on dits* which indiscreet friends circulate. It cannot be denied that in dealings with the public just a little touch of humbug is immensely effective, but it is not necessary. In a large city there were three eminent consultants of world-wide reputation; one was said to be a good physician but no humbug, the second was no physician but a great humbug, the third was a great physician and a great humbug. The first achieved the greatest success, professional and social, possibly not financial.

While living laborious days, happy in his work, happy in the growing recognition which he is receiving from his colleagues, no shadow of doubt haunts the mind of the young physician, other than the fear of failure; but I warn him to cherish the days of his freedom, the days when he can follow his bent, untrammelled, undisturbed, and not as yet in the coils of the octopus. In a play of Oscar Wilde's one of the characters remarks, "there are only two great tragedies in life, not getting what you want—and getting it!" and I have known consultants whose treadmill life illustrated the bitterness of this *mot*, and whose great success at sixty did not bring the comfort they had anticipated at forty. The mournful echo of the words of the preacher rings in their ears, words which I not long ago heard quoted with deep feeling by a distinguished physician, "Better is a handful with quietness than both hands full with travail and vexation of spirit."

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## PNEUMONIA.

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A REVIEW OF THE CASES STUDIED BY THE  
THIRD AND FOURTH YEAR CLASSES, JOHNS  
HOPKINS HOSPITAL, SESSION 1896-97.

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By WILLIAM OSLER, M. D.,  
*Professor of Medicine Johns Hopkins University.*

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In the memorable address with which Sir James Paget opened the Seventh International Congress in London, he spoke of our profession as one that "offers the most complete and constant union of those three qualities which have the greatest charm for pure and active minds—novelty, utility and charity." This element of *novelty* is one with which even those of you who are only beginning your clinical work must be much impressed. For the past eight weeks we have been studying together the prevalent acute diseases—malaria and typhoid fever; and now the picture begins to change, and the presence in the wards of several cases reminds us that the pneumonia season is at hand. We shall begin to-day a systematic study of this the most important acute affection you will be called upon to treat—a disease with manifestations perhaps less multi-

form than typhoid fever or malaria, but one infinitely more dangerous, and much less under our control. As our aim is to make this a school of practical medicine, I dispense as far as possible with all theoretical and didactic considerations, and make the cases teach the lesson of the disease. In the ward classes you will see (as far as is possible) and have notes of every case of pneumonia admitted this session, and I have asked one of your number to be Recorder, and fill up week by week on the blackboard a tabular list, so that you can, as we say, "keep track" of them. Before speaking of the cases now under observation, let me give you in a brief summary our pneumonia lesson of the last session. I am indebted to Mr. Ford, the Recorder of the cases last year, for an excellent analysis.

In a general hospital we see five groups of cases: (1) acute pneumonia developing in healthy children or adults, or in debilitated or dissipated persons; (2) pneumonia developing after anæsthesia or surgical operations; (3) the terminal pneumonia in old hospital cases, a form more often recognized in the dead-house than in the wards; (4) cases admitted with the sequelæ or complications of pneumonia, and (5) cases

admitted as pneumonia, but which prove to be some other disease. Let me refresh your memories by a brief review of the cases of the last session grouped in this way.

I. Ordinary pneumonia. There were twenty-five cases admitted. The ages were as follows : under 10 years 7 cases ; the youngest case was No. 23, a child aged  $2\frac{1}{2}$  years ; between the ages of 30 and 50 there were 9 cases ; the oldest case was No. 20, a man aged 71 years. The part of the lung involved : left lower lobe 10 cases ; left upper lobe 2 ; right lower lobe 16 ; right upper lobe 9 ; double pneumonia 6 cases. A majority of the cases pursued an uneventful course. Well marked crisis occurred in 20 cases—on the fourth day in 2 cases, on the fifth day in 1 case, on the sixth day in 2, on the seventh day in 5, on the eighth day in 3, on the ninth day in 2, on the tenth day in 2, on the eleventh day in 2, on the fourteenth day in 1. Death occurred in five cases, giving a mortality of 20 per cent, which is somewhat lower than is usual in the disease and lower than our total mortality for the past eight years. Case 5, a child aged five years, died on the twenty-fifth day of a streptococcus empyema. A rib was resected and the pleura drained, but

there was a general streptococcus septi-cæmia. In case 6 the patient died of double pneumonia with pericarditis on the eleventh day. Case 7 died of asthenia on the fifteenth day, with a complication of pericarditis. Case 11 died of asthenia on the thirteenth day. Case 24 died on the eleventh day with consolidation of all of the right lung, and the lower lobe of the left.

I have frequently called your attention to the fact that with the exception of involvement of the pleura and pericardium, complications and sequelæ are rare in pneumonia. In only two of the cases did an extensive pleurisy with effusion develop. One case had jaundice. A leucocytosis was present in all of the cases. The lowest count was 12,400 leucocytes per c. m. in case 11, a hard drinker, aged 48, who died on the thirteenth day. The highest count of leucocytes was 63,000 per c. m.

II. Through the kindness of my colleague, Dr. Halstead, and of Dr. Bloodgood, we have been able to keep track of the pneumonia cases developing on the surgical side. The three cases are particularly interesting, as they illustrate the three chief conditions under which pneumonia occurs in surgical practice. It is well known that after injuries, particu-

larly in elderly men or in hard drinkers, pneumonia is very liable to develop. A man admitted March 2, 1897, with a compound fracture of the right tibia and fibula, contracted pneumonia on the thirteenth day. He had consolidation of the right lower lobe, which was followed by an extensive pneumococcus empyema, necessitating resection of the rib and drainage. He made a good recovery.

It is not very uncommon for surgical cases in general hospitals, whether they have been operated upon or not, to be attacked with pneumonia. An exceedingly interesting case of Dr. Finney's was a man aged 48, whom I saw on his admission, with a distended painful abdomen and signs of obstruction. Dr. Finney operated at once and found a strangulation by a small retro-peritoneal band, which was readily nicked and at once relieved the pressure. The patient did well, but three weeks subsequently developed pneumonia in the left lower lobe. It ran a very favorable course and terminated by crisis on the seventh day.

A form of pneumonia of the greatest interest to surgeons is that which follows the administration of an anæsthetic. Renewed attention has been directed to the subject by Mr. Clement Lucas, of Guy's Hospital, and the London jour-

nals of the past year contain a good deal of interesting matter upon it. The question has also been discussed in Boston, and you will find in the *Boston Medical and Surgical Journal* for September 23 a suggestive paper by Dr. W. F. Whitney. This "ether pneumonia," as it has been called, differs in no way from the ordinary form, and it is probable that prolonged and profound etherization is simply a condition which increases the liability to infection, if the pneumococcus happens to be present (as it so often is) in the patient's air passages. It is remarkable with what rapidity an ether pneumonia may kill. We have had one case in which the patient died on the second day. The only case during this session was one of gastrotomy for malignant stricture of the oesophagus in a woman aged 70. She died a few days after the operation of pneumonia involving the bases of both lungs. Dr. Whitney suggests that before operation the mouth should be thoroughly disinfected and the throat gargled with a warm solution of chlorinated soda, (Labarraque's solution), three drachms in two ounces of peppermint water and two ounces of glycerine; and that the nose should be douched with a solution of boracic acid and salt.

III. Terminal Pneumonia. Cases of

chronic diseases are not infrequently carried off with a terminal inflammation of the lung. In pulmonary tuberculosis, the various forms of Bright's disease, cirrhosis of the liver, all forms of chronic heart disease and diabetes, the end may be caused by inflammation of the lungs. This is frequently overlooked in the wards and not detected until the autopsy; in fact the remarkable discrepancy between the post-mortem and clinical records of a hospital in the matter of pneumonia is largely accounted for by this terminal form, the existence of which is often masked by the other features of the case, or which indeed may not present any suggestive indications. The only case of the kind under observation last year you still remember very well. Ida A—, aged 17, who was in ward G for the greater part of the winter with chronic Bright's disease. The condition became much aggravated; she had a great deal of anasarca, and grew much debilitated. On March 8 she began to have dyspnoea, and we detected signs of consolidation in the left lung. She died on the 12th day.

IV. As I mentioned a few moments ago, we had no case of pneumonia admitted to the wards which showed any of the serious sequelæ, but one case was ad-

mitted which illustrated one of the most serious terminations of the disease; namely, abscess. The patient, a man aged 57, was admitted March 25, 1897. His illness began on January 3, with a chill, pain in the right side and shortness of breath, and from the statements which he gives, there is little doubt that he had an ordinary pneumonia. From the outset he had fever, loss in weight, shortness of breath, and cough, with expectoration of a very ill-smelling sputa. The patient presented signs of cavity in the lower lobe of the left lung. The sputum was abundant, with a sweetish, sometimes a very foul odor; elastic tissue and tubercle bacilli were not found. The question of operation was considered, but he refused, which, considering his very weak state, was, I think, wise. He went to his home and died on April 6.

V. No cases are of greater interest than those which present at the outset all the features of frank pneumonia, but which subsequently prove to be the subjects of the pneumonic form of pulmonary tuberculosis. The most interesting of the two cases, as we were able to follow it almost from the outset, was that of A. H., aged 52, a Dane, who was admitted February 12, 1897. He had been steward on a steamer, and had been

taken ill suddenly only a few days before admission, with a chill, cough, dyspnoea and labial herpes. He had dullness with tubular breathing at the right apex. The sputum was at first rusty colored, and there was no suggestion whatever that the condition was anything but ordinary pneumonia. He had very slight leucocytosis; the temperature was not very high, but subsequently there were signs of pleurisy in the left axilla. After the tenth day, when no crisis occurred, we became a little suspicious, and the sputum was very carefully examined. Tubercle bacilli were found on the twelfth day, elastic tissue on the twentieth day. The sputa had also, some of you may remember, that very greenish hue upon which Traube laid so much stress in these cases. Death occurred on the forty-third day, and the autopsy showed the right lung uniformly involved in a fresh tuberculous pneumonia. There was a small cavity in the lower lobe. The left lung showed an old cheesy focus and areas of fresh tuberculous infiltration.

About the other case we could not be so positive. A man aged 58, admitted December 3, 1896, had dullness over the right lung from apex to base behind, with intense tubular breathing.

He had been ill for about six weeks before admission with pain in the right side, cough and dyspnœa. We never found tubercle bacilli or elastic tissue in the sputa. The temperature was not high during the short time he stayed in hospital. He emaciated very rapidly, went to his home, and died within three months of the onset of his illness. He had chills and sweats and involvement of the other lung. There was a history of consumption in his family and though the positive evidence furnished by the tubercle bacilli in the sputa was not forth-coming, yet I think there can be very little question that in this case, too, the process was tuberculous.

Some concrete positive knowledge of these 32 cases makes a good clinical beginning for the fourth year students among you, and should you double this experience during the present session you will at least start with a fair fighting knowledge of one of your worst foes.

OCCASIONAL NOTES ON AMERICAN MEDICAL  
CLASSICS.<sup>1</sup>

INTRODUCTORY LECTURE TO A COURSE OF CLINICAL OBSERVATIONS  
IN THE PENNSYLVANIA HOSPITAL, DELIVERED THERE ON THE  
3D OF DECEMBER, 1776, BY DR. THOMAS BOND.

BY WILLIAM OSLER, M.D.,

BALTIMORE,

Professor of Medicine in the Johns Hopkins University.

THIS is interesting to us as the first clinical lecture delivered in America. Founded in 1752, the Pennsylvania Hospital was the first general hospital organized in the English-speaking colonies. It grew rapidly, so that within fifteen years of its foundation there were 130 patients in the wards. The original staff consisted of Dr. Thomas Bond, Dr. Phineas Bond, and Dr. Lloyd Zacchary.

We have already heard, in speaking of Dr. John Morgan, how the Medical Faculty of the Philadelphia College had been organized. Neither Morgan nor Shippen, the two professors, were connected with the hospital, and it was doubtless felt that it would be of great importance to the young school if the students were enabled to attend its practice and receive instruction in the wards. Accordingly, we find from the minutes of the managers that a letter was received from Dr. Thomas Bond, in which he proposed to give clinical lectures to the students on physic on the nature, causes, and cure of diseases, and to put up a meteorological apparatus in the picture-room for observation of the weather, and keeping an exact account of the epidemic diseases caused thereby. He requested them to call a meeting, at which he should present to them the advantages to be derived from the institution of such lectures. Accordingly, we find the note in the minutes "that on the 26th of the 11th month, 1766, in pursuance of the summons of the sitting managers, all the managers met at the house of Dr. Thomas Bond, together with the following physicians: Dr. Thomas Bond, Dr. Cadwallader, Dr. Shippen, Dr. Redman, and Dr. Evans." The lecture was ordered to be inserted in the minutes of the board, and has in this way been preserved. It is stated in the heading of the lecture that it was delivered in the Pennsylvania Hospital December 3, 1766, which would indicate that Dr. Bond had repeated the lecture before the students in public, and that the notice of the lecture, having been read on the 29th of November, referred to a private reading before the managers at Dr. Bond's house.

The lecture has a special interest as the first delivered in a hospital in this country. In 1827 it was copied by Mr. Paul Eve, at that time

<sup>1</sup> Read at a meeting of the Johns Hopkins Hospital Historical Society.

a student of the Pennsylvania Hospital (who subsequently became a distinguished surgeon in the West), and it appears in the *North American Medical and Surgical Journal*, Vol. iv, for that year.

Of the lecture itself I may give the following abstract: Dr. Bond refers first to the school of physic, lately opened in the city, which, with the co-operation of the institution of literature and charity already founded, will enable the student of physic to acquire all the knowledge necessary for practising every branch of his profession, reputably and judiciously. The student should study medicine in the country in which he is to practise, as every climate produces diseases peculiar to itself, and the precepts and a never-failing experience are handed down locally from father to son and from tutor to pupil. In speaking of the three chairs which had been organized at the medical school, he refers to the necessity of supplementing a theoretical and didactic instruction by a personal knowledge of disease, remarking that the student "must join examples with study before he can be sufficiently qualified to prescribe for the sick; for language and books alone can never give him adequate ideas of disease and the best method of treating them. For which reasons, infirmaries are justly reputed great theatres of medical knowledge." He gives an admirable picture of the way in which ward work should be conducted; "the clinical professor comes in to the aid of speculation and demonstrates the truth of theory by facts; he meets his pupils at stated times at the hospital; and when a case presents adapted to his purpose, he asks all those questions which lead to a certain knowledge of the disease and parts affected; this he does in the most exact and particular manner to convince the students how many and what minute circumstances are necessary to form a judgment of the curative indications on which the safety and life of the patient depends; from all which circumstances and the present symptoms he pronounces what the disease is; whether it is curable or incurable; in what manner it should be treated, and gives his reasons, from authority or experience, for all he says on the occasion; and if the disease baffles the power of art, and the patient falls a sacrifice to it, he then brings his knowledge to the test and fixes honor or discredit on his reputation by exposing all the morbid parts to view, and demonstrates by what means it produces death; and if, perchance, he finds something unexpected, which betrays an error in judgment, he, like a great and good man, immediately acknowledges the mistake, and, for the benefit of survivors, points out other methods by which it might have been happily treated." He gives two illustrations of the value of post-mortem examinations in forming diagnosis and in giving students just ideas of the causes of death. In connection with one of these cases, an abscess of the brain, he remarks on the paralysis of the body on the opposite side.

With a wisdom we can appreciate better than his hearers, he urges the study of the causes of disease, particularly of the severe epidemics, with which Philadelphia had been plagued for many years. He states "the atmosphere which surrounds us is fine, the air we breathe free, pure, and naturally healthy, and I am fully persuaded we shall find, on strict study, when it becomes otherwise, it is from contagion imported or neglected sources of putrefaction among ourselves, and, therefore, whenever we are able to demonstrate the causes, they may be removed and the effect prevented." In the case of malaria, which had been particularly severe during the preceding year in the Middle and Southern States, he held out hopes, from the experience he had had in Philadelphia, that by proper drainage and cleanliness, the severity of the epidemics could be mitigated. He says, "When I first came into this city, the Dock was the common sewer of filth, and was such a nuisance to the inhabitants about it that they were obliged to use more pounds of bark than they have ounces since it has been raised and levelled. Another striking instance of the advantage of cleanliness for the preservation of health affords me an opportunity of paying a tribute, justly due, to the wisdom of the legislature of this province, in framing salutary laws for paving and regulating the streets of this city, and to the indefatigable industry and skill of the commissioners in executing them; whereby they have contributed so much to the healthiness of the inhabitants that I am confident the whole expense will be repaired in ten years, by a lessening of the physic bills alone." It is very interesting to note the clear and decisive manner in which Dr. Bond speaks of the necessity of isolation and disinfection of cases of contagious disease. Speaking of typhus fever, he states that he had lately visited an Irish vessel, which had come into the port, and had found five passengers ill with the jail fever,—the typhus. He saw that the *fomes* of infection were spreading, and ordered the ship "to lay quarantine, to be well purified with the steams of sulphur and with vinegar; directed the bedding and clothing of the people to be well washed and dried before any person should be permitted to land out of it; after which I advised separating the sick from the healthy." We cannot consider him so happy in his remarks upon the prevention of autumnal and intermittent fevers; referring in particular to his remedies, which still are popularly believed to lessen the receptivity of the malarial poison,—namely, sassafras-bark and the natural chalybeate sulphur-waters. In conclusion, he tells the students that he will be prepared to meet them at stated times and to introduce them to a familiar acquaintance with the acute diseases, and with the nature and treatment of chronic diseases, and the proper management of ulcers, wounds, and fractures, and he promises that they shall see many curious cases among the 130 sick persons at the hospital. He promises also to put

up a complete meteorological apparatus, in order to study the effects of the variation of the weather upon the prevailing diseases. And he advises the students to attend Provost Smith's course of experimental philosophy, in order that they may the better appreciate his remarks on meteorology.

In a subsequent minute the managers unanimously agree to the proposal to institute clinical lectures, and placed the fee for the privilege of attendance at one guinea per annum; the money to be applied towards establishing and promoting a medical library.

A few details about Dr. Thomas Bond may be of interest, and for the most of these I am indebted to Dr. W. A. Armstrong, of Philadelphia.

Dr. Bond was born in Calvert County, Md., in 1712. He received his medical education in Europe, and began to practise in Philadelphia in 1732. He appears to have been a very philanthropic man, and about 1750 the idea of a hospital for the sick poor occurred to him. After repeated unsuccessful interviews with wealthy and influential people he finally consulted Benjamin Franklin, who eagerly embraced the project, and who "by the use of a little cunning" introduced a bill into the Assembly, February 7, 1751, entitled "an act to encourage the establishment of a hospital." Franklin's diplomacy secured the unanimous passage of this act, which received the governor's signature May 11, 1751. Soon after this a meeting was called and managers elected, of whom Dr. Bond was one. A contributor, Samuel Rhoads, a builder, was instructed to "look for and secure boards to build the hospital." In the mean time a private dwelling-house on Market Street above Fifth was leased at £40 a year.

October 23, 1751, Dr. Lloyd Zacchary, Thomas Bond, and his brother Phineas Bond, offered "to attend gratis for the first three years." Drs. Graeme, Cadwallader, Moore, and Redman were to be called in extraordinary cases.

The first patients were not admitted until February 11, 1752, and it was not until 1754 that the present site of the Pennsylvania Hospital was purchased. Dr. Bond would appear unquestionably to have been the originator of the Pennsylvania Hospital, and full credit is given to him by Benjamin Franklin. Several notes in the minutes refer to Dr. Bond; thus, on November 30, 1757, he presented the library with medical books valued at £12 4s 9d. On March 28, 1769, the first mention of fees (£26 7s 0d) received from medical students attending the lectures of Dr. Bond. Dr. Bond served as surgeon and physician to the hospital from October 2, 1751, to May, 1776. No mention of his name as attending physician occurred after this date, but at a subsequent meeting, March 26, there is an appropriate minute on his death, in 1784.

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INTERNAL SECRETIONS;  
CONSIDERED IN THEIR  
Physiological, Pathological and Clinical Aspects.

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SPORADIC CRETINISM IN AMERICA.

BY  
WILLIAM OSLER, M.D.

Being a paper to represent the AMERICAN PEDIATRIC SOCIETY before the CONGRESS OF AMERICAN  
PHYSICIANS AND SURGEONS, May 5th, 1897, and

REPRINTED FROM VOL. IV  
TRANSACTIONS OF THE CONGRESS OF AMERICAN PHYSICIANS AND  
SURGEONS  
1897

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INTERNAL SECRETIONS CONSIDERED IN THEIR  
PHYSIOLOGICAL, PATHOLOGICAL AND  
CLINICAL ASPECTS.

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SPORADIC CRETINISM IN AMERICA.

BY WILLIAM OSLER, M.D.

*Professor of Medicine, Johns Hopkins University.*

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1. INCIDENCE OF THE DISEASE IN AMERICA.
  2. RESULTS OF THE THYROID TREATMENT.
  3. DIAGNOSIS.
  4. PATHOLOGY.
  5. RELATIONS OF SPORADIC AND ENDEMIC CRETINISM.
  6. APPENDIX—OPERATIVE MYXCEDEMA.
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I. INCIDENCE OF THE DISEASE IN AMERICA.

In 1893 I made a collective investigation on the subject of sporadic cretinism in this country, and was able to find only 11 cases. Since that time the profession has learned to recognize the condition, and I am able to-day to report upon 60 cases, including those already referred to. Of these 27 have been reported; for the others I am indebted to various physicians throughout the country who have kindly responded to my inquiries, and in many cases sent photographs.

The following cases have been reported in full in the American Journal of the Medical Sciences, Nov. 1893, but it will be interesting here to report on their progress since that date.

*Series I.*

CASE I.—M. ——— has been under observation from Jan. 10th, 1892, at which time she was two years and three months old, and presented a typical picture of infantile myxcedema. I reported upon her case in the February number of the Archives of Pediatrics for 1895. The thyroid extract was started in March, 1893, and she grew four inches in the first fourteen months. She learned to walk and talk, ran about everywhere, and lost altogether the cretinoid appearance. I have seen this child at intervals of a few months ever since. She has continued to take the thyroid extract, and has

grown and developed, and now nothing whatever peculiar is to be noticed about her.

CASE II.—A cretinoid imbecile, nineteen years old at the time of observation, March 3d, 1893, without any special evidence of myxœdema. She has a goitre in which the left lobe is more enlarged than the right. This patient took thyroid extract at intervals for some time without any special benefit.

CASE III.—A child aged three and a half years when she came to the Johns Hopkins Hospital Dispensary, Nov. 25th, 1892, was a typical instance of infantile myxœdema. She was unfortunately lost sight of.

CASE IV.—DR. BULLARD'S CASE, G. S., female, aged six years. Dr. Bullard writes on April 14th, 1897, "She has had no treatment, and is essentially in the same condition as when I wrote in 1893. She has grown little if at all, and is a dwarf.

CASE V.—Sarah McGrath, aged nineteen years. (Dr. Brownell, New York State Custodial Asylum, Newark, N. Y.) (Fig. I.)

March 26th, 1897, Dr. Brownell writes, "Sarah McGrath died about two years since in the Erie County Almshouse, Buffalo, to which she was removed shortly after the history sent you was taken. I regret to say that I have no subsequent notes of her case." Not treated.

CASE VI.—Louisa Schmidt, aged fourteen years. (Dr. Van Sweringer, Indiana School for Feeble-minded Children.) Dr. Delia Howe writes on April 14th, 1897, that the thyroid treatment was commenced in September, 1895, three grains of desiccated thyroid gland t. i. d. She emaciated rapidly and the treatment was frequently intermitted. The protruding abdomen disappeared, but the patient did not gain in height, and her features were not much changed. She became much brighter mentally. The treatment was stopped in March, 1896, as the patient's physical condition was very poor. She died of acute tuberculosis in November, 1896. Height at time of death, 127cm. Thyroid gland weighed 4 grms. and was degenerated. Patient died of acute tuberculosis in Nov., 1896. Case will be reported in full under pathological anatomy.

CASE VII.—Martha L. Y., aged sixteen years. (Dr. J. C. Carson, Syracuse State Institution for Feeble-minded Children.)

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*Fig. 1.—Case V. (p. 170.) Sarah McGrath, aged 19. (Dr. Brownell.)*



FIG. 1.

Fig. 11. a and 11. b.—Case VII. (p. 170). Mordecai L. Y. aged  
16. (Dr. J. C. Carson). Fig. 11. a shows the patient one year  
before and Fig. 11. b one year after the administration of thyroid  
extract.

FIG. II, a.



FIG. II, b.





FIG. III.

*Fig. III.—Case X. (P. 171.) Nellie R., aged 15. (Dr. Finess, reported by Dr. Fred'k. Peterson.) This case shows remarkably well the infantile appearance.*

The further history of this case is as follows. Treatment was begun Sept. 4th, 1895. At that time her height was  $40\frac{1}{2}$  inches, and the weight 57 pounds. After one month the change in her condition was striking. At the end of two months the entire skin was renewed, giving place to the velvety skin of an infant, and a new growth of hair just appearing on the head. At the end of eight months she had grown three and one-eighth inches, and weighed  $62\frac{1}{2}$  pounds. The teeth which have appeared since treatment are eight incisors, one canine, and two second molars. The photographs (Fig. II.) show the condition a year before and a year after treatment. (*Journal of Psycho-Asthenics, Dec., 1896.*)

CASE VIII.—Willie V., aged forty-two years. (Dr. Hoisholt, State Insane Asylum, Stockton, Cal.). April 1st, 1897, Dr. Clark writes that he cannot report any material change in the condition of the patient. He has less frequent epileptic attacks, and seems to be enjoying better physical health than he did formerly. Thyroid extract had not been given on account of the age of the patient, but was commenced on the day the letter was written (April 1st, 1897).

CASE IX.—Johnny V., brother of the preceding case, aged forty years. Of this patient Dr. Clark writes that he sees no change excepting that the scoliosis is more marked; he leans very much to one side when he walks. The thyroid extract had not been tried on account of the age of the patient, but was commenced on the day the letter was written.

CASE X.—Nellie Roume, aged fifteen years. (Dr. Furness, Randall's Island Hospital, New York.) (Fig. III.) Dr. Frederick Peterson reports this case in *Pediatrics* for May 1st, 1896. He says, "Treatment was begun with five grains of the dried gland, which proved too much, and it was reduced to one grain daily. Improvement was noticeable in a few days. In the course of three months she grew thinner, gained two inches in height, cut several new teeth, her hair became more abundant, she assumed an intelligent expression, noticed everything about her, played with a doll, and had increased her vocabulary to twenty-seven words. At this time treatment ceased because of changes among internes and attending physicians."

CASE XI.—I. N., female, aged probably thirty-five years. (Dr. A. E. Osborne, Inmate of the California Home for Feeble-minded

Children.) In a note from Dr. A. E. Osborne of April 1st, 1897, he says, "I regret to have to say that our cretin died shortly after I forwarded you the notes relating to her. I really have nothing further of material interest regarding her." Not treated.

It will be noted that of these cases six have not been treated thoroughly, three have been treated with great improvement, and two have died.

### *Series II.*

I will first give brief notes of the three additional cases which have been under observation at the Johns Hopkins Hospital, and then in order the cases which either have been reported in the literature in this country, or the notes of which have been furnished to me for the purpose of this report.

CASE XII.—J. L., aged forty-three, admitted to the Johns Hopkins Hospital, Surgical Department, for cystitis. He presented a very characteristic appearance of a cretinoid dwarf. He had a muddy complexion, dry skin, harsh rasping voice. There was no goitre. He had a fair amount of intelligence, but he was in many ways infantile and childish. He received no special treatment.

CASE XIII.—Theophilia Purzika, aged 2, was admitted to the Johns Hopkins Hospital Dec. 18th, 1895. It was very difficult to get a history, as the mother was a Pole and did not speak English. This is the second child; natural at birth. No goitre in the family. The thyroid gland can be felt, seems a little large. She presents the typical aspects of infantile myxœdema. Though of fair size for her age, she can neither sit nor stand. The child looks pale; the skin of the face has a sallow, waxy appearance. The tongue is large, held out all the time. The expression of the face is dull and idiotic. The lower jaw drops, and she drools constantly. There are eight incisor teeth, and she is cutting a lower molar and the molars of the upper jaw. The eyelids are puffy and the palpebral orifices look narrow. The skin of the face is rough, and there is a puffiness and myxœdematous character of the skin of both hands and face. The head measures 45cm. in circumference, 25½cm. in the transverse, and 35cm. in the antero-posterior. The anterior fontanelle is large, almost as much so as at birth. The posterior fontanelle is completely closed.

*Figs. IV, a and IV, b.—Case XIII. (p. 172.) Illustrate the effect of two months' treatment.*



FIG. IV. *x.*



FIG. IV. *b.*



FIG. V.

*Fig. V.—Case XV. (p. 173.) A remarkable example of a pregnant cretin. (Dr. Townsend.)*

The abdomen is large and pendulous. The skin of the thighs, as shown in the photograph, hangs in folds. Her length on admission was 65cm. The blood count gave 4,648,000 red corpuscles, 80 per cent. of hæmoglobin, and about 11,000 leucocytes.

On Dec. 20th she was placed on the thyroid extract prepared by Dr. Abel. On commencing the treatment she weighed twenty pounds. Within two months, as illustrated in the photograph, (Fig. IV.) the condition improved remarkably. She took an interest in surrounding objects. The eyes had become bright and intelligent; the puffiness of the face and hands had almost wholly gone. As shown in the photograph, the palpebral orifices had grown much larger. The tongue was not held out so far from the mouth, and the drooling had almost ceased. She remained in the hospital until Sept. 1st, 1896. The myxœdematous condition disappeared entirely, she gained eight pounds in weight, and had thriven very well. It is interesting to note in this case that from the 20th of March to the 4th of April the child received no thyroid extract. She had had a little fever and bronchitis and it was stopped. On the latter date it was noticed that the skin had become harsh and dry, the eyelids more puffy, and the child did not seem nearly so well.

CASE XIV.—Teresa Teichman, aged 2, brought to the Johns Hopkins Hospital Dispensary April 9th, 1896. The parents are Poles. Child at birth was natural. She has never walked or talked; cannot stand alone. She is very apathetic, but seems to understand everything. The mouth is held wide open. The tongue does not protrude. The face is broad; the eyelids are puffy; the nose is broad, the orifices of the nostrils very plainly to be seen. The mouth is large, the lips full, and the cheeks flabby and relaxed. There is a waxy sallow tint to the skin. The head is broad, parietal eminences marked, forehead low. The tongue is large; upper and lower incisors are just appearing. The subcutaneous fat over the body is abundant. There are no pads above the clavicles. The belly is very prominent and pendulous. The general cretinoid aspect is most marked. The thyroid gland cannot be felt. There is no dullness over the manubrium.

CASE XV.—DR. TOWNSEND'S CASE OF PREGNANT CRETIN. (Fig. V.) No note of thyroid treatment. No note of condition of thyroid gland. Aged 38 years. Cæsarean section: recovery. (*Archives of Pediatrics, January, 1897.*)

CASE XVI.—DR. TOWNSEND'S CASE. Female, seen April, 1891, aged one year and eight months. Not treated with thyroid extract. Patient died in summer of 1891 of some intestinal trouble. No thyroid gland felt. (*Arch. of Pediat., November, 1892.*)

CASE XVII.—DR. TOWNSEND'S CASE. Walter McGuire, aged four years. Treatment begun Nov., 1896. Marked improvement within one month. Has grown two inches in height since beginning of treatment; no teeth before; now has four lower incisors, two lower anterior molars, and one upper anterior molar. Is very active and takes an intelligent interest in things. Can walk. Tongue smaller and kept in mouth. Treatment being continued. No note of condition of the thyroid gland. (*Not yet published.*)

CASE XVIII.—DR. FRIEND'S CASE. Hattie G., aged sixteen years and one month. (Fig. VI.) Treated with thyroid extract for one year and ten months; begun about May, 1895; much improved. Within six months the swelling had all disappeared. At the end of seven months seventeen teeth of second dentition appeared. The height increased from 76.5 cm. to 105 cm. Treatment continued almost to time of death. Thyroid gland appears normal. At the autopsy the only cause of death manifested was two drams of bloody fluid in the lateral and fourth ventricles of the brain. All of the veins were surcharged with blood, and the dura, extending about one half inch on both sides of the longitudinal sinus, was of a deep red color. The other organs showed a negative condition. The thyroid gland was absent. The thymus was very large and weighed 64.0 grams. The pituitary gland was very small, and weighed 0.2 grams. Microscopically all organs showed an excess of connective tissue. In the posterior wall of the bladder was imbedded a concretion about the size of a dime. (*Not yet published.*)

CASE XIX.—DR. PETERSON'S CASE. M. P., male, aged eighteen months. Treatment begun June, 1895. Under treatment with the thyroid extract for ten months, at the end of which time it has grown, and seems a normal child in every respect, though still having to continue the thyroid extract. Thyroid gland small and hard. (*Pediatrics, May 1st, 1896.*)

CASE XX.—DR. PETERSON'S CASE. Dwarf cretin, supposed to be between sixty and eighty years. Two weeks of thyroid treatment made no perceptible impression except to improve the temperature and circulation. Thyroid gland perceptible but very small.

*Fig. VI.—Case XVIII. (p. 174.) Female, aged 16. (Dr. Friend.)*



FIG. VI.



FIG. VII. *a.*



FIG. VII. *b.*

*Figs. VII. a and VII. b.—Case XXI. (p. 175.) Male, aged 32.  
Illustrating a very typical condition of advanced cretinism. (Dr.  
Lloyd.)*

FIG. VIII.



FIG. VIII.



*Figs. VIII. a and VIII. b.—Case XXIV. (p. 175.) Female, aged 9. (Dr. Dickson L. Moore.) Fig. VIII. b shows the remarkable change after seven months' treatment.*

CASE XXI.—DR. LLOYD'S CASE. B. M., male, aged thirty-two years. (Fig. VII.) Thyroid gland of the sheep partially cooked was tried, but the patient took such a disgust to it that it was discontinued. He lost appetite and grew thinner, but no other effect was noticed. Thyroid gland entirely absent. (*International Clinic, Phila., 1892, 2d s., Vol. II.*)

CASE XXII.—DR. HERRICK'S CASE. E. M., female, aged four years and nine months. After twelve months treatment with the thyroid extract there was marked improvement. Treatment begun Jan., 1896. She lost in weight, increased rapidly in height, and grew very bright mentally. Thyroid gland not to be seen or felt. (*Arch. of Pediatrics, April, 1897.*)

CASE XXIII.—DR. NOYES' CASE. Winifred P., aged two years. Thyroid gland was palpable. Under treatment with thyroid extract for five and a half months with wonderful improvement. Treatment begun Sept. 15th, 1895. She became very bright and intelligent, and one could not notice anything peculiar about her. She gained eight inches in height. (*N. Y. Med. Jour., Mar. 14th, 1896.*)

CASE XXIV.—DR. DICKSON L. MOORE'S CASE. Eva Swanson, female, aged nine years. (Fig. VIII.) No note as to the condition of the thyroid gland. Under treatment for seven months, with the most marked improvement. Treatment begun Aug. 12th, 1896. She has gained four inches in height; the whole mental condition has changed, and she will shortly be sent to school. (*Columbus Med. Jour., April 13th, 1897.*)

CASE XXV.—DR. FERNALD'S CASE. Female, aged four and a half years. Typical cretin. Weight  $28\frac{1}{2}$  pounds; height 2 ft. 4 in. Put on thyroid treatment Jan. 1st, 1897. At the end of two months she has lost two and a half pounds, and seems somewhat improved. The hair has become soft and fine, and the stupid expression is gone. At the end of four months the weight is  $22\frac{1}{2}$  pounds, and she is much improved. The face looks like that of a normal child. She notes everything going on about her; her vocabulary has increased and she plays intelligently.

CASE XXVI.—DR. ROGER'S CASE. (Minnesota School for Feeble-minded, Faribault, Minn.) Gertie N., aged nine years, no sign of thyroid gland, height 34 inches, weight 32 pounds. Apparently

a typical cretin. Has not been under treatment with the thyroid extract. (*Private Communication.*)

CASE XXVII.—DR. ROGERS' CASE. Jennie J., aged 11, Russian Jew, height 32 inches, weight 35 lbs. No sign of thyroid gland. Typical cretin, admitted to Minnesota School for Feeble-minded, Sept., 1896. Thyroid treatment was begun at Christmas, 1896. Within three weeks the tongue had diminished in size, so that she could keep it in the mouth, and she had lost in weight. Feb. 1st the thyroid extract was stopped, as the general health was so poor. Two months later it was resumed. The legs have become less stiff and she can walk with assistance. The tongue is smaller in size. The abdomen has decreased. Height has increased  $3\frac{3}{4}$  inches. The mental condition is somewhat improved and she can now speak a few words. (*Private Communication.*)

CASE XXVIII.—DR. MOGRIDGE'S CASE. Maggie B., aged seventeen years, typical cretin. Has been put on treatment with thyroid extract. Thyroid gland apparently absent. (*Proc. of Assoc. of Med. Officers of Amer. Institutions for Feeble-minded Children, 1893 and 1894.*)

CASE XXIX.—DR. SINKLER'S CASE. Isabella McG., aged three years and one month. The thyroid gland not felt. Under treatment with the thyroid extract she improved very much, gaining in height, and looking brighter and better in every way. Treatment begun March, 1894. (*International Med. Magazine, Dec., 1894.*)

CASE XXX.—Katie W., aged 30, (Dr. Sinkler's patient). (Fig. IX.) No history of goitre. Retarded development in infancy; walked at three years; mental development very slow. Menstruation first at twenty-six, and she improved a good deal afterwards. Patient at the age of thirty was  $112\frac{3}{4}$ cm. in height, and weighed seventy-four pounds. She had a typical myxœdematous appearance. The thyroid gland could not be felt. The voice was like that of a child. She took the thyroid extract at intervals during the two years, and at the end of that time she had changed remarkably; the myxœdematous appearance had disappeared; she was altogether brighter and more intelligent, and she had grown 5cm. The photographs show the remarkable change which had taken place. (*Jour. of Nerv. and Ment. Dis., 1896.*)

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*Figs. IX. a and IX. b.—Case XXX. (p. 176.) Female, aged 30.  
(Dr. Wharton Sinkler.) Fig. IX. b shows the change in appearance  
at the end of two years' treatment.*



FIG. IX. a.



FIG. IX. b.



FIG. X.

*Fig. X.—Case XXXIV. (p. 177.) Goitrous cretin; female,  
aged 27. (Dr. Kessel.)*

CASE XXXI.—DR. DERCUM'S CASE. W. H., gives his age at one time as 35, at another as 47. History obtained from the patient himself, and is of doubtful value. He is decidedly dwarfed—4 ft. 5 in. in height. The abdomen is large. There is excessive lordosis. The skin has a dirty yellowish hue, and everywhere over the body is much wrinkled, and feels harsh, dry and thick. The head is large, the face broad, the eyes widely separated, the nose short, broad, and flattened. Mentally the patient is at a level of a middle grade idiot. No thyroid gland can be felt. There is no note of treatment. (*Phila. Hosp. Reports, 1893, II, 157, 1 pl.*)

CASE XXXII.—DR. LESZYNSKY'S CASE. Male, aged twenty-five years; absence of the thyroid gland. Patient was treated with the thyroid extract without any amelioration of his condition. (*"The Post Graduate," 1894.*)

CASE XXXIII.—DR. WEST'S CASE. N. R., female, aged 1 year and 5½ months; thyroid gland cannot be felt. Under treatment with the thyroid extract she improved steadily and rapidly, and at the end of six months had gained four inches in height. The mental improvement was very marked. Treatment begun July 6th, 1894.

On April 1st, 1897, Dr. West writes, "There is very little new to tell concerning her. She grows very slowly and learns to talk still more slowly. Large doses of the thyroid, i. e. enough to cause fever, restlessness, etc., for a few days, always cause a change for the better with her." (*Arch. of Pediatrics, May, 1895.*)

Dr. J. Herbert Darey, of Northwood, Iowa, called my attention to the occurrence of two cretins in the State (at Kendallville, Winnesbrick Co.). The father was from Ulster, Ireland. His sister had enlargement of the neck. He and his wife were in no way related. They had five children, one of whom died at the age of eight months of diphtheria. Three of the children had goitre, one of whom died at the age of eight years, following an operation on the goitre.

The history of the cases as sent by Dr. Kessel are as follows:

CASE XXXIV.—Elizabeth L., female, aged 27, height 4 ft. 7 in.; weight 100 pounds. (Fig. X.) Talks but little, but is smiling and in much better spirits than the boy. Head large. Strabismus. Health apparently good. Hears watch only on contact with both

ears. Complains of much tinnitus in the left ear. Appetite good; sleeps well. Thyroid tumor lobular (three lobes) and hard.

CASE XXXV.—ROBERT L., male, aged 29; height 5 ft.; weight 105 pounds. (Fig. XI.) Head is small, and almost no intelligence. Complains of difficult breathing, especially on going up hill or up stairs. Has to lean forward when sitting. Is very hoarse; talks but little, and keeps his chair most of the time. Appetite not good at present. Hears watch on contact only with left ear; at three inches with right ear. Is quite anæmic. Thyroid tumor cystic in large lobe; harder in the smaller lobes.

CASE XXXVI.—DR. CAVERLY'S CASE. James R., male, aged nine years and eleven months, a typical cretin, seen April, 1896. He was at once put upon thyroid treatment, and improvement was quickly noted. The temperature became normal, the skin soft and natural looking. He began to walk, and learned to say a few words. At the end of ten months the improvement was very marked; he had gained  $6\frac{1}{2}$  inches in height. In this case the thyroid gland could not be felt. (*New York Med. Rec., April 10th, 1897.*)

CASE XXXVII.—DR. CAVERLY'S CASE. Eddie R., male, aged eight years and three months, a typical cretin, seen April, 1896. He was immediately put on thyroid treatment. This patient is a brother to the one just mentioned. The improvement in this boy has been much more marked than in James, and at the end of ten months he had out-stripped the older in mental growth. He has gained  $5\frac{3}{4}$  inches in height. (*Ibid.*)

CASE XXXVIII.—DR. CAVERLY'S CASE. Elizabeth R., female, sister of the two boys just mentioned, aged sixteen months, a typical cretin, seen April, 1896. Under thyroid treatment she improved much more rapidly than the boys, and at the end of ten months appears like a perfectly normal child. She has gained five inches in height. (*Ibid.*)

CASE XXXIX.—DR. GEO. M. TUTTLE'S CASE. Female, aged 17 years, a typical cretin. Thyroid treatment was begun Nov. 30th, 1896, and the improvement has been wonderful. Dr. Tuttle says, "Her appearance is markedly changed; the lips and tongue are of normal thickness, and face decidedly more sharp in its outline. The supraclavicular pads are gone, and she is decidedly thinner all over.

*Fig. XI.—Case XXXV. (p. 178.) Goitrous cretin; male, aged 20, brother of preceding. (Dr. Kessl.)*



FIG. XI.



FIG. XII. a.



FIG. XII. b.

*Figs. XII. a and XII. b.—Case XLII. (p. 179.) Male, aged 6. (Dr. Vinke.) Fig. XII. b shows the remarkable change five months later.*

The chronic constipation has disappeared, the mother saying, 'she hasn't given her a nickel's worth of castor oil in two months;' the appetite is enormous. Her mental state has improved wonderfully. She is brighter and far more observing, but much more difficult to manage. She has grown mischievous and quarrelsome. The speech is somewhat more distinct. She has grown one and one-half inches, and is now 35½ inches tall, and her mother had to buy her larger shoes about a month ago. On Saturday (April 10th) when I last heard from her she was reported as having walked a few steps alone for the first time." Thyroid gland not enlarged. (*Medical Review, St. Louis, Jan. 9th, 1897.*)

CASE XL.—DR. SMITH'S CASES. (Illinois Asylum for Feeble-minded Children). Freda R., aged 12, born in Switzerland. No goitre, cannot sit up, cannot talk, tongue large and protruding, hair thin and scattered. Photograph shows evidently a general myxœdematous condition. At present under thyroid treatment. (*Private Communication.*)

CASE XLI.—Richard R., a brother of the first case, aged three years, born in Chicago; three normal children intervened between the birth of these two. No goitre, tongue protrudes, cannot sit up, cannot talk. At present under thyroid treatment. (*Private Communication.*)

CASE XLII.—DR. VINKE'S CASE, male, aged six years, first seen Sept. 2d, 1895, a typical cretin. (Fig. XII.) Patient was at once placed upon thyroid treatment, and at the very outset began to improve. At the end of two months he had lost twenty-two pounds, and gained over an inch in height; the skin became soft, warm, and natural, and he took a lively interest in his surroundings. At the end of five months, when the second photograph was taken, the change was most remarkable; the patient had now a healthy appearance, and his face was intelligent and natural. On April 9th, 1897, Dr. Vinke writes, "This little patient is still under thyroid treatment and is making most satisfactory progress. He has now taken uninterruptedly 15 grs. thyroid extract a day for the past year and seven months. During this time he has grown nine inches and his mental condition has improved correspondingly. His parents intend to send him to school now." (*Med. News, 1896, LXVIII, 309.*)

CASE XLIII.—DR. DELIA HOWE'S CASE (Indiana School for Feeble-minded Youth). Bessie Patterson, aged five years and six months at beginning of treatment. Thyroid gland not to be felt. Height  $29\frac{1}{2}$  inches. Thyroid treatment was begun October, 1895, grs. 3 to 5, t. i. d. Treatment has been intermittent on account of toxic symptoms. There has been marked improvement in the intervals of treatment; that is, the improvement is not marked during the period of taking the remedy, but as soon as the latter is stopped, the child makes a marked advance. At the end of eighteen months treatment she has grown  $6\frac{3}{4}$  inches, and now at seven years of age she measures  $36\frac{1}{4}$  inches. She is now a remarkably well-formed child, the change in every respect being almost marvelous. Mentally she is much improved; is very observant and imitates well, but does not talk. (*Private Communication.*)

CASE XLIV.—DR. DELIA HOWE'S CASE (Indiana School for Feeble-minded Youth). Willie Huff, aged six and a half years. Thyroid treatment begun Dec., 1896. At the end of four months the improvement is very marked. The mental improvement is greater than the physical. He is growing rapidly and becoming straighter. (*Private Communication.*)

CASE XLV.—DRS. JACOBI AND FRUITNIGHT'S CASE. Male, aged 4 years; a typical cretin. Height 25 inches. (Fig. XIII.) Thyroid gland not enlarged. Treatment with the thyroid extract commenced Oct. 2d, 1895. At the end of a month he seems more intelligent and does not protrude the tongue constantly. At the end of two months the improvement is marked, both mental and physical. Notes taken at intervals from this time until the present show a steady improvement, and measurement on March 2d, 1897 shows that he has gained five and half inches in height. He says many words plainly, and can walk a little. (*Pediatrics, 1896.*)

CASE XLVI.—DR. ELSNER'S CASE. Female, aged fifteen months at beginning of treatment. Typical cretin. (Fig. XIV.) Thyroid treatment begun in July, 1894, and within three weeks there was decided improvement of all the symptoms. In August, 1895, thirteen months after the beginning of treatment, the photograph shows a perfectly natural child, and in his letter of April 20th, 1897, Dr. Elsner writes, "She has remained perfectly well since that time, and is now in her fifth year. Her mental development is about equal to that of a child three years old." The child still has to have

*Figs. XIII. a and XIII. b.—Case XLV. (p. 180.) Male, aged 4. (Drs. Jacobi and Fruitnight.) Fig. XIII. b illustrates the remarkable improvement which followed the use of the thyroid extract.*

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FIG. XIII. *a*.

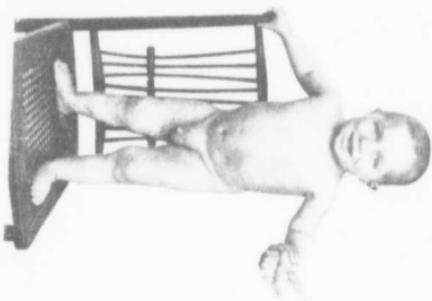


FIG. XIII. *b*.

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*Figs. XIV. a and XIV. b.—Case XLVI. (p. 180.) Female,  
aged 15 months. (Dr. Elsner, Syracuse, N. Y.)*



FIG. XIV. a.



FIG. XIV. b.

occasional doses of the thyroid extract. No note of condition of thyroid gland. (*Private Communication.*)

CASE XLVII.—DR. J. C. SHAW'S CASES. Annie ———, aged 3, seen early in 1894; never walked, but can stand; has not developed mentally. Condition quite characteristic. Height not given. Thyroid extract administered for several months with improvement in the child's mental activity. No note of condition of the thyroid gland. No goitre in the parents. Case lost sight of. Dr. A. C. Brush subsequently reported, at the discussion on Dr. Shaw's paper, that the child came under his care. She had relapsed, but improved again remarkably when placed on the extract. (*Brooklyn Med. Jour., January, 1897.*)

CASE XLVIII.—Female, aged 12, seen December, 1894; height 38 inches. Characteristic condition of cretinoid myxœdema. The photograph taken a year and a half after treatment shows a characteristic and remarkable change. No note of the condition of thyroid gland. No goitre in the parents. (*Ibid.*)

Dr. Shaw has also reported two other cases, but they seem to me doubtful, and are not included here.

CASE XLIX.—DR. FRANK S. WADE'S CASE. Sadie T., aged 13, a typical cretin. No note as to condition of thyroid gland. The treatment with thyroid extract was commenced about June 1st, 1896, and the improvement has been remarkable. She now walks across the floor and can say a few words. The lips are thinner, the puffiness under the eyes has disappeared, the tongue is nearly normal, and is kept within the mouth, the skin is moist, pink and healthy, and the hair is soft and moist. Her face is now quite that of a normal child. (*Private Communication.*)

CASE L.—DR. N. S. MORSE'S CASE (Eldora Emergency Hospital, Eldora, Iowa). Myrtle A. A., aged five and a half years when first seen. A typical cretin. No note of condition of thyroid gland; the doctor says, "there seems to be no neck, i. e., head apparently rests upon or between the shoulders." Thyroid treatment was commenced early in March, 1896, and at the end of a month the improvement was remarkable; she had lost two and a half pounds in weight, and the expression of the face and the character of the skin had entirely changed. The improvement has continued, and at the present time she is apparently a perfectly healthy, intelligent

child. She has gained five and a half inches in height, can walk alone, and speaks plainly many words. (*Private Communication.*)

CASE LI.—DR. NORTHRUP'S TWO CASES. Case 1. Female, aged nine years. A typical cretin. Thyroid gland seems to be present, possibly a little enlarged. After eighty days treatment with the thyroid extract the child had improved in some respects. The tongue was smaller, countenance brighter, some loss in weight at first, afterwards stationary. Treatment will be continued to a year or more. (*Archives of Pediatrics, 1894, Vol. XI.*)

CASE LII.—Case 2. H. N., male, aged 12, (patient of Dr. Sachs). Dr. Northrup says on first sight one would not be sure he could be classed among cretins. At the end of seventy-six days' treatment with thyroid extract the progress was favorable in these respects—he seemed brighter mentally, was a little more active, and grew in height  $1\frac{1}{2}$  cm. No note of condition of thyroid gland. (*Ibid.*)

CASE LIII.—DR. CRARY'S CASE. D. D., female, aged five years, presenting the characteristic features of sporadic cretinism, seen August, 1893. No note as to the condition of the thyroid gland. Treatment with the thyroid extract was begun on September 1st. Within a week a change was noticeable. On Nov. 16th, when the case was reported, the doctor stated that the patient had continued to improve steadily, and at this time the manifestations of the disease which still remained were those which it takes time to grow away from. The mental aspect had improved more than the physical condition. (*American Journal of Medical Sciences, CVII, 1894.*)

CASE LIV.—DR. HAGAN'S CASE, C., male, aged 12; appearance quite characteristic of cretinism. (Fig. XV.) Family history is entirely negative. The boy is thirty-one inches tall, and weighs forty pounds. His intelligence is not more than that of a child of two or three years. There is no goitre; the thyroid gland does not seem to be affected. The case was lost sight of soon after the report, and was therefore not treated with thyroid extract. It has, however, again recently come under Dr. Hagan's care, and he has put him on the thyroid treatment. Dr. Hagan writes on May 2d, 1897, that he has had the case on treatment for three weeks, and the condition is already much improved. The myxœdema is better, and the complexion has improved wonderfully, and he is brighter. (*Atlanta Medical and Surgical Journal, February, 1893.*)

Fig. XV.—Case LIV. (p. 182.) Male, aged 12, shows the very characteristic squal figure of a cretin. (Dr. Hagan, Atlanta, Ga.)



FIG. XV.



FIG. XVI.

*Fig. XVI.—Case LV. (p. 183.) Cretin, aged 12. (Dr. Jno. R. Stone.)*



FIG. XVII. a.



FIG. XVII. b.

*Figs. XVII, a and XVII, b.—Case LVIII. (p. 183.) (Dr. J. W. Ceyner.) Figs. XVII, a to f show a perfectly phenomenal change which took place in this child in eleven months' treatment. I know of no set of photographs, among all that have been published on the subject in late years, which shows such an extraordinary transformation in so short a time.*



FIG. XVII.*b*

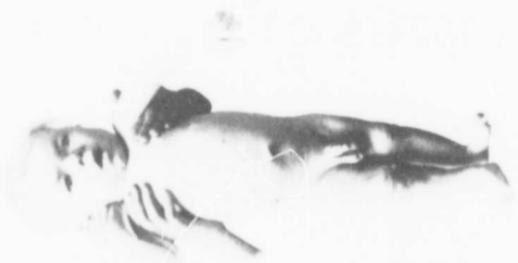


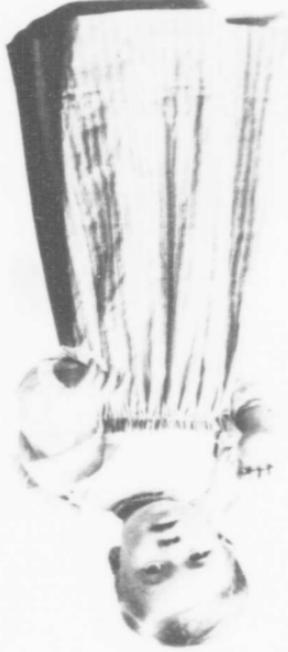
FIG. XVII.*c*

*Figs. XVII. c and XVII. d.—Case LVIII. (p. 183.) (Dr. J. W. Coynes.) Figs. XVII. a to f show a perfectly phenomenal change which took place in this child in eleven months' treatment. I know of no set of photographs, among all that have been published on the subject in late years, which shows such an extraordinary transformation in so short a time.*

FIG. XVII. 2.



FIG. XVII. 1.



*Figs. XVII. e and XVII. f.—Case LVIII. (p. 183.) (Dr. J. W. Coyner.) Figs. XVII a to f show a perfectly phenomenal change which took place in this child in eleven months' treatment. I know of no set of photographs, among all that have been published on the subject in late years, which shows such an extraordinary transformation in so short a time.*

CASE LV.—DR. JOHN R. STONE'S CASE (Parry Sound, Canada). Harry H., male, aged 12 years; a typical cretin. (Fig. XVI.) Height 2 ft. 9½ inches; weight 42 pounds. As a result of six weeks treatment with the thyroid treatment he has gained  $\frac{5}{8}$  of an inch in height, the weight has decreased, the color has changed from pale to ruddy, and the skin has become soft and velvety. The intellectual powers have increased in every respect. No note of condition of the thyroid gland. (*Private Communication.*)

CASE LVI.—DR. M. A. STARR'S CASE. Male, colored, aged 11, typical appearance. Never talked freely, says single words; never had convulsions. Is imbecile, dirty, walks with wide straddle and sways. Skin thick; tongue protrudes. Hands and feet much larger than normal. Skin of legs and feet much thickened, rough and scaly. Seen Feb. 1894 and put on thyroid. In April, 1894, very much improved mentally and physically; not seen since. (*Private Communication.*)

CASE LVII.—DR. E. F. WILSON'S CASE. Bessie D., aged ten. Well until two, when it was noticed that she was not like other children. She grew up very dull and heavy and stupid. She walked with a peculiar waddling gait, not unlike that of a child of two years. She talked enough to say yes and no, and a few other monosyllables. The tongue did not hang out, but she drooled constantly. There was great enlargement of the neck, but no distinct goitre. In November, 1896, the height was 32 inches; waist 24 inches; neck 13 inches. She began to take the thyroid extract in November, and at the date of Dr. Wilson's report, at the first of May, six months later, she had grown seven inches, the waist measurement had reduced from 24 to 16 inches, and the neck from 13 to 10 inches. She has lost altogether her stupid condition and appearance, and is beginning to learn rapidly and well. (*Private Communication.*)

CASE LVIII.—DR. J. W. COYNER'S CASE, male, aged 23 months. Typical cretin. (Fig. XVII.) Thyroid treatment commenced May 15th, 1896. Height 28 inches; abdomen 19 inches. Patient began to improve at once, and photographs taken at intervals show the most marked improvement. After five and a half months treatment she has grown two inches in height, and the abdomen has reduced four inches. A photograph taken after eleven months treatment shows a perfectly normal, intelligent looking child. (*Private Communication.*)

CASE LIX.—Dr. Hoover, of Cleveland, has published the notes of a case, which is interesting inasmuch as the cretinoid appearance developed with a goitre about the age of ten. I am not altogether certain that it really should be reckoned among the cases of infantile cretinism. The brief notes are as follows. The boy, a Bohemian, was aged eleven when seen June 15th, 1895. He was undersized for his age; had grown very little for more than a year, and during this time had not been able to go to school, though previously he had shown the ordinary capacity of children of his age. His family had noticed a gradually increasing stupidity, with the development of a goitre. For more than a year he had been quite indifferent to his surroundings, and had lost all interest in his play and studies. At present he will volunteer no information about himself, and will answer no questions. When he does speak it is in a very croaking, harsh voice. The goitre is large; the circumference of the neck measures 39 cm. It has been increasing rapidly for several months. The boy was placed upon the fresh extract of the sheep's thyroid, a quarter of a gland three times a day. Within two weeks there was a remarkable change. The boy looked brighter, and the circumference of the thyroid was only 33 cm. The case was subsequently lost sight of. (*Western Reserve Medical Journal*, 1895.)

CASE LX.—Dr. JACOBI. Boy, aged eighteen, no goitre. Characteristic evidences of cretinism, marked impairment of mental development, early closure of the anterior fontanelle. This was the first case on record in this country. (*Hospital Gazette and Archives of Clinical Surgery*, Vol. IV, p. 486.)

The clinical summary of the cases is as follows:

*Sex.* Males 23; females 35.

*Age.* Under two years, 6; from two to five years, 12; five to ten years, 12; ten to fifteen years, 10; fifteen to twenty years, 7; twenty to thirty, 3; thirty to forty, 4; over forty years, 4.

*Nationality.* American, white, 12; colored, 1; Polish, 2; French, 1; German, 5; Swede, 1; Hebrew, 1; Norwegian, 1; Irish, 7; English, 1; Swiss, 2; Bohemian, 1; nationality not given, 23.

*Locality.* There is no region in this country in which the disease is endemic, nor does it appear to be more prevalent in those districts, as in Michigan and parts of Ontario, where goitre is common.

*Condition of the thyroid gland.* Goitre was present in 7; gland stated to be normal in 12; gland small in 2; gland not to be felt in 16; no note in 20.

## II. THE RESULTS OF THYROID TREATMENT.

No type of human transformation is more distressing to look at than an aggravated case of cretinism. It recalls Milton's description of the Shape at the Gates:

"If shape it might be called, that shape had none  
Distinguishable in member, joint, or limb."

or those hideous transformations of the fairy prince into some frightful monster. The stunted stature, the semi-bestial aspect, the blubber lips, *retroussé* nose, sunken at the root, the wide-open mouth, the lolling tongue, the small eyes, half closed with swollen lids, the stolid, expressionless face, the squat figure, the muddy, dry skin, combine to make the picture of what has been well termed the "pariah of nature."

Not the magic wand of Prospero or the brave kiss of the daughter of Hippocrates ever effected such a change as that which we are now enabled to make in these unfortunate victims, doomed heretofore to live in hopeless imbecility, an unspeakable affliction to their parents and to their relatives. From a large number of photographs which I have received I have selected a set to illustrate the effect of treatment at different ages, from infancy to the thirtieth year, and illustrating also the influence at periods varying from two months to a year. The series has an educational value, as the pictures tell their own story, enabling the practitioner not only to recognize the victims of this affection, but they emphasize as words cannot the magical transformation which follows treatment.

Fig. XIVa, shows the patient of Dr. Elsner, of Syracuse, New York. The child was eighteen months old at the beginning of treatment, and the photograph shows a very characteristic state of infantile myxœdema. Fig. XIVb, shows the state thirteen months after treatment.

Fig. IVa, shows Case XIII. of the series. She was two years old at the beginning of treatment. Fig. IVb, shows the condition after two months' treatment.

Fig. XIIIa, is a child aged four years, a patient of Dr. Jacobi and Dr. Fruitnight. The facies and general conformation are most typical. Fig. XIIIb, shows the change a year and a half after treatment.

Fig. XIIa, illustrates the case of Dr. Vinke, of St. Charles, Mo., a boy aged six years. Fig. XIIb, shows the condition five months after treatment. In a year and a half he grew nine inches.

Fig. VIIIa, shows a patient of Dr. Dickson L. Moore, of Columbus, Ohio, a girl aged nine years. The treatment was begun August 12, 1896. Fig. VIIIb shows the condition seven months later, March 20, 1897. The child had gained four inches in height, and the entire appearance had changed remarkably.

Fig. IIa, presents a typical picture of a sporadic cretin, aged seventeen years, under the care of Dr. J. C. Carson, of Syracuse, New York. Fig. IIa was taken a year before treatment, and Fig. IIb illustrates the condition a year after.

Fig. IXa, shows a sporadic cretin at the age of thirty years, patient of Dr. Sinkler. The height was  $112\frac{3}{4}$  cm. Fig. IXb shows the condition a year after treatment. She had grown nearly 7 cm., and had lost much of the myxœdematous characters. This case is of special interest as showing the importance of the treatment even in adults.

I know of no single set of photographs which show in quite the same way the phenomenal change as in the following series of pictures very kindly sent by Dr. Coyner, Peoria, Ill.

Figs. XVIIa and XVIIb, show the very characteristic appearance of a sporadic cretin, aged twenty-three months, length 28 inches, circumference of the abdomen 19 inches. Fig. XVIIc, shows the change after three months' treatment; the abdomen measured 16 inches. Fig. XVIId, illustrates the condition after five and a half months' treatment; height 30 inches; abdomen measured 15 inches. Fig. XVIIe, shows the change after seven and a half months' treatment; while the last picture, Fig. XVIIf, shows eleven months after beginning the use of the thyroid a perfectly natural-looking child.

1. *The character of the changes.*

(a) Bodily. Loss in weight, due to disappearance of the myxœdematous condition and of the fat, is noticed within a month or six weeks after the commencement of the treatment. The face becomes thinner, the palpebral orifices wider, the puffiness disappears from about the eyes, the flabby supraclavicular folds melt away, the projecting abdomen diminishes in girth, and the child's figure becomes more shapely. Several of the photographs illustrate this in an interesting manner. This change is much more striking in young children of from three to six or eight years, but it is also well seen in the older patients. Nothing could be more remarkable than the change in the features in Dr. Carson's case, and even in Dr. Sinkler's case, aged thirty years, the change, as shown in the photograph, is

most evident. The expression of the face is altered by the recession of the tongue, and in many instances the drooling ceases as the mouth is kept closed; this relieves in great part the idiotic expression.

Among the constructive and progressive alterations may be mentioned the loss of the waxy pallor of the skin, which becomes softer and much more natural-looking.

The hair, too, changes, and becomes more abundant and finer. Several writers have referred very particularly to this remarkable change in the skin and hair, as though there had been a complete substitution of the old by a new skin and hair. In very young children teething proceeds rapidly; in older subjects, if the second dentition has not begun, the milk-teeth are shed and the permanent ones develop rapidly. No change is so remarkable as the increase in stature. As Dr. John Thomson remarks, "the natural impulses of growth, which were in abeyance in the thyroidless condition, are let loose." In my first case the little girl grew four inches in a year. Among the most remarkable in the collected series are the following: Dr. Friend's case gained eleven and three-quarters inches in one year and ten months; Dr. Vincke's case gained nine inches in one year and seven months, and Dr. Noyes' case gained eight inches in four and a half months, and Dr. Edwin F. Wilson's case gained seven inches in six months.

Fig. XII, illustrates what an extraordinary alteration takes place after seven months' treatment. The loss of the squattiness of figure, the apparent disproportion between the head and the trunk, the loss of the characteristic attitude, and the disappearance of the lordosis are well illustrated. It is to be remembered that the rapidity in growth in some cases has led to increase of a lateral curvature and even to marked bowing of the legs.

(b) Mental change. Even within a couple of months the alteration in the mental condition is noticed. At any rate, the patients look much brighter and the face is not absolutely expressionless. This is very well seen in Fig. IV, illustrating the change after two months' treatment. As a rule, the younger the case the more marked is the mental change. Young cretins who have not learned to speak a word soon begin to talk in their play. In children between six and ten the effects are even more remarkable, and with the loss of the myxœdematous condition there is a corresponding awakening of the mental faculties. In older patients the treatment is not so efficacious. In Case II. of my series, the girl, aged nine-

teen years, did not seem to be very much benefited, although it is true the treatment was abandoned by the mother after a short time. In other instances, as in Dr. Sinkler's case, the mental condition improved very much, even though the patient was over thirty years. I know of no instance in which the treatment has benefited the condition of deaf-mutism.

2. *The dosage.* I have usually begun with a grain of the desiccated gland three times a day in young cretins. It should be carefully watched, and the amount reduced if the pulse becomes more rapid, or if there is fever. Older patients may take as much as five grains in the day, and the amount may be increased or diminished as the symptoms indicate. The cases bear the remedy very well, and in a few months, if no improvement is noted, larger doses must be tried. Unpleasant effects are less commonly seen than in the myxœdema of adults.

3. *The question of continuance of the treatment.* After the disappearance of the myxœdema and the establishment of the processes of growth and development, a very moderate dose seems sufficient, one or two five-grain tablets a week. Intermission for a month or six weeks does not seem to be followed by any striking change, but an intermission for a longer time is followed by symptoms indicating a relapse. In my first case in the early part of this year the treatment was interrupted for two months, and the child became very languid and apathetic, and improved at once when the use of the extract was renewed.

And here the thought arises: Whom has suffering humanity to thank for this priceless boon? As with many great discoveries, no one man, indeed, no set of men. The points in the development of our knowledge of the function of the thyroid gland have been worked out in almost equal shares by physicians, surgeons, and physiologists. Gull and Ord, Kocher and the Reverdins did much; but to the experimental physiologists, in particular to Schiff, to Horsley, and to von Eiselsberg, we owe directly the experimental evidence which made possible the successful treatment of myxœdema and sporadic cretinism. That I am able to show you on these lantern-slides such marvelous transformations, such undreamt-of transfigurations, is a direct triumph of vivisection, and no friend of animals who looks at the "counterfeit presentments" I here demonstrate will consider the knowledge dearly bought, though at the sacrifice of hundreds of dogs and rabbits.

## III. DIAGNOSIS.

The number of cases which I have been able to collect indicates that the profession has rapidly learned to recognize sporadic cretinism. It is also evident from statements, and from photographs, which I have received, that there are a number of conditions which are apt to be mistaken, and that even men in institution life have not very clear ideas upon the subject. There are several points to which I may refer.

(a) *The recognition of early slight cases.* After the third year the condition is, as a rule, diagnosed at sight, and advanced types offer not the slightest difficulty. The earlier the recognition is made, the greater is the prospect of complete recovery. About the eighteenth month the subject may present the aspect of myxœdema rather than of cretinism, and the swollen, waxy skin even suggests Bright's disease. Case I. of the series was supposed to have chronic nephritis. The failure of development, the inability to talk or to walk, and the retarded dentition begin to attract attention as the child reaches this period. The absence of expression, the open mouth, the large tongue, and the drooling suggest that something is wrong. The development may be so slow that a child of three years looks not older than fifteen months. There are, possibly, cases of thyroid insufficiency in young infants which correspond to the *myxœdème fruste* of the French, which may be readily overlooked. To this several writers have recently called attention. Dr. Bury,\* in the discussion last year at the British Medical Association, states that he saw a baby at a year old which had ceased to "get on." It became flabby, fat, lost his vivacity, and began to show a protuberant abdomen, a lax skin, and other cretinoid appearances. Treatment with small doses of the thyroid, one-fourth tabloid daily, speedily picked him up; he grew, became lively, and at the end of six months treatment was discontinued without retrogression. Such cases are probably due to transient, perhaps functional, disturbance in the thyroid. Herrick† also, in his recent paper, refers to the ease with which these milder cases may at first be overlooked.

(b) *The diagnosis from other types of idiocy.* Naturally enough it has been suggested that diminished or perverted function of the thyroid gland might be responsible for the mental and bodily defects in ordinary idiocy, and more particularly in dwarfs. The question is one deserving of careful study, particularly by those who have

\* British Medical Journal, 1896, ii, p. 621.

† Archives of Pediatrics, April, 1897.

opportunities for clinical and post-mortem observation in large institutions.

The Mongol type of idiot resembles the cretin more closely than any other. Telford Smith, in speaking of this form, says: "Idiots belonging to the so-called Mongol type are those who most nearly resemble the cretin, both in physical aspect and in mental character. In idiots of this type we get the stunted growth, the dull, heavy expression, with open mouth and thick lips; the slow, deliberate movement, and hoarse, guttural, and monosyllabic speech; the mental apathy, and lack of spontaneity; the sluggish circulation, and sensitiveness to cold. A thickened condition of subcutaneous tissue is often found, with dulled cutaneous sensibility. The skin is coarse and dry, the hair short and thin. First and second dentition are delayed. As far as palpation enables one to judge, the thyroid gland is subnormal in size. Pseudo-lipomata I have not found." He has tried the effect of thyroid extract with some benefit, but there is not the same remarkable change as in the cretins. I cannot altogether concur with Dr. Telford Smith's statement as to the slow, deliberate movements and mental apathy of Mongolian idiots. It was a form in which Dr. Kerlin, of Elwyn, was particularly interested, and with him I had many opportunities of seeing cases. They rather impressed me as vivacious, often very sprightly and mischievous. In no instance was there any condition of the subcutaneous tissues suggestive of myxœdema.

Deaf-mutism is a not infrequent accompaniment of sporadic cretinism. In the endemic form it is still more common.

The various forms of idiocy dependent upon faulty development of the hemispheres in fetal life, the hydrocephalic and the microcephalic idiots and the forms of imbecility associated with the cerebral palsies of children, are readily distinguished.

(c) *The condition known as fetal rickets*—achondroplasia or the chondrodystrophia fetalis—is liable to be mistaken for cretinism. On August 4, 1886, when at Cacoua in the Province of Quebec, I was asked to see two cretins, and found them remarkable rachitic dwarfs, belonging to this type. As instances of this condition which survive birth are rare, I will here give brief statements with reference to them, and illustrations.

The parents were healthy French Canadians. There were fourteen children in the family, the eldest twenty-seven, the youngest four. Five children had died in infancy. With the exception of the dwarfs, the children were all very healthy and well grown.



FIG. XVIII.



*Fig. XVIII.—Achondroplasia foetalis. Wilhelmine C., aged 16.  
Case described on p. 191.*



FIG. XIX.

*Fig. XIX.—Achondroplasia foetalis. Alphonse C., aged 11½,  
brother of preceding. Case described on p. 191.*

Wilhelmine C., aged sixteen years, height 86.5 cm. (34 inches). (Fig. XVIII.) The mother did not remember anything abnormal about her as a young infant. She walked when eighteen months old. The head seemed large, and the mother said that the fontanelle did not close until the sixth year. When between three and four it was noticed that she did not develop naturally, and that the joints were very large. She is bright-looking and intelligent, but somewhat full and coarse-featured. The head measured 56 cm. The teeth are well formed. She talks fluently and well, and has learned to read a little, and is beginning to write, but she is backward for a girl of her age. The most remarkable phenomenon is the condition of the joints of the long bones. The shafts are short and look thin, and the articulations are very large and irregular. The shoulders are not much affected, but the elbow-joints, the wrist-joints, and the knee and ankles are enormously enlarged. She is a little knock-kneed when she stands. The mobility in the joints is perfect.

Alphonse C., aged eleven and a half years, height 87 cm. (33½ inches). (Fig. XIX.) The mother did not notice anything special about him except that he was late in walking, and the anterior fontanelle did not close until between the third and fourth years. He did not seem to grow much after the fourth year. He presents an identical picture to that of his sister. His head is large, but well formed. He is very intelligent-looking and bright, and is good-tempered. The articulations are extraordinarily large, and contrast with the smallness and shortness of the shafts of the bones. He is somewhat pigeon-breasted, and when he stands is knock-kneed.

The trunk and head in both these children look almost of natural size, but the shortness of the legs, and particularly the shortness of the shafts of the long bones is very striking. The thyroid gland was not enlarged in either case. I recognized that the cases were not cretins, and labelled them as rachitic dwarfs, but it was some years later that I learned the true nature of the affection, namely, the chondrodystrophia fetalis.

The relation of this remarkable condition to cretinism is very carefully discussed by Kauffmann,\* and more recently by Bircher,† to whose papers the reader is referred. John Thomson, in the *Edinburgh Medical Journal* for 1893, gives excellent illustrations of the adult form.‡ The thyroid is not usually involved, though it has been found absent in a fetus which presented this condition (Bowlby).§ The intelligence is not especially disturbed, the facial

\* Untersuchungen ueber die Sogenannte Foetale Rachitis (Chondrodystrophia Foetalis). Berlin, 1892.

† Lubarsch und Ostertag, Ergebnisse, Abt. I, 1896.

‡ They are reproduced in Gould and Pyle's "Anomalies," etc.

§ Pathological Society Transactions, 1884.

and cranial characters are not those of cretinism, and myxœdema is not present. The most characteristic feature is the dwarfing, with remarkable shortness of the limbs (micromelia), owing to disturbance of the growth of the shafts of the long bones, and with, in most cases, enormous enlargement of the articulations, due to a hyperplasia of the cartilaginous ends of the bones. Bircher concludes that the condition is quite independent of the state of the thyroid gland. He is in error, however, when he states that the cases of sporadic cretinism described by Cushing and Fagge belong to this group.

(d) And lastly, the condition of *infantilism* may be briefly spoken of as in some instances dependent upon disturbed function of the thyroid, and there may be a possibility of confounding the cases with slight grades of cretinism.

Infantilism is a "morphological syndrome characterized by the preservation in the adult of the exterior form of infancy with the non-appearance of the secondary sexual characters." Lamy, in an analysis of Meige's extensive article in *l'Anthropologie* for 1895, gives the following description: "Face arrondie, joufflue, lèvres saillantes et charnues, nez peu développé, visage glabre, peau fine et de couleur claire, cheveux fins, sourcils et cils peu fournis. Torse allongé, cylindrique. Ventre un peu proéminent. Membres potelés, effilés de la racine aux extrémités. Une couche adipeuse d'une assez grande épaisseur enveloppant tout le corps et masquant les reliefs osseux et musculaires. Organes génitaux rudimentaires. Absence de poils au pubis et aux aisselles. Voix grêle et aiguë. Larynx peu saillant. Corps thyroïde généralement petit."

Occasionally the subjects of infantilism display opposite sexual characteristics—femininism not only in bodily conformations, but in mental attributes. Apart from hereditary syphilis, in which the condition is not uncommon,\* infantilism seems rare in this country. It is occasionally seen combined with great obesity. More frequently it is an accompaniment of mental defects in imbeciles and idiots. The onset of puberty, with the development of the secondary sexual characters, is delayed for years after the normal age. The sporadic cretin often presents the characters of infantilism even when above thirty (see photograph of Dr. Sinkler's case), but there are rare instances of infantilism, properly so-called, complicated with myxœdematous features, due to loss of function of the thyroid, and such cases might be relieved by appropriate treatment.

\* See Fournier's excellent description in "Les Affections Parasyphilitiques," 1894.

## IV. THE PATHOLOGY OF SPORADIC CRETINISM.

There are three groups of cases, as noted by Dr. W. Rushton Parker:

(a) *With absence of the gland.* The gland has not developed in foetal life, or become completely wasted, so that at autopsy no trace of it is found. The child may be born a cretin, which is excessively rare. In a considerable number of the reports on sporadic cretinism the thyroid is stated to be absent, but it is almost impossible to judge by palpation if the gland is very small. In one of Hilton Fagge's cases the gland was thought to be absent, but post-mortem there was a thyroid gland of some size, with tumor. Dr. Friend, of Milwaukee, has kindly sent me the full report of a case in which the autopsy showed the thyroid gland to be absent:

Hattie G., female, aged sixteen years and one month. Length of time thyroid tabloids given (Burroughs & Welcome) one year and ten months. During this time she grew from 76.5 cm. to 105 cm. Anterior fontanelle closed within six months after treatment was begun. At the end of seven months seventeen teeth of the second dentition appeared. Within the first two months the myxœdema began to disappear, and within six months was lost, the hair of the head becoming of a finer grade and very thick at the same time. The mental condition improved considerably, and as manifested by the action of the special senses, namely, hearing, sight, taste, touch, and in a slight degree, speech, the first by recognition of the voices of the nurses; the second by the attention given to the children at play in the wards and to pictures in books; the third by the refusal of certain foods and a preference for certain kinds; the fourth by a desire to grasp firm substances with the hands, so as to lift herself; the fifth by the formation and expression of two distinct words—*la, da*. With the augmented mental association, motor improvement was also observed. She began to sit up, and by grasping the back of a chair or bed-post, she could also hold herself standing. These associations were indicated within one and a half years of treatment. The tongue ceased protruding within six months after treatment was begun, and the salivary dribbling ceased immediately after the roots of the teeth of the first dentition were pulled and those of the second dentition appeared. The latter appeared within two weeks after the first were withdrawn. As is indicated by the photograph, Fig XI, the loss of the protruding abdomen was distinct and progressive. The blood-count never rose higher than 3,500,000 red corpuscles, and only a relative increase of lymphocytes. The urine showed no changes worthy of special note. The treatment was continued almost to the date of her death.

In reference to her death, Dr. Friend writes:

"The only cause of death manifested was two drachms of bloody fluid in the lateral and fourth ventricles of the brain. I could not discover from whence the blood came, although I examined all the blood-vessels carefully in the lateral ventricles and about the fourth. They were probably capillary diapedesis. I found all of the veins surcharged with blood, and the dura, extending about one-half inch on both sides of the longitudinal sinus, was of a deep red color. From the symptoms, especially indicated by the sudden onset of fever, I am inclined to think that the ptomaines in the extract of the gland may have produced a poisoning. This is, however, difficult to demonstrate. All other organs show a negative condition. The thyroid gland was absent. The thymus was very large and weighed 64 grammes. The pituitary gland was very small and weighed 0.2 grammes. Microscopically all organs showed an excess of connective tissue. In the posterior wall of the bladder I found imbedded a concretion about the size of a dime."

In reply to a question about details as to the presence or absence of the thyroid gland, Dr. Friend writes that a most careful dissection was made, and there was not even a trace of fibrous tissue as indicating the locality of the gland.

Curling first described the absence of the thyroid in cretinism in the two cases which he reported in 1850.\*

Bramwell,† in a review of the literature in 1892, found ten autopsies, in which, in nine cases in which the condition was noted, the gland was absent. Fletcher Beach states that of 116 cases collected from the literature, there were sixteen autopsies, in fourteen of which the gland was absent, while in two goitre existed.

(b) *With atrophy of the gland.* This is a very important group, to which Fagge appears to have been the first to call attention. He gives the case of "a girl, who was stated by her relations to have been perfectly healthy until she was eight years old, when she fell ill with what was supposed to be a second attack of measles, and kept her bed for a fortnight. After her recovery her physical development underwent a remarkable change. Her features were previously well formed; they now acquired the cretinous configuration. Her hair, once black and abundant, became light-colored, dry, crisp, and very scanty. She ceased to grow; at the age of sixteen and three-quarter years she was only four feet one inch in height."‡ He suggests that the febrile illness led to atrophy of the organ, and

\* Transactions of the Royal Medical and Chirurgical Society, 1850, vol. xxxiii.

† Atlas of Clinical Medicine, vol. i.

‡ Fagge: Practice of Medicine, vol. i, p. 772.



2 to 3 years.



2 to 3 years.



7 years.



15 years.



15 years.



15 years.

*Figures illustrating the progress of an untreated case of infantile myxœdema. They show the gradual degeneration from an intelligent, bright child of between two and three years to a cretinoid condition at fifteen. It is very interesting to compare this degeneration with the gradual regeneration illustrated in the pictures of Dr. Coynor's case (Figs. XVII. a to f, p. 183 et seq.)*

*I have to thank Dr. J. J. Putnam for permission to use these pictures, which so far as I know are unique.*

that this was the cause of the supervention of the cretinous state. In Case II. in my first series, the condition seemed to follow an attack of enteritis. Ashby and Wright\* give the history of a case said to have been well until an attack of enteric fever at seven years of age.†

It is interesting to compare these cases with the remarkable instance of operative myxœdema reported by Bruns to the Myxœdema Committee of the Clinical Society.‡ The patient at the time of operation was ten years old. Eighteen years after he had become "a dwarfy cretin." He had not grown since the removal of the thyroid, the expression was that of an idiot, there was characteristic myxœdema, with a mental apathy amounting almost to imbecility.

The determination of the atrophy of the gland during life is very uncertain, as pointed out by Fagge. No trace of the gland may be felt, and yet post-mortem a well-marked, perhaps somewhat wasted, organ is found. In the recorded autopsies in sporadic cretinism atrophy has not, so far as I can gather, been hitherto found.

Through the kindness of the officers of the Indiana School for Feeble-minded Children at Fort Wayne, I am enabled to report upon a fatal case in which there was extreme atrophy of the gland. The patient, Louise S. (Case VI. of the series), aged fourteen years, born in America, parents not related; no goitre in the family; nationality German. Height, 110.5 cm.; circumference of head, 56 cm.; from occiput to root of nose, 33 cm.; from external meatus to external meatus, 26.7 cm.; circumference of neck, 28 cm. The skin is very loose and flabby, elastic and soft, very abundant. She is a deaf-mute, but appears intelligent. There is no curvature. The thorax is 57.3 cm.; abdomen, 68.6 cm. The limbs seem a little enlarged about the epiphyses. There is no goitre. Dr. Delia Howe has sent a subsequent note that she had no treatment until September, 1895. She was then given the thyroid extract, three grains three times a day. She improved in many respects. The protruding abdomen disappeared, and she became very much brighter mentally. She became ill in March, and died of acute tuberculosis in November, 1896. At the time of her death she was

\* Diseases of Children, second edition, p. 479.

† In the British Medical Journal, May 29th, 1897, Dr. Parker has collected ten cases of this kind, in which atrophy of the gland occurred in early childhood, either spontaneously, or following some fever. The clinical condition is spoken of as juvenile myxœdema.

‡ Clinical Society Transactions, supplement to vol. xxi.

seventeen years old, and her height was 127 cm. The thyroid gland weighed 4 grammes. The normal weight of the organ is from fifteen to twenty grammes.

I am indebted to Dr. Barker, the Associate Professor of Anatomy in Johns Hopkins University, for a careful description of the condition of the gland, which is of special value, since, so far as I can learn, there has been no histological description of the thyroid in sporadic cretinism.

The tissue was hardened in formalin and afterwards in alcohol and embedded in celloidin. Sections were stained in hæmatoxylin and eosin; in Mayer's hæmalaun, followed by eosin or by van Gieson's stain; in acid fuchsin, followed by picric-acid-water and picric-acid-alcohol; and in polychrome methylene-blue and neutral orcein.

To the naked eye a very marked increase in the connective tissue separating the lobules of the gland can be made out and, with low magnification (8—15 diameters), connective tissue can be seen entering the individual lobules and separating the acini from one another. The individual acini are seen to be almost solid; with this power no large lumina being visible except here and there where a single cyst-like dilatation filled with colloid can be made out. With higher powers the marked atrophy of the gland and the certain remarkable transformations in the epithelium of the acini become visible. In the specimens stained with hæmatoxylin and eosin, the majority of the acini in the individual lobules are found to possess very narrow lumina, often encroached upon by papillary projections inside them or partially filled up with proliferated and desquamated cells from the walls. In many acini only masses of cells are to be made out, those of the two sides coming in contact with one another, no distinct lumen being visible. The character of the cells lining the acini deviates much from the normal; indeed, one looking at the majority of the follicles under the high power, and not knowing the origin of the specimen, would scarcely be able to recognize the tissue as thyroid. The cell bodies vary a great deal in size, from small cells about equal in dimensions to those of the normal thyroid gland to large flat structures many times the size of the former, actual giant shells. The individual cells in a single follicle are not all of the same size; in the majority of follicles numerous transition stages exist between the small cells and the cells of greatest dimensions. The cells show no constant arrangement in the wall of the follicle, but appear

to be mixed up quite irregularly, very small cells being sometimes immediately adjacent to giant cells, at other times being separated from them by cells intermediate in size.

The borders of the cells are for the most part difficult to make out with ordinary powers, though the outlines of the giant cells with jagged margins can be seen. With oil-immersion lenses, however, the borders of nearly all the cells can be easily defined. The protoplasm of the cells lining the acini in specimens stained in hæmalauan and eosin stains of a reddish brown and brownish pink color, a tint quite different from that assumed by the connective tissue, which takes the simple eosin stain. The protoplasm of the individual cells varies somewhat in appearance, though in the majority of them it has a dull opaque, almost homogeneous look. With very high powers, and cutting off the light, minute white dots of variable size can be made out. In some cells a reticulum-like structure is visible, consisting either of delicate fibrils, or possibly of granules arranged in rows. The meshes are filled with a paler, more refractive substance. Occasionally, a single cell presents a distinctly vacuolated appearance. The cells are all, or nearly all, higher than normal thyroid cells, although a few alveoli lined by flat or low epithelium were met with.

The nuclei of the cells lining the acini show marked alterations. By far the majority of them are larger than normal, many of them being huge, bladder-like nuclei. These are more frequently seen in the largest cells. The nuclei exhibit in various degrees the phenomena which have been classed under the term "karyor-rhexis." There appears to be an increase in the nuclear juice and a displacement, in many of the nuclei, of the chromatin-substance from its normal situation. In some nuclei a peripheral disposition of the chromatin is visible, the central parts being more or less decolorized (Kernwandhyperchromatose of the Germans). In such nuclei it is possible to make out not infrequently the remains of the nuclear framework and of nucleoli, in the shape of pale strands and spherical masses, deprived of their color. In other nuclei clumps and false bands of chromatic substance are present throughout the nuclear mass (Gerüsthperchromatose of the Germans). While many of the nuclei are on the whole paler than normal, more of them stain more intensely than those of the normal thyroid gland; some of the large, bladder-like nuclei stain feebly, others intensely. The intense stain occurs especially in those of them which show very jagged and irregular borders (Verklumpte Kerne of de Cou-

lon). Some of the largest nuclei give one the impression of loose-walled bags without tonicity. At different parts of the surface the nuclear wall is collapsed and depressed, the depressions being filled up by masses of cell protoplasm. No mitoses are visible. A number of nuclei, as a rule deeply staining ones, show projecting buds of nuclear substance which extend from the general mass of the nucleus into the cytoplasmic substance. These are often constricted by a narrow neck and, in a few instances, masses of nucleus appear to be actually separated from the main body, representing a form of nuclear fragmentation. This appearance, however, was met with only rarely.

As a rule, each cell contains a single nucleus, though in a few instances two nuclei are present and in one cell no less than six spherical, rather deeply staining, nuclei were found in one large cell body. These nuclei appeared to be entirely separate from one another and lay in different planes in the cytoplasm.

The lumina of the acini, as has been said, vary much in size. Some of the alveoli really possess no lumina at all; in others only a very small central opening is to be made out, while in others there are larger lumina, a few of the size of normal thyroid alveoli. Extremely few of these acini contain any colloid; the majority are either entirely empty or show inside them only desquamated cells from the alveolar walls. A very few cysts are present, filled with colloid substance. These cysts are of the size of from three to six normal thyroid alveoli and are lined by flattened thyroid epithelium, which otherwise appears to have undergone very little change. Some of these have evidently been formed by the fusion of several acini, for the broken walls of separation can be seen projecting in from their margins. They are almost completely filled with colloid, which is not markedly retracted at the borders. The colloid stains of a rose red color in eosin specimens. No accumulation of leucocytes could be made out within any of the acini or colloid cysts.

The stroma, which is very much increased in amount, consists of firm, white fibrous connective tissue. As a rule, this is not very cellular; in the parts of the gland which appear to be undergoing the most rapid atrophy, however, the nuclei are more numerous. In these regions one sees considerable numbers of blood vessels undergoing obliteration and surrounded by concentrically arranged, young connective tissue cells. Near them are groups of acini in various stages of atrophy. Some of these are reduced so much in size that they consist simply of groups of two or three epithelial cells

surrounded by connective tissue; indeed, in a number of instances, single cells, undoubtedly thyroid epithelium, are to be made out lying isolated in connective tissue masses. These are evidently also the remains of acini.

No very remarkable alterations are to be made out in the blood vessels. The blood is fairly well preserved and the capillaries projecting into the larger acini are filled with red blood corpuscles. A large number of nerves, both medullated and non-medullated, are present in the section, usually near large blood vessels, but no pathological alterations are to be made out in them.

The specimens stained by van Gieson's method, with and without preliminary nuclear staining with hæmalaun, yield excellent pictures, especially for a comparison of the relative amounts of parenchyma and stroma, inasmuch as the epithelial cells are stained bright yellow and the connective tissue stroma takes the acid fuchsin. By means of this stain, spherical masses can be seen within the protoplasm of some of the cells lining the acini. Whether or not these masses are colloid or an allied substance, could not be determined. At any rate, they stain of a yellow color quite like the rest of the protoplasm. The colloid in the cysts mentioned varies in its behavior toward van Gieson's stain. In some of the few cysts present it is of a bright yellow tint; in others it stains of a reddish brown color and is then more refractive. In the connective tissue one or two spaces filled with refractive colloid matter were found. These probably represent lymph vessels, but there is certainly no great amount of colloid inside the lymph spaces, nor is any colloid to be seen within the blood vessels.

Specimens stained with acid fuchsin and differentiated in picric-acid-water and picric-acid-alcohol afforded results essentially the same as those obtained by van Gieson's method, with the exception that, with this procedure, a certain number of the red corpuscles showed a greater tenacity than others for the acid fuchsin. These corpuscles remained stained of a bright red color, after all the rest had lost it and were stained yellow in the picric acid.

Sections treated with polychrome methylene-blue and neutral orcein are of service for studying the cells and the stroma. The nuclei stain blue; the protoplasm assumes a violet tint, while the collagen of the connective tissue fibres stains reddish brown in the orcein. With this method the irregular borders of the epithelial cells in many of the acini were particularly striking; the cells looked ragged at the edges and gave the impression as though they

were losing parts of their substance at the periphery. The vacuolization of the cells is very apparent in these sections also. The cytoplasm of some of the larger cells containing degenerated nuclei possesses an especial affinity for the orcein, staining of a reddish brown color.

A review of the bibliography shows that only eight cases have been reported in which the thyroid has been described in cretins; namely, three cases by Hanau, one by Langhans and four by de Coulon. While there are minor differences, the process in all cases thus far described is essentially the same. The findings in this case are in the main confirmatory of those which have previously been made. De Coulon's descriptions\* are particularly full, and the illustrations accompanying his article, especially his figures 1, 2 and 3, agree very closely with what is to be seen in the specimens here described. It is rare, however, to find acini with as much colloid inside them as he shows in his first two figures. That, in addition to the evidence afforded by the size of the gland and the marked increase of connective tissue in it, the cellular and nuclear changes are atrophic and degenerative in nature, there can be but little doubt. The nuclear changes especially are those which are now generally recognized as characteristic of degenerative processes. They correspond in many respects to some of the lesions described by Oertel in human diphtheria and by Flexner in experimental poisoning of animals with diphtheria toxins. Schmaus and Albrecht believe such nuclear appearances to be evidences of degeneration. The degree of retrogression in the thyroid gland of this case is one of the most marked which has yet been reported, though apparently in De Coulon's cretin, Santschi, the atrophic process had gone even further.

(c) *Sporadic cretinism with goître.* Of the sixty cases collected in this country, seven had goître. Herein lies a very striking difference between the sporadic and the endemic cretinism. In the latter the percentage of goître in some statistics has been as high as sixty (Knapp). In Fletcher Beach's collected statistics of one hundred and sixteen sporadic cretins in different countries, the thyroid is noted as "not felt" in seventy-three; "felt" in eleven, and enlarged in seven cases. He states that of sixteen post-mortems of which he has been able to find an account, the thyroid gland was absent in fourteen cases, and there was bronchocele in two.

Through the kindness of Dr. Darey, of Northwood, Iowa, and of Dr. Kessel, of Cresco, Iowa, I am enabled to report upon and show

\* Virchow's Archiv., 1897.

the photographs of two remarkable goitrous cretins.\* The father's sister had goitre. There were five children; one died at the age of eight months, of diphtheria; one is alive and well, and has no goitre, and three have had goitre; one died at the age of eight years, following an operation on the goitre. In the two whose photographs are given here the goitres made their appearance when they were quite young infants. The notes of the cases have been given (XXXIV and XXXV). (Figs. X and XI.)

#### V. THE RELATIONS OF SPORADIC TO ENDEMIC CRETINISM.

When the "cretinoid state," to use Gull's expression, whether developing spontaneously or following thyroidectomy, became recognized as a direct result of the loss of the function of the thyroid gland, it was a simple matter to suggest that true cretinism, both sporadic and endemic, had the same origin. The generic term cretinism may indeed be used to cover these four allied states—endemic, sporadic, idiopathic of adults (myxœdema), and operative—following total excision of the gland. One and the same pathological basis exists in the entire group—viz., loss or perversion of the function of the thyroid; the anatomical basis is varied—total absence, atrophy or goitre. Kocher,† in his masterly presentation of the subject, takes this wide ground. Without exception, so far as I know, recent writers have assumed this position, but quite recently this relationship has been questioned by Bircher, a well-known student of endemic cretinism, in an excellent section on the "Thyroid Gland," in Vol. I. of Lubarsch and Ostertag's *Ergebnisse*, etc., 1896. He concludes "that the cretinoid degeneration is in no way connected with disturbance in the function of the thyroid gland." He bases this opinion upon the persistence of the thyroid, cystic, and degenerated, it is true, in a large proportion of cases. In twenty cases, fifteen had goitre, four normal thyroid glands, and in one only it could not be felt. In three cases in which he had extirpated the thyroid in cretins and in the non-degenerated parts he had found normal thyroid tissue. Moreover, a cretin from whom he removed the cystic goitre became myxœ-

\* They remind one of Shakespeare's description in the "Tempest" of the

"Mountaineers

Dew-lapp'd like bulls, whose throats had hanging at 'em  
Wallets of flesh."

† Zur Verhütung des Cretinismus und Cretinoid Zustände nach neuen Forschungen. Zeitschrift f. Chirurgie, Bd. xxiv, 1892.

dematous, and was temporarily cured by the implanting of a gland; but, as Hanau and Ewald both remark, this is no evidence that the thyroid has nothing to do with cretinism. It would be very much the same as the development of uræmia in a case of chronic nephritis after bilateral nephrotomy.

Both Curling and Fagge believed the conditions which they described to be identical with endemic cretinism. They further have the great merit of recognizing the loss of function of the thyroid as the probable essential factor in the disease. Curling's title is in itself suggestive: "Two cases of absence of the thyroid body, and symmetrical swellings of the fat tissue of the neck, connected with defective cerebral development." In seeking an explanation he speaks of "the absence of those changes which result from the action of the thyroid, or on some imperfection in the assimilating processes consequent on the want of this gland; and the facts here detailed may not be without significance in directing the researches of future inquirers into the use of this body." Fagge held that the presence of the thyroid gland was "protective against the occurrence of cretinism." A similar opinion had been expressed about endemic cretinism in 1830 by Troxler (Kocher).

We may ask in the first place, are there any essential differences between the sporadic and endemic forms of cretinism? A single definition covers both conditions—*a chronic affection characterized by disturbance of the growth of the skeleton and soft parts, a remarkable retardation of development, an extraordinary disproportion between the different parts of the body, a retention of the infantile state, with a corresponding lack of mental progress.* One has only to compare the picture given of cretins in Switzerland with those of the sporadic form, both in England and this country, to see that the two states, so far as external characters go, are identical. The differences between the two forms are as follows:

1. The endemic variety develops under local conditions as yet unknown, associated with a peculiar poison of doubtful nature. Bircher states that "the cretinoid degeneration is a chronic infectious disease, the organic miasm of which is associated with certain marine deposits of the earth's surface, and which gains access to the body through the drinking water." It is only of late years that any light has been thrown upon the intimate relation of goitre and cretinism. I have already referred to the opinions of Troxler, Curling, and Fagge, and almost all writers on the endemic form agree with the statement of Morel, that goitre is the first step on

the road leading to cretinism. It is possible, however, that changes other than those which lead to goitre may be effective; anything which causes loss of function of the gland.

2. The differences in the changes in the bony skeleton. In the endemic cretin a premature ossification of the spheno-basilar bone has been described, and the fontanelles close early. How far these are constant characters remains to be demonstrated. In the sporadic form the fontanelles often remain open for a long period, even until after the tenth year, and there is a greater retardation in the development of the long bones.

3. The endemic cretin is said not to show the same myxœdematous characters as the sporadic cretin, but the accounts vary in different authors; and the description of the cutaneous condition given by Kocher (whose experience with cretinism has been very large) fits that of the sporadic cretin exactly. Other minor differences are mentioned, such as the shorter life of the sporadic cretin; Ewald,\* indeed, states that he knows of no instance in which life has been prolonged beyond the thirtieth year, but of the cases which we have collected there were seven beyond the thirtieth year. Another point is the less frequent presence of goitre. The percentage of goitre in endemic cretins has been noted as high as sixty; in the Sardinian Commission there were 3912 instances of goitre in 5923 cases. In the collected series of sixty cases there were only seven with goitre. The two cases with goitre, figures X and XI, are good examples of goitrous cretins occurring in a family in which goitre was prevalent.

4. Bircher states that the thyroid extract has no influence upon endemic cretins, a fact which he claims illustrates the independence of loss of thyroid function; but I cannot gather that he, or, indeed, anybody else has systematically tried the thyroid treatment upon young cases. There is some positive evidence. Kræplin† (who holds that in endemic cretinism disease of the thyroid is the first link in the chain, and that changes in the skin, retardation of growth, and dementia result directly from loss of function of the thyroid) speaks most hopefully of arresting the disease by thyroid feeding if begun early. He adds that even in long-standing cases it has been possible by the thyroidin to wholly reduce the swelling of the skin, and he has seen the menstrual functions restored. The psychical features were not much improved.

\* Nothnagel's *Specielle Pathologie und Therapie*, Bd. xxii, the most recent account of cretinism and allied states.

† *Psychiatrie*, fifth edition, 1896.

Prof. Gaule, of Zurich, writes me that he is informed by Kocher that all the cases that are brought to the hospital are treated with the thyroid extract.

Prof. Sahli, of Berne, writes that "so far as I know, the observations on operative myxœdema have been confirmed by the thyroid treatment of young cretins." The question is one deserving of the most careful study in the goitre and cretin districts of Europe.

The minor differences between endemic and sporadic cretinism, many of which are still doubtful, cannot for a moment be set against the similarity of the two conditions in almost all points save the local (telluric) influences in the causation of the former; and there only remains the question of the state of the thyroid gland. It is remarkable that in endemic cretinism the observations should be so scanty. Hanau\* reports three cases, in all of which the thyroid glands showed alterations, being smaller, and in one there was a cyst. The connective tissue was abundant, the alveoli smaller, and in only a few was there the normal colloid. Langhans,† in one case, found the gland enlarged, and made up of large alveoli, many of which were empty and only a few filled with refractive colloid. De Coulon,‡ working in Berne, has examined the thyroid gland in four cretins, and in one cretin of bodily form, but good mental development, and after a most thorough histological study, concludes "that the thyroid had not completely degenerated, but the tissue showed changes which indicated that its function was impaired, or at least reduced to a very low ebb. The smallness of the alveoli, their disappearance in consequence of the relative increase in the connective tissue, the absence of colloid in the majority of the alveoli, and in almost all the lymph vessels, so also the condition of the epithelium and the nuclei . . . speak in favor of this view." Also the condition of the existing colloid and its reactions suggested, he thought, important chemical changes of a degenerative character.

In the atrophied gland of Case VI. the lesions were identical with those found in one of de Coulon's cases, which still further strengthens the position of those who hold the essential unity of the process. In neither form is the state of the thyroid gland always the same; loss or serious perversion of function is the important factor, and this may follow absence, atrophy, or hypertrophy. There is no fixed stamp or type of cretin; the range is from a mere

\* Transactions of the Berlin International Congress.

† Virchow's Archiv., Bd. cxxviii.

‡ Virchow's Archiv., Bd. cxlvii.

mass of humanity without a ray of intelligence, to the high-grade cretin with but slight bodily and still slighter mental changes; and it is only reasonable to believe that to these grades are correlated varying degrees of thyroid degeneration. Bircher lays great stress upon the presence of normal-looking tissue in the glands which he excised from cretins, but gives no statement of any histological study; nor is the development of myxœdema in one of these cases, and of tetany in another, inconsistent with the view that the thyroid is the seat of the essential lesion, since the activity of the gland may have been sufficient only to maintain the organism at a certain plane of cretinoid existence.

If the experimental work on the importance of the para-thyroids should be confirmed, the whole question will have to be reviewed from this standpoint.

There are, of course, gaps in our knowledge, but the evidence at present available warrants, I believe, the conclusion that the changes characteristic of cretinism, endemic as well as sporadic, result from *loss of function of the thyroid gland*.

#### VI. OPERATIVE MYXŒDEMA.

It is somewhat remarkable, considering the number of times thyroidectomy has been performed in this country, that operative myxœdema is so rare. In my previous paper I reported, through the kindness of Dr. McGraw of Detroit, a case which had occurred in his practice. Dr. McGraw writes to me on the date of April 9th, 1897, that this patient was placed upon thyroid extract and immediately began to improve. The myxœdema disappeared, the hair grew, and he has been able to resume his work. He has, however, to take the thyroid extract at intervals.

I have had sent me also the notes of another case by Dr. John C. Fisher, of Litten Springs, California, which is evidently a very typical and remarkable one, and has also got perfectly well. A very interesting feature in this case is that the treatment should have been begun so many years after the development of the condition.

Miss J. L. T., aged thirty-three, born in United States.

"At the age of thirteen years, in the month of July, 1873, an operation was performed to remove a swelling from the neck. This swelling had been growing rapidly for four months. The operation was successful. Six days after the operation a severe hæmorrhage began. We lived near Buffalo and some doctors came from that

city to attend me. The hæmorrhage was not stopped until thirty-six hours afterwards. After I got well and could eat, everything turned to flesh."

The doctor writes, "when I saw the case twenty years after the operation, the patient presented a typical case, as described in literature. She was evidently nearing death. Two assistants were necessary when she walked. I put her on P. D. & Co. desiccated thyroids, two grains t. i. d., increasing to five grains t. i. d. Improvement was immediate and most pronounced. Treatment begun in May. In August the lady went to the World's Fair and walked four or five miles daily without fatigue. She writes that it is necessary to take the thyroid treatment for a short time, now and then, in order to keep in good health. The patient says 'I call myself perfectly well, and my friends all consider it a wonderful cure.'"

ON CHRONIC SYMMETRICAL ENLARGEMENT OF THE  
SALIVARY AND LACHRYMAL GLANDS.

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In the second edition of my *Text-book of Medicine*, issued in 1895, under the heading of "Chronic Parotitis" I mention the case of a young girl, aged thirteen years, then under my care, "who has had for nearly a year enlargement of all the salivary glands, the lachrymal glands, the buccal mucous glands, and the spleen." The case interested me a great deal, and I searched in the literature at my disposal without finding any condition exactly like it. I had overlooked the fact that Mikulicz,<sup>1</sup> in 1892, had described the condition as a characterized form of chronic disease previously unrecognized. His patient, a man, aged forty-seven years, for seven months had symmetrical enlargement of the lachrymal glands, and subsequently of all the salivary glands.

Quite recently Kummel<sup>2</sup> has met with a series of cases, and has collected one or two which had been previously described in the literature. His first case, a man, aged thirty-three years, had swelling of the salivary and both lachrymal glands in association with chronic hypertrophic rhinitis and asthma. He was cured by arsenic. The second case was a man, aged twenty-five years, who had had for two years slight swelling of all the salivary and lachrymal glands. The third case was a man, aged twenty-eight years, who had enlargement of all the salivary glands, particularly of the right parotid. The buccal and lachrymal glands were not enlarged. The fourth case, a woman, aged twenty-seven years, had swelling of both parotids and submaxillaries of two years' duration. The lachrymal glands were not involved. She had also a dry mouth. Both of these cases followed influenza. The fifth case, a man, aged forty-seven years, had swelling of both parotids only, of some years' duration. The sixth case was a woman, aged twenty-three years, in whom the submaxillary glands were swollen for six months. The other cases in the literature were the one of Mikulicz, already spoken of; one of Tietze, a male, aged thirty-six years, who for ten years had swelling of the parotid glands, and for four years swelling of the lachrymal glands. The ninth case was reported by Hallenhoff:

<sup>1</sup> Bruns' Beiträge (Billroth's Festschrift, 1892).

<sup>2</sup> Mittheilungen aus dem Grenzgebiete der Medicin und Chirurgie, Bd. 9., 1897.

a girl, aged twelve years, had for four months enlargement of the lachrymal, parotid, and submaxillary glands. Very full abstracts of these cases are given in Kummel's paper.

The history of the case which has been under my observation is as follows:

*For more than a year enlargement of the lachrymal, salivary, and buccal mucous glands; enlargement of the spleen; syphilitic rhinitis; tuberculosis of the pleura and lungs; death.* Hannah W., aged eleven years, colored, was admitted March 30, 1894, complaining of swollen glands in the neck.

*Family History.*—Father living, but delicate; mother died of typhoid fever. One sister has had convulsions. She has two brothers and several sisters, all of whom are healthy.



*Personal History.*—It is difficult to get any satisfactory account from her or her relatives. She says she has always been very well. Two years ago she had chills and fever for a month.

*Present Illness.*—Six weeks ago she began to feel dull and heavy, and the woman with whom she lived noticed that her face and neck were a

little swollen. She did not complain of any pain. At the same time she had slight sores in the mouth and a discharge from the nose.

I saw her on March 31st, and dictated the following note: The child is well nourished, and has a good color; the tongue is clean. The eyes are a little prominent. A remarkable feature is the symmetrical enlargement of both parotid glands, which stand out very prominently and tilt up the lobes of the ears. To the touch they are painless, and have a firm, board-like hardness. The outlines and lobulations of the glands can be felt with the greatest distinctness. The orifices of the ducts are a little swollen and firm, and a little mucus can be pressed out. Both submaxillary glands are enlarged and firm and hard. The sublingual glands can also be seen as a prominent nodular mass beneath the skin. The child's eyes are naturally prominent, but what adds strikingly to this feature is an enlargement of the lachrymal glands, causing marked bulging just above the outer canthus of each eye. They can be readily felt, and the lobulations are quite distinct. Just within the lower lip there is a small group of enlarged mucous glands. Just beyond the angle of the mouth on either side there are groups of the buccal glands, ten or twelve in number, greatly enlarged, the size of small peas. No other of the buccal glands are enlarged. The tonsils are moderately swollen. The accompanying figure, from a photograph, shows well the enlargement of the salivary glands, but not that of the lachrymal.

At the time of her admission there was no discharge from the nose. There were no signs of interstitial keratitis, and the upper central incisor teeth were well formed. There was slight general enlargement of the lymphatic glands over the body, particularly of those in the posterior cervical triangles. The spleen was enlarged; the edge could be easily felt beneath the costal border, and on deep inspiration the notch could be felt. The liver was not enlarged. The urine was of a natural yellow color, acid reaction, specific gravity 1025, and contained no albumin. The child remained under observation for more than a year. Cultures made from the mucus squeezed from the parotid ducts were negative.

Throughout the summer of 1894 the condition of the glands remained about the same. In June, before I went for my vacation, I noted that "the glands are still large and hard, without any special change." The spleen was perhaps a little smaller.

On October 1st I made the following note: "The right parotid gland is now smaller than the left. The right submaxillary and right sublingual glands are somewhat larger than they were in June. The lymph glands in the posterior cervical triangle have increased in size. The lachrymal glands have become somewhat smaller. The spleen is still to be felt nearly two fingers' breadth below the costal margin. The enlargement of the buccal glands persists." Several careful examinations of the blood were made throughout the spring and summer. The highest count of leucocytes was 10,300 per c.c. There was never any anaemia; the red blood-corpuscles were usually above normal.

In October and November she had a good deal of swelling of the nose, with elevation of the bridge, and Dr. Warfield reported that there was a good deal of thickening of the cartilaginous septum.

Throughout January and February there was distinct ulceration, which Dr. Warfield regarded as syphilitic, and she was ordered the iodide of potassium and mercurial inunctions.

In March, 1895, the right lachrymal gland became very much re-

duced in size, and was hardly perceptible. The left remained as large as previously. On March 27th she had a slight aphthous sore-throat, which was followed by an increase in the enlargement of the salivary glands, particularly of the right parotid and its extension on the cheek.

On April 6, 1895, she began to be feverish, and had pain in the right side of the chest, due to an attack of acute pleurisy with effusion. She had irregular fever through April and May. She gradually improved, and it was noticed throughout May and June that the swelling of the salivary and lachrymal glands had gradually reduced, and on July 19th it was noted that the parotid glands were no longer enlarged. The swelling of the submaxillary and sublingual glands had also disappeared, and the buccal glands were no longer to be seen.

On my return in September, 1895, I noted that there was a complete disappearance of the enlarged glands, and the spleen could only just be felt on the deepest inspiration.

The subsequent history of this case may be briefly referred to. She was readmitted to the hospital April 18, 1897, with signs of chronic pulmonary tuberculosis, with cavities at the right base. She died in July, 1897.

Dr. Livingood, who performed the autopsy, tells me that the lachrymal glands were represented by fibrous structure, and there was at the time of the autopsy no trace of any enlargement of the salivary glands.

When this case first came under observation I thought that possibly it was associated with an inherited syphilis, and this seemed to be borne out by the subsequent development of a rhinitis, regarded by Dr. Warfield as syphilitic. This opinion appeared to be borne out by the gradual disappearance of the swellings, slowly, it is true, under the use of mercury and the iodide of potassium. It is interesting to note that swelling of one or both parotids may occur in secondary syphilis, an instance of which was at that time under observation in a student. Enlargement of the spleen, as in the case here reported, is not mentioned in any of the other cases. Subsequently the question arose as to the possibility of a tuberculous affection of the glands, an idea not confirmed by the subsequent history.

Both Mikulicz and Kümmel regard the disease as a chronic infection of as yet unknown origin. The enlargement of the glands may persist for months or years; causes no general disturbance; is painless. The condition occurs, as a rule, in persons at the middle period of life. Kümmel has made a careful histological study of the enlarged glands, and finds a complete substitution of the normal tissue by leucocytes. He suggests the name *achrocytosis*, indicating a replacement by colorless corpuscles of the glandular elements.

The condition, though not serious, is unsightly, and on this account troublesome. Arsenic seems to have been very beneficial in several cases, and should it fail, iodide of potassium should be used.

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## ON SOME OF THE INTESTINAL FEATURES OF TYPHOID FEVER.

By WILLIAM OSLER, M.D.,

of Baltimore,

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TYPHOID FEVER is a general infection with special localizations in the lymphatic tissues of the intestines, in the mesenteric glands, spleen, liver, and bone-marrow. Perhaps the most interesting advance in our knowledge is the demonstration by bacteriology of the widespread nature of the infection. So far as we know, the bacilli do not multiply and produce the poison in the intestine, but in certain tissues of its wall, and in the organs named. Within the past few years we have learned to recognize a typhoid fever without intestinal lesions.<sup>1</sup> I have not infrequently seen most malignant cases with but slight involvement of Peyer's patches, but never until the present year have I met with a case in which there was a general infection without involvement of the lymphatic tissues of the intestine. The case will be reported in full by Dr. Flexner, and I shall here only make a brief reference to the condition.

An old man, aged 68, was admitted October 28, 1897, complaining of shortness of breath, weakness and pain in the back. He had been a very healthy man, and had had no serious illnesses. For two months he had had loss of appetite and loss in weight. Two weeks prior to admission he had pains in the back and indigestion, was short of breath, and was very thirsty. He kept about, however, until Tuesday, the 26th, when, while undressing to go to bed, he fell over. On the following day he seemed very ill, and on the 28th he was sent to the hospital. He looked a feeble, debilitated man, and seemed to be suffering a great deal of pain, groan-

<sup>1</sup> See Chiari's recent paper in the *Centralblatt für Allgemeine Pathologie*.

ing with each expiration. He was dull and listless, and it was difficult to get satisfactory answers from him. The tongue was dry and thickly coated with a black fur. The pulse was 128; the temperature rose to 104° in the evening. There were signs of consolidation in the right lower lobe, with friction and tubular breathing, and we naturally thought the case was one of senile pneumonia. He had no expectoration; the leukocytes were about 15,000 per cubic millimeter. When I saw him at noon on the 29th he was unconscious. He died at 10 o'clock the next morning, forty hours after admission. The autopsy, made by Dr. Flexner, showed a pneumonia of the right lower lobe, passing into gangrene, marked swelling of the spleen, moderate swelling of the lymphatic glands, no swelling or ulceration of the solitary or agminated follicles in the intestines. Pure cultures of typhoid bacilli were obtained from the pneumonic lung, spleen and from other organs.

The severity of the symptoms of typhoid fever bears no relation to the extent or intensity of the intestinal lesions. The last fatal case in my wards a week or so ago illustrates this point very well. The patient had high fever, incessant delirium, with the most profound nervous manifestations, which persisted in spite of all measures. Post mortem the intestinal lesions were comparatively slight, but the involvement of the spleen and mesenteric lymph-glands was exceptionally severe.

Influenced by the prevalent views of the all-important nature of putrefactive or toxic changes in the bowels—views which, though largely theoretic, have influenced practice profoundly<sup>2</sup>—the purgative and antiseptic methods of treatment have of late steadily increased in favor. Many physicians now believe that the key to the situation in treating typhoid fever is to be found in the intestines, and the disease is regarded as of an enteric rather than of a systemic nature. This I believe to be wrong—wrong in the worst possible way, in principle as well as in practice. Some of us may perhaps go to the other extreme in minimizing the importance of the enteric symptoms, and in avoiding all medicines

<sup>2</sup> For a good conservative statement of the question see Herter's recent paper, *N. Y. Med. Jour.*, 1897, ii.

ious, is .

to be .

unless specially indicated; but it may be worth while to recall the fact that a large proportion of all cases do perfectly well without any interference with the bowels. During the year 1897 I have given special attention to the intestinal symptoms of the cases under my care, 99 in number (to December 8th). The following analysis will show how slight the enteric symptoms *may* be. The intestinal features may be grouped into those of the onset, those of the course, and certain sequelae.

(a) SYMPTOMS OF ONSET.—*ain* in the bowels was complained of in 23 cases. It was rarely severe. In one case the symptoms on admission suggested appendicitis. The patient had only been ill one day with pains in the abdomen, and when seen by Dr. Canac at 6.30 P.M., shortly after admission, he was in great pain; the abdomen was distended, and there was marked tenderness in the right flank, with board-like resistance. The tongue was coated; the temperature was 103°. Naturally appendicitis was suspected, but on the following morning when he was seen by Dr. Cushing, though the abdomen was a little distended, there was no trace of tenderness, and the case progressed as one of ordinary typhoid fever. It has to be borne in mind that the pain may be very localized in the right iliac fossa, and there are now a number of cases on record in which the appendix has been removed in the belief that the condition was one of acute appendicitis.

*Diarrhea at Onset.*—In 40 cases there was looseness of the bowels or active diarrhea. In 12 of these the patients had been given by the doctor, or had taken on their own account, purgative medicine. In other instances medicines had been taken, but the patients did not know whether or not it was of a purgative nature. This probably represents too small a proportion, since in this locality the common practice prevails of giving a dose of calomel or of salts at the onset of a fever, par-

ticularly if typhoid be suspected. While gentle laxatives are not specially contra-indicated, yet I think free and active purgation at the onset of the disease is decidedly harmful, and there is truth in Graves' remark that "patients who have escaped active purgation before admission to hospital get through the disease with little or no tympanites."

(b) *INTESTINAL SYMPTOMS DURING THE COURSE.*—*Pain.* 11 of the 99 cases complained of pain in the abdomen after admission. One of these had persistent pain during the first week; one only for a single day, and one on the 27th day. In two cases the pain was severe enough to excite uneasiness. A man aged 32 (Med. No. 7626) was admitted July 26th, complaining of pain in the abdomen. After a preliminary eight or ten days of uneasy sensations he felt suddenly one evening severe pain in the epigastrium, localized, sharp and severe enough to double him up, and he was not able to lie down for four hours. The pain persisted in the epigastrium, but was not of the same intensity. He was admitted at the end of the third week of the disease and was at first quite comfortable, but at noon of August 2d he had a sudden pain in the right epigastrium. There was no chill, but there was slight distention. The pain was evidently severe, and he groaned with each expiration. It persisted throughout the day, but was not followed by any jaundice. There was never any recurrence of the pain, and the patient was discharged well. Possibly this man had cholecystitis, though there was no evidence of enlargement of the gall-bladder or of gall-stones. In the case of Mrs. H., aged 45 (Gen. No. 20,433), there was at the onset a great deal of abdominal tenderness, and for two or three days after admission great soreness on palpation, with, as she expressed it, aching, sometimes quite severe; there was no constipation. The abdominal tenderness disappeared within a couple of days.

*Diarrhea.*—For many years past, my practice has been not to disturb the bowels in the course of the disease. With the exception of a few doses of turpentine for tympanites, or measures directed against hemorrhage or active diarrhea, I abstain from all active interference. Occasionally, for the constipation of convalescence, I give castor-oil, but I never use the so-called intestinal antiseptics, nor do I give salts, so that my experience in this connection is worth recording from its negative value, as showing how well or how badly cases of typhoid fever do with a minimum of interference. Of the 99 cases under my care during the year, diarrhea occurred (while the patient was in hospital) in only 12 cases. In not a single instance was it severe or protracted enough to require treatment. In three of the cases it was just after admission; in two it was only for a single day. This, of course, is an exceptional experience, and illustrates how variable typhoid fever may be. In October, we had between 30 and 40 cases in the wards, many of them very severe, but not one with diarrhea. Our experience for the first six years gave looseness of the bowels in 30 per cent. of the cases, but only in 9.2 per cent. were the movements at all frequent. We prefer to use injections if the bowels are at all constipated, or we dilute the milk and increase the amount of albumin-water. My experience has been, that the cases with constipation do better than those with diarrhea.

*Meteorism.*—Slight distention of the abdomen was present in eight cases. In no instance was it severe, or the cause of any uneasiness. It is rarely present with constipation, and is usually an accompaniment of diarrhea. When extreme, there is no intestinal symptom, with the exception of perforation, of graver omen or more difficult to combat.

*Hemorrhage.*—In five cases there was hemorrhage

from the bowels, which is about the average percentage. None of the cases died. One patient had passed blood prior to admission.

There was no instance of *perforation*. This is the first year in our hospital work in which this accident has not occurred.

(c) **INTESTINAL FEATURES OF CONVALESCENCE.**—By far the most frequent and annoying is constipation, which is often the cause of a slight rise in fever, and even (according to some) of chills. The use of castor-oil or of enemata of warm sweet-oil will usually suffice to relieve it. The tendency sometimes remains as a very distressing sequela of the disease, but even when most protracted it usually passes away in the course of a year or less. A troublesome symptom, though rare, is diarrhea during convalescence. It did not occur in any of the cases this year. Usually due to persistence of ulceration in the large intestine, it may prove very intractable.

It is interesting to note that we had not a single death this year from any intestinal complications. Of the four fatal cases, one, a colored woman, died the day after a celiotomy for acute cholecystitis and peritonitis; one died of asthenia on the day after admission in the fourth week of the disease; the third case was the old man who died with a general typhoid infection without intestinal lesions. He had pneumonia with pulmonary gangrene. The fourth case died with the most profound involvement of the nervous system. None of the cases remaining in the hospital at the date of writing has any intestinal symptoms.

The most important practical question to-day relating to typhoid fever is whether we shall treat it as an intestinal disease, or as a general infection.

At present a very large majority of the profession, adopting the former view, use so-called antiseptics,

with or without purgatives. Many years ago I abandoned the carbolic acid and iodine treatment—still a favorite, I see, in some quarters—and since then I have used no measures directed either to disinfection of the bowel or to the removal of supposed irritants, etc. Calomel, mercuric chlorid, Yeo's chlorin-water, salol, creosote, guaiacol, beta-naphthol, benzo-naphthol, and the shot-gun compound of Dr. Woodbridge are now much in vogue, and this at least can be said—that they probably do no harm. Though after reading Dr. McCormick's experience of 19 instances of hemorrhage from the bowels in 100 cases of typhoid fever one has a little doubt. This, of course, may have been an accidental experience, though a treatment so active as to call for from four to eight passages in the twenty-four hours cannot escape the suspicion of having something to do with this extraordinary percentage, the highest I have been able to find in the literature. This is not the first time that the profession has had the purgative method of the treatment of typhoid fever urged upon it. Fifty years ago M. De Laroque "gained a certain Parisian notoriety by treating typhoid fever with purgatives in the morning, purgatives at noon, purgatives in the evening, and purgatives in the morning again," Bretonneau, too, one of the great students of typhoid fever, recommended saline laxatives. The Paris journals of fifty years ago are full of discussions on this question. We have possibly been too fearful of the dangers of the use of purgatives in typhoid fever. The experience of a great many men who have adopted the eliminative method of Thistle, or who have used salines and calomel freely, shows that the mortality is not materially increased over that from the ordinary symptomatic plan. My contention, however, is that they are not indicated, as it is not likely that the typhoid bacilli multiply and develop their poison to any extent in the

intestinal contents themselves. One cannot but be influenced, too, by personal experience, and our results on the non-interference plan have been (for a general hospital) very satisfactory.

I am often asked—Why have you not tried the Woodbridge treatment? As well ask why do I not use Bishop Berkeley's *Tar-water*. Any intelligent physician who reads Dr. Woodbridge's articles in the journals, or as they have been collected in his book, must be impressed,—first, with the crude, unscientific character of his work, and with the ignorance everywhere displayed of the nature of typhoid fever; and, secondly, with the persistent vaunting of a specific or cure-all for it. Dr. Woodbridge is a devoted, earnest man, who honestly believes in his plan—so did Bishop Berkeley in his—but until the presentation has been made in a very different way, I can no more accept his statements than those of any other misguided enthusiast who has been fortunate enough to have his wares exploited in the profession by a drug-house of repute. That any firm should have lent their name to this "treatment," that they should have spread broadcast in the profession its literature, may have been good business policy, but displays a sad lack of judgment. On such a question it is much easier to keep silence than to speak one's mind frankly in what may appear an ungracious, unkindly way; but I am quite ready to express this opinion in public, since I have had so often to do it in private, in response to scores of letters from physicians in different parts of the country. To one who appreciates what those great masters, Nathan Smith, James Jackson, W. W. Gerhard, Elisha Bartlett, and Austin Flint, did in this country for the elucidation of typhoid fever, the book issued by Dr. Woodbridge is a reflection on the memory of men whose works and ways are alike our standard and our pride.

A few weeks ago, I picked up Andral's Report to the Academy of Medicine, on the treatment of typhoid fever by purgatives, written some sixty years ago. Parts of it indicate that, in certain directions, we have not made much progress. He could write to-day the sentence: "If, in fact, the pyrexia, now called in France typhoid fever, were nothing more than gastro-intestinal inflammation; if the numerous symptoms that occur in its course were only the sympathetic effects of primary irritation in the digestive canal, the therapeutic question would be one of the simplest." And, in discussing the difficulties in arriving at direct conclusions about methods of treatment, that great clinician could also say to this generation: "Hence the difficulties—too often insurmountable—which present themselves, when we try to reduce to law a therapeutic result; hence, also, the occasional necessity of being more than once compelled to leave to time—that great *teacher*—the decision of such questions."

Dr. 227  
No. 131

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XXV.

Ein Fall von Fistula oesophago-pleuro-thoracica.

Von

Prof. Dr. WILLIAM OSLER

Baltimore.

(Hierzu Tafel X.)

Charles R. M., 31 Jahre alt, ersuchte um Einlass in das Johns Hopkins Hospital am 4. April 1893, über allgemeine Schwäche und eine Fistel an der rechten Seite des Thorax klagend.

Anamnese. Die Vorgeschichte seiner Familie war gut; über seine persönlichen Krankheitserfahrungen machte er folgende Angaben:

Im Alter von zehn Jahren hatte er ein Leiden, über welches er nicht mit Klarheit berichten kann, während desselben erschien an der rechten Seite des Thorax über der Brustwarze eine Geschwulst. Er entsinnt sich, dass die letztere sehr schmerzhaft und empfindlich war, und dass er zu Zeiten sehr viel einer „gelben Materie“ ausspuckte.

Die Geschwulst blieb in der Regel einige Tage sehr prominent, um danach auf einige Zeit zu verschwinden, während der letzteren Periode hatte der Patient heftigere Schmerzen in der Brust und der Auswurf war reichlicher. Dieser abwechselnde Zustand dauerte drei oder vier Jahre, dann brach die Geschwulst nach aussen durch, eine Fistel hinterlassend, die bis heute permanent blieb, und aus welcher zuweilen grosse Quantitäten Eiter auslaufen, während zu anderen Zeiten der Auslauf unbedeutend ist.

Während einer der letzteren Perioden, mehrere Jahre nach dem Erscheinen der Oeffnung, hatte er ein Gefühl der Völle und des Drucks in der Brust; einige Tage später, als er sich nach vorne überbeugte, fühlte er, wie etwas in der Brust plötzlich nachgab, bei der hierauf folgenden Untersuchung der Oeffnung entdeckte er ein Korn Maisamen in der Oeffnung. Seit jener Zeit hat er jenes Gefühl der Völle und des Drucks häufig gehabt und immer gefunden, dass es von einer Verstopfung des Fistelganges durch Speisepartikel verursacht wurde. Er hat auch viele kleine Haemorrhagien aus der Fistel gehabt, zuweilen war der Blutverlust gering, zu anderen Zeiten floss es schneller und brachte kleine Gerinnsel mit. Wenn die Fistel offen ist, kann Patient deutlich hören, wie die Luft während der Respiration aus- und eingeht. Er hat nie Blut oder Nahrung ausgehustet.

Gegenwärtiger Zustand: Patient ist ein kleiner, untersetzter Mann, abgemagert, von gelblicher Hautfarbe. Die Zunge ist rein, keine Ungleichheit der Pupillen, keine Rötung der rechten Gesichtseite ist vorhanden. Die Endphalangen sind bulbös und die Nägel eingekurvt. Die rechte Schulter ist viel niedriger als die linke, und die Muskeln des rechten Schultergürtels sind bedeutend schwächer entwickelt. Der rechte Arm ist kleiner, doch nicht kürzer, und die rechte Thoraxseite ist viel flacher als die linke.

Hinten besteht eine ausgeprägte seitliche Biegung des Rückgrats; das rechte Schulterblatt ist kleiner als das linke, und die rechten fossae supra- und infraspinosae sind deutlicher. Direct unter dem rechten Schlüsselbein befindet sich eine bedeutende Fläche, und zwischen der ersten und zweiten Rippe befindet sich eine 5 cm lange eingesenkte Narbe. In der Tiefe dieser Einsenkung 3 cm von der Sternoclaviculararticulation ist eine Fistelöffnung, aus welcher viel gelb-weisslicher Eiter ausfliesst (siehe Photographie). Während des Hustens kann man hören, wie die Luft aus dem Loch zischt, zu gleicher Zeit ist der Eiterausfluss vermehrt.

Die inspiratorische Ausdehnung der linken Brustseite beträgt 2 cm, die der rechten Seite weniger wie 1 cm.

Der Percussionston ist rein und klar an der linken Seite; an der rechten Seite, vorne, besteht Dämpfung von oberhalb des Schlüsselbeins an bis zur Höhe der Fistel, unterhalb derselben ist er resonant. Hinten, an der rechten Seite, ist der Ton gedämpft bis zur Mitte des Schulterblatts. Bei der Auscultation findet sich an der linken Seite lautes, verschärftes Vesiculärrämen. An der rechten Seite, über der gedämpften Region, sind die Atmungsgeräusche cavernös, doch nicht von Rasselgeräuschen begleitet. Dieselbe laute cavernöse Athmung hört man in der rechten fossa supraspinata. Es besteht kein metallischer Beiklang noch Plätschergeräusch beim Husten. Die Bronchophonie (Pectoralstimme) ist sehr intensiv.

Der Anschlag der Herzspitze ist nicht wahrzunehmen. Die Herztöne sind laut und klar unter der linken Brustwarze. Der Unterleib hat ein normales Aussehen und es besteht keine Vergrößerung der Milz- oder Leberdämpfung. Beim Auscultieren über dem Rückgrat hört man ein lautes Oesophagusgeräusch (oesophageal bruit) ohne wesentliche Veränderungen.

Zwei Wochen nach der obigen Untersuchung präsentierte sich der Patient nochmals.

Er behauptet, seit dem letzten Besuche beständig kränker geworden zu sein. An dem Tage vor dem Besuche hatte er eine kleine Haemorrhagie aus der Fistel. Er klagt viel über das Druckgefühl, welches sich immer einstellt, wenn der Sinus geschlossen ist. Der Eiterausfluss ist gering.

Die subjectiven und objectiven Zeichen sind im wesentlichen dieselben. Ein interessanter Befund, welcher noch nicht notirt war, besteht in einer deutlichen Depression in der Wirbelsäule. Die Einsenkung entspricht der Lage des ersten und zweiten Rückenwirbels. Bei der Percussion zeigt sich diese Stelle sehr empfindlich.

Urin gelb, klar, S. G. 1021 — sauer — eine geringe Andeutung von Eiweiss — keine Diazoreaction — kein Zucker.

Mikroskopische Untersuchung negativ.

Herr Dr. med. Otto Ramsay, welcher die bezügliche Literatur untersucht hat, konnte nur einen Fall finden, welcher

diesem in geringem Grade ähnlich war. Dieser Fall wurde im Glasgow Medical Journal 1859—60 von Dr. med. Mac Lachlan berichtet.

Die Patientin, eine 25jährige Baumwollenweberin, hatte viele Jahre an geringen Schmerzen in dem rechten Infraclavicularraum gelitten, die Schmerzen kehrten namentlich bei den Menstrualperioden wieder. Dr. Mac Lachlan sah die Kranke zuerst bei einem Anfall, welcher einer Rippenfellentzündung ähnelte. Mehrere Monate später sah er sie wieder, dieses Mal litt sie an einem Abscess in der rechten Brust, gerade unter- und innerhalb der Brustwarze. Der Abscess wurde geöffnet und eine grosse Quantität fötiden Eiters entliess demselben zu gleicher Zeit mit dem Entweichen von Luft. Sechs Wochen nach dem Oeffnen des Abscesses bemerkte Patientin zuerst, dass Hafergrütze und andere Nahrung in dem Verband vorkam. Wenn sie aufrecht sass, konnte man beobachten, wie dünnflüssige Nahrung aus der Oeffnung floss, fast sofort nach dem Schlucken derselben. Dies war am besten zu beobachten, nachdem die Höhle durch sanften Druck an der vorderen und rechten Seite der Brust entleert worden war.

Die Atmung war leicht und langsam, kein Auswurf, kein Husten. Die Patientin litt hauptsächlich an Schmerzen in der Brust, welche zuweilen in den Arm schossen.

An der rechten Brustseite befanden sich drei fistulöse Oeffnungen, die unterste befand sich ungefähr einen Zoll unterhalb der Brustwarze und von dieser kamen die Eiterentleerungen.

Physikalische Zeichen: Der obere Teil der rechten Brustseite war mehr tympanitisch als normal. Bei der Auscultation konnte man amphorisches Atmen mit metallischem Beiklang und gurgelnde Rasselgeräusche vernehmen.

Dr. Mac Lachlan war geneigt, den Beginn des Leidens in einem Abscess der Lunge anzunehmen, welcher sich in die Pleurahöhle oder in einem unbeschriebenen Teil derselben öffnete. Es war ihm nicht möglich zu bestimmen, wo die Oeffnung in dem Oesophagus sich befand, doch glaubte er annehmen zu dürfen, dass sie sich unterhalb des Punktes, wo die Trachea sich teilt, befand. Der Fall entging später seiner Beobachtung, wenigstens giebt er keinen Aufschluss über das Endresultat.<sup>1)</sup>

Es giebt viel Berichte über Fälle von Communicationen zwischen dem Oesophagus und der Pleurahöhle — zwischen dem Oesophagus und einem Bronchus oder der Trachea — zwischen dem Oesophagus und dem Mediastinum und schliesslich — zwischen dem Oesophagus und einer Höhle in der Lunge, welche auf Trauma oder Carcinom folgten. Da jedoch keiner von diesen sich nach aussen öffnete, können sie nicht als exacte Parallele dieses gegenwärtigen Falles angesehen werden.

Es ist sehr wahrscheinlich, dass unser Patient als Knabe ein unbeschriebenes Empyem gehabt hat, welches sich möglicherweise zuerst durch die Lunge entleerte, und später sich einen

<sup>1)</sup> In Beziehung hierzu steht auch ein Fall aus der Schwedischen Literatur, der mir nicht zugänglich war: — Samuelson, Ett Fall Fist. Oesophago-pleurothoracica. Festschrift, F. W. Wartänge, Stockholm 1894.

Weg durch die vordere Thoraxwand brach. Es ist fast unmöglich, genau anzugeben, wo sich die Oeffnung in den Oesophagus befindet. Die subjectiven und objectiven Zeichen deuten auf eine Höhle in der Lunge oder in der Spitze der rechten Pleura, welche direct mit dem Oesophagus in Verbindung steht. Die Thatsachen, dass er niemals Nahrung oder Eiter aushustete und dass er beim Schluckact nicht hustet, spricht gegen die Existenz einer Lungenhöhle — auf der anderen Seite hingegen sind der Umstand, dass man beim Atmen die Luft an der Fistel aus- und eingehen hört, und die physikalischen Zeichen über der rechten Lunge (für das Bestehen einer Höhle) bedeutungsvoll. Ein anderer interessanter Punkt ist die Beobachtung, dass er bei gewaltsamer Expiration bei festem Schluss des Mundes und der Nase, ein Tuch oder Stück Papier, welches vor die Fistel gelegt worden ist, wegblasen kann. Natürlicher Weise könnte dies auch bei Bestehen einer Pleurahöhle vorkommen. Warum die Nahrung nur zu gewissen Zeiten aus der Fistel entweicht, zu anderen wieder nicht, können wir nicht erklären.

Do. 223



*Osler, Ein Fall von Fistula-  
oesophago-pleuro-thoracica.*

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## LEPROSY IN THE UNITED STATES, WITH THE REPORT OF A CASE.

BY WILLIAM OSLER, M. D.,

*Professor of Medicine in the Johns Hopkins University.*

[*Clinical Lecture delivered at the Johns Hopkins Hospital, Wednesday,  
Feb. 2, 1898.*]

To no disease perhaps has attention been more actively called of late years than to leprosy, one of the oldest and most dreaded scourges of the race. In great part this has been due to the activity in England of a Leprosy Commission, and to the establishment of a National Leprosy Fund. Through the energy of Dr. Lassar a Leprosy Conference has recently been held in Berlin, two volumes of the proceedings of which I pass about for your inspection. They contain an immense amount of valuable information with reference to the present status of the disease throughout the world, and the best means for its prevention.

I take this opportunity of again showing to you the case which has been in Ward I for some months, and of speaking upon the present condition of the disease in the United States and the prospects of its spreading. First let me refresh your memories about the patient before you. Her history is as follows: She is now 30 years old. She was born in Baltimore, of French-German parents; her father was a native Frenchman who came here when young; he served in the army, was a very healthy man and had no skin eruption. He died at the age of 50. Her mother, who died at the age of 40, appears to have been a healthy woman. When 16 years old the patient visited an uncle in Demerara, remaining only a few months. This uncle, a native American, is at present in Baltimore, and neither he nor any member of his family has ever had a serious skin disease. On returning to this country she lived

in Baltimore, one year in Norfolk, and for the last five years in Alleghany City, Pa. She returned to this city in April, and was admitted to the hospital as a case of obstinate lues.

Her personal history is as follows. She was healthy as a young girl; she married when 20 years old, had one child at 23, which died shortly after birth; she has had one miscarriage since. Her present illness began six years ago. Here is a photograph taken two years prior to the onset of the trouble, from which you can judge of the terrible changes the disease has wrought. She noticed first two brown spots over the elbow, and then several spots on the wrist. She was pregnant at the time, and had with their appearance a little fever and slight indisposition. These spots remained stationary until after her confinement, when they increased in size and became nodular. The disease spread rapidly, the feet being attacked next, beginning on the ankles nearly five years ago. Ever since there has been a steady appearance of lumps and nodules on the skin of the face, legs and arms. Only during the past year have they appeared above the elbows. Two years ago she lost the eyebrows and lashes; the hair of the head is not falling out. The voice began to get hoarse a few months ago, and eight months since she noticed the formation of scabs in the nose.

Her condition at present is very characteristic of tubercular leprosy. She looks a great deal older than her age; the swollen appearance of the eyebrows and cheeks, the rounded outlines of the nose and of the ears, the absence of eyelashes, and the brownish pigmented discoloration, give a picture that is perfectly characteristic. The neck is only slightly involved, showing only a few pigmented areas. The hands, feet and legs are very much involved, the hands showing scars of erosion and ulceration; the finger-nails are not attacked, but in the left hand are fresh punched-out ulcers. On the arms are scars of several very deep ulcers. On the upper arm the earlier stages are shown, the brownish discoloration, and the skin looks raised and infiltrated, and on palpation one can feel that beneath the skin there is a nodular infiltration. The forehead shows a uniform infiltration. She has little or no disturbance of sensation; she feels touch everywhere and feels pain.

She has been under our care since April last, and has improved in very many ways. The general nutrition is much better. The open ulcers and sores which were present on admission have, as you see, almost entirely healed. During the months of June, July and August she had a great deal of fever, but now for some time the temperature has been normal. She has gained in weight, and is in every way very much more comfortable. She is a very tidy, neat woman, and now is able to look after her own room. I may add that it has been to both physicians and nurses of our staff a great pleasure to be able to care for her and make her comfortable.

Where did this patient contract leprosy? You noticed in the history that she had resided in Demerara in the West Indies, a colony much afflicted with the disease. True, it is now fifteen years since she left there, and it was eight years before the first appearance of the disease. It is well known that the period of incubation may be very much longer, even as long as twenty or thirty years. It may be said that without exception all cases of leprosy met with in the Eastern States are persons who have lived for a shorter or a longer time in countries where the disease prevails. The experience in Great Britain is very instructive in this respect. Abraham estimates that within the past ten years the number of cases has been about one hundred, and so far as is known there has been but one instance in which the disease has been transmitted. This was the well known case reported by Benson, of an Irish soldier who returned from India with leprosy. His brother slept in the same bed with him for at least a year and a half, and after his death he wore the leper's clothes. Three years later the brother became leprosy.

You will find in these volumes of the Transactions of the Leprosy Conference—of which by the way there is a very good abstract in Nos. 2 and 4 of the Philadelphia Medical Journal by Dr. Nuttall—a very full discussion of all the problems relating to the disease. Of these by far the most important relates to the method of infection, whether by inoculation, contagion, or hereditary transmission.

The possibility of successful inoculation must be recognized, though Hansen, the leading living expert on leprosy, declares that as yet all attempts at reproducing the disease by direct

inoculation have been unsuccessful. He does not regard Arning's experiment on the Honolulu convict as satisfactory, since this man had leprous relatives. A number of observers, including some of the best students of the disease, have inoculated themselves with negative results. The direct hereditary transmission must be excessively rare, more so indeed than in tuberculosis. As lepers have, as a rule, very few children, heredity can only play a very small part in the spread of the disease. Alvarez stated at the recent Congress that he had never seen a new-born leper child; the youngest patient he had met with was three and a half years old.

The highly contagious character of leprosy has been a fixed belief for centuries, and much of the popular dread is based upon the highly colored views as to the extreme risk of contact with the disease. For a full discussion of the question I must refer you to the Proceedings of the recent Congress. The opinion was universally in favor of its contagious nature, though the greatest difference of opinion existed as to the methods by which the disease is conveyed, and on this question we really need much more information. An important point was brought out at the Congress as to the much more widespread distribution of the lepra bacilli, particularly in the secretions. In modern times one of the strongest points in favor of the contagious nature of the disease is the manner in which it has spread in the Sandwich Islands. Europeans residing in leprous regions occasionally contract the disease, and with scarcely an exception, as in the patient I have just shown you, cases occurring in leprosy-free regions have a history of a residence for a longer or shorter time in localities in which the disease prevails. On the other hand there are a great many facts which would indicate that it is very difficult to catch the disease. It is true that Father Damien on the leper settlement at Molokai, and Father Boglioli (whose portrait I here show you) in New Orleans, contracted the disease in the discharge of their ministerial duties, but it has been the almost universal experience in the leper settlements and lazarettos that the nurses, physicians and attendants are not attacked. At the Tracadie settlement, which I visited a few years ago, the head Sister told me that during the forty years no Sister or servant had contracted the disease, though

the accommodations are rather contracted. Not one of the Sisters who have nursed in the Trinidad Asylum, for now nearly thirty years, has contracted the disease.

A very important question is whether there is any possibility that leprosy will again spread in the more civilized districts of the earth. A good deal of uneasiness has been fostered by sensational newspaper reports. The practical question for us here is, is leprosy spreading in the United States? I have here letters from most of the infected districts, the contents of which I will briefly summarize. Including the two districts in the Dominion of Canada, there may be said to be five foci in which the disease at present prevails. In the northern part of New Brunswick leprosy has existed in a couple of counties since the early part of the century. The cases as recognized are segregated in the lazaretto at Tracadie. Dr. Smith, the physician in charge, writes under date of January 17, 1898: "The number at present in the hospital is twenty-four, eighteen males and six females. . . . Of the above number three are Icelanders whom I brought from Manitoba. Leprosy in Cape Breton has almost died out. With us in New Brunswick segregation is stamping out the disease. The cases have dwindled from about forty in the early history of the disease to about half that number. One of our inmates is a negro I brought recently from St. John, N. B. He had strayed from Bermuda. Leprosy is not on the increase in Canada." In British Columbia the disease has been introduced by the Chinese, but I have recently heard from Dr. Hannington, of Victoria, that there are only eight cases at present in the settlement on Darcy Island. Dr. Hannington does not think that the disease is spreading. Among the Icelandic immigrants in Manitoba there are a few cases, but the strong probability is that it will gradually die out.

In the United States there are three important centres. To "New Scandinavia," as parts of Minnesota and Wisconsin have been called, the disease was introduced by the immigrant Swedes and Norwegians. Altogether more than 150 cases were known. The disease has not spread, and Dr. Bracken, the Secretary of the State Board of Health, wrote January 19, 1898, that there are in Minnesota, so far as is known, only twenty-seven cases, and some of these have probably died since

the last return. All of them contracted the disease before coming to America. A very encouraging fact is that no instance of leprosy has been known to be contracted from any of these Norwegian settlers. In California leprosy has been introduced by the Chinese, and in a few instances by native Americans returning with the disease from the Sandwich Islands. The total number of cases, however, is not large, certainly not more than a dozen, and the likelihood of the disease progressing in the native American population is very slight.

By far the most extensive focus of leprosy is in Louisiana. Dr. Isadore Dyer, who was the delegate from Louisiana to the Leprosy Conference in Berlin, has reported fully on the history of the disease in that State, where it has been known since 1785. Dr. Dyer writes under date of January 12, 1898: "My paper on endemic leprosy in Louisiana, read before the Lepra Conference in Berlin, has not yet been published. It is to appear in the third or fourth volume of the Transactions of this meeting. Full tables are given of all recorded leprosy in Louisiana since 1785, the existing acknowledged cases being separately tabulated. This last table contains 118 cases, in addition to which I have seen six within the past four months, making a total of 124 positive living cases to-day." Dr. Dyer thinks that this does not represent by any means all the cases, but says he believes it is quite justifiable to calculate the number of lepers in this State as not less than 300.

A few cases of leprosy are met with in Florida, South Carolina and in others of the Southern States. Now and again cases occur in the eastern cities, invariably imported, as in the patient at present in the hospital. So far as we know, with the exception of the single case recorded by Dr. I. E. Atkinson of this city, there has not been an instance in which the disease has been transmitted from one of these imported cases to a native American.

I believe the danger of the disease spreading and becoming in any way a serious menace to the country is entirely fanciful. In the question of the annexation of Hawaii the danger of leprosy has also come up. This really would not be a serious objection. I have seen a letter from Dr. Day, from Honolulu, in which he claims that the disease is progressively diminish-

ing, and that the statement made by Dr. Prince A. Morrow, of New York, that every one in ten individuals in the Sandwich Islands is leprous is entirely unwarranted. He quotes figures to show that the number of cases segregated in Molokai has progressively diminished in the past few years. In a recent letter to the San Francisco *Chronicle* the President of the Board of Health states that barely one per cent of the population of the Sandwich Islands has leprosy.

The means for combating the spread of the disease are perfectly plain and well understood. The Norwegian method of segregation should be enforced in Louisiana and in the State of California. Remarkable results have followed this plan. In 1856 there were nearly 3000 lepers in Norway; now there are not more than 700, and most of them are in asylums. The segregation should be compulsory in all instances except when the friends can show that they have ample provision in their own home for the complete separation and proper care of the patient.

In the case of the patient you have just seen, as her husband is not in a position to look after her, it is the duty of the city to care for her in a proper way. She should be removed to Bay View, where a room should be provided with a separate arrangement for washing the clothes and disinfecting the body linen. From a humanitarian standpoint we have been very glad to care for her and to do what we could to check the disease in its active and progressive state. Now that she has improved so much I feel that we are no longer bound to keep her, and as she is a free agent, I shall take an early opportunity to discharge her from my care.



A. Blackwell

ILLUSTRATING DR. OSLER'S ARTICLE ON  
SCLERODERMA.

ON DIFFUSE SCLERODERMA; WITH SPECIAL REFERENCE TO DIAGNOSIS, AND TO THE USE OF THE THYROID-GLAND EXTRACT.

By WILLIAM OSLER, M.D.,

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I. GENERAL PICTURE OF DIFFUSE SCLERODERMA. II. SCLERODERMA AND GRAVES' DISEASE. III. DIFFERENTIAL DIAGNOSIS. IV. SCLERODERMA AND ADDISON'S DISEASE. V. THE TREATMENT OF SCLERODERMA WITH THYROID EXTRACT.

THOUGH studied and described by neurologists and dermatologists, the diffuse form of scleroderma is perhaps more often seen by the general physician, whom the victim consults for rheumatism or disability. The disease is fortunately rare. I never saw a case until 1891; in 1893 a second case was admitted; in 1895 a very remarkable case was brought to me by Dr. Davis of Saginaw; in 1896 there were four patients with the disease in my wards, and in 1897 another case was admitted. These eight cases, forming the basis of this paper, serve to illustrate a number of points in the symptomatology and diagnosis of this extraordinary affection.

The statistical frequency of the disease in America is given as 0.030 by Hyde. Heller and Lewin give only thirty-two cases reported from North America (a total of 451 available for statistics of locality). Of the thirty-two, one came from Baltimore, three from the State of Maryland, one from Virginia, one from Kansas, and one from Georgia. All were whites.

The monograph of Lewin and Heller<sup>1</sup> covers the whole question so thoroughly that to reporters of cases there is left only the duty of calling attention to special features or unusual complications.

The pathology of the disease is fully discussed in the works on dermatology, and in the monograph referred to. We know really nothing of the essential causes, and the data are not yet at hand upon which a satisfactory theory can be based. The disease is variously regarded as a trophoneurosis dependent upon changes in the nervous system; a perversion of nutrition analogous to myxedema and due to disturbance of the thyroid function; a sclerosis following widespread endarteritis; a primary slow hyperplasia of the collagenous intercellular substance of the corium—fibromatosis; or a primary affection of the lymph-channels, central or peripheral. The first-named view, the one most generally held, may well serve as a working hypothesis.

In order to utilize most fully the material at my disposal I will distribute the cases as they illustrate various points, such as the average clinical picture, the association of scleroderma and Graves' disease, the difficulty in early diagnosis, the recognition of certain cases from Addison's disease, and, lastly, the question of treatment with the thyroid extract.

#### I. THE GENERAL PICTURE OF DIFFUSE SCLERODERMA.

In its more aggravated forms diffuse scleroderma is one of the most terrible of all human ills. Like Tithonus, to "wither slowly," and like him to be "beaten down and marred and wasted" until one is literally a mummy, encased in an ever-shrinking, slowly contracting skin of steel, is a fate not pictured in any tragedy, ancient or modern. The following cases present the usual features of the disease in its various stages:

CASE I. *Recurring Arthritis before Onset; Diffuse Scleroderma; Sclero-dactylism, Trophic Lesions.* (Fig. 1.)—Alice B. of Virginia, aged thirty-nine, admitted October 23, 1893, complaining of stiffness in the joints, and difficulty in movement.

*Family History.*—Her father died of Bright's disease; her mother of an unknown cause. She has fourteen brothers and sisters. She knows of no hereditary disease in her family.

*Personal History.*—She has been very healthy; as a child, had measles. She has been married seventeen years, and has had seven children. There has been no disturbance of the menstrual function; she has had no miscarriages. Her youngest child is three years old.

*Present Illness.*—Seven years ago she had attacks of stiffness with severe

<sup>1</sup> "Die Sclerodermie," Berlin, 1895.

pain in the left knee, which would last from three days to a week. She had to go to bed, and the joint was often hot and sore. Then she would be up and about for five or six weeks, and another attack would prostrate her. After about a year the elbows and the right knee became affected, and would be hot and tender for a few days or for a week at a time. Between the attacks she felt perfectly well. With the arthritis she very frequently had an eruption of red, raised, circular spots, varying in size up to half a dollar; they would appear suddenly, spread rapidly over the body, and slowly fade. The joint attacks lasted for two or three weeks, and were repeated on many occasions. Subsequently the rash occurred without any relation to the articular attacks.

About two years ago the right elbow and wrist became swollen, and after the disappearance of the redness and pain she noticed that the joints

FIG. 1.



of the index-finger were stiff. Gradually the right wrist, the fingers of the right hand, and the right elbow became stiff, the whole process taking about two years. About two months after the right hand became involved, the left hand was affected, the wrist first. The knees and ankles have only lately been attacked, and she still has good movement in them.

She first noticed the skin of the right hand and arm becoming dry and glossy about two years ago, of the left a little later. She thinks that for several years she has had slight numbness in the arms and legs. The condition is very much worse in winter and in cold weather.

The first open sore developed on the ulnar side of the right wrist eighteen months ago, and remained open for about six weeks. Since then she has had sores on the elbows, finger-joints, and outer side of left ankle. The

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sore on the right elbow began three weeks ago. She has noticed wasting of the limbs for about two years, shortly after the stiffness began. Her body, too, is thinner than it was. For a year she thinks she has had a little stiffness in the face, a little difficulty in moving the muscles, and in opening the mouth. There has been very little actual pain. She has not had any skin eruption lately. Her appetite has been very good; she has vomited occasionally, and has had several attacks of cramps in the abdomen lasting from eight to twenty-four hours. She has had no cough. The bowels have been regular.

*Present Condition.*—Patient is a small-sized, delicate looking woman. The face presents a remarkable appearance. The forehead is smooth, without a trace of wrinkling. The skin has everywhere a drawn, tight look, especially about the mouth, the angles of which are drawn down. There is a marked pallor of the entire face. The eyes can be opened and closed fairly well. The nasolabial folds are present and there are a few wrinkles at the corners of the mouth. The lips are thin, and the upper one appears to be drawn tightly over the teeth. There is very great restriction of the movement of the lips, and of the muscles of the face. She smiles with great difficulty. The maximum transverse diameter of the mouth is 3.5 cm. The incisor teeth can only be separated about 2 cm. The scalp can be moved slightly; the patient says it is less movable than formerly. Her hair is very thin, and she says that it came out a great deal last winter. The movements of the head are good. The thyroid gland is not enlarged.

*Arms.*—There is general wasting; the movements at the shoulder-joint are limited; the arms cannot be lifted to the level of the shoulder. The difficulty seems to be more in the skin than in the joints. The forearms are semiflexed, and cannot be extended. Flexion is possible to a limited extent. The limitation in movement seems to be due to the hidebound state of the skin. Everywhere over the shoulders and arms the skin has a smooth, glossy, peculiarly waxy look. The skin can nowhere be pinched up, but is firmly adherent to the tissues beneath. A few hairs are seen on the extensor surfaces of the arms. On the outer surface of the right elbow there is a superficial ulcer, and another on the outer side of the wrist. The movement in both wrist-joints is very limited.

The fingers of both hands are contracted and held in the flexed position of typical claw-hand. There is very slight movement in the metacarpophalangeal joints; the little finger of the left hand is flexed at right angles. On the knuckles there are small dry scabs surrounded by hyperemic zones. These, the patient says, may go on to ulcers, or may dry up. There is a small ulcer on the first joint of the little finger of the right hand. The fingers look thin; the skin is drawn, smooth, and glossy, and can nowhere be picked up. In places it has a slight yellowish tint. Over the joints and at the tips of the fingers, which are very much contracted, there is a pinkish tint, which contrasts strikingly with the general waxy pallor of the fingers. The nails are discolored, yellowish, very brittle, and marked with very

rough longitudinal grooves. There is scarcely any movement in the finger-joints. They cannot be extended, nor can she flex them.

*Trunk.*—The skin over the upper part of the chest is thickened, a little glazed, and is with difficulty picked up. The skin of the abdomen is relaxed and looks natural.

The legs are small; muscles wasted. The skin covering the thighs is drawn tightly, thickened, rough, and closely united to the subcutaneous tissues. This condition is much more marked on the right than on the left side. The skin of the legs is affected in the same way. The skin of the feet is much involved, adherent, glossy, and shows in places the scars of former ulcers. The toes look thin; the skin is very hard and drawn, and has a little bluish-pink color, which gives an appearance suggestive of Raynaud's disease. The patient can walk; the movements in the legs, however, are restricted, especially at the ankle-joints and at the knees. The legs cannot be fully straightened. There does not appear to be any special thickening of the joints themselves, but the skin over them is glossy and hidebound.

There is no increase in the skin pigment. The examination of the abdominal viscera is negative. The heart-sounds are clear. The urine has a specific gravity of 1023, and contains neither sugar nor albumin.

The patient was given warm baths, and the skin oiled with frictions, and the local sores carefully treated. She was then given the thyroid extract, (grs. ii, three times a day). She grew very restive, and at the end of ten days decided to go to her home in Virginia. The thyroid extract did not seem to benefit her, but she did not continue the treatment, or give it a proper trial.

September 6, 1896. Heard to-day that this patient, though at first relieved by her stay at hospital, died about eight months after her return home.

This case illustrates the not uncommon onset with arthritis; the skin rash appears to have been of the nature of an erythema multiforme. She presented the most advanced picture of the disease which we have had at the hospital, and in no other case of our series was the skin involvement so extensive, or the sclerodactylism so marked. The trophic lesions in the form of ulcers and their scars were more numerous than usual.

In the following case, the second in order of extent, the disease has made very little progress during eighteen months in which he has taken the thyroid extract.

CASE II. *Diffuse Scleroderma; Onset with Stiffness and Swelling of Hands and Feet; Possible Arrest under the Use of the Thyroid Extract.*—Levi B., Hagerstown, Md., aged forty-four, came to the hospital March 14, 1896, complaining of stiffness of the hands and joints.

*Family History.*—His father died of pneumonia; his mother of "catarrh

of the lungs"; one brother is living and well; six brothers and sisters are dead. He knows of no similar disease in the family.

*Personal History.*—He has always been healthy and strong; no serious illnesses; he never has had lues. He is a farmer, and has worked hard. He has been married twenty-five years; has five living children; one died of spinal meningitis.

*Present Illness.*—About two years ago he began to get stiff and sore in the joints. In the morning he was so stiff that he could hardly move; through the day, with exertion, it would wear off. At the onset he had no swelling of the joints. He thinks that his hands have been stiff and hard for about a year. Last winter his feet were swollen, and the backs of the hands were also swollen like a cushion. He has never been in bed with the swelling of the joints. Has noticed a little stiffness of the face for nearly a year. He says he cannot stand the winters, as his hands get stiff as sticks. He is evidently very susceptible to cold, as even in the cool mornings in the summer he has to wear an overcoat. He is much more comfortable in the hot weather. In the past year and a half the patient has lost a good deal in weight, formerly weighing 250 pounds, now 186 pounds.

Patient is a large-framed, well-built man. At the first glance there is nothing very noticeable about the face other than a slight acne. On more careful inspection it is seen that the cheeks and forehead are unusually smooth; on the left side there is no trace of a nasolabial fold. The color of the lips is good. The eyes close easily, and can be shut tight. The skin of the forehead can be lifted up and wrinkled. He can move all the muscles of the face and of the mouth. Says it does not now feel as stiff as it did. The skin of the cheeks is firm, stiff, and smooth, and can only be picked up in very large folds. The skin of the forehead is not specially parchment-like. The skin covering the lower jaw is distinctly softer than that of the cheeks; there is no involvement of the skin of the ears; no trophic changes. The mouth can be widely opened. The skin of the neck is not involved, except just in the region over the larynx, at which there is a fold distinctly thickened. The thyroid gland cannot be felt. There is apparently no involvement of the skin covering the thorax. The arms can be raised above the head; the left scarcely so much as the right. The restriction of movement is owing to the induration of the skin covering the shoulders. The mobility of the arms backward is a good deal impaired, so that he cannot take off his coat without help.

The skin over the trunk everywhere looks normal. The skin covering the abdomen feels a little board-like and thick.

*Arms.*—Over the outer aspect of both arms the skin is decidedly brawny and thick, and to a slight extent on the pectoral folds; there is a decided difference between the skin on these parts and that just beneath the clavicles. The skin of the forearms looks and feels natural to about the lower third. Then it becomes parchment-like, and can scarcely be picked up. He can flex and extend the arms, but they feel stiff; pronation and supination can be well performed. The hands and fingers are extensively involved.

They look a little brown, and he says at times they have been almost black. They become readily congested when held down. They are cold, moist, and feel everywhere board-like and firm. The skin of the backs of the hands is much indurated, and on the palms of the hands it is also very firm and hard. The fingers feel like marble. There is no place on any one of them at which the skin can be picked up in the slightest degree. They are semiflexed; he cannot make a fist, and the pads of the fingers cannot be made to touch any portion of the palm of the hand. The fingers are movable only at the metacarpal joints. They are completely fixed at the phalangeal joints. The skin of the back of the fingers looks roughened like shagreen. On the first joint of the little finger there is a scar of a sore. On the pads of the middle, ring, and little fingers of the left hand, and on the ring- and index-fingers of the right there are scars of ulcers, which were present last winter. The nails are not altered, and not at all brittle.

The skin of the legs and feet is not affected. He has a little numbness and tingling in them, but no vasomotor changes. The knee-jerks are normal.

The thyroid gland can be felt, and seems of normal size. There are no changes in the organs of the thorax or abdomen. The pulse is not rapid; the superficial arteries are not sclerotic.

The urine was normal. Dr. Barker tested carefully the sensation in the affected areas and found it a little dulled, but without qualitative changes.

The patient remained in hospital for two weeks. He was given the thyroid extract, beginning with 3 grains in the day, and gradually increasing. He was seen again on the 8th of May, when he had been taking the thyroid tablets regularly, since increased to one 5-grain tablet three times a day. There did not appear to be any essential change in the sclerosis, though he thought he was better in some ways.

June 20th. Patient came to-day, and reports that he has been feeling better; less stiffness. To superficial examination there is no special change. October 10, 1896. I saw this patient to-day, and he presented no special change. He thinks, however, that the thyroid extract has benefited him in some ways. He says he moves the arms more freely, and his hands are less stiff. His general health keeps good. The accompanying skiagram of the hand shows very well the absence of any involvement of the bones, and illustrates also the marked contraction of the little finger. (Fig. 2.)

January 9, 1897. Patient came to hospital to-day, and though he expresses himself as feeling better, I can see no special change. It is quite evident that from the date of his first visit in March there has been a progress in the disease. The hands are less freely movable, and he does not lift the arms above the head so readily. He has great difficulty in taking off and putting on his coat.

April 22, 1897. There is no very essential change. The hands are a little congested; he can get the hands up to the head. There is no special change in the skin of the face. The skin of forehead looks pretty natural; that of cheeks is smooth and feels stiff. He has been taking the thyroid ex-

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tract steadily since March 23, 1896. There is a little necrosis on the top of the second joint of the little finger, and on the terminal joint of the ring-finger of the left hand. There is little or no mobility in the fingers themselves. They can be moved at the metacarpal joint. The backs of the hands are a little softer. He has gained in weight within the past year, since taking the thyroid extract. He weighed last spring 182, now 204.

November 18, 1897. Patient came to the hospital again to-day. He has continued to use the thyroid extract, omitting it occasionally for a week. He states that he is very much better, but there are no essential changes either in the hands or in the face. If anything, perhaps the fingers are a

FIG. 2.



little less mobile. His general health keeps good, and there certainly has been no extension in the past six months.

We have followed this case with a great deal of interest. He has been most faithful in taking the medicine, and in carrying out our directions. While he insists that he is better and can do more for himself, it is evident that the condition now is not much changed from that of March, 1896.

The third case illustrates extreme scleroderma, with very painful onset. There was a degree of disability out of proportion to the extent of skin involved. The legs showed the erythema and brawny infiltrations of the early stages of the disease. She did not take the thyroid extract long enough to test its efficacy.

CASE III. *Pains in the Joints at Onset; Diffuse Scleroderma of Arms, Hands, and Shoulders; Erythema of Skin over Knees; Brawny Edema of Legs; Pigmentation of Skin of Arms; Death with Gastro-intestinal Symptoms.*—Mrs. Barbara S., aged forty, applied at the Johns Hopkins Hospital, June 24, 1896, complaining of pain and inability to use her arms and legs.

*Family History.*—Her father died of erysipelas, aged sixty-three; her mother died of pneumonia, aged fifty-nine; one brother is living; one brother died of Bright's disease; there is no history of rheumatism or of tuberculosis in the family.

The patient had the usual diseases of childhood. She is married, and has had eight children, seven of whom are living. She has always been a very healthy woman. She has done a great deal of out-door, and also of indoor, work. She worked very hard all summer and until October (1895). Last summer she had occasional pains in the knees.

The *present illness* came on in October with pains in different joints; the knees, the elbows, and the hands were stiff. The legs were not swollen at first, and she does not remember when they began to swell. There has been gradual impairment of the freedom with which she uses the hands. At first the right, and then the left became affected. She has no actual pain in them, but often an uncomfortable sensation enough to keep her awake. The stiffness has been increasing very much of late.

She was a very dull-witted woman, and she could not say whether her arms and hands had changed much in color, but her friend who came with her, and who lives in town, said that she thought she had changed a great deal, particularly in the arms and hands.

*Present Condition.*—She is a dark-complexioned woman, with dark eyes; she looks perhaps a little pale and sallow. Her friend says that she has changed much in color, and has become distinctly brownish. There is no change in the condition of the skin of the face, and no trace of any scleroderma; the wrinkles are well marked. The skin of the hands and arms is very much discolored, as dark as the darkest grade of sunburn. No areas of leucoderma. The hands are held in the characteristic attitude, with the fingers semiflexed. She says that she thinks it would kill her to straighten the hands, it is so painful across the joints. To the touch the arms and hands are cold and moist. The fingers cannot be extended at all; they cannot be flexed so that the tips of the fingers come beyond the bases of the metacarpal bones. There is a very great degree of disability. To the touch the fingers are uniformly firm; the skin is moved with difficulty, cannot be picked up on the back of the hand or on the back of the wrists. Over the fingers it is very much hidebound. The pads of the fingers and the skin of the palms of the hands are not so much affected. There is no necrosis. She cannot straighten the arms at the elbows on account of the stiffness of the skin. The shoulders are much affected. She cannot lift the arm above the level of the shoulder. There does not appear to be any special impairment in the movement of the joint itself. The legs are not pigmented. There is marked erythema of the skin over both knees. They are not sore to the touch, but very sore when she walks and when she moves about. The erythema over the joints is very marked, but there is no scleroderma. The legs are swollen; there is a brawny pitting, particularly between the ankles and the knees. The skin of the feet is much congested; there is no actual scleroderma. The skin of the upper arms is not so much pigmented.

The skin over the pectoral fold and over the upper part of the breast, and over the manubrium, is quite hidebound. The thyroid gland cannot be felt. Pigmentation over the chest is very slight.

I heard of this patient through her friends to-day, January 21, 1897. They state that when she came to stay with them in June, 1896, she could not dress or undress herself, and could scarcely get up-stairs. Under the use of the thyroid extract she improved a great deal, so they state. She returned to her home in the country, and from what I can gather must have died of an acute gastro-intestinal trouble. She became worse and more helpless, had nausea, vomiting, and diarrhea, and gradually sank and died.

In the following case scleroderma developed rapidly in the course of ordinary phthisis, possibly without any special relation to the lung affection. In four cases mentioned by Lewin and Heller tuberculosis of the lungs was the cause of death; in one case the scleroderma developed in the subject of long-standing phthisis.

CASE IV. *Pulmonary Tuberculosis; Scleroderma of Skin of Back of Neck and Upper Part of Back, of Chest, and of Upper Part of Abdomen.*—Martin M., aged twenty-nine, was admitted to Ward F, May 27, 1891, with tuberculosis of the left apex, and all the accompanying features of that condition in an active state. The lung symptoms had developed within the past six months. Three weeks ago he first noticed a tightness about the neck and back, and a difficulty in moving the head freely. With it there had been some uneasy sensations.

The examination showed a moderately emaciated man. There was nothing special noticed about his face, the skin of which looked and felt natural, except on the lower part of the right cheek, where he says it feels thicker, and it did feel somewhat leathery to the touch. The skin of the scalp is not affected, except behind, over the occipital protuberance. From this point, extending over the entire back and sides of the neck, the skin is brawny, firm, somewhat whitish in color, and can nowhere be picked up in a fold. The induration extends over the scapulae and the folds of the trapezii, but the skin in the intercostal regions and over the rest of the back is not at all affected. The induration extends over the shoulders to the outer aspect of the arms over the deltoids. The skin of the front of the chest is everywhere involved, firm, and board-like; the edges of the pectoral folds and the skin of the axillae are not sclerotic. In front the induration extends over the epigastric region, very slight in the umbilical, and is not present in the flanks and lower zone. The legs are not affected.

The color of the skin is everywhere normal; there are no vasomotor changes; no mottling. On deep pressure it does not pit, but feels thick and board-like. The induration over the trapezius and deltoid seems to involve the muscles, as they feel firm, hard, and brawny.

The patient remained in hospital until July 25th; no change occurred in the condition of the skin. He was discharged, and has since been lost sight of.

## II. SCLERODERMA AND GRAVES' DISEASE.

Lewin and Heller make only one reference to this association, a case of Selme, in which the two affections coexisted. No details are given. This is Jeanselme's<sup>1</sup> case, quoted by Möbius<sup>2</sup> and others.

A woman, aged fifty-eight, who had from the twentieth year a tumor in front of the neck, which for seven or eight years had increased in size. There was slight exophthalmus, tremor, and tachycardia. For two years symptoms of scleroderma, beginning with local asphyxia of the fingers; sclerodactylism became marked, and pigmentation of the skin.

Möbius refers to the subject in the following paragraph: "Leube first observed scleroderma of the face and hands in a patient with Basedow's disease, a condition which diminished with the improvement in the exophthalmic goiter. Of late similar observations have been made by Eichhorst, Jeanselme, and others. According to Dittscheid the scleroderma in Basedow's disease is particularly common in Zurich. G. Singer believes that scleroderma usually occurs in connection with disease of the thyroid gland, which he has found affected in ordinary scleroderma." Leube<sup>3</sup> makes the somewhat remarkable statement, considering how rarely the condition has been described: "Frequently sclerema of the skin as a complication has been observed by me and by others." Grünfeld<sup>4</sup> reports an extremely interesting case in a woman, aged thirty-three, with well-developed Graves' disease of several years' duration. Extensive areas of scleroderma developed, but under the thyroid-gland treatment both the exophthalmic goiter and the scleroderma disappeared completely. Grünfeld also refers to a case reported by Kahler, the original of which I have not seen.

In the following case the scleroderma appeared shortly after the Graves' disease, and did not progress.

CASE V. *Advanced Stage of Graves' Disease—Remarkable Scleroderma of Both Legs.*—M. S., aged forty, of Emmitsburg, Md., consulted me March 23, 1897. The patient had had a bad attack of syphilis ten years ago. He was treated steadily for five years. He has been well since, but he now is apprehensive lest the remarkable trouble which has appeared in his legs should be associated with the syphilis. For two years he has had exophthalmic goiter, and has been under treatment by various physicians in different institutions.

<sup>1</sup> *Revue Neurologique*, 1894, 572.

<sup>2</sup> *Nothnagel's Handbuch*, Bd. xxii, s. 43.

<sup>3</sup> *Specielle Diagnose*, Bd. ii, 3te Aufl., s. 287.

<sup>4</sup> *Weiner Med. Bl.*, 1896, 19.

*Present Condition.*—Patient is a fairly well-nourished man, brownish complexion, with all the characters of an aggravated type of Graves' disease. The exophthalmus is very pronounced. The thyroid is of medium size. There is marked visible pulsation, a thrill, and all the associated vascular phenomena. The apex beat of the heart is in the fifth and sixth interspaces, very marked thud of the first sound at the apex, and loud bruits in the apex region and over the body of the heart. The pulse-rate is variable, from 130 to 160.

The abdomen is full; the edge of the spleen can readily be felt. The liver is not enlarged. Knee-jerks are a little exaggerated. He has no joint troubles, and there is no special pigmentation of the trunk. The legs present a very remarkable appearance. He says that two years ago, shortly after the onset of the exophthalmus, he began to notice a change in the color of the skin of the legs. This has gradually increased and the skin has become swollen, infiltrated, and very hard. With the onset of this condition there was no special redness, no itching, nor any disturbance of sensation. Anteriorly it extends close to the tuberosities of the tibiae; on the sides of the legs it does not reach so high, only to within about three inches of the head of the fibula on the right side, and a little higher on the left side. The form of distribution is quite symmetrical. Behind, it extends in an uneven border a little above the most prominent part of the calves. It shades insensibly into the normal skin. The color is a peculiar tan-brown. It is everywhere smooth, though there are in places little whitish elevations, particularly on the outer surfaces of the legs. One or two of these look like small fibroid nodules. They are very closely set over the skin, but only a few of them project beyond the surface. On palpation the affected areas feel leathery, firm, and hard. The skin can nowhere be picked up. The line of demarcation between the normal and the infiltrated skin is marked by a distinct ridge. A slight discoloration of the normal skin extends beyond the prominent part of this ridge. Below, the affection is limited accurately by a line corresponding to the tops of the boots. There is no coldness, and it does not pit on the deepest pressure.

May 21, 1897. I saw this patient again to-day. He has not been so well. The tachycardia and irritable state of the heart are evidently much worse. I have rarely seen such pulsation and heaving over the whole of the chest and anterior cervical region. There is the most marked pulsation of the veins of the backs of the hands, and the capillary pulse is readily seen. There is no essential change in the scleroderma. Subsequently this patient came into the private ward of the Johns Hopkins Hospital, and the persistent use of the ice-bag, with belladonna, digitalis, and aconite internally, relieved somewhat the irritable state of the heart. After leaving the hospital he became very much weaker, and died on August 8, 1897.

### III. DIFFERENTIAL DIAGNOSIS.

(a) *From Brawny, Solid Edema.*—One meets occasionally in patients with long-standing renal or cardiac disease, with a solid edema

of the legs which is very similar to scleroderma; it is usually an induration following a chronic dropsy.

In the case of Joseph C., aged fifty-five (Hospital No. 5557), who had a chronic nephritis with swelling of the feet and legs for six or eight months, there was an extraordinary state of induration of the skin of the legs, extending as far as the middle of the thighs. There was no special change in color, nor was there great swelling, but the skin was exceedingly indurated, and so firm and hard that on the right leg no portion could be pinched up. On the left leg it only extended one-half the distance up the thigh. It interfered very much with the flexion and extension of the legs. When he was admitted to the hospital he had some swelling of the abdomen and of the genitalia. The patient thought that this condition of induration had come on within the year, and had followed the dropsy. There were no other areas of induration of the skin.

In another case, Robert C. P., aged fifty-five (Hospital No. 8654), admitted November 20, 1893, with chronic enterocolitis, an illness of about six-months' duration. Two months ago he noticed that the feet and ankles were swollen, and on several occasions since the swelling has extended to the thighs and genitalia. The swelling has gradually subsided, but the hardening of the skin of the legs has persisted. The note reads as follows:

"Patient looks thin; skin is desiccated and dry. There are a few ecchymoses about the wrist. The skin of the legs is curiously hidebound like scleroderma; there is no swelling; no edema; pits nowhere on pressure; it is impossible to pick up a portion of the skin anywhere on the legs or feet. To the touch it feels like a piece of firm vellum. On the inner side of the left leg is a healed ulcer." There were no other areas of sclerosis of the skin. He had signs of chronic nephritis, and he had very frequent movements from the bowels. He left the hospital unimproved December 11th.

(b) *From the So-called Scorbutic Sclerosis.*—This could rarely offer any serious difficulty in diagnosis. A case was admitted April 4, 1894, with purpura and the most remarkable brawny induration of the skin of the thighs and calves. The patient could not stand erect, owing to the semiflexed condition of the legs. The parchment-like immobility of the skin, was due altogether to extensive subcutaneous hemorrhage, which also involved the muscles. The existence of purpura, the marked swelling, and the associated features make the diagnosis easy, but it is worth passing notice as one of the conditions in which the most extreme induration of the skin may be present.

(c) *From Myxedema.*—There is a stage of swelling or infiltration of the skin in scleroderma which may resemble Gull's disease very closely. It is greatly to be desired that those who have the opportunity of studying cases in this early period would give special attention to the local features, to the condition of the thyroid gland, and to the effects of thyroid feeding. In Case VI, the features were somewhat swollen, the eyelids puffy, and the forearms swollen, but the extreme vasomotor phenomena, the sclerosis of the fingers, the immobility, and the areas of necrosis made clear, it seemed to me, the diagnosis of scleroderma in the early stage.

(d) *From other Vasomotor and Trophic Affections.*—The early stages of scleroderma present features very liable to lead to error in diagnosis—the erythema, the infiltration, the pigmentation, the extreme cyanosis, and the superficial necroses may suggest Raynaud's disease, or even leprosy. I will first give the histories of two remarkable cases which illustrate these vasomotor phenomena in a very marked way.

CASE VI. *Onset with Vasomotor Changes in Arms and Legs; Gradually Scleroderma of the Fingers, with Areas of Necrosis on the Finger-tips; Beginning Scleroderma on Forearms, with Pigmentation.*—During the meeting of the American Medical Association in May, 1895, Dr. Davis of Saginaw brought to see me a Miss R. of Kansas, aged twenty. The case was shown at the Section on Neurology, and was subsequently very carefully reported by Dr. Herdman of Ann Arbor, in the "Transactions of the Michigan State Medical Society" for 1895. There was nothing of note in her family history, except perhaps that her mother died of consumption. She has five brothers and one sister, all living and well.

She was healthy and strong as a young girl. About the time of puberty she evidently suffered with chilblains, having cold hands and feet, and when the temperature was low the fingers got blue. For the past three or four years she has had marked vasomotor changes in the arms and legs. For more than a year she has noticed a curious stiffness in the face, and in the morning, particularly, it feels a little drawn. For more than a year the hands have been getting stiff, and the fingers have become flexed, so that she cannot put the hands together flat. The fingers have been very congested, and in the winter there were areas of necrosis on the pads of the terminal phalanges of all the fingers, and the knuckles have cracked. While her general health has not been much impaired, she has been nervous and miserable, and at times emotional.

*Present Condition.*—She is a healthy looking, well-nourished woman. The face is smooth, perhaps a trifle immobile. The movements of the muscles of the face are all normal. She says, however, that the upper lip in the morning feels a little drawn, and at times the face feels stiff and leathery. The skin looks smooth but not glossy, and the color is natural. To the touch

the cheeks and forehead feel normal, but comparing it with a healthy person one cannot pick up so small a piece. She noticed the stiffness and slight immobility a year ago. The eyelids are a little puffy and infiltrated. With the exception, perhaps, of this slight immobility and smoothness, there is nothing in the face which would attract the attention of an observer. She expresses it herself by saying that it feels all "drawn up."

On exposing the neck there is a transient erythema. The skin of the neck in front and behind feels a little stiff. The upper arms are well nourished, of good size, and nothing unusual is to be felt. The forearms are symmetrical, and look fuller than natural just above the wrists. There are areas of pigmentation at the flexures of the elbows, and on the anterior surfaces of both arms the skin is glossy. About the central part of the forearms the skin is leathery, parchment-like, and cannot be picked up from the subjacent tissues. The hands and fingers look full and large. They are congested, reddish, the skin shiny. She makes a fist with difficulty, and the knuckles become very anemic. The fingers are a little flexed, and owing to this she cannot put the hands flat together. The skin of the hands and fingers is everywhere firm, resistant, glossy, and cracked over the convexities of the first phalangeal joints. The nails are well formed, except on the left thumb and both index-fingers, where they are small, deformed, and incurved. The pads of all the fingers and of the thumbs are scarred from suppuration and necrotic changes. In cold weather they crack open and sores form. The palms of the hands are moist and very firm and rigid. The tactile, painful, and thermic sensations seem perfect. There is no enlargement of the bones.

The feet are congested, the toes quite purple, looking in a condition of extreme local asphyxia. This, she says, is her constant state when she is up and about. There is a large amount of fat on the legs. The skin does not feel drawn, and there is no diffuse sclerosis. There are no areas of anesthesia. The skin of the abdomen is not affected. Her general condition appears good, and the various functions seem normally performed.

Throughout the year the patient was under treatment with galvanism at her home in Michigan, and about December 1, 1895, she began to use the thyroid extract. Dr. Davis writes on December 7th: "Her feet and hands are so cold all the time that she often sits with warm mits on her hands, and her feet on a hot griddle. The fingers have been sore ever since early in the fall; three or four of them are tied up all the time, and before one is well another begins to be painful and sore."

In March, 1896, Dr. Davis reported that there seemed to be a great deal of improvement under the use of the thyroid extract. The fingers healed, and she seemed altogether better. He thought, too, toward the end of March that there seemed to be some improvement in the hardened indurated regions of the skin.

She took the thyroid extract from November, 1895, to June, 1896.

I heard from this patient on September 12, 1897. She appears to be very much better. Her feet and hands have improved greatly. She has had no

soreness of fingers for more than a year. Her general health is good. She has not taken the thyroid extract since December, 1896, and she attributes her improvement to a general tonic course of treatment, and to the fact that she lives a very much quieter life, taking better care of herself.

*CASE VII. Scleroderma of the Hands and Fingers, and to a Slight Extent of the Cheeks; Tachycardia; Extraordinary Cyanosis of the Skin of the Legs; Subcutaneous Fibroid Nodules.*—Mr. X. of ———, Ga., aged forty-nine, was seen June 15, 1896, with Dr. Charlton, and admitted to the hospital June 17th, complaining of stiffness of the hands and rapid action of the heart.

*Family History.*—His father died at seventy-three; his mother is living and well; brothers and sisters are all strong and well. There are, so far as he knows, no special diseases in his family.

*Personal History.*—He has been a very healthy man. He had malaria when in the army, but for the past twenty-five years has scarcely lost a day from sickness. He has been a free liver, eating and drinking carelessly; he has never been in the habit of going on spree.

His present illness dates from October, 1895, when he had what was supposed to be an attack of influenza. He had rheumatic pains for several months, chiefly in the muscles, usually shooting in character. He was weak and prostrated. About November he had an attack of acute inflammation of the right foot and ankle, which persisted for several weeks, and was severe enough to confine him to bed, and only yielded under the use of colchicum and iodid of potassium. He recovered from this very slowly, and was very prostrated and weak.

In the latter part of January he went to Florida, and the rheumatic pains gradually disappeared, but his general condition of ill-health did not seem to be much improved. The foot became easily swollen and very much congested. He noticed the stiffness of the hands coming on gradually through the autumn, and the hardness and coldness have increased very much since the first of January. He had occasionally pains in the hands, but latterly it has been chiefly a little pricking sensation in the pads of the fingers. The pains in the legs have all disappeared. The doctor says that the rapid action of the heart has been quite marked, and he has at times been very short of breath.

*Present Condition.*—The patient is a well-preserved man; expression of face natural; the normal folds and wrinkles are present. On the right side of the forehead there is a nodular induration, the size of a small cherry, which he says was present as a small spot as a boy, when he received a blow with a piece of brick. It has grown very much since his illness, and at present feels like a firm, subcutaneous fibroid nodule adherent to the periosteum. There are no tophi in the ears. The movements of the face are perfect. He says, however, that as he moves the muscles there is a sense of stiffness and effort, particularly about the cheeks. The skin everywhere feels normal, except just above the nasolabial folds, where it is parchment-like and a little smooth. There are no special changes in the hair.

On exposing the neck and chest the skin at once becomes very hyperemic. There is no trace of induration of the skin.

The upper arms are not involved; the movements are perfect. The skin of both arms from about the middle of the forearm is hidebound and cannot be picked up from the subjacent tissues. There is no pigmentation, and no changes in color.

The hands and fingers are very much affected. They are cold, moist, and look congested. The skin of the back of the hand is picked up with difficulty, and in a very large fold. The fingers are firm, hard, and entirely hidebound. They are cold, and as he expresses it, "feel just like sticks." He cannot make a fist; the terminal phalanges cannot be flexed at all. The proximal phalangeal joints can be bent nearly to a right angle. The fingers are held constantly semiflexed. The pads are very firm, the skin red and shiny; there is no loss of substance. The palms of the hands are hard and leathery.

*Legs.*—He walks and stands well; the reflexes are normal. The legs feel sometimes a little heavy and full. There is no involvement of the skin of any part. The ankles look a little puffy, and both feet are marked in several places with the boots. On deep pressure there is slight pitting half-way up the legs. After standing up to undress and dress himself the skin of the legs and feet presented the most remarkable appearance. They became congested, purple, and cold, nearly half-way up the thighs. There was evidently very great venous stasis and the finger-mark was filled up very slowly. This extraordinary condition, the doctor says, has been present ever since the autumn, and is especially noticeable in the morning after he gets up. There are no trophic changes in the skin; the feet are moist, and he sweats naturally. The ankle-joints are freely movable. The big-toe joints are neither swollen nor tender.

In the hospital, after having been in bed for thirty-six hours, the change in the condition of the legs is remarkable. There is no trace of redness, and the puffiness has disappeared completely. The pulse in the erect posture was 138; after twenty-four hours rest in bed it was 90. The arteries are not sclerotic. The apex beat is in fifth interspace, area of transverse dulness increased, a soft systolic murmur at the apex, probably due to the rapid action of the heart. At the base the sounds are clear.

*Urine.*—Yellow; opaque; heavy white sediment; faintly acid; amorphous phosphates; no casts; 1010; no albumin; no sugar.

September 7, 1896. The fingers look scarcely so purplish as they did, and I think are scarcely so cold. Otherwise there is no essential change. The nails are all heavily ridged horizontally, and the ridges are beaded. The erythema extends up the arms; no special change in the face. He complains somewhat of a little numbness on the left side of the mouth, and on the upper and lower lips, and along the left cheek as far as the lobe of the ear. The nasolabial fold is a little stiff, as it was at the first examination. There is no special change in the skin of the trunk. The feet are

very livid and cold; skin about the ankles and feet feels a little indurated. Certainly, as he sits down there is less congestion about the legs.

He has had a good summer. The pulse-rate has been from 84 to 108; average of 95 or 96. There has been no palpitation of the heart, except for a week when he stopped the digitalis mixture. He took the thyroid extract faithfully until about a month ago. He is stronger, able to get about better, and the color of his face is better. His present weight is 138 pounds, the same as when he came to Baltimore. The weight fell to 131 pounds, but has gained again.

The patient heard from on September 12, 1897. The condition has remained stationary; probably slight improvement, since he is now able to attend to his business.

December 21, 1897. I saw this patient to-day. He has been taking almost uninterruptedly the thyroid extract, and the digitalis; of the latter, 10 minims three times a day. He thinks in many ways he is much better, able to do more, can walk four or five miles, and has been able to attend to his business actively. The remarkable vasomotor changes in the skin of the legs is very much less marked, though he still when he stands up has great congestion and lividity of the feet. The tachycardia has diminished. The pulse-rate is rarely now above 90, though to-day on first examination it was 120. The scleroderma has certainly made no progress in extent. It is still confined to the hands and to a small extent to the face. In the hands the fingers are harder, but there have been no spots of necrosis, and he is still able to flex the fingers so that they can touch the palm of the hand. His face looks much better and has lost the puffy infiltrated appearance. Only about the cheeks there is very positive induration. He says that the lobe of the left ear at times feels a little stiff. He complains, too, of peculiar sensations about the lips, and a tingling, particularly if he takes anything very hot to drink. As the thyroid extract had been given a full trial, it was stopped, and he was ordered salol, grs. xv, t. i. d. (according to Phillipson's<sup>1</sup> directions), a drug which seems to have been very successful in his hands.

Case VI. was shown in the Neurological Section of the American Medical Association at Baltimore, and no unanimity was reached in the diagnosis. It is evident, too, on reading Dr. Herdman's report, that when the patient was under his care the nature was not quite clear, though he inclined to regard it as an anomalous instance of scleroderma.

Case VII. presented a remarkable series of vascular changes, erythema, extreme vasomotor paresis, and tachycardia. I never remember to have seen such extraordinary cyanosis as developed within a few minutes in the legs as he stood up. It was almost as if one could see the blood filling the vessels, and the engorgement became more and more pronounced until the legs to the middle of the

<sup>1</sup> *Deutsche med. Wochenschrift*, August 12, 1897.

thighs were plum-colored. The tachycardia is an unusual feature, not mentioned by Lewin and Heller. It has been persistent. The subcutaneous fibroid nodules met with in this case have been described by Hutchinson and others in this disease. The erythema, with swelling of the skin and pigmentation, not uncommon early symptoms of scleroderma, may lead to the suspicion of leprosy. Dr. Boyce of Kelowna, B. C., brought a remarkable case to the Montreal meeting of the British Medical Association. The members of the Dermatological Section did not agree upon the diagnosis. I saw the case subsequently, and the erythema, the infiltrated areas, and the pigmentation seemed to me suggestive of beginning scleroderma. Many of the members of the section thought the case was one of macular leprosy, a point in favor of which was the swollen condition of the ulnar nerves, which, so far as I can ascertain, has not been described in scleroderma. The patient improved somewhat on the thyroid extract, but Dr. Boyce wrote that he died suddenly ten days after his return to his home. To within a week of his death he was taking 5 grains of the thyroid-gland extract three times a day. Sudden death, rare in early leprosy, is not unknown in scleroderma. A case of Dinkler's and one of Willrich's died without recognizable clinical or anatomical cause.

#### IV. SCLERODERMA AND ADDISON'S DISEASE.

Increase in the pigment of the skin is a very striking feature in scleroderma. It was present in a marked degree in Case VIII. It occurred in 144 of the 508 cases collected by Lewin and Heller. As a rule, slight in degree, and not widespread, occasionally when deep and general it raises the suggestion of Addison's disease. Lewin and Heller speak of at least four cases in which the diffuse scleroderma was regarded as a complication of Addison's disease. As one of the cases in my series presented an extraordinary grade of pigmentation, and as I have looked upon the increased pigmentation as only an exaggeration of a not uncommon trophic change, it may be well to see in the other cases how far the diagnosis of Addison's disease was justified. Fereol's case (No. 119 in Lewin and Heller's series), a man aged forty-three, presented extensive scleroderma, brown color of skin on shoulders, trunk, and face. No mention is made of special cardiac weakness or gastric symptoms. I see no reason whatever to regard this as a case of Addison's disease, and Fereol himself thought it scleroderma with vitiligo. Rossbach's case (No. 8) was in a woman aged sixty-two, with advanced diffuse scleroderma; the skin of face, neck, and hands gradually became dark; the pigmentation extended

The patient died anasarcaous. There is nothing in the abstract, as given by Lewin and Heller, or in the original, to suggest Addison's disease, and the only note on the *post-mortem* is "extreme anemia of the internal organs; hypertrophy of the liver."

Willrich's patient, aged sixty-two (No. 359, Lewin and Heller), had scleroderma of the right hand and arm, with pigmentation of the back of the hand and forearm, face, and neck; later, sclerosis of the thighs; great anemia. *Post-mortem*, no changes were found in the adrenals or in the solar plexus. Here, too, there is nothing whatever to suggest Addison's disease other than the pigmentation. Another case, Leloir's, is said to have *suggested* Addison's disease. In none of these cases was the pigmentation associated with disease of the suprarenal capsules. A more likely case is reported by Schultz,<sup>1</sup> aged nineteen, with sclerosis of the arms and legs, and much muscular atrophy, pigmentation of the face and neck. The patient became extremely feeble, had abscesses and bed-sores, and died somewhat suddenly within four months of the onset of the illness. The right suprarenal was normal; the left was moderately increased in size, adherent to adjacent parts, and presented a few small grayish nodules. The nature of the change in this capsule is not very clear; the cells were swollen, and there were groups of fusiform cells between the glandular columns. I do not think it is possible to say that this patient had Addison's disease; the symptoms certainly do not suggest it, and the state of the left adrenal was too indefinite to allow of any conclusions.

In the following case a maximum grade of pigmentation was present, as illustrated in the colored drawing, for which I am indebted to Miss A. Blackwell. Except the bronzing there was no feature of Addison's disease. There has been no irritability of the stomach, and no extreme prostration, certainly no debility out of proportion to the general disease. I believe that in this, as in the cases above referred to, the deepening of the color is only part of a trophic change in the scleroderma, and has nothing to do with true Addison's disease.

CASE VIII. *Diffuse Scleroderma; Intense and General Pigmentation with Patches of Leucoderma; Swelling of the Inguinal Glands; Progressive Advance in the Disease.*—S. A. B., aged thirty-nine, a timber inspector, Virginia, was admitted to Ward E of the Johns Hopkins Hospital, May 21, 1896, complaining of weakness, bronzing of the skin, and inability to use his hands.

*Family History.*—His father died aged thirty-six, cause doubtful; his

<sup>1</sup> *Neurologisches Centralblatt*, 1880.

mother died in labor; two brothers died of diphtheria; one brother and one sister are living and well.

*Personal History.*—He has had most of the usual diseases of childhood. Three years ago he had rheumatic pains in the joints, but he was not laid up in bed. He had an attack of jaundice two years ago, which lasted several days. He was formerly a heavy drinker, but for some years past he has been more moderate. He had gonorrhoea once; has never had syphilis. As a rule, he has enjoyed very good health, and has been able to work hard. His work has been out of doors, with only an average amount of exposure.

*Present Illness.*—About fifteen months ago he began to feel stiffness in the fingers of both hands, and a short time later his feet and hands became swollen. His face was also swollen for a month or two. He said that it was quite moderate, but he was sure that it was present, and he thinks it followed the feeling of stiffness in the hands. About four months after the first symptoms he noticed that his hands and fingers were becoming very dark in color. The trouble has progressed steadily, and within the past six months his legs have become so stiff that he walks with great difficulty, and the hands have become so much involved that he has almost lost power in them. He has noticed, too, a progressive involvement of the face, an uneasy sensation of stiffness on attempting to move the muscles, and lately an inability to open the mouth wide. For some months past there has been an increasing pigmentation of the skin of the face, and of the chest and abdomen.

His general health has suffered very much. He has lost in weight, and the appetite and digestion are much impaired, but he has had no vomiting.

*Present Condition.*—The patient is a small man, weighing only 102 pounds. Everywhere there is moderate emaciation. His hair and beard are dark; the eyes are gray; features look small and drawn. The skin of the cheeks and forehead is smooth and without wrinkles. The nose and ears look natural. The skin of the forehead is a little glossy, but he can wrinkle it voluntarily. He can retract the upper lip, and move voluntarily all the muscles of the face, but he says the movements are very stiff. The mouth cannot be opened to more than half the normal extent. The skin of the face and neck is very dark, suggestive at the first glance of Addison's disease. On close inspection of the face it is seen to be not uniform but patchy, particularly about the cheeks. The pigmentation is more intense on the neck than on the face. The skin of the forehead feels thin; it is somewhat hidebound, and is with difficulty picked up. Over the cheeks it feels a little thick and brawny. There are no changes in the skin of the ears or of the scalp. Under the jaws it is thin and readily pinched, but on the front of the neck, in the cervical triangles, over the sternum and clavicles, and over the lower part of the back of the neck it is indurated and parchment-like. In these situations it is seen to have a drawn, tight appearance, which is well shown in the photograph. (Fig. 3.) The sternomastoid muscles and the clavicles stand out very prominently. Over the thorax the skin is deeply pigmented, in places quite patchy, and there are

*On Diffuse Scleroderma.*

FIG. 3.



lines in which it is very deep. It is absent over the pectoral fold, and is not nearly so marked in the axilla; the areolæ of the nipples are not very dark. It is very intense on the skin of the back, except the supraspinous fossæ. The skin over the upper part of the chest is quite hidebound. It is very much less marked in the axillary region. Over the back the skin is very leathery and dense. When he attempts to move the arms they cannot be raised above the level of the shoulders, and the motion backward is very much restricted, owing to the induration of the skin over the shoulders and chest.

The skin of the abdomen presents a very intense pigmentation. Toward the pubes and in the iliac fossæ it is as dark as a mulatto, with scattered areas of leucoderma, which give it a peculiar mottled appearance.

There are bunches of enlarged lymph-glands both above and below Poupart's ligament on both sides. These are well shown in the photograph. There are no other glandular enlargements in the body. The arms are thin, musculature feeble; the motion is much limited. They cannot be moved backward to any extent, and he cannot raise the elbows level with the shoulders. The skin feels everywhere stiffened, less in the upper than the lower arms, in which it can scarcely anywhere be picked up in a fold. There is no difference in the two arms. The arms can be flexed and extended. The pigmentation of the skin is moderate on the upper arms, and deepens greatly toward the wrist.

*Hands.*—Right: Pigmentation of the dorsum is extreme. Over the first, second, and third metacarpal bones there is a large patch of leucoderma. The skin of the hands is of a deep mahogany brown. The patch of leucoderma has in it many spots of pigmentation, which are shown in the accompanying plate. Flexion and extension of the wrists are much restricted, owing to the induration of the skin. The fingers are in a position of semiflexion and cannot be extended; movement at the metacarpal joints is very limited. The second phalanges cannot be extended upon the first, nor the third upon the second. The position of the hand is well represented in the photograph and in the colored plate, which also shows the deep pigmentation. There is a great deal of hair about the wrists, more than on the arms, but this he says was always present.

The left hand presented the same appearance, except there were fewer patches of pigmentation. There were no losses of substance on the pads of the fingers; the nails were natural looking; there was a small festering sore on the first phalangeal joint of the middle finger of the left hand. The fingers and hands feel cold and hard as though modeled in wax. The skin is everywhere closely united to the subjacent tissues, and cannot be folded or pinched. The palmar surfaces are not affected—not pigmented. The disability in the hands is extreme, and though it does not hurt him to make any movements, yet he can only just approximate the thumb to the fingers, and has great difficulty in feeding and clothing himself.

*Legs.*—The pigmentation is very marked on the thighs and is mottled on the inner aspect. The pigmentation is much less on the legs; less, in fact, than on any other part of the body. The legs cannot be fully flexed on the thighs—can scarcely be brought to a right angle. The movements in the ankles are fairly good. The skin of the thighs is uniformly involved, feels stiff and leathery, not more marked in one place than in another. When the legs are flexed there is a sort of creaking in the extensor tendons. Over the legs and feet the skin is very hidebound and can nowhere be folded. The knee-jerk is present.

*Sensation.*—A touch or a pin-prick is everywhere felt. Heat and cold are readily distinguished. The skin is dry, but he says he sweats in the warm weather and the palms of the hands are now moist. The mucous membranes are normal and present no pigmentation. There is no change whatever in the condition of the urine; sp. gr., 1025; acid reaction, no albumin, no casts.

Examination of the heart and lungs and abdominal viscera was negative. The temperature was normal. Pulse from ninety to ninety-five per minute; rather small, but of good tension.

The patient remained in hospital until June 2d. He was given thyroid extract on May 23d, grains iii t.i.d.

November 12, 1896. A note from this patient's brother, who is a physician, stated that he has taken the thyroid extract at intervals ever since he was in the hospital. At first he thought it benefited him, but of late he

has been slowly but steadily declining; the joints are stiffer and the skin very much harder.

Patient heard from September 21, 1897. He stated that he was in very much the same condition, so far as his general health was concerned. The joints were stiffer and his hands were nearly closed, and the fingers very badly drawn in. The discoloration he reports to be the same. The thyroid extract has not done him any good.

#### V. THE THYROID TREATMENT OF SCLERODERMA.

Singer<sup>1</sup> found the right lobe of the thyroid gland much reduced in size in a typical case of diffuse scleroderma, and suggested that the disease was due to dysthyreosis in consequence of the chronic fibroid changes in the gland. By far the most important contribution to the question has been made quite recently by Hektoen.<sup>2</sup> In a woman aged fifty-one, with diffuse scleroderma, the thyroid gland was found to be small and fibrous, weighing only fourteen grams (average about twenty-two). It was the seat of extensive fibrous changes with atrophy and destruction of the glandular portion. The iodine separated was only 2.94 milligrams, only one-third the amount contained in the normal gland. I know of no other cases in which the thyroid has been found diseased. Hektoen concludes: "Now, if athyreosis can produce such changes there can be no inherent reason why dysthyreosis, due to various causes, may not lead to scleroderma. In this case it lies temptingly near to assume that the endarteritis of the thyroidal vessels may have been the essential cause of the changes in the thyroid and, in accordance with the suggestions already made, indirectly of the scleroderma. Arteriosclerosis might, it would seem, lead to parenchymatous atrophy and fibrous growth in the thyroid as well as in other organs. Viewed from this point, the arteriosclerosis would seem to play an indirect but essential part in the genesis of the diffuse scleroderma of the old rather than the direct rôle advocated by Dinkler and others. The causes that may disturb the functions of the thyroid and the results thereof are various, and it seems warranted to suggest that the relations of arteriosclerosis, dysthyreosis, and scleroderma merit further study."

Marsh<sup>3</sup> of Troy, N. Y., has reported a case of scleroderma in a child aged two, which followed diphtheria. The condition was quite extensive. Marked improvement followed the use of the extract in grain doses. Dr. Marsh writes (December 29, 1897) that the child has recovered completely, and now shows no trace of the disease.

<sup>1</sup> *Berliner Klin. Wochenschrift*, 1895, No. 11.

<sup>2</sup> *Journal of the American Medical Association*, June 26, 1897.

<sup>3</sup> *Medical News*, vol. lxxi.

Dreschfeld<sup>1</sup> used the thyroid extract in two cases of diffuse scleroderma. In one, there was improvement at first, and the skin became softer, and when the medicine was discontinued she noticed an increase in the stiffness. There was no ultimate benefit. In the second case the thyroid gland extract did not seem to do any good.

At the New York Dermatological Society on September 25, 1894, Dr. Lustgarten<sup>2</sup> referred to a case of generalized scleroderma cured by the use of the thyroid extract. I can find no full report of this case.

The most successful case in an adult is one reported by Grünfeld,<sup>3</sup> already referred to under the section on "Scleroderma and Graves' Disease." The scleroderma disappeared entirely after the use of the thyroid-gland extract. No atrophy was left in the affected areas. Four cases are referred to in Lewin and Heller's monograph, all unsuccessful.

Six of the cases here reported took thyroid-gland extract for periods ranging from ten days to nineteen months. In Case III. the patient only took the thyroid extract for a few weeks, and her friends stated that under its use she improved slightly. She died of an acute gastro-intestinal trouble, but I could get no information as to whether this had any relation to the use of the thyroid extract, or even whether she was taking it at the time. Case VI. took the thyroid extract from November, 1895, to June, 1896, in doses of from 2 to 5 grains three times a day. She improved, had no soreness of the fingers, and the general health was better, but she attributed her improvement more to general tonics than to the thyroid extract. This patient was in the early stages of the disease, and she certainly took the thyroid extract long enough to determine whether or not it had a curative action. In Case VIII. the patient was in an advanced stage of the disease. He took the thyroid extract in from 3- to 5-grain doses three times a day from May 23, 1896, until about the middle of November, 1897. He omitted it for a few days at intervals. According to the statement of his brother, who is a physician, it did not seem to do him the slightest good. In Case II. the extract was used almost continuously for nineteen months, most of the time in 5-grain doses. While he thinks that he is better, there is no obvious change. The disease has not progressed actively. Case VII. is very interesting, as the patient was in an earlier condition showing very marked vasomotor changes. He took the thy-

<sup>1</sup> *Medical Chronicle*, January, 1897.

<sup>2</sup> *JOURNAL OF CUTANEOUS AND GENITO-URINARY DISEASES*, vol. xiii.

<sup>3</sup> *Loc. cit.*

roid extract from the time of his admission to the hospital, June 17, 1896 to December 21, 1897, when I last saw him. As a rule he took two 5-grain tablets daily, occasionally reducing it to one. Though the condition in his hands has not improved, yet in the eighteen months the disease has certainly not progressed. His general health is very much better, and the vasomotor changes are not so evident.

One interesting point is brought out, particularly by these last two cases; namely, the harmlessness of the protracted use of the thyroid extract. In Case VII., though the patient had tachycardia, he took the remedy without any ill effects. In Case II. the patient gained in weight under its use. The thyroid extract has certainly no specific action in scleroderma, as it has in myxedema. In no case did the skin of the affected regions become softer or regain its natural appearance.

In two of my cases the disease did not progress under its use, but this is the best that can be gathered from my own experience. Of course it might be said that it was only in the early stages that good results could be expected, but two, at least, of my cases had a fair trial, while the affected parts were still in the stage of infiltration and erythema.

In Dr. Marsh's patient—one of the few in which a permanent cure has followed the use of the thyroid extract—the question may be raised whether the case was one of diffuse scleroderma, or whether it was not one of acute sclerema—of the same nature as sclerema neonatorum, following diphtheria. The whole process was very acute, extending from the first inception to complete cure, over a period of only four months.

Altogether, my personal experience and the results, as recorded in the literature, do not favor the treatment of the disease by the thyroid-gland extract. It may be tried without harm, and should it fail, frictions, and salicin preparations should be used.

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### CEREBRO-SPINAL FEVER.

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A CLINICAL LECTURE ON SEVEN CASES AT THE JOHNS HOPKINS HOSPITAL, DELIVERED BEFORE THE POST-GRADUATE CLASS, JUNE 15, 1898.

I wish to speak to you today about "a singular and very mortal malady," to use the words of Danielson and Mann, the original observers of cerebro-spinal fever in this country. We have been much interested in studying a series of cases that have come under our observation recently, and I thought the present a fitting opportunity to review the subject while it is fresh in your minds. The history of the disease in this country is given in various works. Hirsch's "Geographical Pathology" contains a very full statement. Volume I of Joseph Jones's "Medical and Surgical Memoirs" gives in many ways the best description of the early outbreaks, unless you wish to go to the original authorities. The recent monograph by Councilman, Mallory and Wright, issued by the Massachusetts State Board of Health, descriptive of the epidemic in and about Boston, is the best modern presentation of the subject from all standpoints.

Briefly summarized, the disease has appeared in this country in four different periods. In 1806, the year after the first description of the disease in Geneva, an outbreak occurred in Medford, Mass., which was very carefully studied by Danielson and Mann. During the next twenty years there were numerous out-

the early descriptions of the disease is by Dr. Williamson, who recorded an outbreak in this city in 1808. The second period dates from about 1840 to 1850. It was during this time that the disease was very thoroughly studied by Ames, of Montgomery, Ala. The third period extends from 1860 to 1874, in which there were severe local outbreaks. During the civil war there were numerous epidemics, those in the Northern army you will find referred to in the "Medical and Surgical History of the War," those of the Confederate forces are in this really extensive memoir of the disease by Joseph Jones. Since 1874 sporadic cases have occurred at intervals in different places, but there have been no extensive epidemics. In 1893 there were outbreaks in New York and Western Maryland, which were studied by Drs. Flexner and Barker, and in Boston and parts of Massachusetts there have been cases since the summer of 1896.

As an epidemic, cerebro-spinal fever presents several interesting points. The disease is never pandemic; that is, widely and extensively diffused over large areas of country, but the outbreaks are more or less localized. There is an absence of any continuous extension. Thus at present the disease lingers in Massachusetts. We have heard of cases occurring in parts of the Southern States, and we are probably here on the eve of an outbreak, and cases are reported to have occurred among the miners at Skaguay, on the way to Klondike. For years subsequent to an epidemic sporadic cases of the disease occur, and you will see year by year cerebro-spinal fever as a cause of death in the health reports of the large

however, other forms of meningitis, or the cerebro-spinal form of typhoid fever.

Passing now to the more practical aspect of the question, let me read you brief abstracts of the histories of the seven cases which we have had under observation within the past few weeks.

Case 1.—On March 24 a colored boy, John H., aged twenty, was admitted, complaining of chills and fever. The history was very difficult to obtain, as he was incoherent. Subsequently we found out that he had been working at Hawkins's Point since August, where he had had frequent attacks of chills and fever. He worked until noon of the 21st, when he suddenly lost power in his left leg and sank to the ground. Placed on his mule he started home, but fell off several times. He states also that he lost power in both arms. This condition continued for the past three days, during which time he was not able to make a step alone. He was brought to the hospital by three men. His temperature shortly after admission was  $103^{\circ}$ .

He was a well-nourished, healthy-looking boy. There was ptosis of the right eyelid, dilatation of the pupil of the right eye, but no strabismus. The spleen was not palpable. The patient sat up with difficulty, complained of a great deal of pain in the back. He sweated profusely during the examination. The examination of the lungs was negative. There was a leucocytosis of 26,000.

On the 24th herpes were present on the lips. There was very marked stiffness of the neck and retraction of the head. The temperature during the first week was distinctly remittent, a diurnal range of from two to three degrees, the maximum between  $103^{\circ}$  and  $104^{\circ}$ .

On the 20th of March, the eighth day of his illness, Dr. Thayer obtained by lumbar puncture 40 cc. of a cloudy fluid without blood. It was sterile both on color-slips and in culture.

On the 30th and 31st the patient was very much better, the mental condition clearer. He was rational; the ptosis had disappeared, but there was still stiffness of the muscles of the neck. Between 8 P. M. on March 31 and 8 P. M. on April 1, the temperature fell from  $103^{\circ}$  to  $102^{\circ}$ .

mal and remained so. He made a rapid convalescence, and left the hospital on May 12.

Case 2.—Henry T., aged twenty-three, was brought to the hospital actively delirious on April 10. There was nothing of moment in his family history.

Until April 6 the patient was well and strong. He worked on the morning of the 6th, and in the evening he had a violent shaking chill.

On the 7th he complained greatly of pains in his head and back. The temperature was  $101^{\circ}$ . He was very dull, and had a muttering delirium.

On the 8th the headache was very intense. The temperature ranged between  $102^{\circ}$  and  $103^{\circ}$ . He continued delirious on the 9th, and was brought to the hospital on the morning of the 10th.

On admission he was delirious, pupils were widely dilated; the tongue was dry and coated. The spleen could not be felt. There was no herpes. The temperature was  $104^{\circ}$ .

On the 11th the delirium continued. There was marked stiffness of the muscles of the neck, and there was a leucocytosis of 22,000. There were no rose spots, no eruption on the skin. Albumen and tube casts were present in the urine. The pupils were of medium size, reacted to light. He had had no special stomach symptoms.

On April 12 a lumbar puncture was made, and only about fifteen drops of a clear serous fluid was obtained, which was negative on cover-slips and also in culture media. The spleen was not palpable. The temperature was distinctly remittent, ranging from  $100^{\circ}$  to  $102.5^{\circ}$  and  $103^{\circ}$ .

On the 18th and 19th it was more continuous. On the 20th, it dropped to  $99^{\circ}$ , and on the morning of the 21st he had a severe shaking chill, and the temperature rose to nearly  $105^{\circ}$ . The pupils were equal; the ophthalmoscopic examination showed nothing abnormal. Following the chill on the 21st the temperature fell again to  $99^{\circ}$ , and on the 22d there was a second severe chill, in which the temperature rose to nearly  $105^{\circ}$ , and fell to normal on the 23d, and the patient entered

In this patient the sudden onset, the headache, the marked cerebral symptoms, the stiffness of the neck, the leucocytosis, which ranged from 22,000 to 28,000, and the absence of all signs of typhoid fever, the prompt recovery, suggested strongly cerebro-spinal meningitis, though the cultures were negative.

Case 3.—John G., school boy, aged eight, admitted April 21, with headache and pain in the back of the neck. His illness began five weeks ago. He was brought home one evening supported between two playmates, complaining of severe headache and pain in the back of the neck. He became delirious, and for six or seven days had high fever, retraction of the head and stiffness of the muscles of the neck, and a great deal of vomiting. These symptoms continued until admission.

He was very much emaciated, and looked as though he had been through a serious illness. The temperature was 102.5°. He still complained of headache, but seemed rational and answered questions promptly. The pupils were equal. He had signs of herpes about the septum of the nose. The spleen was not palpable. He was a little dull and heavy during the following day, and the neck seemed to be very stiff. He had a leucocytosis of 13,000. There was no Widal reaction. Two days after admission his temperature became normal and he began to improve, and got well very rapidly.

In this case the sudden onset, the marked cerebral symptoms for four or five weeks with retraction of the neck, the stiffness in which persisted after admission, and the absence of signs of typhoid, were also very suggestive of the cerebro-spinal fever. The lumbar puncture was not made in this case.

Case 4.—Wm. A., colored, aged twenty-eight, cook, admitted May 12, complaining of headache, pain and stiffness in the neck. He had been a very healthy man. The present illness began suddenly on April 14, four weeks previous to admission, with violent headache and nausea. That night he became delirious, and has been so at times ever

fever, sweating, pain in the head, retraction of the head and great stiffness in the muscles of the neck. On admission the temperature was 100.5°. He was rational, but drowsy, and slow in responding to questions. He lay on the left side, with the head markedly retracted and held stiffly. It could not be pushed forward even to a very slight extent either voluntarily or passively. There was no leucocytosis; the Widal reaction was absent. The retinae and nerves were negative.

On May 13 we noted that there was marked retraction of the head, which was held very stiffly and could not be lifted from the pillow without raising the whole body. The general condition seemed to be very good; temperature was 98°. On the following morning when I saw him he seemed rational. He sat up in bed himself, but was quite unable to move his head forward. From this time on he had no fever, gained rapidly, but the uncomfortable sensation of stiffness in the neck remained as late as June 11, the time of his discharge.

These four cases had aroused our suspicions, though two of them had come in practically convalescent, and in the other two we had not been able to arrive at a positive diagnosis from the lumbar puncture. Then in rapid succession three cases were admitted about which there could be no question, and which removed any lingering doubt as to the nature of the previous cases.

Case 5.—John L. H., aged thirteen, school boy, admitted May 31, with headache, much pain, and a temperature of 103°. He had been a very healthy boy, and came of healthy stock. On May 28, 29 and 30 he felt very ill, had pain in the head and persistent vomiting. On the 30th he said that he could not see out of either eye, and there was a droop in the right eye.

On admission he was a healthy-looking and well-nourished lad; temperature 103°. He was very restless, threw his arms about and talked irrationally. There was ptosis of the right lid; the right pupil was dilated, and there was marked strabismus. The head was not

pulse was full and bounding, 104. There were no changes in the retinae. There was a leucocytosis of 31,000. On June 1 his temperature rose to 105°. By lumbar puncture about 50 cc. of an opalescent fluid were obtained, which showed diplococci on cover-slips. On June 2 herpes developed on the nose, and purpuric spots appeared on the neck and chest. The temperature was remittent. It sank to 99° on the morning of the 2d, and rose throughout the day to nearly 104°. He cried out a great deal with pain in the head, and could not bear to have the neck touched or moved. When questioned he seemed perfectly rational, but when left to himself he had a wandering delirium.

On the 3d and 4th he seemed a little better. On the night of the 4th he became very much worse, very delirious, and tried to get out of bed. The pulse became more rapid; there were signs of marked bronchitis at the bases, and the leucocytosis reached nearly 45,000. He became very cyanosed, with an extraordinary fulness and pulsation of the peripheral veins. There was marked congestion and fulness of all the vessels of the retinae, but no optic neuritis. The temperature fell to sub-normal, 97°, rose on the 5th at 1 P. M. to 100°, when he died.

The report of the cultures by Mr. Knox under Dr. Flexner's supervision showed the diplococcus intracellularis. Cultures from the nose did not show any organisms.

In this case the boy died about the eleventh day of a very acute illness, and there was no question as to the nature of the trouble. The post-mortem, which most of you saw, confirmed the diagnosis. I will read you the anatomical diagnosis. Epidemic cerebro-spinal meningitis—basal and spinal exudate; acute sero-purulent ependymitis; bronchopneumonia and bronchitis. I show you here a portion of the cord which has been preserved, and you see how completely plastered it is with the exudate.

Case 6.—Martha K., aged eight, admitted June 1 in a state of unconsciousness. She had been a very healthy child. On May 30 she had been perfectly well

and had spent the day picking peas. On coming from the field she complained of headache, walked slowly, vomited and complained of pain in the back. At 7 P. M., when she reached home, she lay down on a bench and vomited again. She vomited also through the night. She was restless, but slept.

On the 31st she felt hot at times and cold, and slept all day, and could not walk. She had castor oil, and the bowels were moved. She was unconscious all day. There was no nose-bleeding.

On admission the temperature was 101°. She was unconscious, and the lips were dry. There were herpes at the angle of the mouth. There was marked retraction of the head and neck, but there was no pain. The spleen was not palpable. There was no rash on the skin.

On the 2d her temperature rose to above 104°. The condition remained practically the same. A turbid fluid was removed by lumbar puncture, which showed numerous diplococci. The leucocytosis has been from 20,000 to 25,000. On June 3 her condition was practically the same. The temperature was markedly remittent, dropped to 100.5° and then rose to nearly 105°. She had difficulty in swallowing; the retraction of the head was extreme, and at intervals there we. At 2 o'clock on this day an erythematous eruption was noticed over the neck. The respirations became very much increased. There were no changes in the retinae.

On June 4 she became very much worse; there was a patchy erythema on the hands; none on the trunk. The temperature rose again to nearly 105°, and she died on June 4, on the sixth day of her illness. The cultures showed the diplococcus intracellularis.

Case 7.—Edward R., aged forty-seven, admitted June 4 in a condition of active delirium. He had had a severe attack of cerebro-spinal meningitis five years ago, and he had also had pneumonia. He had been a heavy drinker. His illness began on June 2 with a chill. On the 3d he had a second chill, and became irrational, and his wife noticed the stiffness in the neck. He suffered very much with

his head, and breathed very heavily. He was very delirious all the night of the third.

On admission his face was flushed. There was visible pulsation in the vessels of the neck and Cheyne-Stokes respiration. The pupils reacted well, but were somewhat dilated. He was in a heavy stupor, breathed noisily, answered questions in a wandering way, and at once lapsed into a heavy sleep. The temperature was  $102^{\circ}$ . There was a leucocytosis of nearly 15,000.

On the morning of the 5th the temperature, which had fallen at 10 P. M. to  $99^{\circ}$ , rose to  $105.6^{\circ}$  at noon on the 5th. There was incessant tremor and clonic movements of the hands and arms. When turned on his side the head was held somewhat backward, and the neck was decidedly stiff. There was no optic neuritis. The patient's temperature remained high from noon on the 5th to 10 P. M., then dropped to  $100^{\circ}$  at 4 A. M. on the 6th. He then became rapidly worse, was profoundly comatose, cyanosed, and there was marked opisthotonos with a great spastic condition of the thumbs.

This morning for the first time purpur was noticed, which came out in quite large spots, especially marked on the legs. By lumbar puncture 10 cc. of turbid fluid was obtained. Cover-slips showed numerous diplococci. Throughout the morning of the 6th the patient became very much worse; the respirations were more rapid and the temperature rose progressively until in the evening at 8 P. M. it reached  $108^{\circ}$ , when he died, on the seventh day of his illness.

Cultures showed very characteristic diplococci. There was no autopsy.

The cases have come from various sections of the city, no two from a single street or house. Dr. Jones, the health officer, tells me that there has been a decided increase lately in the number of deaths certified as meningitis. Dr. Stokes had given him the statistics for the six weeks ending June 15. In 1896 during this period there were thirty-seven deaths from all forms of meningitis, in 1897 twenty-six deaths, while this year there were in the six weeks seventy-one

deaths, a decided increase. Eleven of these had been certified as cerebro-spinal meningitis.

You have had an opportunity, while these early cases were in the wards, to study three other forms of meningitis, the tuberculous the so-called occlusive or posterior meningitis in a child, and that remarkable case of meningitis serosa in a woman in Ward G. Several important clinical features differentiate the meningitis of cerebro-spinal fever from these forms. In the first place, you will notice in marked contrast to the tuberculous form, the suddenness of onset in the cases. The little boy, you remember, was taken abruptly while at play, the little girl when returning from picking peas, and the first case, the colored boy, while he was at work on his mule. In Case 5 I repeatedly called your attention to the fact that though the lad was evidently very ill and quite delirious, yet he responded to questions intelligently, and evidently understood what was said to him. This was noticed in two other cases, and is very unusual in tuberculous meningitis when, as in these patients, the symptoms are pronounced. The more strictly basilar localization of the meningitis in cerebro-spinal fever accounts for the greater mental clearness. The early cases of an outbreak are always difficult to recognize, and though we had a strong suspicion as to the character of our first cases, we did not arrive at a positive conclusion until the fifth, sixth and seventh cases came under observation.

The symptoms presented by the cases were very characteristic, more particularly in all of them the stiffness of the muscles of the neck and back. The little girl, you remember, had such a degree of rigidity that the hand could be placed under the head and the whole body moved like a statue. She had also in the last day of her illness extreme opisthotonos, with aggravated stretching, extensor convulsions. In Case 7 there was almost tetanic rigidity of the muscles, and at times clonic contraction of the arms. Then in Case 4, the colored man who came in in the fourth week of the disease, though he was rational and the

fever subsided two days after admission, you will remember how stiffly his head was held, and the whole trunk could be lifted, owing to the rigidity of the neck. Early rigidity of the muscles of the neck and extreme tension and opisthotonos are very much more pronounced in cerebro-spinal fever than in any other form of meningitis. The temperature curve in these cases is of great interest. In the last three acute fatal cases it was distinctly remittent in type, and the diurnal range was often as much as two, three or even four degrees. In Case 7 the ante-mortem temperature was unusually high, 108°. You will have noted in connection with the blood the very pronounced leucocytosis in all but Case 4 (a convalescent) to 26,000 in Case 1, to 28,000 in Case 2, to 13,000 in Case 3, admitted in the fifth week, to 45,000 in Case 5, to 25,000 in Case 6, to 15,000 in Case 7.

The skin eruptions, which were so marked in the early epidemics, when the disease was indeed called petechial or spotted typhus, were not marked. In Case 5 there were a few purpuric spots about the neck and chest; in Case 6 there was an erythematous eruption about the neck and hands, and in Case 7 a purpuric eruption appeared on the legs. Herpes occurred in six of the seven cases. There is perhaps no acute fever, not excepting pneumonia, in which herpes is so frequent an accompaniment.

Of late years two points of very great moment in the diagnosis of the disease have been brought out, Quincke's lumbar puncture, which enables us now to make a comparatively early diagnosis, and the determination of the diplococcus intracellularis as the probable cause of the disease. The spinal puncture as recommended by Quincke is a perfectly harmless procedure. As you saw in the wards, it sometimes requires a little skill to get into the canal. Not only does it do no harm, but in some cases it seemed to be beneficial in relieving the pressure. A dry tap does not mean that meningitis is not present. In the cord from Case 5 the exudate in the meninges was of such a buttery consistency that it could not have flowed had tapping been made on the day of his death.

The diplococcus intracellularis was first isolated by Weichselbaum in 1887, and subsequently studied by von Jäger and others. The studies in the Boston epidemics have been of great moment, particularly those of Williams and of Wentworth in the determination of the presence of the diplococcus in the fluid obtained by lumbar puncture. In the thirty-five autopsies reported upon by Councilman, Mallory and Wright, the diplococci were found in cultures and on microscopical examination in all but four cases. In one of these they had previously been found in the fluid withdrawn by spinal puncture; two of the other cases were chronic, and in the fourth case there was a mixed infection with tuberculosis. This large percentage speaks very strongly in favor of the constant association of this organism with the disease.

We need additional careful studies on the various types of the disease. On returning to your home some of you may have opportunities of studying cases. The patients you have seen here presented the ordinary type. The fulminant form, which may kill in from twelve to twenty-four hours, has not been much studied of late, and upon it we need additional careful observations. The chronic type, too, is a very remarkable form. The only case I think we have previously had in the hospital was one of this sort, which I reported some years ago. In it the symptoms may persist for two or three months.

While the prognosis in other forms of meningitis is practically hopeless, that in cerebro-spinal fever is by no means bad for a large proportion of the cases. So far as we know, the meningitis due to the bacillus tuberculosis is uniformly fatal. That associated with the streptococcus, whether developing spontaneously or as a result of injury or ear disease, is also very fatal, and, so far as we know, recovery never occurs in the pneumococcus form. The death rate in cerebro-spinal fever varies greatly. Hirsch puts it from 20 to 75 per cent. Of the 111 cases collected in the monograph by Councilman, Mallory and Wright, seventy-six died, a

The treatment of cerebro-spinal fever is not in a satisfactory state. In our first four cases the recovery, so far as one could judge, did not follow the use of any special drugs or any special plan of treatment. The appearance of the meninges, of the cord and of the base of the brain in Case 5 are not very encouraging as to any possible benefit from medicine. For the fever, sponging and other forms of hydrotherapy should be employed. An ice-cap should be placed upon the head. For the pain it is, as you saw in two of our fatal cases, necessary to give morphia, and it is very warmly recommended by both Stillé and von Ziemssen. Bichloride of mercury may be tried, and

has indeed warm advocates. The question of counter-irritation is an important one. That the profession has abandoned in great part the use of blisters is evidenced by the fact that not one of these seven cases was blistered before admission. If thought advisable, the best method is to touch along the spine lightly with the Paquelin cautery. The use of the cold to reduce the fever, the administration of opium to allay the pain, and careful feeding to support the strength of the patient constitute the extent of our therapeutics in this formidable disease.\*

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\*As I correct this lecture an eighth case has been admitted to the wards.

THE ARTHRITIS OF CEREBRO-SPINAL FEVER.<sup>1</sup>

BY WILLIAM OSLER, M.D.,

*Professor of Medicine, Johns Hopkins Medical School, Baltimore, Md.*

SINCE March, 1898, eleven cases of cerebro-spinal meningitis have been admitted to the wards. The disease has been prevailing to a slight extent in the city, scarcely enough to justify the use of the term epidemic, but as this is the first opportunity we have had since the opening of the hospital to study it these few cases have been most interesting. A lecture upon seven of them, which I gave to the post-graduate class on June 15th, has already appeared in the *Maryland Medical Journal*, July 16th. To-day I wish to call your attention to a feature of the disease which was not illustrated by any of the previous cases, namely, the remarkable joint complications.

Arthritis is a very inconstant symptom. North, in his valuable "Treatise on a Malignant Epidemic commonly called Spotted Fever,"<sup>2</sup> speaking of the more unusual symptoms, mentioned "swelling, like rheumatism, of the joints." In his collection of communications from different physicians describing the early epidemics between 1806 and 1811 several of the correspondents mention inflammation of the joints, like the acute rheumatism. A more specific early statement is that given in the admirable report on the disease by Thomas Welch, James Jackson and John C. Warren, a committee appointed by the Massachusetts

<sup>1</sup> Clinical Lecture, Johns Hopkins Hospital, November 6, 1898.

<sup>2</sup> Treatise on a Malignant Epidemic commonly called Spotted Fever, New York, 1811, p. 15.

Medical Society in 1810. "In some cases swellings have occurred in the joints and limbs; these have been very sore to the touch, and their appearance has been compared to that of gout. The parts so affected feel as if they had been bruised. These swellings are in the smaller as well as in the larger joints, and are often of a purple color. Those on the small joints especially sometimes disappear as the disease approaches its crisis."<sup>3</sup>

In many of the carefully studied epidemics in France and Germany special attention has been paid to the joint lesions of the disease. In the recent outbreak in Boston arthritis occurred in only 6 of 111 cases.<sup>4</sup>

In Ward F there have been two patients with severe cerebro-spinal meningitis, in both of whom arthritis was an early and quite marked manifestation.

*CASE I. Clinical Summary.* Abrupt onset with chill; fever; delirium; stiffness of the neck; enlargement of the spleen; multiple arthritis; patchy erythema of the skin with purpura; lumbar puncture; demonstration of diplococcus intracellularis in the meningeal exudate, in the blood, and in the pus from knee-joint; death on the sixth day.

*Anatomical Summary.* Purulent cerebro-spinal meningitis; extensive collapse with areas of pneumonia at bases of both lungs; purulent arthritis.

At the ward class on Saturday, November 5th, in one of the small rooms behind Ward F I found Jacob B., age twenty-four years, who had been brought to the hospital the evening before in a state of delirium and unconsciousness. He was a medium sized, fairly-well nourished man, with dark features; he looked very ill. The decubitus was dorsal, with the face and

<sup>3</sup> Medical Communications and Dissertations of the Massachusetts Medical Society, vol. ii, 1813, p. 135.

<sup>4</sup> Connelman, Mallory and Wright: Report Massachusetts State Board of Health, 1898.

neck turned to the left, in which position they remained during the examination. He could not be roused. The pupils were of medium size, equal, did not react well to light, no strabismus. There was no discharge from the nose or ears. The respirations were rapid, 36 per minute, the breath foul and pungent. The pulse was 132. The lips and mucous membranes were of good color, and the tonsils and throat were free from exudation. There were no herpes. The condition which attracted most attention was that of the joints. The right wrist was swollen and puffy and a little red. The skin over the knuckles of the hand was reddened and the joints seemed a little swollen, and there was a slight erythematous swelling over one or two of the phalangeal joints. The wrist was less swollen; there was a marked reddening over the styloid process of the right ulna. Both elbows were reddened and swollen, particularly over the olecrana, and on the left side a brawny swelling extended for several inches over the triceps. The redness was very intense, the inflammation seemed superficial, and the swelling did not extend to the front of the joints. The right knee was swollen and there were purplish-red blotches over the patella. The left knee was less swollen, but presented the same blotchy erythema. There was tenderness in the calves of both legs, and while examination of the joints caused no sign of wincing, deep pressure in the right calf caused an expression of pain to pass over his face. There was blotchy redness without much swelling over the malleoli, and on the inner surfaces of both feet there were spots of purpura.

The examination of the lungs showed a decided flatness in the lower right axilla, extending into the intrascapular area, with harsh, not typically tubular, breathing, and a few crackling râles. The heart sounds

were clear. The abdomen showed no rose spots, was flaccid and a little tense; the spleen was enlarged and could be readily felt below the costal margin. On the evening of admission there was a leucocytosis of 17,000, which by the next morning had risen to 22,000.

While the limbs were perfectly flaccid, it was impossible to move the neck, which was so rigid that the whole trunk could be lifted by placing the hands under the head. The patient's temperature, which, on admission, was 101°, sank to 98° at 8 P. M., but had slowly risen, and at the time of examination was about 102°.

The patient's history, as obtained from the friends by Dr. Hastings, was that the illness came on rather suddenly, with a chill and nausea and vomiting, on Tuesday, the 1st, since which time he had been in bed and had fever. On Thursday night he was actively delirious. He first complained of much pain in the back of the head and neck; he had slight diarrhea, two or three movements daily, no epistaxis. When visited at his home by Dr. Hastings before admission to the hospital the delirium and stupor were marked, pulse 120, respirations 28, and there was great rigidity of the limbs.

It was evident that the patient was suffering with a very profound infection. The condition of the joints resembled that in an acute pyemia. The deep coma and the rigidity and stiffness of the neck were, however, suggestive of cerebro-spinal fever. The consolidation of the lower part of the right lung appeared to be pneumonic, but while meningeal symptoms in ordinary pneumonia are not uncommon, they are very rarely associated with stiffness of the neck or rigidity of the limbs, and arthritis is an excessively rare event. Lumbar puncture was performed by Dr. Fletcher, and

50 cubic centimetres of a turbid fluid with a few white stringy flakes was removed. Cover-slips showed diplococci resembling the diplococcus intracellularis. From the right knee about half an ounce of pus was obtained, which showed similar looking diplococci.

Throughout Saturday the patient grew progressively worse. His temperature rose to  $103.5^{\circ}$  in the evening. The leucocytes were 37,000 per cubic centimetre. The respirations increased to 60 per minute; the pulse became small and much more frequent, between 160 and 172. The right knee-joint became much more swollen, and the swelling and redness of the elbow-joints, and the metacarpo-phalangeal joints of the second and first fingers of the left hand and of the first phalangeal joint of the left ring finger were much more swollen. Both wrists were also more red. A marked change had taken place also in the lungs. The area of flatness on the right side had increased, and there was also in the subscapular region on the left side an area of flatness with distant tubular breathing. The stiffness of the neck was not so marked, and the patient moved the head about from side to side. The pupils were not irregular, and there was slight external strabismus of the left eye. Towards the evening purpuric spots appeared on the thighs, most extensive on the inner side. There was general muscular rigidity. The urine contained a large amount of albumin, the specific gravity was 1.024, and it contained many hyaline and granular casts. The symptoms progressively increased through the night, and he died at a little after ten o'clock on the 6th of November, on the morning of the sixth day of his illness. The temperature rose to  $105.5^{\circ}$  at 4 A. M., and remained above  $105^{\circ}$  until his death. Just before death the head was thrown backward by a quick contraction of the muscles, and there were movements of the limbs, particularly on the right side.

Early in the morning of the 6th there was a diffuse purple mottling of the skin of the trunk and limbs.

The condition found post mortem you see illustrated in the specimens before you. Notice over the surface of the convolutions of the brain, more particularly, too, over the sulci on the right side, a creamy, purulent exudate; the same is seen over the upper part of the cerebellum, and to a less extent over the pons and medulla. There is very little exudate in the anterior portion of the base in the region of the optic chiasm. The cord presented a slighter degree of exudate, chiefly in the upper part; it was not involved to the same extent as in some other cases which came to autopsy in the spring.

The condition of the lungs is very interesting. You will remember that at the ward class on Saturday morning there was flatness in the lower right axilla and infrascapular region, with fine crackling râles and harsh, but not definitely tubular, breathing. Corresponding to this a large part of the lower lobe was dark in color, collapsed, and to the touch there were areas of consolidation. A very similar condition developed quite rapidly in the left lower lobe, and when removed it showed the same state, very dark in color, with here and there more prominent areas, also dark, but which felt much firmer and indurated. On inflation through the bronchus this dark, airless tissue was shown to be really in a condition of collapse, though there were areas of pneumonic consolidation scattered through it. The spleen was enlarged and soft. There were no special changes in the heart, though perhaps there were a few small beads of vegetation on the aortic cusp. There was suppuration in the right knee-joint; the other joints could not be opened.

Perhaps the most remarkable feature of this case is the widespread diffusion of the diplococcus intracellu-

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laris throughout the body. For the first time the organism has been isolated from the blood during life and from the joints. A full report upon this interesting aspect of the question will be given subsequently by Dr. Gwyn.

CASE II. *Clinical Summary.* Onset of illness with arthritis; continued fever; tentative diagnosis of typhoid fever; development of paraplegia; lumbar puncture; purulent meningitis; laminectomy; irrigation of the spinal membranes.

You remember that on last Wednesday, November 2d, I showed you a man from Ward F, John F., age twenty-five, a sailor, who was admitted October 29th, complaining of pain in the right hip and left ankle. He had knocked about the world a good deal, but he seemed to have escaped all serious illnesses, except an attack of gonorrhoea and of syphilis in 1894. In the spring of 1897 he received an injury to the hip and was eight weeks in hospital at Shanghai. Subsequently he was in hospital for three weeks at Yokohama, and was told that he had rheumatism.

His present illness began on Wednesday, October 26th, with pain in the right ankle, which became swollen and red. The next day the left ankle, and the following day his right hip, became painful. He felt feverish, but he had no headache. He was able to walk to the hospital. On admission his temperature was 104°. There were tenderness and stiffness in the right hip-joint, without swelling or redness. The left ankle was swollen, red and very tender. There was a slight redness and tenderness of the left wrist. I need not detail to you again the general negative condition on the very complete examination made by Dr. Hastings. One feature, for which indeed I showed him specially last Wednesday, was the abundant crop of peliomata over his abdomen and thighs. Until the day

you saw him his temperature had been pretty steadily between 102° and 104°. On the 2d it fell to 100°. We were very doubtful as to the condition. He had more fever and looked much more ill than in an ordinary attack of acute rheumatism. We suspected typhoid fever. The inflammation in the ankle-joint subsided in a couple of days. A suspicious feature was that on the 31st and on November 1st he complained of a great deal of pain in the back and hips, and, as he said, all over, and he had several profuse sweats. On November 1st it was noticed that he held his head in a retracted position, but there was no stiffness of the neck muscles. He was delirious at times, but as a rule answered questions intelligently. The joint symptoms had subsided completely at this date. During the past week there have been remarkable changes. We suspected, as I said, typhoid fever, though he had no rose spots and the Widal reaction was not present. The spleen, however, was palpable and he looked very much like a patient with enteric fever.

On November 4th he had retention of urine, and he did not seem to be so well, though the temperature was lower, not above 103°, but he had delirium. There was no retraction of the head or stiffness of the neck. On the 4th, 5th and 6th he still had to be catheterized. At the examinations to this date nothing special had been noted about his legs. I remember quite well that on the 3d, when I examined the condition of the ankle and of the hip, he seemed to use the legs quite naturally. At 3.30 P. M. on the 6th, as he was being prepared for an enema, it was noticed that the legs had a very helpless appearance, and when the patient was asked to move them he could not. On further examination complete anesthesia was found as high as the level of the navel, above which there was a band six or seven centimetres in width of hyper-

esthesia. At 5 p. m. the patient was in the same condition, only the abdomen had become more full, and there was extreme tenderness. The legs were quite limp, and the patient was quite unable to move them. There was slight stiffness of the neck, most marked on trying to bend the head forward. The reflexes, superficial and deep, of the legs were absent, rectum reflex was present. At 6 p. m. lumbar puncture was performed and about two drachms of a thick, creamy, brown-tinted pus removed. It showed microscopically cells and numerous diplococci, mostly extracellular and in clumps; some of these looked very like the diplococcus intracellularis. At 9 p. m. on the same evening Dr. Cushing exposed the lower part of the cord and a thick, purulent pus was drained away, coming chiefly from the lower part. The region of the cord seen looked hyperemic. A small catheter was passed under the dura, and the membranes were irrigated with normal salt solution, with which much pus escaped. The patient stood the operation well, but there has been no change since in the condition of the paralysis. He is rational and the temperature has not been so high. The leucocytosis persists, and is to-day 30,000 per cubic centimetre.

When the spinal symptoms developed we naturally thought of cerebro-spinal fever, and it very possibly is a case of this disease. The smears taken from the spinal puncture showed some suspicious-looking diplococci, though from cultures, both at puncture and operation, there have grown the staphylococcus pyogenes aureus. There is no evident source of infection, as is usual in cases of meningitis due to the ordinary pus organisms. It is to be regretted that cultures were not made from the inflamed ankle-joints when he first came into the hospital.

The infectious arthritides, while common in some

fevers, are very rare in others. In acute rheumatic fever, the typical infectious arthritis, the nature of the poison is still unknown; it is probably specific and peculiar, and the joint lesions show little or no tendency to pus formation. The other infections differ very much indeed in the frequency with which joint complications occur. In the gonorrhoeal infection, the septic fevers, cerebro-spinal fever, Malta fever, dengue and scarlet fever they are common, while in measles, typhoid fever, small-pox and pneumonia they are exceedingly rare.

There are two points of special interest in these cases; first, the early onset of the arthritis. I confess that in Case II we were completely thrown off our guard. I suspected for a day or two rheumatic fever; then as the symptoms subsided and as the temperature kept up we thought possibly it might be an unusual instance of arthritis in early typhoid fever, as gonorrhoeal infection could be excluded.

Case I illustrates probably the maximum degree of involvement of the joint in cerebro-spinal fever. It shows, too, the rapidity and severity with which the complication may develop. When Dr. Hastings saw this man at his home on the third day of his illness the joints were sore and red and swollen.

The second point, of still greater interest, is the light which Case I throws on the nature of the infectious arthritides. The arthritis in cerebro-spinal fever brings up a question, much discussed of late years by neurologists, of the cause of the joint affections in diseases of the central nervous system. All grades—simple congestive synovitis with areas of painful redness resembling erythromelalgia, acute multiple synovitis and arthritis, extensive disorganizing suppuration of joints—are found in the acute and chronic forms of spinal cord disease. A very careful bacteriological

study should be made of these cases. The joint lesion is usually regarded as trophic in character; and I think the general view has been that in cerebro-spinal fever also the arthritis is a secondary effect of the inflammation of the cerebro-spinal meninges. In this case the separation of the specific organism from the inflamed joints and from the blood demonstrates that the joint complication may be the direct effect of a widespread diplococcus septicemia.

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## ON THE STUDY OF PNEUMONIA.

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In the rapid development of the medical curriculum, we teachers of the "bread and butter" subjects must take care that our facilities keep pace with those in the purely scientific branches. Today it is easier to train students in anatomy and physiology than in medicine and surgery. Indeed a school may possess a first class scientific equipment with third class clinical advantages.

A teacher of medicine should have ever two objects in view: first, to give to the student, in the Art and in the Science, good methods; and secondly, to enable him to follow closely and accurately as many cases of disease as possible.

Among diseases there is not one which requires to be more fully and carefully presented than pneumonia—the most common as well as the most serious acute affection of this country, with a mortality exceeding that of all the other acute fevers put together, measles, scarlet fever, diphtheria, whooping-cough, typhoid fever and dysentery. In presenting this disease to my class I have in the past three years adopted a plan which has been very useful. So soon as the pneumonia cases begin to come into the wards I appoint a committee, usually of third year students, whose duty it is to collect all the data concerning the disease during the session. The cases are seen sometimes on application at the dispensary by the third year class, more frequently in the wards by the fourth year students, and at my Wednesday Clinic I demonstrate, as far as possible, every case. The recorder of the Committee places the cases in order on one of the black-boards in parallel columns; name, age, date of admission, mode of onset, whether

with chill, etc., the height of the fever, the duration, the termination, whether by crisis or not, leucocytes and complications. This record remains throughout the session. Should death occur and a post-mortem be made, the specimens are demonstrated to the class.

After December 1st, when the cases begin to come in, the disease is kept quite actively before us. For the purpose of analysis we group the cases as follows: I. Acute pneumonia developing in healthy children and adults, or in debilitated or dissipated persons. II. Pneumonia developing after anaesthesia or surgical operations. III. The terminal pneumonia of old hospital patients, a form more often recognized in the dead-house than in the wards. IV. Cases admitted with the sequelae or complications of pneumonia; and V. Cases admitted as pneumonia, but which prove to be some other disease.

At the beginning of the session, when the first pneumonia case is shown at the clinic, the recorder or secretary of the Committee of the previous year summarizes for the class the experience of the past session. I give here the analysis of the cases studied by the third and fourth year students for the session of 1897-98, which was read by Mr. J. W. Ladd on Nov. 5th, 1898.

"GROUP I. In this there were 23 cases, developing in adults or children; 19 of these occurred in apparently healthy persons, 4 in heavy drinkers. Seven of the cases died, a mortality of 30.4 per cent. Several of these cases were of very great interest, one particularly, a young girl, who has come back today on purpose to show herself. She was aged 13, and was admitted March 22nd, with acute rheumatic fever of three days duration. She had had an attack three years previously. On admission the right upper lobe was involved; subsequently the lower lobe became involved, and also the left upper lobe became consolidated, and on the fifth day in hospital there was pericarditis. For days she was desperately ill, and to add to her troubles, following the pneumonia there was a pleural

effusion on the right side. She probably, too, had endocarditis."

"*Case XIX* was also of very special interest on account of the very extensive involvement of both lungs. In succession the whole of the right lung and the lower lobe of the left were attacked. The patient made a good recovery."

"**GROUP II.** Pneumonia developing after injury, anaesthesia or surgical operation was represented by only two cases, *XVIII* and *XXVI*.

In *Case XVIII* the patient was 59 years of age and was admitted March 4th, with strangulated hernia. Two cans of ether were used at the operation, which lasted forty-eight minutes. The etherization was of one hour and thirty-one minutes duration. Two days after operation an extensive double pneumonia developed, of which he died on the third day."

"*Case XXVI*, admitted on the gynaecological side with inguinal hernia and tumor of the bowel. Anaesthesia one hour and thirty-two minutes duration. Two cans and a half of ether were used. The operation lasted fifty-three minutes. On the third day the temperature was 104°; the right lower lobe was involved. The patient recovered satisfactorily."

"**GROUP III.** Three cases. This particularly interesting and common form is usually overlooked in the wards, and not recognized until the autopsy."

"*Case XVII*, a colored man, aged 53, was admitted Oct. 19th, with aortic insufficiency. He remained in the ward through the winter, grew progressively worse, had jaundice, and a pleural effusion. At the autopsy there was also a pneumonia of the lower lobe of the right lung, which had not been made out clinically, and of which he had not presented any symptoms."

"*Case XXIII*, an old woman brought in moribund was found at autopsy to have pneumonia and pericarditis.

"*Case XXVIII* was also brought in in a condition of extreme debility with acute nephritis, pneumonia and a general pneumonococcus septicaemia."

GROUP IV presented but one case of interest. Case I, following the disease, had an acute nephritis and left the hospital against advice with the symptoms of this condition well marked."

"GROUP V had no representative last session.

Among features of interest may be mentioned the following:

*Age.* Four cases were under sixteen years, the youngest, *Case XIII*, a child of two. There were fifteen cases between the ages of twenty and fifty; 9 cases were over fifty; there were 2 patients in the sixty-eighth year."

*Month of onset.* There is a progressive increase through the winter in the number of cases admitted month by month, until in February or March the maximum is reached. Last year ten cases were admitted in March, double the number admitted in any other month."

*Region involved.* The right lower lobe was involved in 18 cases, the left lower lobe in 8, the right upper lobe in 17, the left upper lobe in 3; the lobes on both sides were affected (double pneumonia) in 6 cases.

"Three of the cases had previously had pneumonia."

*Leucocytosis.* The highest leucocytosis was 50,000 per ccm., the lowest 10,200. The average leucocytosis of the cases that recovered was 23,476 per ccm., the average of the cases dying 26,111 per ccm. This is rather opposed to the general opinion that the fatal cases have as a rule a low leucocytosis. The alcoholic cases last session had very high leucocyte counts, which raised the average materially."

"The highest temperature in any individual cases was 107°; the highest number of respiration per minute was 76."

*Complications.* Compared with typhoid fever, pneumonia is a disease with comparatively few serious complications and sequelae. One case left the hospital with acute nephritis. Seven cases had during the disease acute febrile nephritis, indicated by albumin, numerous tube casts, sometimes blood corpuscles in the urine. This state was transient and disappeared in each case. Three cases had slight jaundice. Pericarditis

was present in three cases; one, the little girl just shown the class, had a severe attack with a great deal of pain. She, too, in all probability had endocarditis. Only one case had pleural effusion. Eight of the cases presented marked nervous symptoms. One patient was quite maniacal at the onset, and one had a convulsion during the pneumonia."

"*Mortality.* Of the 23 cases of ordinary pneumonia 7 died, a mortality of 30.4 per cent. Five of these were practically moribund on admission. One of the ether pneumonia cases died, and the three terminal pneumonias, none of which would probably have come into the records of pneumonia if the diagnosis had not been made post-mortem."

Presented in this way the student gets a very practical, concrete idea of the disease, pneumonia. There are few general hospitals in the country, with which medical schools are connected, to which a smaller number than 25 cases of the disease are admitted during the session, so that a student should be able to glean information from at least fifty cases during his third and fourth years. Thus the class of 1898 had presented to them the data of 32 cases in their third year, and 29 cases in their fourth year.

I would also like to make a plea for the more careful study of pneumonia in private practice. Upon young men just starting I would urge particularly to take careful notes of their cases, and to study each individual patient intelligently. Experience in any disease is not a measure of the number of cases seen; it is not a matter of mere accretion, of the adding of fact to fact,—this is knowledge. True experience brings more than knowledge; it brings wisdom, and this is a question of personal mental development. A knowledge of pneumonia may be gained from books and from the dead-house; the physician must gain clinical wisdom,—the fruit of intelligent study and observation of the patient himself.\*

\*In his well known lines Cowper expresses this difference very clearly:

"Knowledge and wisdom, far from being one,  
Have oftimes no connection. Knowledge dwells  
In heads replete with thoughts of other men;  
Wisdom in minds attentive to their own.  
Knowledge is proud that he has learned so much;  
Wisdom is humble that he knows no more."

In connection with the clinic it is well to have for reference the important literature on this disease. Every student should read Laennec's chapter on peri-pneumonia. The English and American editions of his works are easily to be procured. The following works are among the most important: The monographs of Grissolle (1841), of Sturges and Coupland (second edition), and of Finkler (1891); S. H. Dickson's essay in his *Studies in Pathology and Therapeutics* (1867); and the articles in the recent Systems, Charecot & Bouchard's *Traite*, Allbutt's System, Nothnagel's *Handbuch*, and Juergensen's article in Penzoldt and Stintzing's *Handbuch*. The series of papers by Edward E. Wells, (*Journal American Medical Association*, 1892, 1893-1894) of Chicago, on the various aspects of the disease are also very valuable and contain exhaustive references to the literature.

No. 133

# THE PROBLEM OF TYPHOID FEVER IN THE UNITED STATES

BY

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An Address delivered before the  
Medical Society of the State of  
New York, February 1st, 1899

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## The Problem of Typhoid Fever in the United States.

WHAT I am about to say on the subject of typhoid fever may appear to many of you trite and stale; and so <sup>The triteness of the subject.</sup> indeed it is, but under the circumstances the very staleness is a warrant for repetition, the triteness makes earnest reiteration a necessity. Nor do I forget that only two years ago a most interesting discussion on typhoid fever was held under the auspices of this Society, a discussion which brought out many important practical points. Since then the country has had a very bitter lesson—not a more bitter one than it has had year by year as each autumn recurs, but the method of application, coming as a sad conclusion to a brilliant victory, aroused a degree of public feeling which may be taken as an augury of hope.

### I.

For three generations the physicians of the country have <sup>The labors of American Physicians.</sup> been studying the problems of the continued autumnal fever. No other disease has possessed such a perennial interest; of no other acute disease can we read so full a history from American sources alone. With no other disease are associated the names of men still honored as our great leaders. The physicians of the first generation, to 1830, lived in a period <sup>In the first.</sup> of transition, when old theoretic conceptions were giving way to proper methods of observation. It is particularly interesting to see typhoid fever as depicted by one of the best of them, by one who in thirty-five years practised medicine extensively in every New England State but Rhode Island. I re-read at intervals Nathan Smith's *Practical Essay on*

*Typhous Fever*, published in 1824, each time with increasing respect for his sagacity. There is more strong, sane sense in his booklet of 85 pages than in anything that had appeared on "the slow nervous fever" since Huxham. It is most refreshing to turn from contemporary treatises on fever in English, French and German to this clinical masterpiece. Happy the patients who fell into the hands of the old founder of Dartmouth Medical School and the first Professor of Medicine at Yale! With but little modification his section on treatment might be transferred to one of our year books as the freshest and the best.

in the second,

The men of the second generation did notable work in bringing new methods of observation, and in clearly outlining the differences between typhus and typhoid fever. They came to the problem splendidly equipped, inspired by their great teacher, Louis, whose practical mind appealed with peculiar force to the young Americans who studied with him between 1828 and 1845. Among them Elisha Bartlett, James Jackson, Jr., W. W. Gerhard, George C. Shattuck and Alfred Stillé were chiefly instrumental in promoting in this country the study of fever. To appreciate their position one has but to read W. W. Gerhard's masterly contributions, and Bartlett on Typhus and Typhoid Fevers, the first edition of which was published in 1842—a treatise which might be put into the hands of a student to-day for the main features of the morbid anatomy and symptoms of these diseases. The contrast between the modern stand taken at that date by leaders of medical thought in this country and in Europe, particularly in England, is shown by the fact that Sir William Jenner, recently dead, had to attack the problem anew in 1849-50, before English physicians could be convinced of the essential distinctions between typhoid and typhus fever. In acknowledging the work of others he particularly mentions the names of Gerhard, Shattuck and Bartlett, as men who had already done what he was about to attempt. And I should like to remind you that one of the best contributions to the subject, Austin Flint's *Clinical Reports on Continued Fever*, was the

outcome of a Committee appointed by this Society nearly fifty years ago.

I shall not allude to the labors of the men of our own <sup>and in the third generation.</sup> generation. The care and zeal with which typhoid fever has been studied during the past thirty years by the physicians of this country has been beyond all praise. I wish to emphasize as strongly as it is possible to do in words that we, as a profession, have been persistently alive to its importance. This I feel is necessary to affirm, as I have heard the suggestion from a lay quarter that perhaps if we had studied the disease more thoroughly there would be less of it in the country.

## II.

To bring into stronger relief the contrast which I wish <sup>The extraordinary progress of our knowledge,</sup> to draw, bear with me for a few minutes while I review a few familiar points. One of the great facts in the history of the past half century has been the remarkable increase in our knowledge of the infectious diseases. In any general survey of this group there is perhaps no single member of it upon which we physicians can dwell with greater pride and satisfaction than upon typhoid fever. In every relation the growth of our knowledge has been extraordinary. The etiology <sup>in etiology,</sup> has been so worked out as to justify the hope that the remaining gaps will soon be filled. Think for a moment of the laboratory work of the past twenty-five years! Our position to-day is the result of the combined labors of thousands of workers in Europe and in this country—labors carried out with a devotion and zeal for which we general practitioners (I say nothing of the public) are not always properly appreciative.

I need not dwell upon any special points in the morbid anatomy, or indeed upon the symptomatology, <sup>in symptomatology,</sup> in both of which we have progressed chiefly in a very much wider recognition of the clinical and anatomical features of the disease.

The diagnosis has been simplified, partly by the accurate <sup>in diagnosis,</sup> differentiation of it from typhus fever (which has almost

totally disappeared), partly by the discovery of the parasite of malarial fever, but still more by the grouping of well recognized symptoms, and by certain special methods for the detection of the bacilli or of the reaction of their products.

in treatment: And most important of all for the individual patient, our enlightenment on the question of treatment has been full, I will not say conclusive, in all directions. Nursing and diet are universally recognized as the most essential elements, and we have abandoned, in great part at least, the active measures of our grandfathers, bleeding, vomiting and purging. The death rate has been lowered eight or ten per cent. It is not an easy matter, however, to get the average physician out of the drug habit in typhoid fever. The words of that wise old man, Nathan Smith, should still carry weight: "It does not follow, of course, that the disease in all cases requires remedies, or that a patient should necessarily take medicines because he has the disease."

but greatest  
of all in meas-  
ures of preven-  
tion.

But these advances, as we call them, sink into insignificance before the triumphs of sanitation in the prevention of the disease. Sixty years of sanitary reform have swept away typhus and cholera, and have restricted yellow fever within narrow areas; we have learned how to fight tuberculosis and diphtheria, and in a hundred other ways the prevalence of the infectious disorders has been lessened. One demonstration stands out in clear relief above all others—*with a clean soil and pure water typhoid fever disappears*. In cities which stood at the head of the list in mortality from the disease, as Munich and Vienna, the death rate has dropped to the lowest known percentage after the introduction of drainage and a good water supply. The object lesson of some of the continental cities has been paralleled in a few, but far too few, of the cities of this country. Figures in illustration and black diagrams have done duty at our societies, until many of the members squirm at the very name of Munich. That imperfect drainage and a polluted water supply mean a high mortality rate from typhoid fever is the very alphabet of sanitary science. In scores of

Typhoid fever  
the sanitary in-  
dex in a com-  
munity.

instances carelessness in one or other of these points has led to widespread epidemics; incessant vigilance is universally recognized as the price of safety. I need not dwell further upon this aspect of the question, but I repeat, Mr. President, that we can point with justifiable pride to typhoid fever as the best understood, the most carefully studied of the acute infections, the one most directly under our control, the one in which the greatest victories of hygiene have been won.

### III.

Let us turn from this picture with its glowing colors to a more sombre canvas. Last autumn this nation, in the moment of victory, had a rude awakening, a sudden conviction, a hard lesson. A voice like that heard in Ramah went up throughout the land—'lamentation and weeping and great mourning.' From Montauk Point to San Francisco, from Minneapolis to Tampa, Rachels were weeping for their lads, cut off by a cruel disease. The most bloodless campaign in history was followed by a relatively greater mortality from disease than in any recent war, and chiefly from this very disease over which I have been chanting the peans of the triumph of our profession. To us these autumnal dirges rang no new tune; we had heard the same in the palace of the rich, in the crowded tenement, in the hospital ward, in peaceful New England valleys, in the settler's shanty of the far West, in the lumberman's shack, in the mining camp. Year by year we had listened to the Rachels of this land weeping for their fair sons and fairer daughters, not killed by any pestilence that walked in darkness, but by a preventable sickness that destroyed in the noon-day—the noon-day of the intelligence of a civilized people. People asked each other, what did it all mean? Nothing more than a slight extension of the judgment upon criminal neglect of sanitary laws. The number of soldiers who died of typhoid fever during and after the war was a bagatelle in comparison with the total annual deaths from the disease in this typhoid-stricken country.

The bitter cry  
of the autumn of  
1898.

Not a new one  
to us!

The disease, a public pest. Throughout the length and breadth of the land typhoid fever prevails so extensively in township and county, in village and city, that any large body of men aggregated together was almost certain to become infected.

This is a nation of contradictions and paradoxes. A clean people, by whom personal hygiene is carefully cultivated, displays in matters of public sanitation a carelessness which is simply criminal. A sensible people, among whom education is more widely diffused than in any other country in the world, supinely acquiesces in conditions shameful beyond expression. I do not propose to weary you with statistics, of which our Journals and Reports are full, but I will refer to a few facts drawn at random from three cities and three States, illustrating this shocking neglect.

A few facts.—

(a), from cities;  
Philadelphia.

Philadelphia, the most typical American city of the Union, presents to-day a state of appalling apathy. For years the diluted sewage of the Schuylkill Valley has furnished drink to its best citizens, who bathe for many days of the year in water resembling a thin pea-soup. Individually the Philadelphian seems to be—nay, he is—an intelligent being, who deplures sincerely this condition. Collectively such a community must be regarded as lacking in one of the most essential features of civilization. Last week (ending January 28th) there were 40 deaths from typhoid fever in the city, and 427 cases reported! Last year it is estimated that there were between 5,000 and 6,000 cases of typhoid fever, 600+ of which were fatal. A writer in the Philadelphia Medical Journal last week estimates the annual money loss from this disease at a million and a half dollars.

Baltimore.

In Baltimore we are a little better off, though typhoid fever prevails extensively, and more than two hundred people die of it annually. The city is unsewered, with 80,000 cess-pools, and has a water supply with unprotected sources. With proper sanitary measures the present death rate of between 40 and 50 per 100,000 of the population should fall to 10 or 12.

The condition of the National Capital is an excellent sanitary index of the whole country, and illustrates, too, how persistently those in power neglect the repeated warnings of the medical profession. One might have supposed that in Washington, governed by a Commission under direct control of the central government, and to a large extent free from the influence of politics, sanitary measures, which are everywhere recognized as essential, would be carried out. For years the Medical Society of the District of Columbia has agitated the subject, and Committees have urged upon the Commissioners certain much needed reforms, particularly relating to the purification of the Potomac water, which is practically the only source of supply. A Committee, of which Dr. George W. Johnston was Chairman, reported recently that for the past seventeen years there has been an annual average of nearly 1,500 cases of typhoid fever.

Washington :

Dr. Smart, of the Army, a leading expert in sanitation, expressed the plain truth when he said the other day that, *in the matter of the purification of the water supply of her large cities, the United States was a generation behind Europe.*

Serious as is this condition in so many of the large cities of the Union, it is not, in reality, so dangerous as the widespread extension of the disease throughout the smaller towns and country districts. The last Reports of three important States illustrate this. We gather from the Report of the Board of Health of the State of Indiana that of the ninety-two counties typhoid fever prevailed in all but ten, and from some of these there were no reports. A total of 655 persons died in the Counties of the State from typhoid fever for the year ending September, 1897.

(b), from States;

Indiana,

In your own State the last Annual Report issued (1897) gives the total number of deaths from typhoid fever as 1,585, to which must be added a very large proportion, at least, of the deaths recorded as due to the malarial fevers. If we allow, say, 38 deaths from the various forms of malarial infection in New York State, which I put as a very large figure for the year, this brings the total mortality from

New York,

typhoid fever to 2,000+. It is interesting to note, as bearing out what I said in connection with the wide extent of the disease in the country and smaller towns, that these districts of the State, with a percentage of city population under 50 per cent., have a relatively greater death rate. The Maritime district, for example, with 90 per cent. of city population, has a death rate of only 16+ per 100,000 of population, while the Hudson Valley, with only 40 per cent. of city population, has 37+, and the Mohawk Valley and Southern Tier, with 31 and 30 per cent. respectively of city population, figure with 34 and 37+ deaths per 100,000 of population.

Michigan.

In the organized study of sanitation Michigan is one of the model States of the Union. Dr. Baker's reports upon the prevalence of typhoid fever are of particular interest. In his last, 1897, it is stated that there were in Michigan 642 separate outbreaks of the disease, with 774 deaths, a rate of 23+ per 100,000 living. There were only three counties from which the disease was not reported. It is gratifying, however, to note the gradual reduction of the death rate from typhoid fever in this State during the twenty-nine years available for statistical data. While still far too high, the persistent efforts of the State Board of Health are gradually limiting the ravages of the disease.

#### IV.

Typhoid fever  
a question of  
grave national  
concern.

Mr. President, the problem of typhoid fever, no longer in our hands, has become a question of grave public concern. Can we, as a profession, do more? From the text *Salus populi suprema est lex*, in season and out of season, we have preached sermons which fill huge volumes of State reports, and, as regards typhoid fever, we have preached in vain. Perhaps not wholly in vain, since in many cities, as in Boston, in many states, as in Massachusetts and Michigan, the incidence of the disease has lessened materially; but the existing conditions are proof that we have failed to bring conviction home to the minds of the people. An incidental

advantage of the late war was the direction of public attention to the widespread prevalence of the disease, but it is doubtful if the lesson was bitter enough to enforce at once the teaching that matters of health come within the province of practical politics. It may seem a hard saying, but for the sake of prospective victims in the years to come, let us hope that the deaths from typhoid fever this year in Philadelphia may reach 1,000 and the number of cases 10,000. Then the citizens of that town will stop drinking sewage and will soon be able to wash in clean water. Great epidemics are the only great sanitary reformers, but, except in limited areas, typhoid fever rarely now assumes pandemic proportions. Quite as impressive, though more difficult to teach, is the lesson of its disappearance in large towns, previously hot-beds of infection, by attention to ordinary sanitary laws.

The solution of the problem is easy. What has been done in many parts of Europe can be done here; the practical conviction of the people is all that is necessary. Upon them is the responsibility. Let us meanwhile neither scold nor despair. The good-natured citizens who make up our clientele, pay our bills and vote the straight party ticket, have but little appreciation of scientific questions, and are led as easily (more easily) by a Perkins or a Munyon than by a Lister or a Koch. Under the circumstances it is marvellous that so much has been achieved in fifty years. "The larger sympathy of man with man," which we physicians are called upon to exercise daily in our calling, demands that we continue our efforts—efforts often fruitless in results, but very helpful to ourselves—to educate this foolish public. What is needed seems so easy of accomplishment—the gain would be so enormous! We ask so little—the corresponding benefits are so great! We only demand that the people of this country shall do what Elisha asked of Naaman the Syrian—that they shall wash and be clean—that they shall scour the soil on which they live, and cleanse the water which they drink.

The problem will be solved when, first, *every city in the Union has a supply of pure water (including ice), and is*

The solution  
of the problem—

not 'some  
great thing;'

simply to  
'wash and be  
clean.'

The practical  
needs (a) in  
cities;

(b). in country districts.

*properly drained; secondly, when suburban and rural hygiene is systematically organized.* In many ways a city's danger is from the country. Infected milk, infected ice, infected oysters and dirty health resorts account for a considerable percentage of the cases treated in the towns. Many of the State Boards of Health need a more efficient organization; all need larger annual appropriations. A bureau of public health should form an integral department of each state government, with which civic, county, township, town and village Boards should be in close organic affiliation. The salaries of the Health Officers should be changed from the beggarly pittance, almost the rule, to sums which would warrant a demand on the part of the public that such officials should have modern training in sanitary science. Special courses should be offered in the Medical Schools, as is done in England, and even diplomas given. All this will come when the health of the people is made a question of public, not of party, policy. It is encouraging to note that such states as, for example, Massachusetts and Michigan, in which the Health Boards have the most efficient organization, are those in which the death rate from typhoid fever has been progressively diminishing.

Our duties as physicians.

The responsibility for the wide-spread prevalence of the disease rests directly upon the wanton carelessness of the people. God's own country, with man's own back-yards, and the devil's own cess-pools expresses the existing conditions. A three-fold duty devolves upon the members of our profession; first, to preach cleanliness! cleanliness!! cleanliness!!!; secondly, to give a loyal and willing support to the State Health Officials; and thirdly, to guard every case of typhoid fever as a centre and possible source of further infection.

The awful wantonness of the sacrifice, so unlike that of Nature.

Let us hope, Mr. President, that the lesson of last autumn has been taken to heart by the citizens of this land. Sometimes from our desolation only does a better life begin. Surely the blood penalty has been paid in full for the gross neglect of sanitary laws. The wantonness of the sacrifice is so terrible, so inhuman. Nature is inexorable, and red in

tooth and claw with ravin, knows nothing of our humanitarian care of the individual. But her sacrifice is never wanton. Careful of the type, careless of the single life, sacrifice is a law of being, a condition of existence. In one of his delightful lectures on the *Foundations of Zoology* Professor Brooks tells us that of the countless millions of the king of fish which yearly enter the Columbia River seeking the breeding grounds, in the stern impulse of propagation, none return. "The whole race is wiped out, utterly exterminated, as soon as it arrives at maturity and physical perfection, in order that the perpetuation of the species may be assured." Our ways, thank God, are not Nature's. Indulge as we may in speculations on the improvement of the race, in practice we care nothing for the species, only for the individual. Reversing Nature's method, we are careless of the type, careful only of the single life. Year by year unwilling witnesses of an appalling sacrifice, as fruitless as it is astounding, year by year we physicians sit at the bed-sides of thousands upon thousands, chiefly of youths and maids, whose lives are offered up on the altars of Ignorance and Neglect. Walking always in its shadow, compassed always by its sorrows, we learn to look on death with mingled feelings. There is the death that comes with friendly care to the aged, to the chronic invalid, or to the sufferer with some incurable malady. Very different, indeed, is it with typhoid fever. A keen sense of personal defeat in a closely contested battle, the heart-searching dread lest something had been left undone, the pitifulness of the loss, so needless—and as a rule 'in the morn and liquid dew of youth'—the poignant grief of parents and friends, worn by the strain of anxious days and still more anxious nights—these make us feel a death from typhoid fever to be a Delian sacrifice.

The pitifulness of the death from typhoid fever.

For fifty years the profession has uttered its solemn protests, as I do this day; Mr. President, we have done more—we have shown how the sacrifice may be avoided and the victims saved.

AN ACUTE MYXŒDEMATOUS CONDITION, WITH  
TACHYCARDIA, GLYCOSURIA, MELÆNA, MANIA,  
AND DEATH.\*

BY WILLIAM OSLER, M.D.,

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Acute myxœdema may occur as a transient condition in goitre. In 1892, I reported the case of a young man, aged twenty-three, who had a goitre of moderate size, with which was associated for a period of five or six months a myxœdematous condition of the hands and face, which disappeared completely.

In 1893, I was consulted by Mrs. B., aged thirty-seven, who had exophthalmic goitre, and a swollen, myxœdematous state of the subcutaneous tissues of the legs below the knees. They did not pit; it was a brawny induration which had persisted for several months; there was no change in color. There are a good many observations in the literature of the co-existence of the two disorders, or of the development in myxœdema (sometimes following the use of thyroid gland extract) of the phenomena of Graves' disease, or vice versa. A brief summary of the recorded cases is found in Möbius' monograph in "Nothnagel's Specielle Pathologie und Therapie" (Vol. XXII, 1896).

The cases of Sollier<sup>1</sup> illustrate the usual sequence. A woman, aged thirty-one, seen first in March, 1891, had had

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\*Read at the twenty-fourth annual meeting of the American Neurological Association, May, 1898.

<sup>1</sup>Sollier: *Revue de Méd.*, 1891.

exophthalmos in January, 1890, without enlargement of the thyroid, but with much nervousness, pallor, tachycardia, and well-marked tremor. There was in addition a very pronounced myxœdematous swelling of the face, neck, and extremities, and supraclavicular fossæ. The thyroid gland was not enlarged, but seemed rather atrophied. In the second case, a woman, aged thirty-nine, who had had a good deal of mental worry and trouble, presented all the characteristic features of Graves' disease without goitre. The lobes of the gland could not be felt. The earliest symptoms were associated with rheumatic pains in the limbs and a transient œdema. There was much disability, and she was treated for chronic rheumatism. When admitted she presented the characteristic features of advanced myxœdema with enormous infiltration of the subcutaneous tissues. There was slight exophthalmos; pulse 110 to 120, and well-marked tremor.

I can find no description of a group of symptoms similar to that presented in the following record.

February 25, 1897. I saw to-day with Dr. Ellis, of Elkton, Mr. P., aged 31, an assistant freight manager on a western railroad.

*Family history.* There was no special tendency to nervous troubles. His father had been a dissipated man; his mother was living and well.

*Personal history.* He had enjoyed excellent health; had been very vigorous and strong. He was a man of exemplary habits; had not had syphilis, and had not been addicted to drink. He had been a very hard worker, and had been promoted rapidly to a very responsible position. He was married in 1892. He was a man of medium height, about five feet, eight, and his usual weight was 145 pounds. A photograph taken three or four years ago showed rather a thin-faced man.

*Present illness.* In October, 1896, his wife noticed that he was increasing rapidly in size, and before Christmas he had to get a completely new outfit of underclothes and outer garments. His weight, which as stated, was about 145 pounds, increased by January 1, 1897, to 182 pounds. He got very large in the abdomen, so much so that he suspected that he had dropsy, and in December remarkable scars appeared in the skin of the flanks. He felt pretty well and was able to attend to his work. His color was good, but every one remarked on the extraordinary increase in his size, and a personal friend asked him if he had been drinking, as he looked so bloated. He was at this time overworked, and his wife states that he became rather sleepless and irritable, and his usual disposition became changed. On and off, between

October and January, he had attacks of diarrhœa; the stools were sometimes dark colored, and he thinks there was blood in them. The movements were sometimes large and came on very abruptly, and once he had an almost involuntary evacuation. It is not altogether clear, however, that he actually at this time did pass blood. After the New Year he did not feel so well, complained of a good deal of prostration and weakness, and once he fell on the sidewalk from weakness. He kept at work, however, until February 5, when his friends insisted that he should go away for a change. He evidently could not at this time have felt very seriously ill, for he had a great deal of heavy business on hand, and worked up to three hours before leaving. He went to Florida, and while there became very much worse. He grew restless, wandered about a great deal, was sleepless, and got very "queer in his head." His wife said that he had certain delusions, said very funny things, and had an idea that people were troubling him. He said once that he would be all right "if he could get rid of these people." His skin had been very dry and harsh, and sometime in January, a red rash appeared on the upper part of the chest. In Florida he became so much worse, that he decided to return at once to Elkton, where his people lived. He arrived there on the 13th, and Dr. Ellis, who had known him from boyhood, states that he never was more shocked in his life than to see his condition. He was bloated; the face was almost purple, and he looked like a man who had been on a debauch for a month. He thought too that his eyes were a little prominent.

When I saw him on February 25, the patient was in bed, where he had remained since the 13th. He had improved in some ways, and Dr. Ellis thought his face had become very much less swollen. His mind had become perfectly clear, and he had no delusions. The features looked very heavy and bloated and congested; the lips were red, the cheeks flushed; the eyes looked a little prominent, the conjunctivæ were injected and watery. The eyelids covered the whites of the eyes; there was no Graefe's sign, no retraction of the lids, and the power of convergence was unimpaired. The tongue was slightly furred; the gums were natural looking. The neck looked thick and brawny; the supraclavicular pads were large and the lower part of the sternal notch was obliterated. Pulsation was noted in the carotids. The neck was flat in front, no prominence in the region of the thyroid, and the gland could not be felt.

On inspection of the thorax the skin looked congested and reddened in the upper part of the sternum, and there were the brownish scars of a rash in the upper part of the front of the chest.

The abdomen was full and large, and the skin presented in crescentic lines on either side in the flanks and in the iliac regions the most extraordinary atrophic lineæ, six on either side, the largest one extending in a curved line from near the tip of the tenth costal cartilage to within an inch of the spine of the pubes. It was fully three-fourths of an inch in breadth at its widest part. All were curved, and presented a purplish red color. The thighs and legs were large, but symmetrical. The skin looked everywhere dry, particularly on the backs of the hands and on the feet, and in the former situation looked infiltrated. While he was bloated and puffy, the general appearance was not at all that of a case of myxœdema.

There was not the slightest pallor or muddy hue of the skin. On palpation there was nowhere any tumor. The skin felt infiltrated and firm, and had to be picked up in large pieces, particularly over the backs of the hands and over the cheeks, everywhere a very solid infiltration. Over the manubrium and the lower cervical regions the infiltration was particularly marked.

The thyroid gland could not be well felt. If anything it was diminished in size. There was no enlargement in any of the groups of lymphatic glands.

When he arrived in Elkton, Dr. Ellis noticed the rapid action of the heart, and since then the pulse rate had not been under 120. The heart sounds were clear; there was no bruit at the base. The apex beat could be seen and felt a little outside the mammillary line. There seemed a little increase in the transverse area of dullness. Percussion over the manubrium was clear. The spleen was not enlarged. It was difficult to make a careful palpation of the liver. It was thought at first that perhaps the left lobe was enlarged, but on subsequent examination I think it was perhaps the serrations of the left rectus. Percussion gave no increase in the area of liver dullness.

The appetite had been good, and he had had no nausea, no vomiting.

After arriving in Elkton he had had on several occasions passages of blood, sometimes it was rather watery, no clots. He had sometimes as many as three and four stools in the day.

A special feature was the increasing weakness. Getting out of bed prostrated him very much, and he even had difficulty in sitting up, he felt so weak. There was a slight fine tremor of the fingers when the hands were held out, but I could not be certain that it was more than might be expected in a man who had become feeble and weak. There seemed no disturbance of sensation anywhere. The knee-jerks were present. From the time of his arrival in Elkton there had been

no sign of any mental disturbance. He seemed at times a little dull and apathetic, but the delusions had disappeared. He passed rather more urine than normal, but it contained neither albumin nor casts. His temperature was normal; during October and November his wife said that he constantly complained of feeling hot and flushed.

As I had seen this patient only at night, I visited him on March 1, in order to see the condition by daylight. The congested appearance of the face, the flushing of the skin of the chest on exposure, and the rapid pulse were very striking. On the other hand he had become apathetic and stolid. The eyes could scarcely be called prominent. The face looked very full and congested. The pulse had become more rapid, was 132 to 136, and occasionally dropped a beat. He had been sleeping very well at night, and he remained quite rational. Dr. Ellis thought that the weakness had increased considerably. He could no longer get up to use the commode. He had one involuntary passage. He had passed nearly eighty ounces of urine within fifteen or sixteen hours. The examination of it showed: deep yellow color, clear, no apparent precipitate; acid; 1.029; very large quantity of albumin; sugar present, reduces Fehling's and Mylander's solutions; polariscope, rays rotated to right indicating 2.5 per cent.; only a few finely granular casts, and a few squamous epithelial cells. There were still three or four stools in the day, usually thin and blood stained.

In a letter from Dr. Ellis, March 3, he states that the polyuria had persisted. The temperature had risen suddenly and had kept between  $103^{\circ}$  and  $103.5^{\circ}$ . He had become active, even violently, delirious. The pulse continued with undiminished, indeed increasing, frequency. There was still blood in the stools. The most remarkable feature was the rapid diminution of the infiltration of the skin.

March 4. I saw the patient this morning. Dr. Ellis tells me that he began the thyroid extract on Monday, and continued it until Tuesday night, when the maniacal symptoms developed. He took in all twenty-five grains. Last night he had a combination of chloral and sulfonal and was much quieter, slept five or six hours. Throughout Tuesday night and the greater part of Wednesday he was in a very excited condition, using shocking language and making attempts to get out of bed, which he was really too weak to effect. The change in the patient since I saw him on Monday was very remarkable. He had become much thinner. The bloated infiltrated condition of the skin of the face and neck and upper part of the chest had lessened very greatly. There was not the same bloated aspect about the eyes, and the conjunctivæ

were not reddened. The abdomen, too, looked smaller, and there was evidently less infiltration about the legs and arms and hands. The skin was everywhere very dry and rough. He still looked flushed about the face and neck.

The pulse was between 140 and 145, regular, and of rather better volume than yesterday. The heart impulse was forcible, outside the nipple in fifth interspace. The pupils were of medium size, reacted to light.

The mental condition was peculiar. He seemed to recognize me. He was quiet most of the time; then would do odd things, as blowing three or four times forcibly, and frequently stretching out his hands to grasp imaginary objects, or he would ask some foolish irrelevant question. He was quite docile, and took food from Dr. Ellis; with the others he was a little obstinate. There was no jactitation and the tremor was very slightly perceptible. The diarrhoea had stopped for nearly thirty-six hours. The urine had been passed involuntarily. Examination of a sample by Dr. Fitcher showed the following: Specific gravity, 1.023, large amount of albumin, moderate number of fine and coarsely granular casts, and five per cent. of sugar.

On March 7, I received a note from Dr. Ellis, stating that the patient died of exhaustion that morning at nine o'clock. The active delirium never recurred. An autopsy could not be obtained.

Briefly summarized, a healthy man, weighing 145 pounds, rapidly increased in weight during three months to 182 pounds, the features became full and bloated, and the abdomen enlarged so rapidly that it split the corium in the inguinal regions in wide crescentic lines. Attacks of diarrhoea and marked irritability of temper were the only additional symptoms of moment. On February 5 he went South, and in Florida became extremely restless and had delusions. He returned to Elkton on February 13. From this date to March 7, the day of his death, his illness may be divided into two periods. To about March 1 the infiltrated, bloated condition persisted, his mind was clear, the pulse rate was not above 120, he had slight diarrhoea, sometimes with bloody stools. From March 1, coincident with the administration of the thyroid gland extract, he rapidly diminished in weight, and by the 4th he had lost in great part the bloated, infiltrated appearance. The tachycardia was more marked, he had become excited and delirious, and he had developed since March 1 an intense glycosuria.

The clinical picture presented by this case does not conform to any one disease, but presents certain combinations of myxœdema with exophthalmic goitre. In the cases recorded

in the literature, so far as I can ascertain, the myxœdema has followed the symptoms of exophthalmic goitre at a variable period of months or years. This patient presented first the features of an acute, rapidly developing myxœdema. The increase in weight within three months was remarkable, but his appearance when I saw him first was not that of ordinary myxœdema. He had the bloated, swollen appearance of a stout man who had been drinking heavily. During the last part of his life the symptoms were those which we see in the toxæmia of acute exophthalmic goitre, viz, the tachycardia, the slight tremor, the delirium and the diarrhœa. When I saw him there was no evidence of exophthalmos, though Dr. Ellis thought that on his return to Elkton the eyes were a little prominent.

It seems most rational to suppose that in this case there was a perversion of the function of the thyroid gland, resulting in a toxæmia, which presented some of the features of myxœdema and some of Graves' disease.

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THE CLINICAL FEATURES OF SPORADIC TRICHINOSIS.

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OCCURRING in the form of an extensive outbreak following a *fest*, no disease is more readily recognized than trichinosis, as in the epidemics at Hadersleben and Emmersleben, in which several hundred persons were attacked. In the smaller, more common family outbreaks, as they may be termed, the diagnosis is rarely in doubt. The difficulty really arises in the sporadic cases, a very large proportion of which are overlooked. Clinically, in hospitals and in private practice, trichinosis is an exceedingly rare disease, and yet in post-mortem and anatomical work the number of subjects in which calcified trichinæ are found is by no means inconsiderable. My own experience in this matter illustrates this. When a student at the Toronto School of Medicine, in 1868, I found two subjects with calcified trichina cysts, from one of which I reared in rabbits the adult worms. I found them in six subjects in the post-mortem-room of the Montreal General Hospital. I saw them in two at the post-mortem room of the Philadelphia Hospital, and the other day Dr. F. A. Packard reminded me of a case in which we had found them in the dead-house at the hospital of the University of Pennsylvania. In all of these eleven cases the trichinæ were widely spread throughout the muscles, and during the invasion the subjects must have had a very serious illness. Dr. Flexner tells me that among the first 1000 autopsies in my colleague Welch's department of the Johns Hopkins Hospital there were three cases.

Until quite recently I have had no clinical experience with the disease, having seen (to recognize) but one case in Traube's clinic in Berlin, in 1873. The probability is, of course, that in a hospital service of more than twenty years I have frequently overlooked cases, just as might have been done in three or four of the cases here reported. Within the past two years and a half five cases have been in my wards—one in March, 1896; two admitted during 1897, and two during the present year, 1898. I propose to take up the clinical features presented by them, and to gather, if possible, some facts which may perhaps enable us in the future to recognize this disease more readily. As a preliminary I would like to give an abstract of the history of the first case in which it was recognized that in man the trichinæ produced a severe and fatal disease. Before 1860 the presence of the parasites in the muscles was regarded as an anatomical curiosity. The report is by

Professor Zenker (*Virchow's Archiv*, Bd. xviii.), the well-known pathologist, at present in Erlangen, at that time in Dresden. A girl, aged twenty years, was admitted to the City Hospital, Dresden, on January 12, 1860. She had been ailing from about Christmas time, and about the New Year had to go to bed. She complained of debility, sleeplessness, loss of appetite, constipation, fever, and thirst. At first the fever was very intense, and the abdomen was distended and painful. Although there was no enlargement of the spleen, and rose spots were not present, the diagnosis of typhoid fever was made. Very soon there developed throughout the entire muscular system extreme pain, particularly in the extremities, so that the patient complained day and night. The arms and legs were held bent at the elbow and knee-joints, and could not be extended without the greatest pain. An edematous swelling of the legs was present. Later a low typhoid pneumonia appeared; the patient became profoundly apathetic, and died on January 27th. The autopsy was performed the next day, and Professor Zenker says: "One can judge of my astonishment when I, in the first microscopical preparation made, saw at a glance dozens of non-encapsulated, free trichinæ in the parenchyma of the muscles." Further investigation showed the muscles to be swarming with the worms. There was no involvement of the Peyer's glands. In this case Zenker determined two other very interesting points, namely, the presence of the living adult trichinæ in the intestines, and he also found muscle-trichinæ in the flesh of the animal a portion of which the girl had eaten on December 21st. The publication of this classical case, in March, 1860, aroused the greatest interest; and clinically the discovery may be said to be the most important helminthological contribution of the century.

It was very soon determined that the disease was a very serious one, particularly in countries such as North Germany, in which the habit prevailed of eating swine flesh in a raw or only partially cooked state. The dread lest the disease should be carried by American pork has been the cause of no little friction between this country and Germany, though a few years ago Carl Fraenkel stated that it was very doubtful if any case of trichinosis had been caused in Germany by American pork. There is very little question, however, that in this country the hog is more frequently infected with trichinæ than in Germany. That the disease is much less common is owing altogether to the habits of the people, only a small number of whom eat pork in a raw or partially cooked state. In the hospital wards I fear we see cases without recognizing their nature.

The following is the abstract of the histories of the cases:

CASE I.—Robert T., an Englishman, aged twenty-eight years, admitted March 3, 1896, complaining of pains in the body and fever. There was nothing special in his family or personal history.

The patient had been out of work for three months, during which time he had been in Waterbury, Conn., New York, and Philadelphia. He had been in Baltimore for two weeks, had been a good deal exposed, and had had insufficient food.

*Present Illness.* For six or seven weeks he has had vague pains in the muscles of the legs, which felt tired and as though they had a ton weight, as he expressed it, attached to them. He had no diarrhoea or vomiting, except on one occasion, when he vomited after he had eaten something that had disagreed with him. For two weeks he had been much worse, had a very full feeling in his head; he had no chill, no cough. He had walked about each day, but had felt that he was getting weaker, and this morning on coming to the hospital had to be assisted.

On admission the temperature was 102°, pulse 104, respirations 24. He was a well-nourished, medium-sized man; lips and mucous membrane pale, tongue heavily coated. There were tenderness and hyperaesthesia everywhere, and the patient groaned when any motion was made. The heart's action was rather forcible, and he had an apex systolic murmur. The spleen was not palpable. The abdomen was tender; there was gurgling in the right iliac fossa. On the following day the diazo reaction was found to be present in the urine. The temperature rose in the night to 104.5°, and we regarded the case as one of typhoid fever. For the next four days his temperature ranged from 102° to 104°; the tongue was very heavily furred. The spleen could not be felt, and there were no rose spots. He complained only of muscular pains.

A very careful examination of the blood was made on March 5th. The leucocytes were 17,000. A differential count by T. R. Brown, the clinical clerk, gave a percentage of polynuclears, 55; transitional, 1; mononuclears, 4; lymphocytes, 3; and eosinophiles, 37.

On March 7th Dr. Thayer noted that the patient complained of general soreness and tenderness, also soreness in the gluteal region on pressure. The spleen was not palpable; there were no rose spots. The diazo reaction persisted. On March 9th the patient looked very dull and heavy, and the tongue was dry and coated. The pulse was 96, tension rather low. The patient still complained very much of pains in his muscles and in various parts, particularly in the right arm on pressing the biceps. He also flinched on pressing the muscles of the legs and thighs. Up to this time we had regarded the case as probably one of typhoid fever. There was no oedema of the eyelids.

On the 10th and 11th the temperature was lower, and reached normal. The soreness, however, persisted, and on the 12th at noon Dr. Parsons excised a piece of the biceps muscle of the left arm, in the most tender region. Numbers of trichinae were found in the examination of the fresh teased muscle.

From this date on the patient did remarkably well, and the fever subsided, though until the 23d there were still slight daily elevations. He presented at no time any oedema of the face or eyelids, but after he got up, at the beginning of April, he had swelling of the ankles for several days. He remained in the hospital through April and until the 13th of May. He improved progressively, but walking about a great deal tired him. The study of his blood by T. R. Brown to

the date of his discharge is given fully in his paper.<sup>1</sup> The eosinophilia persisted, and on the day of his discharge the percentage was 16.8.

CASE II.—Emile B., aged twenty-nine years, a sailor, of German nationality, admitted April 15, 1897, complaining of chills and fever, muscular pains, and weakness. The patient had been on a steamer sailing between Baltimore and Cuba.

*Present Illness.* He dated his illness from the first week in April. It set in gradually with loss of appetite, muscular weakness, and uneasy, painful sensations in the abdomen. He had headache for the first time on April 9th, which continued until admission. The bowels were regular until the day of admission, when he had two liquid stools. On the 10th he noticed a rather sudden oedema of the eyelids and face, which caused him some discomfort and some pain on opening and closing the eyelids. Since the 11th there had been pain in the muscles of the back, in the calves of the legs, and, while eating, in the muscles of the jaws. He thinks he had fever, and he had shaking chills at intervals. On shipboard the patient ate mostly salted meats, but had frequently eaten raw sausages, but never raw ham. His temperature on admission was 103°, and rose by 8 p.m. to 105.5°. The pulse was 120, slightly dirotic.

The patient was a very well-developed man, with good color. The upper eyelids looked a trifle redder than the face and were a little swollen; no oedema elsewhere. On opening and closing the mouth he had slight pain and stiffness at the angles of the jaws; no pain on pressure in the muscles of the calves or in the arms. He drew a deep breath without pain. The spleen was palpable. There were two slightly suggestive rose spots seen. There was no glandular enlargement. On the morning following admission his temperature dropped to normal, and, as he had just come from Cuba, malaria was naturally suspected, and the blood was examined with great care, but was negative. On the day of his admission the blood showed 13,000 leucocytes per c.mm.; red blood-corpuscles 5,000,000 per c.mm. A differential count of the leucocytes by Dr. Fletcher showed 44 per cent. of eosinophiles.

On the 16th, 17th, and 18th the temperature was typically intermittent, rising each day to about 105° and sinking to normal, or, as on the 19th, to subnormal. We were still very suspicious of malaria, but repeated examinations of the blood by Dr. Thayer showed it to be without parasites or pigment. The differential count of the leucocytes by Dr. Fletcher showed 42 per cent. of eosinophiles. On the 18th the spleen puncture was made with negative results so far as parasites were concerned. There was no Widal reaction.

After the 20th the temperature did not rise above 102°, and on the 24th fell to normal. He had very little pain in the muscles after the first few days in the hospital, and we were in considerable doubt as to the nature of the case. The persistent increase in the eosinophiles suggested trichinosis, and the stools were examined with great care, but no parasites were found.

On the 21st Dr. Young excised a portion of the muscle, in which the trichine were found by Dr. T. R. Brown, who in his paper on the condition of the blood in trichinosis deals very fully with the blood condition in this patient also.

<sup>1</sup> Journal of Experimental Medicine, 1898, vol. iii.



After the 24th there was no further fever, and he made a very satisfactory convalescence. He left the hospital on May 18th.

One interesting point which may be mentioned in his case was the low morning temperature which he had for weeks. For several hours each morning it was between  $96^{\circ}$  and  $97^{\circ}$ .

CASE III.—John H. Y., aged forty-seven years, a German, admitted December 31, 1897, complaining of headache, pain in the left side, chilly sensations, and swelling of the feet. He had been in the hospital in July of 1897 with typhoid fever—a moderately severe attack. The blood on his second admission gave the Widal reaction.

The patient lived with his German employer, and frequently had eaten sausages and other forms of pork insufficiently cooked.

*Present Illness.* Five weeks ago he began to have frontal headache and cough. It followed exposure and a thorough drenching. He does not think that he had fever. His work required him to be up at 3 A.M., and for the past five weeks he has had a coughing spell each day just after rising. He also vomited, which gave him some relief. He had not had any bleeding from the nose, nor chills. Five days before admission he had diarrhoea, four or five stools daily, associated with griping pains in the abdomen. For two or three days after this he noticed pain and numbness in the legs, feet, and arms, and the skin on these parts felt tight and cold. About the same time he noticed stiffness of the knees and elbows and other joints, and he thought that his legs and feet and arms were a little swollen. His employer called attention to the fact that his eyelids were swollen. He evidently could not have been very ill, for he kept at work until the day before admission. He had, however, to be helped to the hospital.

On admission the patient looked well nourished; the eyes were suffused, reddened, and the eyelids puffy. The temperature was  $102.5^{\circ}$ , the pulse 112, respirations 32. The abdomen was a little swollen, but not tender. There were no rose spots. The spleen could not be felt.

On the 22d the temperature ranged between  $100^{\circ}$  and  $103^{\circ}$ . He complained of pains in the arms and legs, which were particularly severe at night. There was slight tension of the skin, as if the muscles were swollen.

Shortly after admission the blood, examined by Dr. Gwyn, was negative for malarial parasites, but there was a great increase in leucocytes, 34,000; eosinophiles, 45 per cent.

I saw this patient at the ward class, and there were two or three points about the case which impressed me very much; in the first place, the puffiness of the eyelids and the suffused, puffy condition of his face. The hands were quite cyanotic and looked a little swollen. He made a fist with difficulty. The muscles of the forearm were quite tender and looked a little swollen, and in places there was a slight erythema of the skin. This was especially the case in the bicipites, which were very sore. The feet were livid; the legs were very stiff on attempting movement. The muscles of the calves were not specially tender. The stools were examined with care, but were negative. The following day the muscular sensitiveness had diminished considerably. I made a careful examination of the individual muscle-groups without finding any extreme sensitiveness. The stools were examined, and the eggs of the common *ascaris* were present in considerable numbers, but no trichinae. He had a purge the evening before. On the 23d a small

piece of muscle was removed. The urine contained neither albumin nor sugar; there was no diazo reaction.

The temperature fell to normal on the 24th, and for the next week there was an occasional rise to 100°. After January 2d the temperature remained low. For days it did not reach 98°, and the morning record was sometimes 96°. By the 24th the blueness of the hands and feet had disappeared; there was still a little puffiness of the forearms. Following the purge he had some diarrhoea, which, however, was checked by the 25th.

In the hardened specimen of the muscle the parasites were found in the early stage of development. The differential count of the leucocytes by Dr. Gwyn showed a maximum of eosinophiles on January 10th of 50 per cent. The range was constantly above 40 per cent.; and on his discharge, January 16th, quite well, the leucocytes were 8000 and the eosinophiles 48.3 per cent.

CASE IV.—John L., an American, aged thirteen years, admitted August 4, 1898, complaining of headache. There was nothing special in his family or personal history.

He had always been a very healthy boy; is a huckster by occupation.

*Present Illness.* He began to feel badly on Saturday, July 30th. On the following day he had bleeding at the nose. The headache continued through Monday and Tuesday. On Saturday he also had pains in his legs. His bowels had moved regularly; he had had no chills and no vomiting or nausea. He complained of nothing but the headache and the pains in his legs.

On admission he was a healthy looking boy, with good color. He had a rather dull facial expression. The tongue was coated. The eyelids were somewhat swollen. The temperature was 100°, pulse 108, respirations 28. There was no swelling or tenderness of the abdomen, no rose spots; the spleen was not palpable. On the following day he seemed much better; the temperature was only 100°; he had a very dull, heavy expression, suggestive of typhoid fever. The tongue was thickly coated. The edge of the spleen was readily to be felt below the left costal margin. There were no rose spots. There was a good deal of gurgling in the right iliac fossa. The Widal reaction was not present. There was no diazo-reaction in the urine. He had no diarrhoea.

For the first week in hospital there was really nothing to attract attention about this case. It looked like a mild case of typhoid.

On August 8th, however, it was determined that he had a marked leucocytosis, above 18,000, and this rather excited the attention of Dr. Thayer, as it is so rarely met with in this disease. A differential count showed that 48 per cent. of the leucocytes were eosinophiles. A more careful examination was then made of the muscular system of the boy, but nothing further was elicited; there was no tenderness, no swelling.

On August 11th a piece was excised from the muscles of the right calf. Dr. Brown had found from previous experience that if only a small piece of the muscle was taken it was safer to harden it and make serial sections for the examination of the worms. This was done, and trichine were found in it.

On August 13th a differential count of 300 leucocytes gave polynuclears 43 per cent.; small mononuclears, 7.3; transitionals, 1.7; eosinophiles, 48. The boy was discharged August 20th, feeling quite well.

CASE V.—Herman W., a German, aged twenty-seven years, was admitted Wednesday, November 9, 1898, complaining of thirst, heaviness of the limbs, and pain in the chest. There was nothing in his family history of special moment.

*Personal History.* He had been singularly free from illnesses; had been a temperate and very healthy man. During August of this year he had an attack of nausea and vomiting; no diarrhoea. He drinks very little milk, eats no oysters, and says he has been in the habit of eating raw and smoked pork, having used it on several occasions just before the onset of present illness.

*Present Illness.* Ten days ago, about October 30th, he began to have headache, which has persisted. He has also had alternate chilly and warm sensations, which would come on several times each day. He had some pain in the chest, with cough, and a feeling of heaviness and aching in the bones. On two occasions he had slight bleeding from the nose. During the first five or six days of his illness he vomited a good deal. He says that for a week he had no movements from the bowels; lately he has been irregular; has had no diarrhoea, but has had some soreness in the abdomen.

When admitted he looked like a healthy, well-nourished man, rather pale, and he was perspiring profusely. The temperature was  $101.5^{\circ}$ , and rose in the evening to  $104^{\circ}$ . The pulse was 100, full, bounding, and dicrotic; respirations 20. There was no glandular enlargement. There was slight puffiness of the eyelids in the early morning. The superficial glands seemed slightly enlarged, not tender. Examination of the heart and lungs showed no special changes. The abdomen was natural looking, on palpation everywhere soft, slight tenderness in the region of the navel. There were no rose spots. The spleen was not palpable.

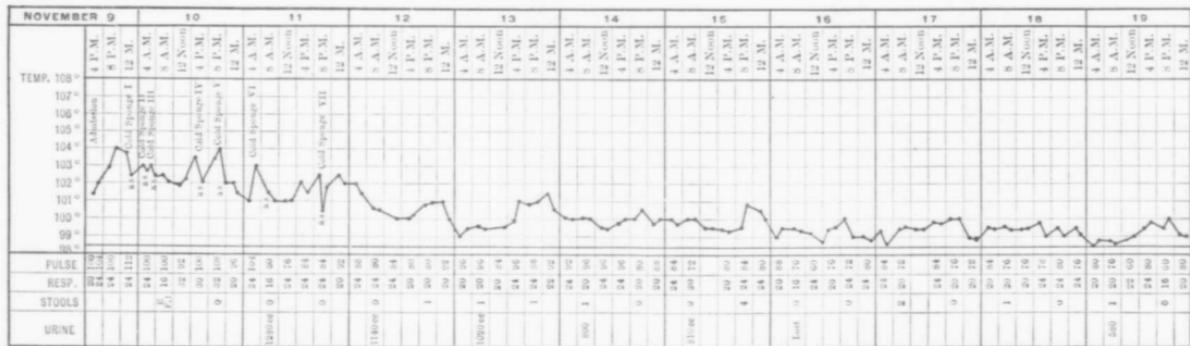
On November 10th he looked rather dull and heavy. The temperature ranged between  $102^{\circ}$  and  $104^{\circ}$ . The Widal reaction was not present. The blood examination was negative for malarial parasites. On examination of the fresh specimen, Dr. Gwyn noticed an enormous increase in the eosinophiles. This, with our previous experience, at once called attention to the possible nature of the case. Then, on careful testing, it was noted that he had slight tenderness of the calf muscles.

November 11th the temperature ranged between  $101^{\circ}$  and  $103^{\circ}$ . The tongue was moist, with a thick coat. The abdomen was not distended, nowhere tender. At the left costal margin in the nipple line there was a slight reddening of the skin over an area about 3.5 by 2.5 cm. The spleen was not palpable. The patient complained of some stiffness of the legs, and there was slight tenderness on pressure in the calf muscles. There was no diarrhoea. He had perspired at night very profusely.

On November 12th there was still slight edema of the upper eyelids, and on pressure the muscles of the arms and forearms, the pectorals, and those of the calves of the legs were quite sensitive, and he complained of a more or less constant pain in them. I noted on the 12th a slight swelling of the thyroid. The differential counts gave a leucocytosis on different occasions of from 14,000 to 17,000 per c.mm., and the eosinophiles from 22 to 36 per cent.

On the 13th and 14th he had loose, fluid stools, which were very carefully examined for adult trichinae, with negative results. On

CHART II. CASE V.



November 14th a piece of the right gastrocnemius muscle was removed for examination.

On the 16th a note by Dr. Fitcher reads: "Puffiness of eyelids not quite so marked. There is still considerable tenderness complained of. The temperature has been falling since the 11th, and for the past two days has ranged between 99° and 100°. There are no rose spots. The spleen is just palpable at the costal margin on deep inspiration. There is marked pallor of the face; lips and conjunctiva are slightly anaemic." From this time on, the patient made very good progress. The temperature became normal on the 20th, and there have been slight elevations since to 100°. There has been slight tenderness of the muscles. The stools have been examined repeatedly, but have been negative for parasites; but on the 18th there were rather numerous Chareot-Leyden crystals.

On November 21st he complained of a good deal of stiffness of the legs.

On November 26th the prepared sections of the piece of muscle were ready for examination, and parasites were demonstrated in the specimens, in one section as many as four or five found. On December 14th, after the patient had been up and about for three weeks and had gained in weight and in color, the leucocytes were still about 20,000 per c.mm., and of them the eosinophiles were more than 60 per cent.

The symptoms in a case of sporadic trichinosis may be quite as distinctive as when a whole series of cases occur in rapid succession in a household or in a community. But this is not always so, and the remarkable discrepancy between the clinical and anatomical experience shows that we must frequently overlook the disease. The special interest of the small series of cases here reported rests with the fact that, while all were of moderate severity, the diagnosis was suggested by the blood examination and confirmed in each case by examinations of the muscle.

The clinical features of the disease are conveniently grouped into those associated with growth and development of the parasites in the intestines and those which follow the migration of the young brood into the muscles.

*Gastro-intestinal Symptoms.* Several days elapse after the ingestion of the trichinous pork before the larval muscle trichinae reach their sexual maturity, and two or three days before the female gives birth to the embryos. During this period the patient frequently has severe symptoms—nausea, vomiting, and diarrhoea, with colicky pains in the abdomen. In large epidemics there have been a few cases in which the disease assumed a choleraic type.

The gastro-intestinal features of the five cases may be briefly summarized:

In Case I. there was no nausea or vomiting to speak of; no diarrhoea. Headache at onset and general diffuse pains in the joints, bones, and muscles were the chief complaints.

In Case II, there were loss of appetite, uneasy sensations in the abdomen, no nausea or vomiting, and the bowels were quite regular until the day of admission. He had headache, but not severely.

In Case III, the first complaint was of headache and cough. He vomited once, and for five days before admission he had diarrhoea, with griping pains in the abdomen. There were pains in the legs and arms and stiffness in the joints.

In Case IV, headache was an early and persistent symptom; he also had epistaxis; the bowels were regular; he had neither nausea nor vomiting; pains in the limbs were present.

In Case V, the patient vomited a good deal at the onset of the illness. He was constipated for a week, had no diarrhoea, but had slight soreness in the abdomen.

Practically, then, in these five cases the gastro-intestinal symptoms were not marked at the onset. In only one were they at all severe. This is in striking contrast to the records given in the epidemics of the disease, in which, as Niemeyer states, "the absence of intestinal symptoms, as well as of the severe attacks of vomiting and purging, is exceptional."

*Symptoms of Invasion.* Pains in the joints, bones, and muscles. All of the patients complained of irregular pains in the muscles and joints and back at the onset of the disease, more particularly of pains in the legs or of general heaviness in the limbs, and aching in the bones. These symptoms may be not more than those usually associated with an acute infection, and they are different from the pains subsequently complained of, which are confined more particularly to the muscles.

Of all the symptoms of invasion, fever is the one which is most apt to lead to error in diagnosis in the sporadic cases. This, with the accompanying phenomena of rapid pulse, headache, stupor, and general symptoms of serious illness, suggests to the physician the diagnosis of typhoid fever, as was the case in Zenker's patient. According to Strümpell, the temperature may for a time reach  $104^{\circ}$  or  $106^{\circ}$ , but the fever is seldom continuous for any length of time, being usually interrupted by frequent and considerable intermissions. Niemeyer speaks of the fever as high, with slight morning remissions, and says that it very closely resembles the curve of typhus and other infectious diseases. He states, in addition, that occasionally the temperature curves can scarcely be distinguished from those of typhoid. Eichhorst speaks of the fever as chiefly of the remittent type, simulating very often the curve of typhoid fever.

In Case I, during the first five days in hospital the temperature presented only slight daily remissions. It ranged from  $101.5^{\circ}$  to  $104.5^{\circ}$ ; then on the sixth, seventh, and eighth days it became very irregular, touching

normal or near to it each day. Then for a week there was very slight fever, from  $99^{\circ}$  to  $101^{\circ}$ , after which the temperature remained normal for the greater part of the day, though for three or four weeks there was on some days a slight evening rise to nearly  $100^{\circ}$ . Altogether the temperature-curve in this case resembled very closely that of a mild typhoid fever.

Case II. presented a very remarkable temperature-curve. (See Chart I.) Several writers have referred to the intermittent form of fever in trichinosis, and this patient, as shown in the chart, had very typical paroxysms for the first four days. On the first day the temperature rose to  $105.5^{\circ}$ , and between 8 P.M. on the 15th and 10 A.M. on the 16th had fallen to normal. Then, without a chill, it rose in the afternoon of the 16th to  $105^{\circ}$ , and again dropped with a sweat to  $97.7^{\circ}$  by noon of the 17th. Two similar paroxysms followed on subsequent days. Then there was slight, irregular fever for six days, and the temperature reached normal and remained so. During convalescence he had very low morning temperature for several weeks: sometimes it was  $96^{\circ}$ , more frequently  $97^{\circ}$ . In this case the typically intermittent character of the fever made us at first suspect malaria.

Case III., the patient who really had the most serious local symptoms in the muscles, had a very moderate fever. On the second day after admission it rose to  $103^{\circ}$ ; on the fifth day it touched normal; then there was for three or four days a slight rise to  $100.5^{\circ}$ . Then, after the eighth day in the hospital, the temperature remained normal. He also presented during convalescence persistent low temperature. For days in the four-hourly temperature-chart the fever did not rise above  $97^{\circ}$ .

In Case IV. the fever was very slight. For four days there was a little fever, the temperature ranging to  $100^{\circ}$ ; then it became normal.

Case V. had a fever-range very suggestive of typhoid fever. (Chart II.) Shortly after admission it reached  $104^{\circ}$ , and the diurnal variations for three days were not more than  $2^{\circ}$ , in spite of the spongings, which were carried out under the belief that he had typhoid fever. The temperature, however, did not touch normal until about the tenth day in the hospital, and he then had for three or four days a slight rise to  $100^{\circ}$  before it became quite normal.

The pulse-rate seemed to be dependent more upon the height of the fever.

The respirations were sometimes increased out of proportion to the fever.

In several points the similarity of the disease to typhoid fever is very striking. Of the features of onset, headache, general malaise, and pains in the bones and limbs are very suggestive. It will have been noted that headache was complained of very much by four of the patients.

More suggestive still are the gastro-intestinal symptoms—slight diarrhoea and pains—which were severe in only one case of this series.

Epistaxis was noted in Cases IV. and V. Altogether the symptoms of onset in all of the cases here discussed were those which we meet with in typhoid fever. With the exception of Case II., the temperature-curve also resembled typhoid fever. Enlargement of the spleen was met with in three cases, and, with the preliminary features spoken of, tended to confirm the diagnosis of typhoid fever.

Ehrlich's diazo reaction was well marked on admission in three cases, suspicious in one, absent in one on admission, but developed three days later. In one of the cases there were two "suspicious" rose spots.

There are in trichinosis three features of great value in diagnosis. Two of these are well known, and the third has been brought out by a careful study of the blood in these cases.

1. *The Muscular Pains and Swellings.* While in typhoid fever it is by no means uncommon to have aching of the limbs and back, it is exceedingly rare to have special complaint of pain in the muscles themselves. When pronounced, as in Case III., early in a febrile affection, this is one of the most suggestive symptoms of the disease, but it may be slight, as in Cases I., II., and V., and not enough to attract the particular attention of the attending physician, as in Case IV. In a very severe infection the swelling and hardness of the muscles, the extreme pain on pressure, the position of flexion of the arms and legs, without any redness or swelling of the joints themselves, are almost pathognomonic. Early in typhoid fever these pronounced symptoms in the muscular system are never seen. At the height or late in the disease, however, there may be swelling and tenderness of the muscles of the legs and, indeed, of the arms. I have referred to a number of such cases (*Studies in Typhoid Fever*, ii. pp. 399-401), which are probably examples of neuromyositis.

2. *Œdema.* In its most characteristic form this is seen in the eyelids and over the eyebrows, and it is of great value as a symptom, because of its very early appearance in trichinosis and because of its extreme rarity—or, rather, complete absence—in typhoid fever. It was present in characteristic form, however, in four of our cases. In the hands and feet it is more commonly seen late in the disease. An important form is that which occurs over the affected muscles, as in Case III. The œdema, with slight erythema, above the swollen, tender muscles, was very characteristic.

3. *Leucocytosis and Eosinophilia.* So far as I know, the state of the blood in trichinosis has not received any special attention. For several years past Dr. Thayer has been making a careful study of the leucocytes in typhoid fever, so that in Case I., admitted March 3, 1896, when after two days the symptoms were doubtful, a careful blood count was made by Dr. T. R. Brown, at the time one of the clinical

clerks, who found the leucocytes 17,000 per c.mm.—a point in itself almost excluding typhoid fever early in the disease. But, what was much more extraordinary, in making the differential count he noted a great increase of the eosinophiles; instead of a normal 2 per cent. solution there were 37 per cent.—a most remarkable and unusual condition of the blood. Nothing could be added to Dr. Brown's careful and elaborate study of the state of the blood and the changes in the muscles in this disease.<sup>1</sup> The eosinophilia persisted in this case, and the percentage reached, on April 23d, the extraordinarily high figure of 68.2 per cent. On that date there were 17,700 leucocytes, so that more than two-thirds of them were eosinophiles. When the patient left the hospital, on May 12th, the eosinophiles still formed 16 per cent. of the leucocytes.

While it seemed highly probable that the eosinophilia was definitely associated with the acute myositis, subsequent observations could alone determine how far it was of value in diagnosis. The case made, however, a very deep impression upon us all. But in so rare a disease as trichinosis we did not expect for some time to have an opportunity to confirm the observation. Scarcely a year later, however, when Case II. was admitted, with a remarkable intermittent fever without the presence of malarial parasites, and the eosinophiles were found to be on the day of admission 44 per cent. and the following day 67 per cent., we became suspicious of trichinosis, and a portion of muscle was excised and the parasites were found.

Seven months later a third case was admitted—a man who had typhoid fever only six or eight months before. After his admission eosinophilia was determined—48 per cent.—and we were again put upon the scent, and the diagnosis of trichinosis was confirmed by the excision of a portion of muscle.

During the present year, in Cases IV. and V., the blood count, showing an enormous increase in the eosinophiles, was the most important point in the diagnosis, confirmed in each instance by the removal of a portion of muscle. Our experience in these five cases is, I think, of very considerable clinical import. The eosinophilia was pronounced in each case and accompanied by a marked leucocytosis.

There now remains the interesting question whether in other forms of acute infectious myositis the eosinophiles are greatly increased in number. Such cases are extremely rare, much rarer, indeed, than trichinosis, and if eosinophilia does occur with it, the final decision would rest with the examination of the portion of muscle. In the recent monograph, by Lorenz, on diseases of the muscles (Nothnagel's *Handbuch*, 1898, Bd. xi.), the condition of the blood in polymyositis is not

<sup>1</sup> Loc. cit.

referred to except in a case associated with erythema multiforme. The leucocytes were 4900 per c.mm. No mention was made of their varieties. Under cocaine the removal of a portion of muscle is a simple operation; and with the ordinary scalpel, not the harpoon, a small bit can be taken from the biceps, with little or no discomfort to the patient. The special trichina compressor, such as is used in Germany in the pork inspection, may be used; or, if only a small portion of the muscle is excised, it is best, perhaps, to harden and make sections of the entire piece, in which way there is no possibility of overlooking even a single trichina.

Routine blood examinations have added enormously to the work of house physicians and of the clinical clerks. It requires a great deal of time, if done carefully and conscientiously; and when it comes to the question of differential counts of the leucocytes, if the service is at all heavy with acute cases, the added labor is really very serious. Should eosinophilia prove to be, as we believe, an important diagnostic sign of trichinosis, this labor will not have been in vain.

*In Memoriam*  
WILLIAM PEPPER

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BY  
WILLIAM OSLER, M.D.  
Professor of Medicine, Johns Hopkins University

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FROM  
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## IN MEMORIAM—WILLIAM PEPPER.<sup>1</sup>

IN *Rugby Chapel*, that noble poem in memory of his father, Matthew Arnold draws a strong contrast, on the one hand, between the average man, who eddies about, eats and drinks, chatters and loves and hates—and then dies, having striven blindly and achieved nothing; and, on the other, the strong soul tempered with fire, not like the men of the crowd, but fervent, heroic and good, the helper and friend of mankind. Dr. William Pepper, whose loss we mourn to-day, while not a Thomas Arnold, belonged to this group of strong souls, our leaders and masters, the men who make progress possible.

There are two great types of leaders; one, the great reformer, the dreamer of dreams—with aspirations completely in the van of his generation—lives often in wrath and disputations, passes through fiery ordeals, is misunderstood, and too often despised and rejected by his generation. The other, a very different type, is the leader who sees ahead of his generation, but who has the sense to walk and work in it. While not such a potent element in progress, he lives a happier life, and is more likely to see the fulfilment of his plans. Of this latter type the late Professor of Medicine at the University of Pennsylvania was a notable example—the most notable the profession of this country has offered to the world.

### I.

William Pepper began life under conditions which are very often unfavorable to success. His father, a distinguished physician, the professor of medicine in the school in which his son was educated, belonged to a family of position and influence. For the young man there were none of those tempering "blows of circumstance," no evil star with which to grapple and grow strong. Quite as much grit and a much harder climb are needed to reach distinction from the top as from the bottom of the social scale, and to rise superior to

<sup>1</sup> This address was prepared to be delivered at the opening of the session of the Johns Hopkins Medical School, October, 1888; but I was ill at the time.

the *res abundans domi* has taxed to the uttermost many young men in this country. We have heard enough of the self-made men, who are always on top; it is time now to encourage in America the young fellow who is unhappily born "with a silver spoon in his mouth." Like the young man in the Gospels, he is too apt to turn away sorrowfully from the battle of life, and to fritter his energies in Europe, or to go to the devil in a very ungentlemanly manner, or to become the victim of neurasthenia. To such the career I am about to sketch should prove a stimulus and an encouragement.

At the age of 21, in 1864, the year of his father's death, Pepper graduated from the Medical Department of the University of Pennsylvania, having previously taken the B. A. degree. What now were the influences which sent this youngster bounding up the ladder three rungs at a time? In the first place, the elder Pepper was a clinical physician of exceptional abilities; but more than this, intellectually he was a son of the great Louis, one of that band of much loved American students, whom Louis sent to their homes with high ideals, with good methods of work, and with a devoted admiration of their chief. The talk at home while young Pepper was a medical student must often have been of the old teacher, of his ways and works, of his noble character and of his loving heart. The father's mental attitude had been moulded finally by Louis, and the son's early work shows deep traces of the same influence. Indeed all through life the clinical manner and habits of thought of the younger Pepper were much more French than English or German. In this respect he differed widely from his contemporaries who became dominated by the Vienna and Berlin Schools. Dr. Pepper, Sr., died a few months after his son's graduation, leaving him a moderate competency, and the example of a life devoted to all that was highest in our profession. It is interesting to note that the two diseases portrayed most skillfully by Louis, typhoid-fever and phthisis, were those which both the elder and the younger Pepper studied with special ardor.

For more than a century the Pennsylvania Hospital has been the nursing mother—the *pia mater*—of the kings of the clinic in Philadelphia, but in the long list of medical officers

given in Morton's history of that institution you can find no young man who made his connection with the hospital so immediately productive as William Pepper. To it I attribute the second potent factor in his rapid professional development. In the summer following his graduation he served temporarily as apothecary. In 1865 he was elected one of the resident physicians, and had as a colleague his friend, Edward Rhoads. On the completion of his service he was appointed pathologist to the Hospital and curator of the Museum, positions which he held for four years. He immediately threw all his energies into the study of morbid anatomy, and in 1868 was appointed lecturer on the subject in the University. Making autopsies, working in the Museum, studying tumors and microscopic specimens, his time could not have been more fortunately spent, for in these early years he thus obtained a knowledge of morbid anatomy which stood him in good stead when time became more precious and engagements numerous. Throughout his entire career this work lent accuracy and firmness to his diagnosis. He never forgot the value of morbid anatomy, nor the debt which he owed to it. I have known few practitioners more keen (or more successful) in obtaining permission for autopsies. Very often he would send an especially interesting specimen to my laboratory, knowing that I would gladly get it ready for his clinic. Quite early in my association with him I saw that he had served an apprenticeship in the dead-house. He could come into the clinic and pick up a heart which he had never seen, but only felt and heard, and go at once to the seat of the disease.

The descriptive catalogue of the Pathological Museum at the Pennsylvania Hospital was issued in 1869, and while a large portion was from the pen of Dr. Morton, every page bears witness to the careful and thorough manner with which Dr. Pepper had worked over the specimens. The early volumes of the Transactions of the Pathological Society attest his zeal in this study.

As the third powerful element in his progress I place his association with Dr. John Forsyth Meigs, in the revision of the well-known work, *The Diseases of Children*. The third edition had appeared in 1858. The fourth edition, by Meigs and Pepper, was practically a new work. Dr. Meigs was an

exceedingly busy man, and the bulk of the revision fell to his junior. The descriptions of disease were admirable, the pathology well up to date, and the authors broke away in a remarkable manner from many of the traditions and routines of old-time practice. If you compare Meigs and Pepper of 1870 with the third edition, or with the contemporary books on the same subject, you will see what a radical work it was for that date. To one section of the edition we may turn with special interest, namely, to diseases of the caecum and appendix. Nowhere in literature, I believe, before 1870, is the importance of the appendix so fully recognized, or is there so good a description of the results of perforation. One cannot but regret that no edition of this work appeared after the sixth, in 1877. The experience gained by Pepper, while still a very young man, in the preparation of this work, was of incalculable value. It familiarized him with the literature, gave him an insight into the art of book-making, brought him into close personal contact with a man with remarkable medical instincts, and altogether was a circumstance which, I think, may be justly regarded as one of the three most powerful influences during the formative period of his career. Indeed, in many quarters Dr. William Pepper, Jr., as he used to be called, really never got the credit for the association with Meigs in the work on *Diseases of Children*. For years I had the impression that it was his father who was the joint author of the work; and even quite recently, since Dr. Pepper's death, I heard a man well versed in medical literature and interested in diseases of children, express great surprise that the Pepper of Meigs and Pepper was the late Provost of the University.

In 1870 *The Philadelphia Medical Times* was started, but the health of Edward Rhoads, who had been selected as editor, had failed so rapidly that the opening of the new enterprise was entrusted to his friend, William Pepper, who brought out the first twelve numbers of the journal, and then transferred the editorship to the late James H. Hutchinson. I have glanced over Vol. I, to glean indications of Pepper's early work. Among five or six contributions two are of particular interest, as they indicate the sort of work this young man was doing in clinical medicine. At page 274 is recorded a case of scirrhus of the pylorus with dilatation of the stomach,

an ordinary enough case nowadays, but one which has gone into literature and is often quoted on two counts: first, the accurate study of the peristalsis of the stomach-wall, which was visible, and made the subject of very careful electrical experiment; and, secondly, the practical point of using the stomach-tube, at that date a novel procedure, and, so far as I know, not previously practised in America in cases of the kind. The other contribution, still frequently referred to in the literature, on Progressive Muscular Atrophy of the Pseudo-hypertrophic Type, is one of the most exhaustive contributions to the subject made up to that date, and is a model of accurate clinical and anatomical study.

An advertisement in a supplement to one of the numbers gives us an idea of the sort of work he was doing at this time in teaching. In conjunction with H. C. Wood, Jr., he announces a course of practical medicine at the Philadelphia Hospital, to extend throughout the months of April, May and June. They announce that between them they have 175 patients under their care. Dr. Pepper was to meet the class at 8 A.M. on Tuesday, and Dr. Wood at 9.30 A.M. on Friday.

It seems to me that for so young a man, Pepper had a great deal of good sense to have avoided the pitfalls of medical journalism. He must have seen at an early date that to be successful in it meant practically the sacrifice of everything else.

By the end of December, 1870, young Pepper, then only a little past 27 years of age, already had a well-established reputation as a teacher and worker. I do not know of another instance in the profession in which a man at his time of life had made so favorable a start. From this date on we may divide his life into three periods,—to 1881, when he was appointed Provost of the University, his Provostship, 1881-1894, and the short period since his resignation from that office.

## II.

The decade from 1871-80 demonstrated that a man of men, to use a phrase of Milton's, had arisen in the profession in Philadelphia, a man with both "*geist* and go," one who could not only blow a trumpet-blast loud enough to awaken the slumbering conservatives of his native city, but who

could command a following which enabled him in spite of all opposition to set on foot much-needed reforms. As illustrating his activity during this period, I can allude, and only briefly, to three important pieces of work. The removal of the University to West Philadelphia doubtless made her friends aware of the possibilities of the situation. In the Medical School, then a relatively much more important section, the plans had been organized for well-equipped buildings and laboratories in West Philadelphia. An exceedingly judicious plan, for which I do not know whether Pepper was solely responsible, but one in which he had his whole heart, was the organization of a hospital to be under the control of the faculty and trustees. Blockley was within a stone's throw of the new buildings of the Medical School, and its rich stores of material were available, but it was a very wise and far-seeing scheme which regarded the clinical equipment as an integral part of a medical school which should be under the immediate supervision of the faculty. For many years it was a hard struggle to make both ends meet, and even when I joined the faculty of the University in 1884, the hospital was constantly in need of funds (and much besides). One thing it never lacked, hopefulness on the part of Dr. Pepper, who never for a moment consented to look at the dark side of the picture, always saw a few years ahead, predicted success in the days when the debt was the greatest; and with many other schemes on hand he never let an opportunity slip to forward the interests of that part of the institution which he loved, perhaps, better than any other. In 1881, the Vice-Provost, in an address at the inauguration of Dr. Pepper as Provost, expressed the popular feeling as follows: "To him who has pleaded for mercy to the helpless sick, as a lover would plead his own cause; who, working with other men of goodwill, took by tacit election the headship among them; who has touched with a master hand the springs of influence—to him public esteem has given the wreath as the moral architect of our Hospital." It is gratifying to think that he lived to see it placed on a solid basis of success, with the maternity department splendidly organized, the Pepper Clinical Laboratory, which he himself gave in memory of his father, the centre for high-class work, and the new Nurses' Home and the Agnew Wing in full operation.

Were I asked to name the most satisfactory single piece of work in Dr. Pepper's life, I should say unhesitatingly that which related to the promotion of higher medical education. This little volume<sup>2</sup> contains two addresses, one delivered October 1, 1877, the other October 2, 1893. They represent a forecast and a retrospect. At the time of the removal of the University to West Philadelphia the University Faculty was a strong one, but it contained a number of men who were saturated with old-time prejudices, and who were bitterly opposed to any change in the methods of medical education. Once before, in 1846, the University had made an attempt to elevate the standard of medical education, but unsuccessfully. In 1871, the Harvard Medical Faculty had been taken in hand and reorganized, so that the example had been set, but there was probably no school in the Union in which the outlook for reform was thought to be less hopeful than at the University. The struggle was a hard one; the brunt of it fell upon the young men, more particularly upon Pepper, who was the very head and front of the new movement. The plan of reorganization was not carried without much bitterness; indeed, it looked at one time as though the faculty would split, as Professor Rogers, who did resign, very nearly carried with him several strong colleagues. As Dr. Pepper says in his second address, speaking of the inauguration of the new system in 1877: "We thought, too, alas, of the long and painful controversy, lasting almost five years, over the proposition to again elevate our standard of medical education, and of how the end had been attained only at the cost of old friendships and of the allegiance of valued associates, whose convictions remained unchanged as to the injury that would be worked to the University by the proposed advance." The movement was immediately successful, and the changes then made were but precursors to other more radical advances. It was always a source of great gratification to Pepper to feel that the plans for which he had worked so hard had been crowned with such success. Years hence these two addresses, with their appendices, will be regarded as perhaps the most valuable single contributions to the literature of the phenomenal educational move-

<sup>2</sup> Higher Medical Education; Two Addresses, by Wm. Pepper. Lippincott & Co., 1894.

ment through which we have lived during the latter quarter of this century.

The third event of which I spoke was the organization of the medical department of the Centennial Exposition of 1876. I only mention it as one which gave him an opportunity to demonstrate how strong were his executive abilities.

In 1881 Pepper was elected Provost of the University of Pennsylvania. The feeling was unanimous that he was the man in whose hands the destiny of the institution would at any rate be safe, but no one could have predicted such a decade of development as took place under his management. The material progress is indicated by an increase in the acreage in West Philadelphia, from 15 to 52; the number of students increased from 981 to 2180, and the fees of the students during the same period more than trebled. I do not know that there has been an instance of such remarkable growth in any University in this country, unless it has been in a newly established one, such as the University of Chicago. That the University to-day occupies a position in the very first rank of educational institutions is due to the energy of William Pepper.

Passing without further comment the work of his Provostship, since this has been dwelt upon with great fulness in various obituary notices, I may here refer to several important undertakings during this period. There had never been published in this country a composite work by native writers, corresponding to the System of Medicine by Reynolds or to Ziemssen's Encyclopedia. A circular was issued in November, 1881, to the joint authors, but it was more than three years subsequently before the first volume of the system was issued; the five volumes were then published in rapid succession, the fifth appearing in 1886. While unequal, as all such systems must necessarily be, it remains a great work, and contains articles which have become classical in American literature. It proved to be perhaps the most successful literary venture ever made in this country by a medical publishing company, and it extended widely the reputation of the editor.

For many years those of us whose work lay in the special field of medicine had felt that a society was needed in which

we could meet our fellows in the same line of work. As early as 1881 I had written to Dr. Tyson, shortly after my first visit to Philadelphia, urging the organization of such a body, but it was not until the winter of 1885-86 that the initial steps were taken to form the "Association of American Physicians." I remember well in the preliminary meetings how by tacit consent Dr. Pepper assumed the headship, and in formulating the details and in arranging the final organization his executive abilities made the work very easy.

A few years later a much more difficult scheme was engineered by him to a successful issue in the welding of the various special societies into the Triennial Congress of American Physicians and Surgeons. Much of the success of the first meeting in 1888 was due to the admirable manner in which, as Chairman of the Executive Committee, he shaped the policy of the organization. One astonishing feature in his character was the intense energy and enthusiasm with which he threw himself into these and similar schemes. Letters of suggestion here, of advice in another quarter, conferences, caucuses,—as if, indeed, he had nothing else on his mind, nothing to do but the business on hand. He always appeared at a meeting prepared, knowing exactly what was needed, and, as I have said, taking the headship by tacit consent, the business was "put through" in a way not always seen in gatherings of medical men.

For many years Dr. Pepper had advocated a closer union between the United States and the Latin-American republics, the commercial and intellectual relations of which he maintained should be with this country rather than with Europe. Practical expression to the conviction he gave on organizing the first Pan-American Medical Congress (of which he was President), and in interesting the governments of the South American States in his Commercial Museum.

Though a chief promoter both of the Association of American Physicians and of the Congress of American Physicians and Surgeons, he was a warm advocate of the claims of the National Association, the meetings of which he very often attended, and in the success of which he was deeply interested. Of late years the extraordinary calls upon his time made attendance upon medical societies very difficult, and more than once he has expressed to me his deep regret that

unavoidable engagements either prevented it altogether or made his visits hurried and unsatisfactory.

For some years before his formal resignation of the Provostship, Dr. Pepper had felt that he had done as much as any one man could, and that it was in the interest of the University that he should give way to someone else. It was his hope, I know, to be able to resign at the end of his ten years' service, but circumstances delayed his action until 1894.

But it was not for rest, or for any warning that he was doing too much, that he asked to be relieved from the cares of the University. Other great schemes had been absorbing his energies. For years he had been impressed with the importance of museums and collections. The Wistar Museum of Anatomy had been a source of great satisfaction. In 1891 he undertook the establishment of the Archaeological and Paleontological Museums. The strong personal interest which he took in Archaeology encouraged his friends to hope that he had at last found a hobby which might divert him from more trying duties. He could talk on the outlook in Babylonia, button-holing some local Dives, and impressing him with the needs of their last University expedition, as though he had no other interest in life. To the next man it was of the wonderful "finds" in Florida or Peru, and of their great importance in the history of the early races of this continent. It was extraordinary how he could warm up in talking of these and allied subjects, and his quick, receptive mind and retentive memory enabled him to grasp the important points in the problems to be attacked.

For a quarter of a century he devoted his marvellous energies to the University of Pennsylvania, believing that in serving her he could best serve his city and State. The last years of his life were given to promote the material and intellectual welfare of his native town. The success of the museum schemes gave courage to his ambition, and he began the organization of the Commercial and Economic Museum, of which he was president at the time of his death. His desire was to see about the University of Pennsylvania a great group of museums which would not only illustrate the past and present history of man in all his relations, but which would reflect the commercial and economic aspect of

his present activities, and particularly one in which the raw and manufactured products of the world would be represented, a place in which the business man of Pennsylvania could be put in touch with producer or consumer in any country. An immense scheme, involving millions of dollars, it has advanced to a stage in which not only is success assured, but in which people are beginning to appreciate what a boon has been bestowed on a great manufacturing city.

And then, as if such a colossal enterprise were not sufficient to keep him busy, he undertook the organization of a Free Library for Philadelphia. It was no doubt through his influence that his uncle had given a quarter of a million dollars for the purpose. This library was very near to his heart, and its remarkable success in so short a time was, he has told me, a source of the keenest pride. Not long before his death he secured a bequest of a million dollars for a public art-gallery.

From this hurried sketch you may get an idea of the ceaseless energy and activity of his life, but it would be very incomplete without some specific reference to his work as a practising physician. The medical profession in every country has produced men of affairs of the first rank, men who have risen high in the councils of nations, but with scarcely an exception the practice of medicine has not been compatible with such duties. So absorbing are the cares of the general practitioner or the successful consultant, that he has but little time to mingle in outside affairs, and the few who enter public life do so with many backward glances at the consulting-room, and with well-grounded forebodings of disaster to professional work. But Dr. Pepper maintained to the end the closest relations with the profession, both as a consultant and a teacher. To me one of the most remarkable features of his life is the conscientiousness with which he attended to a large and exacting practice. That amid such multifarious cares and duties he should have been able to maintain an undiminished activity in his calling is perhaps the greatest tribute to his genius. As a teacher his forte was in the amphitheatre, where he displayed precision in diagnosis, great lucidity in the presentation of a complicated case, and a judicious and thorough knowledge of the resources of our art.

Naturally, as he became more and more involved in outside affairs, he became less able to contribute important papers to medical literature, but a glance through the files of the *American Journal of the Medical Sciences*, and the *Transactions of the Association of American Physicians* show during the past ten years a large number of very valuable contributions, many of them in collaboration with younger men. The journal literature of the same period is full of more ephemeral contributions in the form of clinical lectures.

I have already referred to several important early contributions. Among others of special importance I may mention his studies on pernicious anemia, the first made, I believe, by any physician in this country, and his contributions to Addison's disease. In tuberculosis he always took a very warm interest. For many years he was supposed to be a victim of pulmonary tuberculosis, and indeed the autopsy showed that he had a healed patch of the disease in one lung. In lectures and in numerous general articles he dwelt upon the great importance of the disease. One of his most interesting contributions was on the local treatment of cavities in the lungs. He also made an extensive investigation into the subject of pulmonary tuberculosis in the State of Pennsylvania. Diseases of the stomach and intestines were always favorite subjects of study. His papers on appendicitis were of special value, particularly those upon the relapsing form of the disease. His work on pulmonary tuberculosis early led him to make careful inquiries into the climate of different sections of the country, and few members of the profession had a more accurate knowledge of the subject. He was a strong believer in the value of the mineral springs of this country, and some years ago, with Dr. Daland, he collected an enormous amount of material which was the basis for his Report on the Mineral Springs of America. In 1893 he edited the *American Text-Book of Medicine*, which had a large sale, and served to keep his name prominently before the profession.

### III.

As a man the late Provost formed a most interesting study, and as I had such a warm appreciation of his character, I may, in the privilege of friendship, say a few words of a more personal nature.

I remember as though it were yesterday the occasion of our first meeting in 1881. I had come to Philadelphia to look over the museums and hospitals. I was much impressed with his cordiality, the ease of his manner, the freshness and elasticity of his mind. He was just starting to his lecture, and I was delighted to accompany him. For years I had not listened to a clinic so well and so artistically planned, and conducted with such readiness. I did not see him again until I became his colleague. In five years of pleasant fellowship in the Faculty of the University of Pennsylvania I remember to have been seriously vexed with him but once, and that was on account of my present confrère, Howard Kelly. A number of us had backed that Kensington colt—as we called him in those days—I forget for what appointment. I only remember that I was very keen about it at the time. At the last moment Pepper entered a dark horse, who won easily to our great chagrin. To my warm expostulations he listened with great patience, but after about five minutes of that delightful persuasiveness which was so freely at his command, I left him, not only with all bitterness assuaged, but almost sorry that I had not supported his candidate. In Athens he would have been called a sophist, and I do not deny that he could, when the occasion demanded, play old Belial, and make the worse appear the better cause, to perplex and darken maturest counsel—but how artistically he could do it!

His faults? I am not here either to portray or to defend them.

“They say, best men are moulded out of faults;  
And, for the most, become nauch and more the better  
For being a little bad.”

He was human, and to those of a man he added the failings of a college president. To some sedate Philadelphians he seemed a modern Machiavelli, but a man engaged in vast schemes with many clashing interests is sure to be misunderstood, and to arouse sharp hostility in many quarters. The average citizen, if he does not understand, is very apt to dread or to dislike a new Ulysses.

In many ways the American is the modern Greek, particularly in that power of thinking and acting, which was the strongest Hellenic characteristic. Born and bred in one of

the most conservative of cities, surrounded by men who loved the old order, and who hated change, or even the suggestion of it, Pepper displayed from the outset an adaptability and flexibility truly Grecian. He was preeminently a man of felicities and facilities, to use a somewhat flash but most suitable phrase. Matthew Arnold's comment upon the happy and gracious flexibility which was so incarnate in Pericles has often occurred to me in thinking of the character of the late Provost: "Lucidity of thought, clearness and propriety of language, freedom from prejudice, freedom from stiffness, openness of mind, and amiability of manner." There was another Grecian feature which must not be lost sight of. You remember in the *Timeus* how the Egyptian Priest said to Solon: "You Hellenes are never anything but children; there is not an old man among you . . . in mind you are all young." To the very last there was a youthful hopefulness and buoyancy of spirits about Pepper that supported him in many trials and troubles. I never knew him despondent or despairing. If things looked dark, if plans and projects on which his heart were set had miscarried, he met the disappointment with a smile, which robbed it of half its power. The persistency of this buoyant hopefulness often wore out the most obstinate opposition; in fact, it was irresistible. Nor was it the hopefulness which we condemn as visionary, but a resourceful hopefulness, based on confidence in himself, and, most valuable quality of all, capable of inspiring confidence in others.

Nor must I neglect to bear testimony to his inherent kindness of heart. Busy and prosperous, and so much absorbed in large projects and with the care of lives very important in a community, a great physician is apt to slight the calls of the poor and needy, whose lives are of importance only to themselves. Necessarily his contact with such is in the hospital wards. The family physician has not a monopoly of the charity work. The consultant has often to take a share, and with his large and varied associations, Pepper had an unusual number of calls upon his time and sympathy, as well as upon his purse, and to all he responded with a gracious liberality. Only a year or two ago an instance came to my notice which illustrated his kindness. From one of the lower counties of Maryland one of those sad

wrecks which "the little red school-house" is apt to make of women, had been under Pepper's care at the University Hospital. She had improved very much, had been able to return to work, but after a time had again broken down. She had written to him for advice. In reply he urged her to put herself under my care at the Johns Hopkins Hospital, which was much more accessible, and he offered to give her a note of introduction to me. I was much impressed by the kindly tone of the letter, which was written with his own hand (an unusual event of late years with him), and full of consideration and sympathy.

Not endowed, it was supposed, with a very strong constitution, the wonder is that he should have been able to do so much and to live so long. The 'bridle of Theages,' an inherited or acquired delicateness which has often proved in its possessor a blessing to the race, was no checkrein to him; and I have heard him say that he preferred the life of a salmon to that of the turtle. Though premature in one sense, his death came after he had seen fulfilled the desire of his eyes, and to the rich life which he had lived the future could have added but little, though doubtless his restless spirit would have driven him into fresh fields. The reformation of medical education, the reorganization of the University of Pennsylvania, the establishment of a great Commercial Museum and a Free Library—these and a score of minor plans he had either seen completed or well under way. Surely if ever a man could sing a *Nunc Dimittis* it was William Pepper! But as no man liveth, so no man dieth to himself, and we may mourn with those who shared his inner life, and who so generously gave so much of it to us of the profession and to the public. For them we feel his loss to be irreparable, his death to be premature. For them we could have wished an extension of his time to the Psalmist's limit.

I have no desire to criticise the method of his life. Exceptional men cannot be judged by ordinary standards. The stress and strain of thirty years told severely on his arteries, and for two or three years there had been unmistakable warnings in attacks of angina pectoris. He kept at work with vigor unabated until last spring, when he had signs of dilatation of the heart, with bronchitis and dyspnoea. The last time I saw him, in May, I think, he was in bed, improving

rapidly, he said, and very cheerful, talking much of his plans, particularly of the Commercial Museum and of the Library. He spoke of a proposed visit to the Pacific Coast, and of the good it was sure to do him. Then came the sad announcement of his death in California—a shock to all his friends, since, with the discretion which we doctors often exercise, the secret of his serious attacks had been well kept. I may be permitted to quote one or two extracts from a letter from his physician, who was with him at the time: "He died at eight in the evening with a copy of *Treasure Island* in his hands. At seven I had left him gazing upon Mount Diabolo, shadowed in the gathering darkness. I was called at eight and found him in the attitude and with the expression of *angor animi*, from which he never roused. He had suffered a few months before with cardiac dilatation; at the time of his death he was recovering the lost compensation, and appeared on the clear road to recovery. He had said a few days before 'the battle has been won.' Throughout his illness he exhibited the most perfect disposition and the greatest patience and forbearance. . . . The fatal attack was, I think, about the seventh, extending over a period of three years; the last previous attack was in April, at the time he was lecturing upon angina pectoris. He knew that the end must come some day, but he did not expect it so soon. I have never seen so beautiful a nature in sickness; his conduct and disposition were worthy of Marcus Aurelius."

With such a book as *Treasure Island* in his hand, we can imagine that the great Enchanter of the Pacific had filled his mind with the possibilities of peace and quiet (so long denied him)—possibilities turned instantly to realities with the summons to the peace and quiet of an eternal rest. Some lines of the same writer express both the spirit in which William Pepper utilized his time in the service of his fellow-men, and the chief lesson of his life to us who survive:—

"Contend, my soul, for moments and for hours;  
Each is with service pregnant, each reclaimed  
Is as a Kingdom conquered, where to reign."

Sporadic Cretinism (Infantile and Juvenile  
Myxœdema).

BY  
WILLIAM OSLER, M.D.

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# SPORADIC CRETINISM (INFANTILE AND JUVENILE MYXŒDEMA).

By WILLIAM OSLER, M.D.

IN vol. ii. Dr. Bury has discussed the whole subject of cretinism, and has dwelt with particular fulness on the morbid anatomy and general symptomatology. In the eight years which have elapsed since the appearance of his article three points of great interest have been added: (a) a knowledge of the frequency of sporadic cretinism; (b) its relationship to the thyroid gland; and (c), most important of all, a method of successful treatment.

I do not propose to deal with the question of endemic cretinism except in the discussion of its relations to the sporadic form. The recent literature to date is given in Ewald's article in *Nothnagel's Handbuch*, Band xxii. I shall take up only the incidence of the disease in America, the pathology, the relations to endemic cretinism, and the treatment.

## I. INCIDENCE OF THE DISEASE IN AMERICA.

In 1893 I made a collective investigation on the subject of sporadic cretinism, and was able to find only eleven cases. Since that time the profession has learned to recognize the condition, and I have collected sixty cases, including those already referred to. Of these twenty-seven cases have been recorded; for the others I am indebted to various physicians throughout the country who have kindly responded to my inquiries, and in many cases sent photographs.

The clinical summary of the cases is as follows:

*Sex.*—Males, 24; females, 36.

*Age.*—Under two years, 6; from two to five years, 12; five to ten years, 12; ten to fifteen years, 10; fifteen to twenty years, 7; twenty to thirty years, 3; thirty to forty years, 4; over forty years, 4.

*Nationality.*—American, white, 12; colored, 1; Polish, 2; French, 1; German, 5; Swede, 1; Hebrew, 1; Norwegian, 1; Irish, 7; English, 1; Swiss, 2; Bohemian, 1; nationality not given, 23.

*Locality.*—There is no region in the country in which the disease is endemic, nor does it appear to be more prevalent in those districts, as in Michigan and parts of Ontario, where goitre is common.

*Condition of the Thyroid Gland.*—Goitre was present in 7; gland stated to be normal in 12; gland small in 2; gland not to be felt in 16; no note in 20.

## II. THE PATHOLOGY OF SPORADIC CRETINISM.

There are three groups of cases, as noted by Dr. W. Rushton Parker :

(a) *With Absence of the Gland.*—The gland has not developed in fetal life, or becomes completely wasted, so that at autopsy no trace of it is found. The child may be born a cretin, which is excessively rare. In a considerable number of the reports on sporadic cretinism the gland is stated to be absent, but it is almost impossible to judge by palpation if the gland is very small. In one of Hilton Fagge's cases the gland was thought to be absent, but post mortem there was a thyroid gland of some size, with a tumor.

Curling<sup>1</sup> first described the absence of the thyroid in cretinism in the two cases which he reported in 1850.

Bramwell,<sup>2</sup> in a review of the literature in 1892, found ten autopsies, in which in nine cases (in which the condition was noted) the gland was absent. Fletcher Beach states that of one hundred and sixteen cases collected from the literature there were sixteen autopsies, in fourteen of which the gland was absent, while in two goitre existed. In only one case, Dr. Friend's, in the series which I have collected, was absence of the gland noted post mortem.

(b) *With Atrophy of the Gland.*—This is a very important group, to which Fagge appears to have been the first to call attention. He gives the case of "a girl, who was stated by her relations to have been perfectly healthy until she was eight years old, when she fell ill with what was supposed to be a second attack of measles, and kept her bed for a fortnight. After her recovery her physical development underwent a remarkable change. Her features were previously well formed; they now acquired the cretinous configuration. Her hair, once black and abundant, became light-colored, dry, crisp, and very scanty. She ceased to grow; at the age of sixteen and three-quarters years she was only four feet one inch in height."<sup>3</sup> He suggests that the febrile illness led to atrophy of the organ, and that this was the cause of the supervention of the cretinous state. In Case II. in my first series the condition seemed to follow an attack of enteritis. Ashby and Wright<sup>4</sup> give the history of a case said to have been well until an attack of enteric fever at seven years of age.

It is interesting to compare these cases with the remarkable instance of operative myxædema reported by Bruns to the Myxædema Committee of the Clinical Society.<sup>5</sup> The patient at the time of operation was ten years

<sup>1</sup> Transactions of the Royal Medical and Chirurgical Society, vol. xxxiii., 1850.

<sup>2</sup> Atlas of Clinical Medicine, vol. i.

<sup>3</sup> Fagge. Practice of Medicine, vol. i. p. 772.

<sup>4</sup> Diseases of Children, second edition, p. 479.

<sup>5</sup> Clinical Society Transactions, Supplement to, vol. xxi.

old. Eighteen years after he had become "a dwarfy cretin." He had not grown since the removal of the thyroid. The expression was that of an idiot; there was characteristic myxœdema, with a mental apathy amounting almost to imbecility.

The determination of atrophy of the gland during life is very uncertain, as pointed out by Fagge. No trace of the gland may be felt, and yet post mortem a well-marked, perhaps somewhat wasted, organ is found. In the recorded autopsies in sporadic cretinism atrophy has not, so far as I can gather, been found.

Through the kindness of the officers of the Indiana School for Feeble-Minded Children at Fort Wayne, I am enabled to report upon a fatal case in which there was extreme atrophy of the gland. The patient, Louise S. (Case VI. of the series), aged fourteen years, born in America, parents not related, no goitre in the family; nationality, German; height, 110.5 centimetres; circumference of head, 56 centimetres; from occiput to root of nose, 33 centimetres; from external meatus to external meatus, 26.7 centimetres; circumference of neck, 28 centimetres. The skin is loose and flabby, elastic and soft, very abundant. She is a deaf-mute, but appears intelligent. There is no curvature. The thorax is 57.3 centimetres; abdomen, 68.6 centimetres. The limbs seem a little enlarged about the epiphyses. There is no goitre. Dr. Delia Howe has sent a subsequent note that she had no treatment until September, 1895. She was then given the thyroid extract, three grains three times a day. She improved in many respects. The protruding abdomen disappeared, and she became very much brighter mentally. She became ill in March, and died of acute tuberculosis in November, 1896. At the time of her death she was seventeen years old, and her height was 127 centimetres. The thyroid gland weighed 4 grammes. The normal weight of the organ is from 15 to 20 grammes. I am indebted to Dr. Barker, the associate professor of anatomy in Johns Hopkins University, for a careful description of the condition of the gland, which is of special value, since, so far as I can learn, there has been no histological description of the thyroid in sporadic cretinism. The following is an abstract of his report. To the naked eye there was a very marked increase in the connective tissue separating the lobules, and with low power the acini were seen to be separated from one another. The individual acini were almost solid, except that here and there there were single cyst-like dilatations filled with colloid. High powers showed the most marked atrophy of the gland and certain remarkable transformations in the epithelium. A majority of the acini in the individual lobules possess very narrow lumina, which are often encroached upon by papillary projections, or partially filled with proliferated and desquamated cells. Cells lining the acini are so much altered that, not knowing the specimen, one would not recognize them as of the thyroid. The cell bodies vary a great deal in size, from small cells equal in dimension to those of the normal thyroid to large, flat structures, actual giant cells. The nuclei

of the cells show marked alterations, many of them being huge, bladder-like nuclei. In some nuclei the chromatin is disposed peripherally.

The lumina of the acini vary much in size; some of the alveoli possess no lumina at all. In others only a very small central opening is to be seen. Extremely few contain any colloid. A majority are either entirely empty or show inside them only desquamated cells from the alveolar walls. A few cysts from three to six times the size of the normal alveoli are present, lined by flattened thyroid epithelium. Some of them have evidently been formed by the fusion of several acini. The colloid varies in its behavior to van Gieson's stain. In some of the few cysts present it is of a bright-yellow tint; in others it stains of a reddish brown, and is then more refractive. In the connective tissue one or two spaces filled with refractive colloid were found. These probably represent lymph-vessels, but there is no great amount of colloid inside lymph-spaces, nor is any colloid to be seen within the blood-vessels. Dr. Barker remarks that "the findings in this case are in the main confirmatory of those which have previously been made in endemic cretins. The condition is very similar to that which has been reported by de Coulon in endemic cretinism."<sup>1</sup>

(c) *Sporadic Cretinism with Goitre*.—Of the sixty cases collected in this country, seven had goitre. Herein lies a very striking difference between the sporadic and the endemic cretinism. In the latter the percentage of goitre in some statistics has been as high as sixty (Knapp). In Fletcher Beach's collected statistics of one hundred and sixteen sporadic cretins in different countries, the thyroid is noted as "not felt" in seventy-three, "felt" in eleven, and enlarged in seven cases. He states that of sixteen post-mortems of which he has been able to find an account, the thyroid gland was absent in fourteen cases, and there was bronchocele in two.

Figs. 1 and 2 show two cases of goitrous cretins, for the notes of which I am indebted to the description of Dr. Darcy, of Northwood, Iowa, and of Dr. Kessel, of Cresco, Iowa. It is interesting to note that the father's sister had goitre, and a brother of these patients died after an operation for goitre.

### III. THE RELATIONS OF SPORADIC TO ENDEMIC CRETINISM.

When the "cretinoid state," to use Gull's expression, whether developing spontaneously or following thyroidectomy, became recognized as a direct result of the loss of the function of the thyroid gland, it was a simple matter to suggest that true cretinism, both sporadic and endemic, had the same origin. The generic term cretinism may, indeed, be used to cover these four allied states, endemic, sporadic, idiopathic of adults (myxedema), and operative, following total excision of the gland. One and the same pathological basis exists in the entire group,—viz., loss or perversion of the function of the thyroid; the anatomical basis is varied,—total absence,

<sup>1</sup> Virchow's Archiv, February, 1897.

atrophy, or goitre. Kocher<sup>1</sup> in his masterly presentation of the subject takes this wide ground. Without exception, so far as I know, writers have assumed this position, but quite recently this relationship has been questioned by Bircher, a well-known student of endemic cretinism, in an excellent section on the thyroid gland in vol. i. of Lubarsch and Oestertag's "Ergebnisse," etc., 1896. He concludes "that the cretinoid degeneration is in no way connected with disturbance in the function of the thyroid gland." He bases this opinion upon the persistence of the thyroid, cystic and degenerated, it is true, in a large proportion of cases. In twenty cases fifteen had goitre, four had normal thyroid glands, and in one only it could not be felt. In three cases in which he had extirpated the thyroid in cretins and in the non-degenerated parts he had found normal thyroid tissue. Moreover, a cretin from whom he removed the cystic goitre became myxœdematous and was temporarily cured by the implanting of a gland; but, as Hanau and Ewald both remark, this is no evidence that the thyroid has nothing to do with cretinism. It would be very much the same as the development of uræmia in a case of chronic nephritis after bilateral nephrotomy.

Both Curling and Fagge believed the conditions which they described to be identical with endemic cretinism. They further have the great merit of recognizing the loss of function of the thyroid as the probable essential factor in the disease. Curling's title is in itself suggestive, "two cases of absence of the thyroid body, and symmetrical swellings of the fat tissue of the neck, connected with defective cerebral development." In seeking an explanation he speaks of "the absence of those changes which result from the action of the thyroid, or on some imperfection in the assimilating processes consequent on the want of this gland; and the facts here detailed may not be without significance in directing the researches of future inquirers into the use of this body." Fagge held that the presence of the thyroid gland was "protective against the occurrence of cretinism." A similar opinion had been expressed about endemic cretinism in 1830 by Troxler (Kocher).

We may ask, in the first place, are there any essential differences between the sporadic and the endemic form of cretinism? A single definition covers both conditions,—*a chronic affection characterized by disturbance of the growth of the skeleton and soft parts, a remarkable retardation of development, an extraordinary disproportion between the different parts of the body, and a retention of the infantile state, with a corresponding lack of mental progress.* One has only to compare the picture given of cretins in Switzerland with those of the sporadic form both in England and in this country, to see that the two states, so far as external characters go, are identical. The differences between the two forms are as follows:

- (1) The endemic variety develops under local conditions as yet unknown,

<sup>1</sup> Zur Verhütung des Cretinismus und cretinoid Zustände nach neuen Forschungen, Zeitschrift für Chirurgie, Band xxxiv., 1892.

associated with a peculiar poison of doubtful nature. Bircher states that "the cretinoid degeneration is a chronic infectious disease, the organic miasm of which is associated with certain marine deposits of the earth's surface, and which gains access to the body through the drinking-water." It is only of late years that any light has been thrown upon the intimate relation of goitre and cretinism. I have already referred to the opinions of Troxler, Curling, and Fagge, and almost all writers on the endemic form agree with the statement of Morel, that goitre is the first step on the road leading to cretinism. It is possible, however, that changes other than those which lead to goitre may be effective; any condition associated with loss of function of the gland.

(2) The differences in the changes in the bony skeleton. In the endemic cretin a premature ossification of the spheno-basilar bone has been described, and the fontanelles close early. How far these are constant characters remains to be demonstrated. In the sporadic form the fontanelles often remain open for a long period, even until after the tenth year, and there is a greater retardation in the development of the long bones.

(3) The endemic cretin is said not to show the same myxœdematous characters as the sporadic cretin, but the accounts vary in different authors, and the description of the cutaneous condition given by Kocher (whose experience with cretinism has been very large) fits that of the sporadic cretin exactly. Other minor differences are mentioned, such as the shorter life of the sporadic cretin. Ewald,<sup>1</sup> indeed, states that he knows of no instance in which life has been prolonged beyond the thirtieth year, but of the cases which we have collected there were seven beyond the thirtieth year. Another point is the less frequent presence of goitre. The percentage of goitre in endemic cretins has been noted as high as sixty. In the Sardinian Commission there were three thousand nine hundred and twelve instances of goitre in five thousand nine hundred and twenty-three cases. In the collected series of sixty cases there were only seven with goitre. The two cases with goitre (see Figs. 1 and 2) are good examples of goitrous cretins occurring in a family in which goitre was prevalent.

(4) Bircher states that the thyroid extract has no influence upon the endemic cretin, and this he claims illustrates the independence of loss of thyroid function; but I cannot gather that he, or, indeed, anybody else, has systematically tried the thyroid treatment upon young cases. There is some positive evidence. Kraepelin<sup>2</sup> (who holds that in endemic cretinism disease of the thyroid is the first link in the chain, and that the changes in the skin, retardation of growth, and dementia result directly from loss of function of the thyroid) speaks most hopefully of arresting the disease by thyroid feeding if begun early. He adds that even in long-standing cases it has been possible by the thyroëdin to reduce wholly the swelling of the

<sup>1</sup> Nothnagel's *Specielle Pathologie und Therapie*, Bd. xxii.,—the best recent account of cretinism and allied states.

<sup>2</sup> *Psychiatrie*, fifth edition, 1896.

skin, and he has seen the menstrual function restored. The psychical features were not much improved.

Professor Gaule, of Zurich, writes me that he is informed by Kocher that all the cases that are brought to the hospital are treated with the thyroid extract.

Professor Sahli, of Berne, writes, "So far as I know, the observations on operative myxœdema have been confirmed by the thyroid treatment of young cretins." The question is one deserving of the most careful study in the goitre and cretin districts of Europe.

The minor differences between endemic and sporadic cretinism, many of which are still doubtful, cannot for a moment be set against the similarity of the two conditions in almost all points save the local (telluric) influences in the causation of the former, and there remains only the question of the state of the thyroid gland. It is remarkable that in endemic cretinism the observations should be so scanty. Hanau<sup>1</sup> reports three cases, in all of which the thyroid glands showed alterations, being smaller, and in one there was a cyst. The connective tissue was abundant, the alveoli smaller, and in only a few was there the normal colloid. Langhans<sup>2</sup> in one case found the gland enlarged and made up of large alveoli, many of which were empty and only a few filled with refractive colloid. De Coulon,<sup>3</sup> working in Berne, has examined the thyroid gland in four cretins, and in one cretin of bodily aspect but of good mental development, and, after a most thorough histological study, concludes "that the thyroid had not completely degenerated, but the tissue showed changes which indicated that its function was impaired, or, at least, reduced to a very low 'ebb.' The smallness of the alveoli, their disappearance in consequence of the relative increase in the connective tissue, the absence of colloid in the majority of the alveoli and in almost all the lymph vessels, so also the condition of the epithelium and the nuclei, . . . speak in favor of this view." Also the condition of the existing colloid and its reactions suggested, he thought, important chemical changes of a degenerative character.

In the atrophied gland of Case VI, the lesions were identical with those found in one of de Coulon's cases, which still further strengthens the position of those who hold the essential unity of the process. In neither form is the state of the thyroid gland always the same; loss or serious perversion of function is the important factor, and this may follow absence, atrophy, or hypertrophy. There is no fixed stamp or type of cretin; the range is from a mere mass of humanity, without a ray of intelligence, to the high-grade cretin, with but slight bodily and still slighter mental changes; and it is only reasonable to believe that to these grades are correlated varying degrees of thyroid degeneration. Bircher lays great stress upon the presence of normal-looking tissue in the glands which he excised from cretins,

<sup>1</sup> Transactions of the Berlin International Congress.

<sup>2</sup> Virchow's Archiv, Bd. cxxviii.

<sup>3</sup> Ibid., Bd. cxlvii., 1, January, 1897.

but gives no statement of any histological study; nor is the development of myxœdema in one of these cases and of tetany in another inconsistent with the view that the thyroid is the seat of the essential lesion, since the activity of the gland may have been sufficient only to maintain the organism at a certain plane of cretinoid existence.

If the experimental work on the importance of the para-thyroids should be confirmed, the whole question will have to be reviewed from this standpoint.

There are, of course, gaps in our knowledge, but the evidence at present available warrants, I believe, the conclusion that the changes characteristic of cretinism, endemic as well as sporadic, result from *loss of function of the thyroid gland*.

#### IV. DIAGNOSIS.

The number of cases which I have been able to collect indicates that in this country the profession has rapidly learned to recognize sporadic cretinism. It is also evident from statements and from photographs which I have received that there are a number of conditions which are apt to be mistaken for it, and that even men in institution life have not very clear ideas upon the subject. There are several points to which I may refer.

(a) *The recognition of early slight cases.* After the third year the condition is, as a rule, diagnosed at sight, and advanced types offer not the slightest difficulty. The earlier the recognition is made the greater is the prospect of complete recovery. About the eighteenth month the subject may present the aspect of myxœdema rather than of cretinism, and the swollen, waxy skin even suggests Bright's disease. Case I. of the series was supposed to have chronic nephritis. The failure of development, the inability to talk or to walk, and the retarded dentition begin to attract attention as the child reaches this period. The absence of expression, the open mouth, the large tongue, and the drooling suggest that something is wrong. The development may be so slow that a child of three years looks not older than fifteen months. There are possibly cases due to thyroid insufficiency in young infants, which correspond to the *myxœdème fruste* of the French, which may be readily overlooked. To this several writers have recently called attention. Dr. Bury,<sup>1</sup> in the discussion last year at the British Medical Association, states that he saw a baby a year old which had ceased to "get on." It became flabby, fat, lost its vivacity, and began to show a protuberant abdomen, a lax skin, and other cretinoid appearances. Treatment with small doses of the thyroid, one-fourth tabloid daily, speedily picked him up; he grew, became lively, and at the end of six months treatment was discontinued without retrogression. Such cases are probably due to transient, perhaps functional, disturbance of the thyroid. Herrick<sup>2</sup> also in his recent paper refers to the case with which these milder cases may at first be overlooked.

<sup>1</sup> British Medical Journal, 1896, ii. p. 621.

<sup>2</sup> Archives of Pediatrics, April, 1897.

(b) *The diagnosis from other types of idiocy.* Naturally enough, it has been suggested that diminished or perverted function of the thyroid gland might be responsible for the mental and bodily defects in ordinary idiocy, and more particularly in dwarfs. The question is one deserving of careful study, particularly by those who have opportunities for clinical and post-mortem observation in the large institutions.

The Mongol type of idiot resembles the cretin more closely than any other. Telford-Smith, in speaking of this form, says, "Idiots belonging to the so-called Mongol type are those who most nearly resemble the cretin, both in physical aspect and in mental character. In idiots of this type we get the stunted growth, the dull, heavy expression, with open mouth and thick lips; the slow, deliberate movement, and hoarse, guttural, and monosyllabic speech; the mental apathy and lack of spontaneity; the sluggish circulation and sensitiveness to cold. A thickened condition of subcutaneous tissue is often found, with dulled cutaneous sensibility. The skin is coarse and dry, the hair short and thin. First and second dentition are delayed. As far as palpation enables one to judge, the thyroid gland is subnormal in size. Pseudo-lipomata I have not found." He has tried the effect of thyroid extract with some benefit, but there is not the same remarkable change as in the cretins. I cannot altogether concur with Dr. Telford-Smith's statement as to the slow, deliberate movements and mental apathy of Mongolian idiots. It was a form in which Dr. Kerlin, of Elwyn, was particularly interested, and with him I had many opportunities of seeing cases. They rather impressed me as vivacious, often very sprightly and mischievous. In no instance was there any condition of the subcutaneous tissue suggestive of myxedema.

Deaf-mutism is a not infrequent accompaniment of sporadic cretinism. In the endemic form it is still more common.

The various forms of idiocy dependent upon faulty development of the hemispheres in fetal life, the hydrocephalic and the microcephalic idiots, and the forms of imbecility associated with the cerebral palsies of children are readily distinguished.

(c) *The condition known as fetal rickets*—achondroplasia, or the chondrodystrophia fetalis—is liable to be mistaken for cretinism.

The relation of this remarkable condition to cretinism is very carefully discussed by Kaufmann,<sup>1</sup> and more recently by Bircher,<sup>2</sup> to whose papers the reader is referred. John Thomson, in the *Edinburgh Medical Journal* for 1893, gives excellent illustrations of the adult form.<sup>3</sup> The thyroid is not usually involved, though it has been found absent in a fetus which presented this condition (Bowly).<sup>4</sup> The intelligence is not specially dis-

<sup>1</sup> Untersuchungen ueber die sogenannte Fetale Rachitis (Chondrodystrophia Fetalis), Berlin, 1892.

<sup>2</sup> Lubarsch und Ostertag, Ergebnisse, Abt. i., 1896.

<sup>3</sup> They are reproduced in Gould and Pyle's *Anomalies*, etc.

<sup>4</sup> Pathological Society Transactions, 1884.

turbed, the facial and cranial characters are not those of cretinism, and myxœdema is not present. The most characteristic feature is the dwarfing, with remarkable shortness of the limbs (micromelia), owing to disturbance of the growth of the shafts of the long bones, and with, in most cases, enormous enlargement of the articulations due to a hyperplasia of the cartilaginous ends of the bones. Birchler concludes that the condition is quite independent of the state of the thyroid gland. He is in error, however, when he states that the cases of sporadic cretinism described by Curling and Fagge belong to this group.

(d) And, lastly, the condition of infantilism may be briefly spoken of as in some instances dependent upon disturbed function of the thyroid, and there may be a possibility of confounding the cases with slight grades of cretinism. Infantilism is "a morphological syndrome characterized by the preservation in the adult of the exterior form of infancy with the non-appearance of the secondary sexual characters."

Occasionally the subjects of infantilism display opposite sexual characteristics,—feminism not only in bodily conformations, but in mental attributes. Apart from hereditary syphilis, in which the condition is not uncommon,<sup>1</sup> infantilism seems rare in this country. It is occasionally seen combined with great obesity. More frequently it is an accompaniment of mental defects in imbeciles and idiots. The onset of puberty, with the development of the secondary sexual characters, is delayed for years after the normal age. The sporadic cretin often presents the characters of infantilism even when above thirty (see photograph of Dr. Sinkler's case), but there are rare instances of infantilism, properly so called, complicated with myxœdematous features, due to loss of function of the thyroid, and such cases might be relieved by appropriate treatment.

#### V. THE RESULTS OF THYROID TREATMENT.

No type of human transformation is more distressing to look at than an aggravated case of cretinism. It recalls Milton's description of the Shape at the Gates,—

"If shape it might be called that shape had none  
Distinguishable in member, joint, or limb,"

or the hideous transformations of the fairy prince into some hideous monster. The stunted stature, the semi-bestial aspect, the blubber lips, the retroussé nose, sunken at the root, the wide-open mouth, the lolling tongue, the small eyes, half closed, with swollen lids, the stolid, expressionless face, the squat figure, the muddy, dry skin, combine to make the picture of what has been well termed the "pariah of nature."

Not the magic wand of Prospero nor the brave kiss of the daughter of Hippocrates ever effected such a change as that which we are now enabled

<sup>1</sup> See Fournier's excellent description in *Les Affecti ns Parasyphilitiques*, 1894.

FIG. 1a.



FIG. 1b.



Female, aged fifteen months. (Dr. Elsner.)

FIG. 2a.



FIG. 2b.



Male, aged six. (Dr. Vinke.) Fig 2b shows the remarkable change five months later.

FIG. 6c.



FIG. 6d.



FIG. 6f.



FIG. 6e.



(T. J. W. Coyner.) Figs. 6c to 6f show a perfectly phenomenal change which took place in this child in eleven months' treatment. I know of no set of photographs among all that have been published on the subject in late years, which shows such an extraordinary transformation in a short a

to make in these unfortunate victims, doomed heretofore to live in hopeless imbecility, an unspeakable affliction to their parents and to their relatives. From a large number of photographs which I have received, I have selected a set to illustrate the effect of treatment at different ages, from infancy to the thirtieth year, and illustrating also the influence at periods varying from two years to a year. The series has an educational value, as the pictures tell their own story, not only enabling the practitioner to recognize the victims of this affection, but also emphasizing, as words cannot, the magical transformation which follows treatment.

Fig. 1 *a* shows a patient of Dr. Elsner, of Syracuse, New York. The child was eighteen months old at the beginning of treatment, and the photograph shows a very characteristic state of infantile myxœdema. Fig. 1 *b* shows the state thirteen months after treatment.

Fig. 2 *a* illustrates the case of Dr. Vincke, of St. Charles, Missouri, a boy aged six years. Fig. 2 *b* shows the condition five months after treatment. In a year and a half he grew nine inches.

Fig. 3 *a* shows a patient of Dr. Dickson L. Moore, of Columbus, Ohio, a girl aged nine years. The treatment was begun August 12, 1896. Fig. 3 *b* shows the condition seven months later, March 20, 1897. The child had gained four inches in height, and the entire appearance had changed remarkably.

Fig. 4 presents a typical picture of a sporadic cretin, aged seventeen years, under the care of Dr. J. C. Carson, of Syracuse, New York. Fig. 4 *a* was taken a year before treatment, and Fig. 4 *b* illustrates the condition a year after.

Fig. 5 *a* shows a sporadic cretin at the age of thirty years, a patient of Dr. Sinkler. The height was one hundred and twelve and three-quarters centimetres. Fig. 5 *b* shows the condition a year after treatment. She had grown nearly seven centimetres, and had lost much of the myxœdematous characters. This case is of special interest, as showing the importance of the treatment even in adults.

I know of no single set of photographs which show in quite the same way the phenomenal change as shown in this series of pictures, very kindly sent by Dr. Coyner, of Peoria, Illinois.

Figs. 6 *a* and 6 *b* show the very characteristic appearance of a sporadic cretin, aged twenty-three months: length, twenty-eight inches; circumference of the abdomen, nineteen inches. Fig. 6 *c* shows the change after three months' treatment; the abdomen measured sixteen inches. Fig. 6 *d* illustrates the condition after five and a half months' treatment: height, thirty inches; abdomen measured fifteen inches. Fig. 6 *e* shows the change after seven and a half months' treatment; while the last picture, Fig. 6 *f*, shows, eleven months after beginning the use of the thyroid, a perfectly natural-looking child.

1. *The Character of the Changes.*—(a) *Bodily.*—Loss in weight, due to disappearance of the myxœdematous condition and of the fat, is noticeable

within a month or six weeks after the commencement of the treatment. The face becomes thinner, the palpebral orifices wider, the puffiness disappears from about the eyes, the flabby supra-clavicular folds melt away, the projecting abdomen diminishes in girth, and the child's figure becomes more shapely. Several of the photographs illustrate this in an interesting manner. This change is much more striking in young children of from three to six or eight years, but it is also well seen in the older patients. Nothing could be more remarkable than the change in the features in Dr. Carson's case; and even in Dr. Sinkler's case, aged thirty, the change as shown in the photograph is most evident. The expression of the face is altered by the recession of the tongue, and in many instances the drooling ceases, as the mouth is kept closed. This relieves in great part the idiotic expression.

Among the constructive and progressive alterations may be mentioned the loss of the waxy pallor of the skin, which becomes softer and much more natural looking. The hair, too, changes and becomes more abundant and finer. Several writers have referred very particularly to this remarkable change in the skin and hair, as though there had been a complete substitution of the old by a new skin and hair. In very young children teething proceeds rapidly; in older subjects, if the second dentition has not begun, the milk-teeth are shed and the permanent ones develop rapidly.

No change is so remarkable as the increase in stature. As Dr. John Thomson remarks, "The natural impulses of growth, which were in abeyance in the thyroidless condition, are let loose." In my first case the little girl grew four inches in a year. Among the most remarkable in the collected series are the following: Dr. Friend's case gained eleven and one-quarter inches in one year and ten months, Dr. Vincke's case gained nine inches in one year and seven months, Dr. Noyes's case gained eight inches in five and a half months, and Dr. Edwin F. Wilson's case gained seven inches in six months.

Fig. 3 illustrates what an extraordinary alteration takes place after seven months' treatment. The loss of the squatness of figure, the apparent disproportion between the head and the trunk, the loss of the characteristic attitude, and the disappearance of the lordosis are well illustrated. It is to be remembered that the rapidity in growth in some cases has led to increase of a lateral curvature, and even to marked bowing of the legs.

(b) *Mental Change*.—Even within a couple of months the alteration in the mental condition is noticed. At any rate, the patients look much brighter and the face is not absolutely expressionless. As a rule, the younger the case the more marked is the mental change. Young cretins who have not learned to speak a word soon begin to talk in their play. In children between six and ten the effects are even more remarkable, and with the loss of the myxœdematous condition there is a corresponding awakening of the mental faculties. In older patients the treatment is not so efficacious. In Case II. of my series the girl, aged nineteen, did not

seem to be very much benefited, although it is true the treatment was abandoned by the mother after a short time. In other instances, as in Dr. Sinkler's case, the mental condition improved very much, even though the patient was over thirty. I know of no instance in which the treatment has benefited the condition of deaf-mutism.

2. *The Dosage.*—I have usually begun with a grain of the desiccated gland three times a day in young cretins. It should be carefully watched, and the amount reduced if the pulse becomes more rapid, or if there is fever. Older patients may take as much as five grains in the day, and the amount may be increased or diminished as the symptoms indicate. The cases bear the remedy very well; and in a month, if no improvement is noted, larger doses must be tried. Unpleasant effects are less commonly seen than in the myxœdema of adults. The glycerin extract may also be employed. The thyroïdin of Baumann is now in the market, and may be used in doses of five minims. It is very fortunate that the active principle of the gland seems effective in all the preparations.

3. *The Question of Continuance of the Treatment.*—After the disappearance of the myxœdema and the establishment of the processes of growth and development, a very moderate dose seems sufficient, one or two five-grain tablets a week. Intermission for a month or six weeks does not seem to be followed by any striking change, but an intermission for a longer time is followed by symptoms indicating a relapse. In my first case the treatment was interrupted for two months last year, and the child became very languid and apathetic, but improved at once when the use of the extract was renewed.

### CHRONIC SPLENIC ENLARGEMENT WITH RECURRING GASTRO-INTESTINAL HÆMORRHAGES.

By WILLIAM OSLER, M.D., LL.D., F.R.S., *Professor of Medicine,*  
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EXCLUDING the enlarged spleen of leukaemia, chronic malaria, cirrhosis of the liver, heart disease, and rickets, the cases of so-called primitive enlargement of the organ fall into two groups.

First, a series in which the spleen is enlarged without causing any symptoms, other than those due to mechanical pressure. In the past few years I have seen four patients, all women, apparently in perfect health, who complained only of a feeling of pressure in the abdomen, in all of whom the spleen was much enlarged. In two cases in which the organ was freely movable and caused a great deal of discomfort, my colleague Halsted opened the abdomen and successfully packed the spleen in position with gauze, an operation much less serious than splenectomy and very efficacious. Both these patients have been seen more than two years subsequent to the operation, and have remained quite well. In a third case, a girl was sent into the gynaecological department, supposed to have an ovarian tumour. She was robust and strong, with good colour, and had been hard at work. She subsequently had a twist of the ligaments and sphacelus of the spleen, with enormous enlargement, adhesion to the abdominal wall, redness, and inflammation. The organ was freely incised by Halsted, and an enormous quantity of necrotic spleen tissue removed; the patient made a good recovery. This condition is, I think, more common than we suspect. The spleen is, as a rule, only moderately enlarged. In some cases there has been a history of past malaria, but in a majority the condition is one of, so far as we can tell, primary enlargement. It must not be forgotten that only a blood examination can determine whether or not such patients have leukaemia, since in this disease, as is well

known, an individual may look well, and have indeed nearly a normal number of red blood corpuscles.

Secondly, cases of enlargement of the spleen with anæmia, Griesinger's anæmia splenica, the splenic pseudo-leukæmia of H. C. Wood, or, as it is sometimes termed, the splenic variety of Hodgkin's disease. I prefer the name splenic anæmia, introduced by Griesinger. The term should be restricted to the class of cases in which a progressive anæmia develops in connection with a primitive splenomegaly. The relation of the enlarged spleen to the anæmia is still in doubt, whether the perverted state of the blood is due to splenic inadequacy (which does not seem at all probable, since removal of the spleen has cured some cases), or whether both the enlarged spleen and the anæmia are due to some chronic toxæmia. In my experience the cases have not been uncommon. I have seen four cases during the present year, one with Dr. Graham of Toronto, two reported in this paper, and a fourth, which is at present under observation.

Among peculiarities which have been illustrated by my cases, I may mention the following:—The remarkably chronic course, extending from three to twelve years; the chlorotic features of the blood, the hæmoglobin value, often not more than 50 per cent.; the peculiar bronzing of the skin, not a jaundice, which was not present in any of my cases; and, lastly, hæmorrhages, which may be toxic, as in leukæmia, and widespread, or mechanical, resulting directly from the condition of the enlarged spleen.

It is to this latter point I wish to call particular attention in this paper, to a condition in which for many years hæmorrhages occur from the stomach and bowels. The bleedings are profuse, and in the cases here recorded have occurred during a period of from nine to twelve years, while in the intervals the patients have regained their flesh and strength and have been able to carry on their occupations.

Hæmorrhage in chronic enlargement of the spleen has long been recognised. Latour,<sup>1</sup> who seems to have clearly recognised the association, quotes two interesting observations from the older writers; in one (Obs. 741), Franck's case, a woman who had for several years a tumour in the abdomen, died from hæmatemesis; the spleen weighed 14 lb. In the other (Obs. 742), a case from Morgagni, a young woman, æt. 20, had gradually grown pale for two years, and had pains in the chest and abdomen. A tumour developed in the left hypochondrium. She had several attacks of vomiting of blood. The spleen was larger than the liver, and weighed 4½ lb. There were polypoid concretions in the splenic vein. The best section on the subject in any modern work is given in Watson's "Practice," in which he gives the following explanation:—"It seems to me highly probable that one at least of the offices of the spleen is to provide a receptacle or reservoir

<sup>1</sup> "Hist. phil. et med. des hémorrhages," 1828, tome ii. p. 318.

for this blood, when its free passage through the portal vessels is temporarily obstructed. It then becomes a sort of safety valve (if such an illustration be allowable), which obviates the danger that might otherwise arise to more vital parts from any great or sudden disturbance of the venous circulation. The stress of the congestion is continually felt in the submucous capillary system; and the hæmorrhage which is apt in such cases to occur from the loaded membrane receives a simple solution, upon principles almost purely mechanical."

There are to be found in the literature many isolated cases. In this Journal for January 1869, George W. Balfour and Thomas Grainger Stewart report a very unusual case. A young man, æt. 20, had an enlarged abdomen for five years. In May 1868 he had vomiting of blood, and on admission in June he had ascites. There was no leukaemia. After death the spleen weighed 3 lb. 6 oz., and the liver 1 lb. 15 oz. There were aneurysmal dilatations of the splenic vein and thrombi in the portal vein.

Grissolle<sup>1</sup> reports an interesting case in which the spleen weighed 4 kilos., and Douglas Stanley<sup>2</sup> reports a fatal case in splenic anæmia.

As showing the occurrence in the tropics, I may mention the case reported by Croskery<sup>3</sup> from Jamaica.

In the large treatises, enlargement of the spleen as a cause of gastro-intestinal hæmorrhage is either not discussed at all, or only in a very cursory way. No mention of it is made in the very full section of diseases of the spleen by Lockwood in Loomis and Thompson's "System," or by Stockton and Jones in the same "System," on hæmorrhages from the stomach. Except in connection with leukaemia, it is only referred to incidentally in Allbutt's "System"; there is no reference to it in the monograph on the spleen by Litten in Nothnagel's "Handbuch." Stengel does not mention it in the section on the spleen in the "Twentieth Century Practice," and among recent writers on the diseases of the stomach, Ewald, Martin, Hemmeter, and Einhorn make no mention of the association.

When in Montreal my attention was called to the subject by the occurrence of several interesting cases, and in 1882 I published a short paper<sup>4</sup> and reported four cases. Of these, two occurred in leukaemia, and were of special interest, inasmuch as the hæmorrhage was the symptom to call attention to the condition; in one case, indeed, the diagnosis of leukaemia was only made post mortem. Of the other two cases one was an instance of ordinary splenic anæmia, in which, in association with a

<sup>1</sup> *Gaz. d. hôp.*, Paris, 1850, p. 257.    <sup>2</sup> *Brit. Med. Journ.*, London, 1895, vol. ii.

<sup>3</sup> *Dublin Hosp. Gaz.*, 1858, p. 39.

<sup>4</sup> "Hæmatemesis in Chronic Splenic Tumour," *Canada Med. and Surg. Journ.*, Montreal, December 1882.

greatly enlarged spleen, the patient had in January and July 1879 severe hæmorrhages from the stomach, and later in the same year died in a third attack. The fourth case possibly comes in the group to which I particularly wish to call attention in this paper. The patient, a child *æt.* 11, had a greatly enlarged spleen without leucæmia. There had been swelling of the abdomen for two or three years, and at her ninth year, two years before I saw her, she had a severe attack of hæmorrhage from the stomach. There was an indefinite history of a previous attack, four years before her visit to me. A month before I saw her she had a very severe attack, in which she vomited in a couple of days nearly three quarts of blood. In the intervals she had thriven well, though she always looked a little pale. The red blood corpuscles were 2,250,000, white corpuscles 6,696 per *cm.*

In 1890 a case of hæmorrhage from the stomach, in association with splenic anæmia, was admitted to the Johns Hopkins Hospital. A young man *æt.* 20 had lived in a malarial district, but had never had chills and fever. In April of 1889, after feeling badly for a month or so, he vomited blood, and afterwards passed dark blood in the stools. In May, his physician, for the first time, noticed an enlargement of the spleen. In June he applied at the out-patient department of the hospital, when he had an extreme degree of anæmia and a greatly enlarged spleen. On admission, 14th January 1890, he had a great deal of pigmentation of the skin, and the spleen was very large, reaching nearly to the navel. The red blood corpuscles were slightly over 2,000,000 per *c.mm.*, and the leucocytes a little over 12,000 per *c.mm.* He gained rapidly in weight, had no further hæmorrhage, was discharged on 24th March, and has not since been heard from.

The three cases here reported are characterised, as I stated, by a remarkably protracted course of from nine to twelve years, during which time hæmorrhages, at times of great severity, took place from the stomach and bowels.

CASE I.—*Clinical Summary.*—*Recurring attacks of hæmatemesis and melæna between 1885 and 1897; excellent health in the intervals; chronic enlargement of the spleen; death in an attack. Anatomical Summary.*—*Chronic hyperplasia of the spleen; liver smooth, macroscopically showing no signs of cirrhosis, microscopically showing only slight fatty changes.*—W. M., *æt.* 35, referred to me by Dr. Brewer of New York, 9th December 1892, complaining of hæmorrhage from the bowels.

The patient had always been a healthy man, of a strongly nervous temperament. He had had no special illnesses. His habits had been good; and he denied having been a heavy drinker; had usually taken light wines, not whisky. He was a composer, and had worked hard at his profession. Ten years ago, at Orange, N. J., he had an attack of malaria. Eight or nine years ago he had a well-defined attack of syphilis,

for which he was treated thoroughly during two years. He had had no signs since. About a year and a half after, while at dinner, he felt nauseated, faint, and dizzy. He lay down for a couple of hours, and in a short time passed, per rectum, a quantity of dark material which was said to be blood. About three years afterwards he had an attack of vomiting, and brought up dark material with blood and clots like liver. He was in bed for a week, and was very pale and anæmic. Dr. Janeway saw him at this time, and thought he possibly had ulcer of the stomach. He gradually recovered, regained his colour, and, with the exception of slight dyspepsia for a time, he seemed to get quite well. He did not lose in weight, had a good appetite. Three weeks ago he noticed that there was dark material with the stools. This reappeared several times, and last week, on two or three evenings in succession, after large injections, he passed smaller quantities. At one evacuation about a week ago he is sure there was clotted blood in the stools. Since that time they have been normal. Neither in this nor in the preceding attack have there been any sharp pains or colicky attacks, just a little sense of uneasiness and distress. There has been no straining, no pain in the bowels.

*Present condition.*—Medium-sized man, black hair and eyes, a little pale, but not anæmic; tongue clean; pulse regular; no fever. Well nourished; superficial veins slightly bluish, not distended; panniculus well preserved. Abdomen full, natural-looking, a little more prominent in left than in right hypochondrium. Skin clear, no rash. Respiratory movements of abdomen normal. In left hypochondrium, just below ribs, a prominent mass projects exactly six cms. from costal margin in nipple line. The edge is rounded, not specially sensitive on pressure. Towards the ensiform cartilage it is not at all well defined; when a sharp breath is drawn, it comes down almost to the level of the navel. It comes from beneath the ribs, and feels like an enlarged spleen. The notch, however, is not palpable, nor is there the clearly defined margin towards the middle line so usual in splenic enlargement. The upper limit of splenic dulness is at the seventh rib, and extends to the costal margin in the mid-axillary line. The edge of liver is just palpable on deep inspiration beneath costal margin; upper limit of dulness in nipple line at seventh rib. It does not extend to the costal border. There are exactly four cms. of vertical liver flatness in nipple line. It is obliterated in mid-sternal line. In mid-axillary line it is greatly reduced, not more than two fingers' breadth. When patient turns on the left side, percussion in the mid-axilla gives scarcely more than a finger's breadth of liver dulness. On inflation of the stomach there is no marked distension.

The blood examination was practically negative; there was no leucocytosis; unfortunately the blood count was mislaid. The blood was frequently examined after he had recovered completely from the attacks, and showed no special alterations. The urine was clear, acid, no albumin; the pigment ring with nitric acid was intense.

On 12th February 1893, Dr. Brewer wrote as follows:—"Since you saw him, Mr. M. has had three severe hæmorrhages. Between his attacks he gains very rapidly, becomes strong and well, has an excellent appetite, perfect digestion, and looks the picture of vigorous health. The

hæmorrhages nearly always follow some physical exertion. It seems incredible to me that a man can have cirrhosis enough to give him such violent hæmorrhages and yet have such perfect digestion and appear so absolutely well at other times." Dr. Brewer noted that immediately after a hæmorrhage the spleen was greatly reduced in size, while two weeks later it reached five inches below the ribs. This observation, he states, was confirmed by Dr. Janeway and Dr. Walter James.

Subsequent to this date, I heard twice from Dr. Brewer about the case. On one occasion he wrote: "Mr. M. had a very alarming hæmorrhage last May. It followed a generous meal of plain, digestible food, and there was no evidence of gastric or intestinal disturbance. He vomited a very large quantity of freshly clotted blood, and for many days passed black stools. On the following day, he had another hæmorrhage, in which I thought he would die, for his pulse could not be counted. He became extremely pale, and was only revived by very energetic hypodermic stimulation. There was, however, no return of the hæmorrhage, and he slowly gained strength. It was not until three weeks had passed that he was able to go out again. I had not seen him for seven months until the day I received your letter, when I was summoned to see his wife. He had been in perfect health since May, had not even passed a black stool, had gained from 12 to 15 lb., and had had an excellent digestion. The spleen is still enlarged. I cannot find the liver abnormal."

Dr. Brewer writes, that from 1892 until 1897, the date of his death, this patient had five or six severe, almost fatal hæmorrhages, and a number of other short periods in which he passed black stools. "After each severe attack he would recover completely, regain his weight and colour, and for many months would enjoy an excellent appetite and perfect digestion."

The autopsy was performed by Dr. Blanchard, and no lesion whatever was found in the œsophagus, stomach, or intestine, the mucous membrane of which was very carefully looked over on three separate occasions. The spleen was very large and hard. The liver was somewhat smaller than normal, was slightly fatty, but not cirrhotic. Portions of the organs were very kindly sent to me for examination.

In this case, which had attracted a great deal of attention, the diagnosis could not be positively made. I was inclined to lay a great deal of stress upon the diminution in the liver volume, though I did not think the condition an alcoholic cirrhosis, but rather some anomalous form associated with his acquired syphilis. Though I had had the experience spoken of in connection with hæmorrhage in enlarged spleen, I did not think this likely to be the cause of the hæmorrhage without the œmœmia, which goes almost invariably with enlargement of the spleen, either idiopathic or in malaria. The third possibility of duodenal or gastric ulcer I did not entertain.

I put away the notes of Mr. M.'s case, and though I have seen many instances of enlarged spleen since 1892, in none were there associated hæmorrhages. During the present year two cases have been under my care with almost identical symptoms to those presented by Mr. M., namely, hæmorrhages from the stomach and

bowels at intervals for a period of many years, in association with enlarged spleen.

*CASE 2.—Clinical Summary.*—No history of malaria or of syphilis; nearly ten years ago first attack of hæmatemesis; since then, at intervals of about a year, very severe attacks, in which he vomited blood and passed blood in the stools; enlarged spleen; exploratory laparotomy; stomach and duodenum normal; liver smooth, not cirrhotic; removal of enlarged spleen; recovery.—C. D. B., æt. 33, Fincastle, Virginia, farmer; admitted first on 9th March 1898, complaining of hæmorrhages from the stomach and bowels, and pain with an enlargement in the left side of the abdomen.

*Family history.*—His father is living and well, æt. 75; his mother died in child-birth, æt. 42. He has four brothers and three sisters living and well.

*Personal history.*—With the exception of the illness to be described, he has been a very healthy man; had, as a child, whooping-cough, chicken-pox, and measles. He has not had syphilis. He drinks in moderation; neither smokes nor chews tobacco.

Fifteen years ago he began to have dyspepsia, and for two years he had severe indigestion, frequently vomiting his food. He went to Nebraska, and lived there for several years in comparative comfort, occasionally, however, taking patent medicines. He seems on the whole, of late years, with the exception of the attacks to be described, to have had a very fair digestion, and not to have been seriously troubled with his stomach.

Nine years ago he had the first hæmorrhage from the stomach, and vomited, he thinks, at least four quarts of blood. He was very much prostrated, and on his recovery he went to California. After fifteen months he had a second attack, in which he brought up a very large quantity. Since then he has had attacks at intervals of from twelve to fifteen months to the present time, the last occurring on 12th December 1897. All of them have been severe, and he has brought up varying quantities, from a couple of quarts to a gallon and a half of blood. He has also passed blood in hard, dark "chunks" in the stools. The last attack covered a period of four days. It came on when he was feeling very well and without any obvious cause. He thinks he brought up at the most moderate computation at least a gallon and a half of blood. He has never passed blood in the stools except after hæmorrhage from the stomach.

Four years ago he noticed a pain in the left side under the ribs, which gradually grew worse. Three years ago he first noticed a lump in this region. This has grown larger, but he does not think it has increased much within the past eighteen months. After the attacks he is exceedingly pale, and takes months to recover, but he says that in the intervals he has felt well and is able to do his work satisfactorily. He has no special pain in the abdomen, has never had severe gastralgic attacks, has never vomited food which he has taken two or three days previously, and never of large quantities. He always has to be a little careful in eating.

His condition on the first admission was as follows:—He was a

medium-sized man, with dark hair. He was dark in colour, and said he thought he had become somewhat darker during the past few years. No discoloration of the mucous membranes. He looked anæmic, and the sclerotics were pearly. He was well nourished, and the fatty panniculus was preserved. The lymphatic glands were everywhere palpable, but not enlarged. Examination of the heart and lungs showed nothing of any moment except the presence at the apex beat of a soft systolic murmur, which was transmitted to the mid-axilla.

The abdomen looked natural. The superficial veins were not dilated. Beneath the left costal margin the surface was rendered prominent by an ovoid mass (just opposite the tip of the tenth rib), which descended with each inspiration. On palpation the abdomen was a little tense and rigid. The tumour mass seen beneath the costal margin was rounded, descended deeply on inspiration, felt firm and hard. On its right border there was a slight depression. Anteriorly, it extended beyond the prolongation of the parasternal line. It was not painful on pressure; no friction was heard over it on deep inspiration; no bruit. The upper limit of splenic flatness was at the lower border of the seventh rib. On bimanual palpation the mass could be freely moved, and corresponded in all respects with an enlarged spleen. The liver was not enlarged; the edge could be felt just outside the border of the right rectus; did not seem firm or specially rounded. The liver flatness was somewhat high, in the fifth interspace, and extended to the costal margin.

*Stomach.*—On inflation the epigastrium became more prominent, particularly to the right of the middle line; marked peristalsis could be seen. The lower border of the stomach tympany did not reach the navel. Stomach contents removed after a test breakfast gave the following: strongly acid to litmus, reacts to Guizburg, 8 c.c. of decinormal sodium hydrate required to neutralise acid of 10 c.c. of filtered stomach fluid; no lactic acid present.

*Blood examination.*—Hæmoglobin, 25 per cent.; red blood corpuscles, 3,072,000 per c.mm.; leucocytes, 2800 per cm. The urine was normal. The patient remained in hospital only a week, improved somewhat, and took his food well. As we were uncertain as to the nature of the trouble, he was advised to return in October for an exploratory operation. When he left the hospital the hæmoglobin was 47 per cent., red blood corpuscles 3,150,000 per cm., and the leucocytes 3100 per c.c.

On 26th October the patient returned. He had had no attack of hæmorrhage, and his general condition had improved. He had gained in weight and strength. When he left the hospital on 18th March he weighed 136 lb., on his return 155 lb. The appetite had been very good, and he had had no attacks of gastralgia. His colour looked very much better, though the general hue of the skin still had a somewhat sallow appearance. Examination of the abdomen showed the same condition of enlargement of the spleen as made in the previous note. There was no enlargement of the liver, the edge of which was palpable just below the costal margin.

On the 28th the test breakfast was given, and showed no changes in the secretion. The blood count showed red blood corpuscles 4,754,000 per c.c., hæmoglobin 57 per cent., leucocytes 6428 per c.c. Of these there were polymuclear 84.4 per cent., small mononuclear 4.4, large

mononuclear 5, transitional 3·4, eosinophiles 2·8. Three normoblasts were seen in counting 500 leucocytes. An occasional irregularity in the corpuscles was seen, and a slight variation in the shape of the red corpuscles. The patient looked very much better, had a good appetite, had gained in weight, and as he was anxious to have something done, an exploratory laparotomy was performed by Dr. Cushing, 9th November. The peritoneum was everywhere perfectly smooth; the liver was smooth, natural-looking, and showed no signs of cirrhosis. A very careful inspection was made of the stomach; there was no cicatricial puckering of the peritoneal surface, nor could Dr. Cushing anywhere feel signs of thickening or induration about the pylorus or other parts. The duodenum and pancreas felt perfectly normal. Under these circumstances, and as it seemed highly probable that the hæmorrhages were due directly to the enlarged spleen, Dr. Cushing removed it. There were a good many adhesions at the posterior border. The capsule of the spleen was a little thickened. Sections showed a marked degree of fibrous hyperplasia.

The patient recovered well from the operation, and the subsequent history to date is as follows:—He has done remarkably well. The red blood corpuscles have remained about 4,000,000, with a relatively low hæmoglobin. There has been an increase in the leucocytes since the operation. This point has been made a special study by Dr. Cushing, who will report upon it subsequently.

*CASE 3.—Clinical Summary.*—No malaria; no syphilis; eleven years ago, first attack of hæmatemesis; for four or five years recurring attacks of melæna; in 1892 second attack of hæmatemesis; an occasional attack of melæna; January 1898, severe hæmatemesis and melæna; great enlargement of the spleen; marked æmia of the chlorotic type.—A. B., æt. 38, Durham, N. C., admitted to Ward C on 10th November 1898, complaining of hæmorrhages from the stomach.

*Family history.*—Father died at the age of 56, of heart disease; mother at the age of 40, of apoplexy. His brothers and sisters are healthy and strong.

*Personal history* (taken by Dr. T. McCrae).—He had the usual diseases of childhood. He has never had malarial fever, typhoid fever, or rheumatic fever. He has never lived in a malarial region. No history of lues. He uses a good deal of tobacco; has been a very moderate drinker. Ever since boyhood he has not had a strong digestion, and has often uneasy feelings after eating, with belching of gas. He has never had nausea or vomiting. His bowels have been rather constipated. Of late he has taken a purgative about once a week. He has never had hæmorrhoids. He has been married ten years, and has two healthy children. His wife is healthy; she has had no miscarriages. His occupation, as manager of a tobacco factory, has kept him indoors a great deal; he has not had very much exercise. His average weight has been about 150 lb.

*Present illness.*—Eleven years ago (he remembers the date accurately, as it was the year before he was married) he had the first attack of hæmorrhage from the stomach. Prior to this date he was free from any stomach troubles, and never had had any gastric pain or distress. He was walking along the street early one evening, and whistling at the time, when he suddenly felt his throat fill up, and, coming to a lamp-post,

he found his mouth full of blood. He went into a chemist's shop a block or two away, and a doctor there gave him some salt and water, and the blood stopped after he had brought up four or five mouthfuls. He slept well that night, but in the morning when he sat up in bed he began to bring up dark masses, looking like pieces of liver, and after it some fresh blood. The amount altogether he does not think was more than a pint. He stayed in bed for two days, and felt weak for ten days. There was neither nausea, gastric pain, nor coughing with this attack. He did not notice any change in the stools, but at this time he did not know the importance of watching them.

For the next four or five years he did not have any vomiting of blood, but every three or four months he would pass, for two or three days, black, tarry stools without pain or discomfort of any kind. At first he did not know their significance, but he soon began to notice that after each attack he felt weak and out of sorts.

In December 1892 he had a second attack of vomiting of blood. He had gone home in the afternoon, and felt somewhat weak, particularly after having gone to the water-closet. He was put to bed by his wife. He became very pale, collapsed, and nauseated. He then vomited nearly pure blood, which was dark in colour and contained clots. During the night he vomited at intervals a large amount, and he was so prostrated that on the following day he could not lift himself or move in bed. For several days after this, the stools were large, dark, like tar, and very offensive. Following this attack he was nauseated for at least a week, but without any pain in the stomach. He was laid up for six weeks, and it was quite six months before his ordinary strength returned. He was very pale, and, as his friends used to say, "looked like a dead man." It was during this time that his physicians, on examining the abdomen, found that the spleen was enlarged. He cannot say whether it was enlarged before this. He says that it has remained in about the same condition and of about the same size ever since. At times there were slight pains in the region of the spleen.

For the next two years and a half he was very careful about his diet, and was quite free from any gastric symptoms. He regained his strength, but never recovered a perfectly good colour. Gradually he widened his range of diet, and at the end of 1895 he was eating all sorts of ordinary food. From this time to January 1898 he was fairly well. He thinks he may have at times passed tarry stools, but they never were accompanied by any special prostration or paleness, and he had not to give up work.

In January 1898, one night, on going to bed, he suddenly felt very weak, and knew at once there was a hæmorrhage. In a few minutes nausea came on, and he vomited, bringing up almost pure dark blood, as much, he thinks, as a pint and a half. After this he had no more bleeding, but for a day or two the stools were tarry. He was very pale and weak after this attack, and it was nearly a month before he returned to business.

In March he noticed again the tarry stools and the same weak sensation, which passed off after keeping quiet for a few days. From this time until Saturday, 29th October, he was very well. On that morning he got up, took a good breakfast, and went to work. Within

an hour he became nauseated, and kept very still, and sent for his physician, who, after feeling his pulse, said that he would have more tarry stools. He had a feeling of soreness and fullness in the stomach, but no pain, and he did not vomit. He went home to bed, and for two or three days passed dark-coloured stools. He returned to work in a few days, and has kept at work until he came to the hospital.

Apart from these attacks his health has been very good. He has never had jaundice, but has constantly had a sallow, muddy colour, which always deepens after an attack.

On asking him more particularly about certain features, he states as follows:—He has never had any severe pain. There has at times been some soreness in the region of the spleen, nothing more. This has been particularly after an attack, and he would often have to caution his servant to be careful, as he brushed him before going out, to do so very lightly over the abdomen. His weight and strength have kept about the same, except at the time of the attacks. His appetite has always been good, and he has taken a general diet; in the intervals between the attacks his digestion has been very good. He has been constipated at times, but as a rule his bowels have been regular. Eighteen years ago he had once an attack of cramp colic, accompanied by purging and vomiting, due to something he had eaten.

*Condition on admission.*—The patient was a fairly well-nourished man (weight, 135 lb.). The complexion was sallow and muddy, not yellow or icteroid. Some patchy pigmentation over the forehead. The tongue was pale and flabby; the gums and mucous membranes were pale.

*Thorax.*—Large and well developed; pulmonary resonance everywhere normal.

*Heart.*—The point of maximum impulse was in the fifth interspace; the area of superficial flatness was diminished; the sounds were clear; the second accentuated in the pulmonary area. The pulse was 84, soft and easily compressed.

*Abdomen.*—On the left side below the costal margin there was slight fulness. On palpation, occupying the left side, there was a smooth, painless mass which projected from beneath the costal border. To the right it did not extend quite to the middle line; in the anterior axillary line it reached almost as low as the crest of the ilium. At its right border there was an edge with a well-marked notch. It descended freely with inspiration. On bimanual palpation it was freely movable. The area of splenic dulness was much increased, beginning in the mid-axillary line at the eighth interspace.

*Liver.*—The edge was readily felt at the margin of the right rectus, and seemed normal. The area of dulness was reduced. There was no dilatation of the stomach. There was no glandular enlargement.

*Blood.*—Haemoglobin, 30 per cent.; red corpuscles, 4,018,000 per cm.; leucocytes, 6500 per cm. Differential count of 400 corpuscles—polynuclear, 73; small mononuclears, 10; large mononuclears, 12; transitionals, 3; eosinophiles, 2. There was no special poikilocytosis.

There were no retinal haemorrhages. The urine was of low specific gravity, 1008 to 1010; it contained no albumin, no sugar, and no casts. The knee-jerks were present.

The patient remained in the hospital a week, during which time he had no fever; the appetite was good; the general condition was improved. He was urged to take iron and arsenic for two or three months, and then to return for an exploratory operation.

REMARKS.—The special feature of hemorrhage I look upon as entirely due to mechanical causes. In none of them have there been associated cutaneous or retinal hæmorrhages, such as we very often see in leukaemia. I do not think anything can be added to Watson's explanation, which I have already given. In support of this, I may refer to the anatomical fact that a very large portion of the blood from the stomach is discharged into the splenic vein. Based on the measurements of the areas of all the main branches of the splenic artery, it has been estimated that of its blood 60 per cent. passes to the spleen, and 40 per cent. to the stomach (Mall. Krause). The veins of the vasa brevia passing from the fundus of the stomach are very large; and though I can find no estimate of the relation which they bear to the other veins of the organ, yet they certainly must drain a very large section of the organ.

The diagnosis of conditions associated with enlargement of the spleen is important, but somewhat complicated, owing to the number of lacunæ in our knowledge of the etiology of the various forms, and of their relation to one another. As I said before, we must recognise a primitive splenomegaly with a practically normal blood-count. The cases of chronic enlargement of the spleen, extending over many years, present, as a rule, an anæmia of a chlorotic type, with low hæmoglobin and low leucocyte count. The more pronounced does the corpuscular anæmia become, the more striking are the changes in the red blood corpuscles, and in advanced cases the blood may be like that of a pernicious anæmia. The most confusing and puzzling condition, however, is that in which, with enlargement of the spleen, the condition of leukaemia may be presented during one month, and in the following that of a simple splenic anæmia. A patient at present under observation, had in May and July an extreme degree of leukaemia, while at the end of September, with a moderately enlarged spleen, he had a simple anæmia with a slight increase in the polynuclear leucocytes.<sup>1</sup>

And, lastly, comes the question of the diagnosis from Banti's disease, primitive splenomegaly, with an associated terminal cirrhosis of the liver and jaundice. I have never met with an instance; but two of the cases I here report illustrate how careful one must be in the diagnosis *intra vitam*. All three cases here reported have the chronic character and the severe hæmatemesis, features upon which Banti lays a good deal of stress. There were no changes whatever in the liver in Case 1 microscopically, and macroscopically in Case 2 the liver looked perfectly normal. It

<sup>1</sup> Case cxxxv. in Bennett's "Clinical Lectures," 3rd edition, p. 870, was of this nature.

is to be noted also in the clinical report on both these cases, that the area of liver dulness seemed considerably reduced, and in Case 1, I was rather inclined to regard the hæmorrhage as of hepatic origin.

Then, moreover, a certain number of cases of splenic anæmia present ascites quite early in their course, and an instance of this kind has been recently under my observation in a physician from Illinois, who had an enlarged spleen for at least four years, with ascites in May 1895. Death occurred in the early part of this year, with ascites. The autopsy showed only an enormously enlarged spleen without cirrhosis of the liver.

CAVENDISH LECTURE

WEST LONDON MEDICO-CHIRURGICAL SOCIETY  
JUNE 16th, 1899

On the Etiology and Diagnosis  
of Cerebro-Spinal Fever

BY

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[Reprinted from the "West London Medical Journal"]



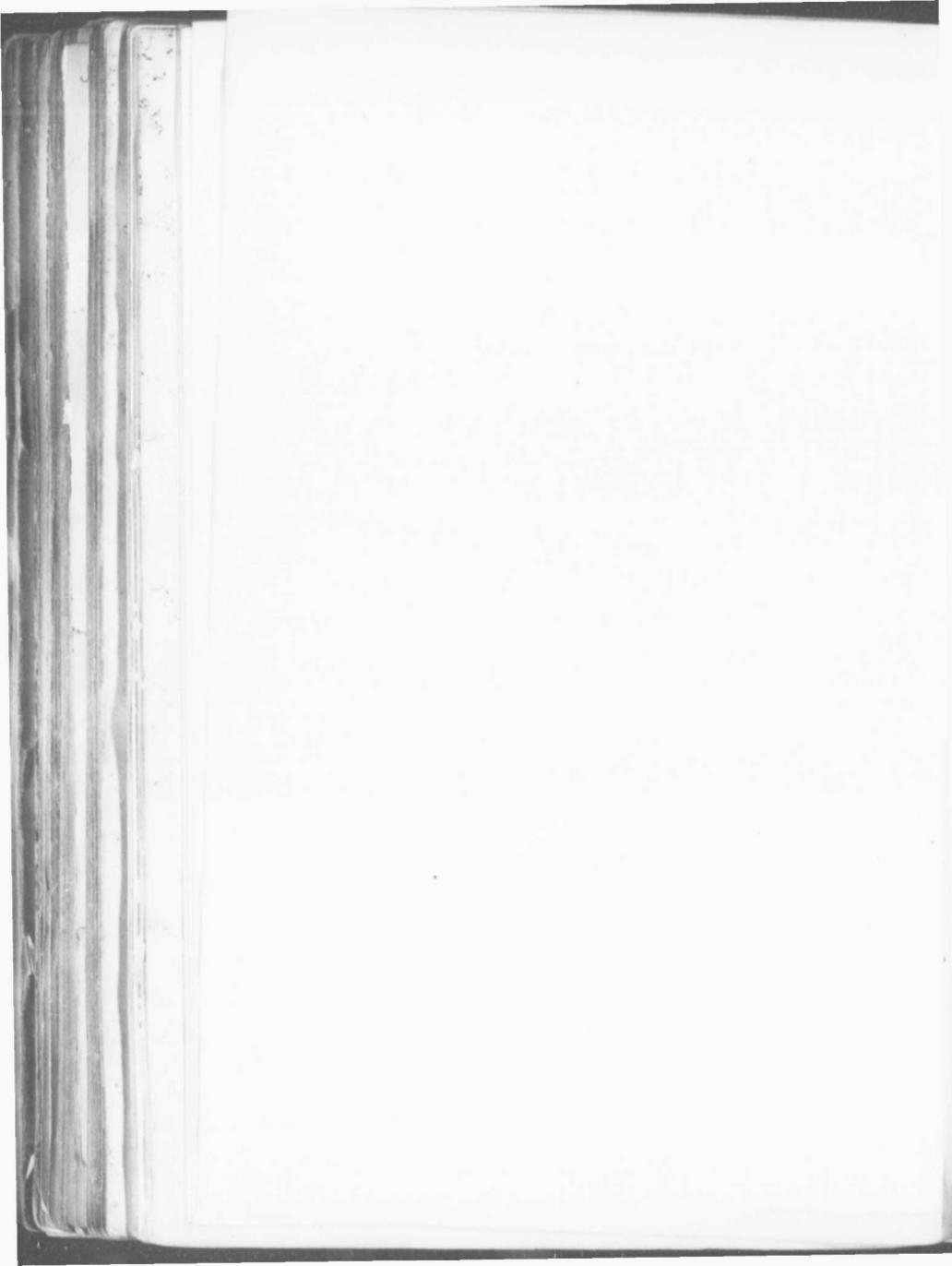
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1899



CAVENDISH LECTURE  
ON  
THE ETIOLOGY AND DIAGNOSIS OF  
CEREBRO-SPINAL FEVER.<sup>1</sup>

BY WILLIAM OSLER, M.D., F.R.S., F.R.C.P.

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- I. Summary of the features of cerebro-spinal fever as an epidemic.—  
II. Bacteriology of cerebro-spinal fever.—III. Diagnosis.—  
IV. Sporadic meningitis.—V. Note on treatment.*

IN practice we occasionally meet with a meningitis which is not tuberculous, which is not a complication of pneumonia or ulcerative endocarditis, and which is not a sequence of ear disease or of injury, and which is not a terminal infection in some chronic malady. As the meninges of both brain and cord are diffusely inflamed, we label the condition cerebro-spinal meningitis. At intervals, in certain regions, the cases multiply, and we then speak of epidemic cerebro-spinal fever. Until recently my experience, though somewhat varied, had been confined to a few instances in which the absence of the usual factors justified the diagnosis of the sporadic form of this disease. Within the past year a small outbreak in Baltimore has enabled me to study certain points in the etiology

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<sup>1</sup> Read before the Society, June 16, 1899.

and diagnosis of this most interesting affection, and has thus determined my choice of a subject on which to address you.

I.—SUMMARY OF THE FEATURES OF CEREBRO-SPINAL FEVER AS AN EPIDEMIC.

Upon these I shall only touch very briefly.

(a) One of the most fatal of all acute diseases, it fortunately takes a very humble position among epidemics as a destroyer. No fever attacks so few individuals in a community during its periods of prevalence; so that the general mortality may be but slightly increased. On the other hand, scarcely any known fever kills so large a proportion of those attacked. The recent epidemic in Boston illustrates this very well. Of 111 cases in three hospitals 76 died, a mortality of 68·5 per cent.

(b) The outbreaks occur in certain waves or periods, of which the fourth during the present century is at present prevailing in the United States. For several years there have been local epidemics of the disease in widely separated regions, usually in villages and country districts; but in 1896, 1897 and 1898 a slight epidemic occurred in Boston, and in the latter year cases began to be recognised in Baltimore and other towns. From a recent collective investigation, made under the direction of Surgeon-General Wyman, of the U.S. Marine Hospital Service (*Public Health Reports*, vol. xiv.), we learn that cerebro-spinal fever has prevailed during the past year (as a rule in a mild form) in twenty-seven States, and in the District of Columbia. It is not possible to say that the movement of troops last summer had anything to do with the spread of the disease. The limitation for a year or more to one district or city, without spreading to adjacent towns, the localisation even (as at present in Washington and Philadelphia) to special districts of a city, the recrudescence for several seasons in succession, are well-known features illustrated by the present epidemic.

(c) Among specific diseases cerebro-spinal fever stands in some points close to pneumonia. Sporadic cases of both occur in intervals of epidemic prevalence, though in pneumonia they are much more numerous, while epidemics of pneumonia, like those of cerebro-spinal fever, are most

striking in barracks, asylums and jails. Even when not prevailing as an epidemic there may be remarkable house epidemics of cerebro-spinal fever. The seasonal relations are the same in both, and the two diseases may prevail together. The abrupt onset, the great frequency of herpes in both, the leucocytosis, "the almost identical characters of the fibrinopurulent exudate in the two diseases" (Netter), the frequent complication of pneumonia in epidemic cerebro-spinal fever and of meningitis in pneumonia are additional points of contact. The degree of contagion is about the same in both diseases, and, lastly, it has been claimed that the organism described in cerebro-spinal fever is only a variety or a degenerate form of the pneumococcus.

On the other hand, Leichtenstern, speaking against the view that the pneumococcus is the cause of epidemic cerebro-spinal fever, says:—"Pneumonia is a disease spread over the entire earth, and appears at all times, there being no land immune from it. Epidemic meningitis is very rare, and in many countries is still unknown. Croupous pneumonia attacks every age, the disposition increasing somewhat with increasing age, epidemic meningitis is a disease which affects children and young people; beyond thirty-five there is slight disposition to it. Croupous pneumonia has a typical course and a crisis; epidemic meningitis has no crisis. The complications of the two diseases are different, &c." (Quoted by Councilman, Mallory and Wright.)

## II.—BACTERIOLOGY OF CEREBRO-SPINAL FEVER.

Until within the past few years the etiology of cerebro-spinal fever has been obscure, and a majority of observers regarded the organism found in the meningeal exudate as the pneumococcus, or a variety of it. More than twelve years ago, however, Weichselbaum described a diplococcus with special cultural peculiarities, which he regarded as the specific organism of the epidemic form of the disease. Little or no attention was paid to his communication until 1895, when his observations were confirmed by Jaeger. So little notice, indeed, had they attracted that neither Ormerod in "Allbutt's

<sup>1</sup>"Epidemic Cerebro-spinal Meningitis." A Report of the State Board of Health of Massachusetts. Boston, 1898.

System" (vol. i., published in 1896), nor Latimer in "Loomis and Thompson's System," published in 1897, mention Weichselbaum's organism. The work of Heubner,<sup>1</sup> in Germany, and more particularly the studies of Councilman, Mallory, and Wright, have fully confirmed the observations of Weichselbaum, whose organism, known variously as the meningococcus and the diplococcus intracellularis meningitidis, is now regarded as the specific cause of the disease. As the bacteriology of the subject is very fully discussed in the monograph by Councilman and his associates, and in the just issued article by Netter in vol. xvi. of the "Twentieth Century Practice," I shall confine my remarks to an account of our experience in the study of the cases which have been in my wards during the past year. To Dr. Norman B. Gwyn, who has charge of the bacteriological work in my clinical laboratory, and to Dr. N. McL. Harris, bacteriologist in the pathological department of my colleague, Prof. Welch, I am under special obligations for their careful study of the cases during life and after death.

The meningococcus in cover-slips made from the exudate has usually a diplococcus form, and lies within the polynuclear leucocytes; hence the definition *intracellularis*. Many of the cells may be stuffed with them. They may also occur free. It stains with the ordinary staining re-agents, and is decolorised by the Gram method. It grows best on Loeffler's blood serum, on which it forms "round, whitish, shining, viscid-looking colonies with smooth, sharply defined outlines, which attain a diameter of 1 to 1½ mm. in twenty-four hours" (Councilman). In cultures it is usually short-lived; but Netter states that Germano has found that it resists desiccation, and has preserved its vitality to the end even of ninety days. He states also that Neisser has shown that the organism is transportable by atmospheric currents, even the most feeble, and that it is very susceptible to aerial convection. It is found in the cerebro-spinal exudate, rarely elsewhere in the body; but it has been isolated from the blood, the pus from the joints, the pneumonic areas in the lungs and the nasal mucus.

<sup>1</sup> *Jahrbuch für Kinderheilkunde*, 1891, and the *Deutsche medizinische Wochenschrift*, 1897.

The organism is feebly pathogenic for animals. Rabbits and mice resist subcutaneous inoculation. Heubner, and Councilman and his associates, have produced typical meningitis by inoculating cultures of the meningococcus beneath the spinal membranes of goats.

Our clinical and pathological experience with the organism is as follows:—In twenty-one cases which I have seen, the lumbar puncture was made in sixteen. In three patients seen in consultation the diagnosis seemed so clear that lumbar puncture was not made. In cases 1 and 2, both mild, the puncture was made, in one on the seventh day, in the other on the sixth; but no organisms were found. Cases 3 and 4 were admitted late in the disease, and it was not thought necessary to perform it. Of the remaining fourteen cases, in thirteen the diplococcus intracellularis was present on cover-slips and in cultures. In the remaining case its presence was doubtful on the cover-slips, and the staphylococcus grew in culture. Of the cases which came to autopsy, five in number, the bacteriological results, as given by Dr. Harris, are as follows:—Autopsy No. 1104; meningitis, meningococcus; the pneumococcus from a pneumonic area in the lung. No. 1189, a case with extensive arthritis, in which the diplococcus intracellularis was found in the blood and joint tissues during life, as well as from the meninges. *Post-mortem*, the meningococcus was separated in pure cultures from the cord and brain, and from the lung the pneumococcus and the bacillus lactis aerogenes; from the blood in the coronary arteries the pneumococcus. The other organs were sterile. In case 10 (Autopsy No. 1247), on which laminectomy had been performed, the spinal meninges at the time of his death (about two months later) were perfectly normal. At the operation the staphylococcus pyogenes grew in the cultures. In No. 1314, a case in which laminectomy was performed, the meningococcus was isolated from the meninges, both during life and after death. The bacillus coli communis, the bacillus lactis aerogenes, and the staphylococcus pyogenes albus were also isolated; from a broncho-pneumonic area in the lung the pneumococcus and the staphylococcus pyogenes aureus, from the spleen the staphylococcus pyogenes citreus, and from a thrombus in the superior longitudinal sinus and from the pelvis of the left kidney the streptococcus septicus

liquefaciens (Sternberg). This case had a diphtheritic and hæmorrhagic cystitis. No. 1364, a very protracted case, in which death occurred in the twelfth week, and from which the meningococcus had been isolated from the spinal fluid twice, from the meninges *post-mortem* the streptococcus pyogenes and the bacillus coli communis were isolated; and the staphylococcus pyogenes aureus and the bacillus coli communis from the broncho-pneumonic areas in the lungs. In a fatal case outside the hospital the meningococcus, the pneumococcus and the bacillus coli communis grew in cultures from the cerebral meninges. There was no focus of pneumonia in the lungs.

The following memoranda by Dr. Harris are of interest:—

"Cultural methods employed. In the first cases we followed the method recommended by Councilman; namely, the use of blood serum 'slants.' Such was found to be almost useless on account of contaminating organisms, for, out of a series of eight tubes, only one gave pure cultures.

"In the other cases the exudates and fluids were plated out in alkaline 5 per cent glycerin-agar. This procedure gave entire satisfaction in that the growth of the meningococcus was quite vigorous, and that associated organisms in the exudate (Cases 1314 and 1324A) were readily separated and classified.

"Upon certain points our observations agree with those mentioned in Councilman's article.

"(a) We have never seen, as Jaeger states, a capsule formation, nor in any case unassociated with other pyogenic organisms were we able to stain the specific organism by Gram's method.

"(b) The cases coming to autopsy at the height of the disease furnished upon cover-slip and culture abundant evidence of the presence of the meningococcus, whereas cases which succumbed late in the disease yielded feeble results, or, as in case 1364, no evidence at all.

"(c) The biological features of our several cultures gave practically the same results as Councilman obtained, except that in a few cases, after carrying the organism through several generations, litmus milk was found to be slightly bleached, but with no evidence of acid formation.

"Regarding potato culture, Councilman's statement of an invisible growth on this medium should be expanded by remarking that microscopic preparations invariably show evidences of moderate increase, and that the organisms are much larger than on ordinary media.

"At no time has a blood serum culture been observed to bear any striking resemblance to a growth of pneumococcus on a similar medium.

"As in Councilman's experience, great variations in viability of the organisms was noted. But it is worthy of mention that where there is condensation water in the tube and growth present in it, the organisms as a rule will be found to be alive many days after life has ceased in the growth upon the surface of the medium.

"*Staining reactions.* Supplementary to Councilman's remark upon focal staining points when using methylene blue, it might be said that if old Loeffler's methylene blue solution is used, the coloration of that focal point is a decided violet-red.

"*Animal experiments.* Subcutaneous inoculation in rabbits and mice (white and grey house mice) was resisted in every case.

"In rabbits inoculated beneath the dura mater, or into the ventricles of the brain, death occurred in all within fourteen days to six weeks, and in no instance were we able to find evidences of gross pathological lesions, nor the presence of the meningococcus on cover-slip or culture. The animals were all greatly emaciated.

"Mice inoculated into pleural or peritoneal cavities died in from three to four days, in most cases with general septicæmia.

"*Special remarks.* Regarding Jaeger's observation of the occurrence of chains of cocci in exudate or spinal fluid, it may be said that it has not been observed, but on blood serum growths it was quite common to find chain-formation with the unstained light line of cell division running parallel to long axis of chain. However, this feature is not by any means uncommon amongst the pyogenic staphylococci.

"Attempts to isolate the specific organism from any other site than the spinal fluid, and the meninges of spinal cord and brain, have in every case been attended with failure. This is especially noteworthy in case 1189, which presented arthritis. A large quantity of the sero-purulent fluid was inoculated, incubated for three days, and the plates were found sterile, and yet cover-slips of the fluid showed considerable numbers of intracellular diplococci. The heart's blood of this case failed to give positive results at autopsy, although during life the organism had been isolated from the blood as well as from the joint lesion.

"Pneumonic or broncho-pneumonic foci have always given the pneumococcus, either alone or with the pyogenic staphylococci.

"One case, No. 1314, brings out a possible source of error in the use of Gram's stain upon the cover-slip preparations of the exudate in cases where a secondary infection may be present. The cover-slips from the meningeal exudate in this case were examined by Gram's method before cultures were ready, and cocci were found which did not decolorise, thus causing some surprise, but it was cleared of doubt by finding the staphylococcus pyogenes albus in association with the meningococcus upon the agar plate.

"Case 1325A is most interesting in that from the exudate on the cerebral meninges the meningococcus, the pneumococcus and the bacillus coli communis were isolated and positively identified. A mouse was inoculated intra-pleurally with 3cc. of a twenty-four hour old blood serum condensation-water growth, and succumbed upon the third day with a general infection.

"Another mouse received 5cc. of a strong suspension in Durham's medium of a twenty-four hour old agar-agar culture of the pneumococcus, but showed no evidence of illness. The milk culture of this organism when stained by Welch's capsule stain exhibited well-defined capsules and stained by Gram's method.

*Microbic Association in Cerebro-Spinal Fever.*—Councilman, Mallory and Wright state that "Mixed infections with other

organisms were not uncommon. The pneumococcus was found seven times, once in connection with Friedländer's bacillus. Terminal infections with staphylococci and streptococci were occasionally found.<sup>1</sup>

Netter refers to this point in the following terms:—"In a very small number of cases observers have reported finding at the same time with the pneumococcus or the diplococcus the staphylococcus pyogenes, the streptococcus, the colon bacillus, the bacillus proteus, and the capsulated bacillus. These microbic associations are always secondary, however, and we must refrain from regarding any but the two agents above described as the primary causes of cerebro-spinal meningitis."<sup>1</sup>

In the report on the bacteriology of the *post mortem* by Dr. Harris, the frequency and number of microbic associations will have been noticed. Three points are of interest in this connection:—In chronic cases, as 10 and 17 of our series, the diplococcus intracellularis may no longer be present; we have obtained it, however, for the first time on the 25th, 31st and 41st days of the disease. Of the two cases referred to, No. 17 presented a most typical picture of the disease, and the diplococcus intracellularis was obtained in the spinal fluid on the 31st and 35th days. At the autopsy the meninges showed a moderate amount of exudate, and there was fluid (purulent) in the posterior horns of the ventricles. The diplococcus intracellularis was not found, but the streptococcus pyogenes and the bacillus coli communis were isolated from the meninges.

Case 10 is of particular interest, and I give here a brief summary of the history:—

A sailor, John F., aged 25, was admitted October 29, 1898. The illness had begun on October 26, with swelling and pains in the right ankle, and the next day the left ankle became swollen, and then the right hip. He was able, however, to walk to the hospital. On admission there were also redness and tenderness of the left wrist. For the first week we were very doubtful as to the nature of his trouble. The temperature was between 102° and 104°, and we rather suspected typhoid fever. On the 31st he complained of pain in the back and hips, and on November 1 it was noticed that his head was in a very retracted position. On November 4 he had retention of urine. On the 6th it was noticed that he could not move his legs. Lumbar

<sup>1</sup> *Loc. cit.*, p. 193.

puncture was then performed, and two drachms of a thick creamy pus removed which showed cells and numbers of diplococci, some in cells, but a majority free and in groups. Dr. Cushing performed laminectomy, and drained away a large amount of purulent exudate, and irrigated the spinal meninges with normal salt solution. Cultures made from the fluid obtained by the lumbar puncture and at the operation grew the staphylococcus pyogenes aureus. From the history and symptoms the case was doubtless one of cerebro-spinal fever, subsequently infected with the staphylococcus.

More frequently the pneumococcus has been found in association with the diplococcus intracellularis. In our series it was present only once (Case 13) in the fluid obtained by lumbar puncture. On the 5th day 20 cc. of a faintly cloudy fluid were removed, and both organisms grew in culture. On the 7th day the pneumococcus was isolated from the blood. Netter found the pneumococcus associated with the diplococcus intracellularis (*post-mortem*, I take it, though it is not so stated) in ten of sixteen cases of cerebro-spinal meningitis.

A third point is the occasional association of the tubercle bacillus with the diplococcus intracellularis, but so rarely that it is not a point of much practical importance.

On the whole, then, our observations support those of Weichselbaum, Jaeger, Heubner, Councilman and others, that in epidemic cerebro-spinal fever there is an organism with special cultural peculiarities which may reasonably be regarded as the exciting cause of the disease. Netter alone, among recent observers, seems to doubt this, and says that he only found the diplococcus intracellularis in 16 out of 39 cases, and in 10 of these the pneumococcus was present at the same time. His most recent statement in the "Twentieth Century Practice" (1899) is worth quoting: "Certain observers, and more particularly Jaeger and Heubner, believe that the diplococcus intracellularis is the sole pathogenic agent in epidemic cerebro-spinal meningitis, and that the pneumococcus has no influence whatever in the production of true epidemic meningitis. Councilman is a little less emphatic, although he appears disposed to adopt this way of thinking. I do not, however, in any way accept this view. The pneumococcus can, without any doubt, cause meningitis, and in spite of Heubner's experience, the rôle of the pneumococcus has been most surely established experimentally. The

frequent occurrence of pneumonia complicating meningitis and of meningitis complicating pneumonia, and the coincidence with meningitis of many other inflammations which may be excited by the action of the pneumococcus, imply that between pneumonia and meningitis there exists a relation which cannot be denied." He seems to think that the diplococcus intracellularis may be a degenerate form of the pneumococcus, and in support of this view cites: "Its intracellular position is evidence of a phagocytosis going on, the impossibility of cultivating most of the individuals, as shown by the small number of colonies obtained, its decolorisation by Gram's method, and its usual innocuousness in animals. I would not, however, insist upon this opinion, or lay too much stress upon the arguments just mentioned, for the question is only hypothetical as yet."

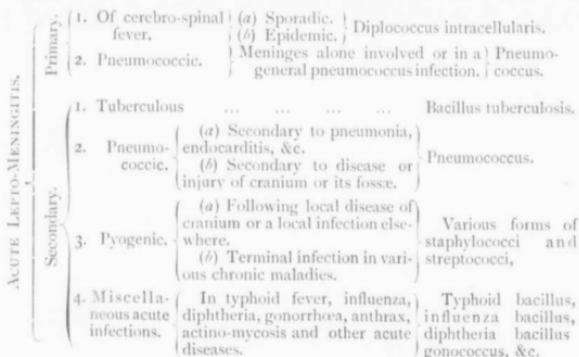
It does not seem to be altogether clear from certain of Netter's observations that he has been dealing with the meningococcus. Thus in his communication (*Bull. et mem. Soc. Méd. des Hop. de Paris*, xv., p. 407, 1898) the coccus which he found in the 8 cases was rounded, usually in pairs, sometimes in short chains; at other times capsules were seen. They stained by Gram's method, and in bouillon long chains developed, and mice resisted infection when inoculated subcutaneously. He concludes from these observations that the meningococcus is nothing more than a degenerate pneumococcus. Dr. Harris, in a note on this, remarks: "Such conclusions are entirely unwarranted, or if his observations are correctly stated, he evidently had the veritable pneumococcus to deal with, and by some strange mode of reasoning concludes that he has the meningococcus in his series of cases, and that it is identical with the pneumococcus, though of a degenerate form!"

Netter's position is most illogical and confusing. Throughout the article in the "Twentieth Century Practice"—in many ways one of the very best in literature—he assumes that the specific disease, cerebro-spinal fever, may be caused either by the pneumococcus or the diplococcus intracellularis. That a primary cerebro-spinal meningitis may be due to the pneumococcus is universally acknowledged; but it is in the highest degree unlikely that a remarkable specific affection like cerebro-spinal fever should be caused by two different or-

ganisms. Towards the close of the article the inconsistency of this view seems to impress him, for he says certain peculiarities "prevent us from concluding that the two diseases (*i.e.*, pneumonia and cerebro-spinal fever) are absolutely identical."

III.—DIAGNOSIS OF CEREBRO-SPINAL FEVER.

Meningitis is not always easy to recognise clinically. Mortifying *post-mortem* disclosures are even more common with it than with pericarditis. The unexpected meningitis of pneumonia, of Bright's disease, and of other chronic affections, teaches us how latent may be the process; on the other hand, who has not in typhoid fever and in pneumonia made a positive diagnosis of meningitis, and has found *post mortem* the cerebro-spinal membranes perfectly free. Sooner or later the truth of Stokes' dictum is brought home to each one of us: "There is no single nervous symptom which may not and does not occur independently of any appreciable lesion of the brain, nerves or spinal cord." The anatomical classification of lepto-meningitis is not very satisfactory, and, as I have stated, there is great lack of uniformity in the terms employed. The nomenclature of the Royal College of Physicians recognises four groups—purulent, tubercular, syphilitic, and cerebro-spinal fever. An etiological classification, possible to-day in part, is of necessity incomplete. In the annexed diagram I have made a provisional grouping of the chief forms:—



The acute primary lepto-meningitis in a large proportion of all cases follows an infection with the diplococcus intracellularis or the pneumococcus. It will be a great gain if Still's observations (to which I shall refer later) on the posterior meningitis are confirmed. I do not know where Quincke's meningitis serosa should come in an etiological grouping. Of three cases diagnosed as such in our records, in one a micococcus was isolated, but nothing further is stated as to its identification. It is highly improbable that, as Netter holds, cerebro-spinal fever either in the sporadic or epidemic forms is caused by the pneumococcus. The body of evidence accumulated within the past few years in Germany and America is strongly in favour of the specific relationship of a definite, easily recognised organism, the diplococcus intracellularis. The pneumococcus may produce a primary meningitis, and pneumonia at certain seasons and in certain regions may frequently be associated with this lesion, but both clinically and bacteriologically this form can be distinguished from the disease under consideration.

While the possibility of the occurrence must be admitted, I have not recognised a primary meningitis caused by the pyogenic organisms<sup>1</sup> or by the tubercle bacillus. The terminal meningitides I have placed among the secondary forms; and, as in the terminal pleurisies and peritonitides, a variety of organisms are found. Even in cerebro-spinal fever the streptococci and staphylococci, always on the watch for a *locus minoris resistentiæ*, may drive out the original foe, as in cases 10 and 17 on our list.

To the secondary forms of meningitis in the table I shall not refer, except to call attention to the importance of the pneumococcus in this group also; nor can I discuss within the limits of this lecture the clinical features of the varieties of meningitis, and must confine my remarks to a few special points in the diagnosis of cerebro-spinal fever, and to a consideration of certain sporadic forms of meningitis.

<sup>1</sup> The case of John Brooks (autopsy No. 1065) is of interest in this connection. He had an illness of eight weeks' duration, with obscure cerebral symptoms. On admission he had a urethral discharge. At autopsy there was found an extensive cerebral meningitis, with distension of the ventricles and slight meningitis of the dorsal cord. From the exudate and from the urethral discharge streptococci and staphylococci were isolated. The slight urethral secretion might readily have been overlooked, and the case regarded as a primary pyogenic meningitis.

I.—*Certain features in the symptomatology of cerebro-spinal fever.*  
 —No other form of meningitis presents a symptomatology of the same fulness—general, cerebral, spinal, and peripheral features are present in almost every case. This results in

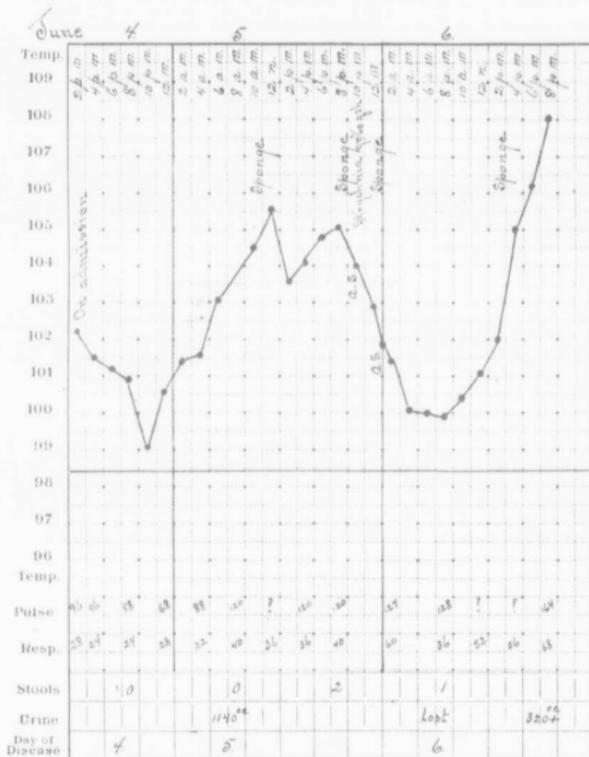


CHART I., CASE 7. E. R.

part from the extent of the cerebro-spinal involvement, in part from the very frequent implication of the nerves, and to some degree is a consequence of the very chronic course. I shall discuss only a few of the important symptoms.

(a) *Onset.*—In striking contrast to other forms, particularly the tuberculous, cerebro-spinal fever sets in abruptly. Without warning, while at work, or awakening the patient from a sound sleep, comes the pain in the head, &c. This peculiarity may also be met with in primary pneumococcic meningitis; but in the form secondary to pneumonia, and in that which arises in endocarditis, latency of onset is the rule.

(b) *Fever.*—There is no constant type of fever in any form of meningitis. In cerebro-spinal fever the pyrexia is very variable, and I have given here a few charts in illustration. There may be no fever at onset—as shown in Charts VIII. and IX. of the sporadic cases. Of our epidemic cases, all had fever on admission.

Irregularity in the fever may be present from the start. There is not a steady rise at first to a fastigium, but even on the third or fourth day the temperature may fall to normal. Chart I. shows this extreme irregularity in a two-hour record. The remissions were very pronounced, and the temperature rose to  $108^{\circ}$  just before death.

In other cases the course is singularly like that of typhoid fever, and for days the two-hour temperature chart may not show a variation of more than a degree. This is well illustrated in Chart II. from Case 17. This patient (as shown on the lantern slide) had the facial aspect of a case of typhoid fever. Chart III. from Case 13 shows also a very steady fever with but slight remissions to the time of death on the fifteenth day. Chart IV. from Case 15 presents a still more marked resemblance to a typhoid fever curve, particularly in the daily remissions, giving the spiked chart with which we are all so familiar in the third week of the disease. Intermissions, exacerbations, and great irregularities similar to those in tuberculosis, are very pronounced in the more chronic cases. Chart V. from Case 16 gives the maximum and minimum daily temperature from the twenty-ninth to the seventy-ninth day. It will be noticed how variable is the time of the highest point of daily fever. On thirteen days the maximum temperature was in the morning—an inverse type, to which many writers have referred, in this disease. The exacerbations are better shown in a two-hour record. In Chart VI. from Case 15 the intermitted type is shown, but the paroxysms are readily distinguished from those of tertian malarial intermitted fever by their prolonged course.

CEREBRO-SPINAL FEVER

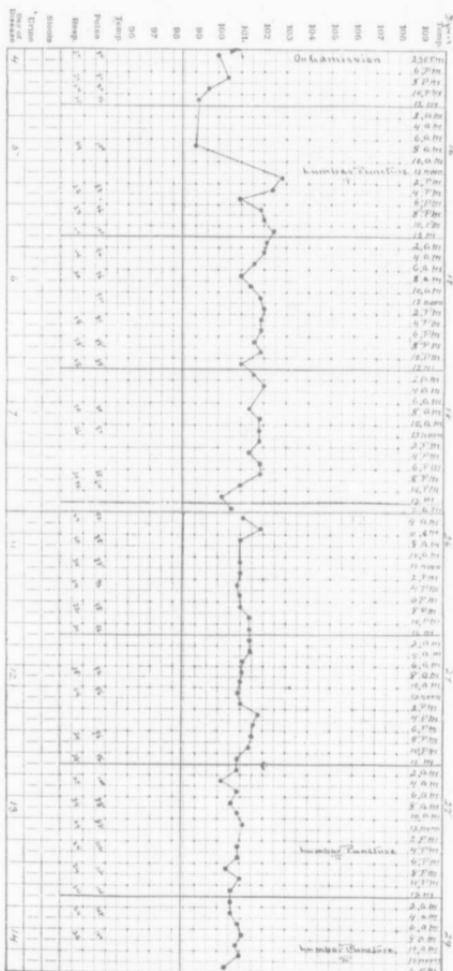


CHART II, CASE 17. P. C.

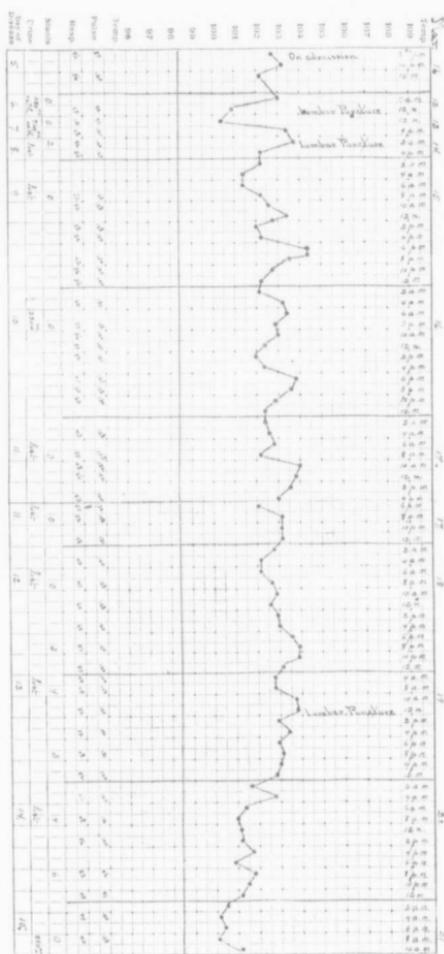


CHART III., CASE 13. O. S.

In cases of this sort, when chills occur, the picture is very suggestive of malaria, and one can understand why some of the older writers regarded the disease as a manifestation of paludism. The chart of Case 8 is worth a passing comment. After a very steady temperature on the ninth, tenth and eleventh days the record on the twelfth day was normal. On the thirteenth day there was a paroxysm without a chill, lasting from 10 p.m. on June 19 to 4 a.m. on the 21st. On the fourteenth and fifteenth days the temperature was normal. On the evening of the latter the fever rose, and the paroxysm

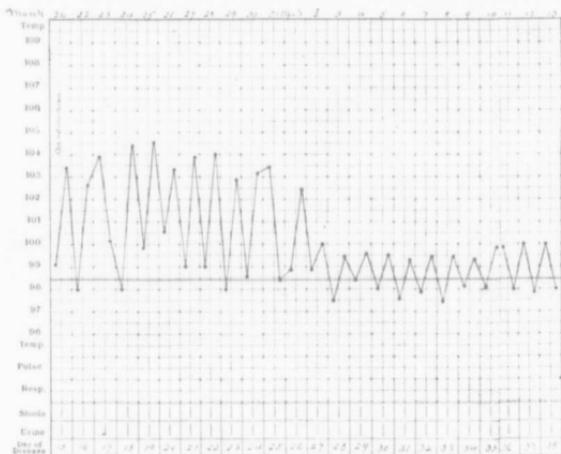


CHART IV., CASE 15. J. N. M.

lasted through the sixteenth day, and at 4 p.m. the patient complained of decided chilliness. On the seventeenth day no fever. At 10 a.m. on the eighteenth day the patient had a rigor, in which the temperature rose to 104.5; the paroxysm lasted more than thirty hours. Then, on the twentieth, twenty-first, and twenty-second days he had recurring attacks, two with chills; the one on the twenty-second, without chill, extended into the twenty-third day. After this the patient's temperature remained normal, and he recovered rapidly. During these attacks he complained a great deal of pain in

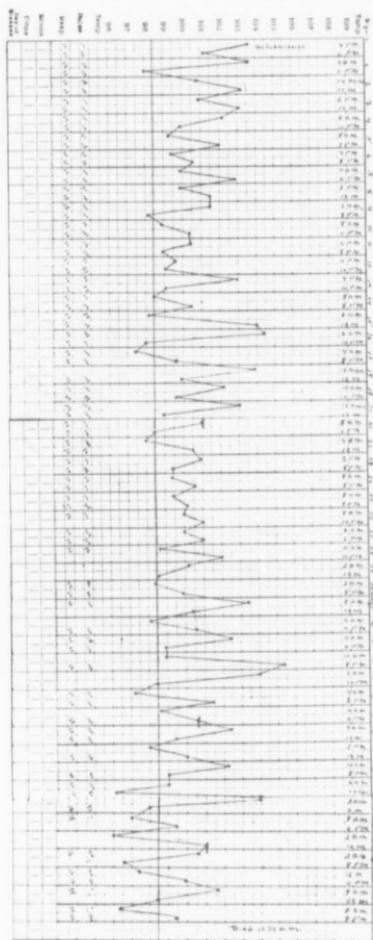


CHART V., CASE 16. CHAN, A. K.



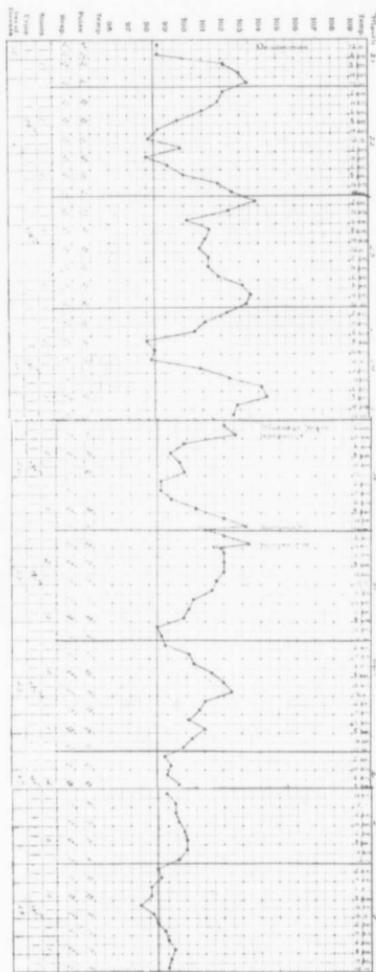


CHART VII, CASE 15. C. A. K.

the head and back. The spleen was not enlarged. The blood was examined daily for the malarial parasites, but none were found. And lastly, Chart VII. from Case 15 illustrates the relation of the temperature to the lumbar puncture. After the sixth, seventh, and eighth puncture the fever dropped; after the twelfth it rose.

(c) *Skin Rashes*.—Various skin rashes are common in cerebro-spinal fever, and form an important feature in the diagnosis. Of twenty-one cases which I saw during the epidemic, in thirteen a skin eruption of some form or other was present. Herpes, of course the most common, was present in eight cases. A diffuse erythema about the chest and abdomen, and over the joints, was present in four cases. Petechiæ were noticed in eight cases, extensive in only three. In three cases a very remarkable and peculiar rash was present in the neighbourhood of the joints, particularly over the extensor surfaces of the knees and elbows, and about the ankles. There was a diffuse, livid erythema of great intensity, on which a purpuric herpes developed—a vesicular rash, the individual vesicles of which became filled with blood. As the erythema faded and the vesicles dried, they could be felt as little nodular hemispherical bodies, which persisted for a week or ten days.

(d) *Blood*.—A careful study of the blood was made in all of our cases. A leucocytosis was present in every instance. In four the first blood count was made on the third day, and the leucocytosis was 25,900, 14,500, 40,800, and 32,000 per cm. The first blood count was made on the fourth day in four cases, and the leucocytosis was 26,240, 31,800, 19,300, and 7,600 per cm. In only four cases did the leucocytes exceed 40,000 per cmm., and the maximum count was on the ninth day in a fatal case 47,000 per cm. The leucocytosis persists even in the most protracted cases. In a lad who died in the twelfth week of the disease the leucocytes were 23,000 per cm. shortly before death. As a rule there was no special reduction in the red blood corpuscles. In one case a moderate anæmia developed, and in the fifth week the red corpuscles were only 3,100,000 per cmm. In one case the diplococcus intracellularis was isolated from the blood during life.

Leucocytosis has no special value in the differential diagnosis of the various forms of meningitis. I had an impression that

it was not so constant in the tuberculous variety, but Dr. Parfitt analysed the records in eleven of our cases and found that in only three was a leucocytosis absent. The lowest count was 6,500 per cm. Of eight cases with leucocytosis there were four with 20,000 or more white corpuscles per cm. The highest count was in a child aged 8, 24,333 per cm. Altogether the leucocytosis seems not to be so high or so persistent in the tuberculous meningitis.

(c) *Arthritis*, or more often peri-arthritis, much more common in cerebro-spinal fever than in other forms, was present in two of our cases. In Case 7 the joint lesion came on with great rapidity, and by the fourth day he had a multiple suppurative arthritis, resembling an acute pyæmia. The diplococcus intracellularis was isolated from the pus in the joints. In the other (Case 10) the disease began with arthritis.<sup>1</sup>

II.—*Kernig's Sign*.—Described by a Russian physician, and studied in Germany and France, this interesting sign has not attracted the special attention of English and American physicians, though J. B. Herrick, of Chicago, at the last meeting of the Association of American Physicians, spoke of its value. It has been present in all of our cases in which it has been looked for. It is, I think, an old observation that the subjects of protracted meningitis, particularly children, very often lie with the thighs flexed upon the abdomen, and with the legs in a state of partial contracture, so that they are with difficulty extended. To test for Kernig's sign the patient should be propped up in bed in the sitting position, then, on attempting to extend the leg on the thigh there is contraction of the flexors which prevents the full straightening of the leg. On the other hand, in the recumbent posture the leg can be fully extended. Many patients with meningitis are not in a condition to sit up, and the test can be equally well made by flexing the thigh on the abdomen, when on attempting to extend the leg, if meningitis be present, the limb cannot be fully extended, as shown in fig. 1. Friis found the sign in fifty-three of sixty cases, and Netter in forty-five of fifty. It is stated to be present in all forms of meningitis when the spinal meninges are involved. The presence of the sign is no

<sup>1</sup> A full report of these cases is given in the *Boston Medical and Surgical Journal*, December 29, 1898.

indication of the intensity of the spinal involvement, as it existed in a very marked degree in a recent case of pneumococcic meningitis, in which there was no positive exudate on the spinal meninges, only a turbid fluid. Netter's explanation of the phenomenon is as follows: "In consequence of the inflammation of the meninges the roots of the nerves become irritable, and the flexion of the thighs upon the pelvis when the patient is in the sitting posture elongates and consequently stretches the lumbar and sacral roots, and thus increases their irritability. The attempt to extend the knee is insufficient to provoke a reflex contraction of the flexors



FIG. 1.—Kernig's sign, showing the strong contraction of the flexors on attempting to extend the leg.

while the patient lies on his back with the thighs extended upon the pelvis, but it does so when he assumes a sitting posture."

III.—*Lumbar Puncture*.—During the past ten years no single measure of greater value in diagnosis has been introduced than Quincke's lumbar puncture. We are now able in a large number of cases to make a prompt decision as to the existence of meningitis, and are further enabled to recognise the form of the disease. I shall not detain you with details of

the technique, available now in all text-books, and recently considered at great length in an elaborate "Referat" by Neurath, in the *Centralblatt f. d. Grenzgebiete der Medizin und Chirurgie*, Bd. I. It is a simple, quite harmless procedure, and in a majority of the cases can be done without general anaesthesia, or with the aid of a local freezing mixture. A dry tap is rare in cerebro-spinal fever; the needle may be plugged with fibrin, or a nerve root may come directly against the orifice. Puncture in the third or fourth interspace may be negative, while in the second a free flow is secured. In one of our early cases in which no fluid was obtained, the autopsy showed an exudate as thick as butter, with little or no fluid. A first puncture in a case is very often negative. Though simple, the technique is, like other procedures of the kind, bettered by practice. Very often at first a few drops of blood flow, then a clear or turbid fluid, either drop by drop, or sometimes in quite a strong stream.

The fluid may be clear, turbid, purulent, or more rarely a brownish yellow or quite bloody. In a great majority of all cases when meningitis is present the fluid is turbid. In rare instances clear fluid may be obtained when meningitis exists, and in a protracted case the fluid may be turbid at one puncture and clear at the next. Several observers have noted that the fluid may become clear in the intermissions of the disease. A clear fluid may be obtained from a puncture in the second lumbar interspace, while lower down a turbid fluid may be withdrawn. I saw this possibility very well illustrated in a recent *post mortem*; the fluid in the lower dorsal and upper lumbar regions was perfectly clear, while that in the lower lumbar and the sacral regions of the canal was very turbid and contained numerous flocculent masses.

The fluid should be allowed to flow into a sterilised test-tube. When the fluid is at all turbid there is usually a slight sediment and a coagulation of fibrin. Cover-glass preparations are made either directly from the turbid fluid, or if the turbidity is slight and the cell elements few in number, after it has been centrifugalised. Cultures should be prepared at the time of making the lumbar puncture by allowing one or two cubic centimètres of the fluid to flow on to a Loeffler blood serum medium.

The amount of fluid obtained varies from a few drops to

130 cc. The samples in these flasks show the large amount which may be removed, one 126 cc., another 112 cc.

Wentworth claims that within certain limits there is some relation between the degree of turbidity of the fluid and the severity of the symptoms, and this was borne out by our more limited experience. Even in the most protracted cases the turbidity may persist. Only once was a clear fluid removed in an exacerbation. On several occasions a bloody fluid was removed in case 18. In the wards at the same time was a remarkable instance of septic meningitis in which, after turbid fluid had been withdrawn at one puncture, at a subsequent one, before death, blood flowed from the needle, and *post mortem* there was extensive meningitis and a rupture of the basilar artery with hæmorrhachis.

The number of the organisms found bears no constant relation to the intensity of the symptoms. In acute cases they are present, as a rule, in large numbers. The later the disease, the less likelihood is there to find the diplococcus intracellularis in the fluid; but we have found them in the second, third, fourth, fifth and seventh week. The following are some of the days on which the organisms were found: seventeenth day, fourteenth day, twenty-fifth day, thirty-first day, forty-first day, and nineteenth day.

Has the lumbar puncture any therapeutic value? Williams, of Boston, states that he has seen beneficial effects, and there are a few cases in the literature in which the severity of the symptoms were promptly mitigated by the removal of a variable amount of the spinal fluid. Wentworth (whose experience has been very large), speaking of these cases, says: "I have never seen any such cases, though constantly on the watch for them. A temporary relief, lasting for a few hours, has followed the operation in a few cases, but the same remissions frequently occur without any treatment." Netter says that he has seen convulsions, which had lasted for a long time without intermission, cease after the withdrawal of only about two drachms of fluid.

We have given this point our closest attention, and many times have performed the puncture directly for its supposed benefit. In case 8 the note reads: "Much better after the first puncture; brighter every way." Case 9, puncture at 11 a.m.: "Patient's condition has greatly improved; the

muttering has ceased, and the irregular movements are less marked." To case 16 I may refer more fully. It was an example of the chronic form in which the patient lingered for nearly three months. The accompanying table has been prepared by Dr. Marshall, one of my house physicians. It gives the day of the disease, the amount of fluid withdrawn, the character of the exudate, the microscopical appearances, the culture results, the leucocytosis, and the effect (?) of the puncture on the temperature. The first puncture, made on the twenty-ninth day of the illness, was negative. From the second puncture 100 cc. of a yellowish turbid fluid were withdrawn, which contained pus cells and intracellular cocci in abundance, and the cultures were positive. In all seventeen punctures were made between the twenty-ninth and the seventy-fifth day of the disease, of which fourteen were positive. A turbid pale yellow fluid was removed at each tapping. On five occasions 100 cc. or more were obtained, once 125 cc. and once 126 cc. Following the two first effective tapplings the patient appeared better, the temperature dropped, and he seemed much brighter, but he soon became worse, and the fever rose. Following the sixth, seventh, eighth, and eleventh punctures the temperature fell,  $4.5^{\circ}$ ,  $3.8^{\circ}$ ,  $4.2^{\circ}$ , and  $5.8^{\circ}$ . There was no change in the general condition, though he sometimes was a little brighter, and the drop in fever followed so directly that it seemed only natural to attribute the good results to the lumbar puncture. The thirteenth puncture was practically negative, yet the temperature fell  $5.1^{\circ}$ , and after the fourteenth tapping the temperature rose  $2.6^{\circ}$ . Evidently not the withdrawal of the fluid, but the peculiar character of the disease, already spoken of, was responsible for the remissions. The chart illustrates further the persistence of the leucocytosis, and the sterile characters of the fluid after the forty-fourth day. I have here for demonstration the lumbar portion of the cord and its membranes. The position of the last puncture can be seen, and the repeated operations have caused a slight hæmorrhagic pachymeningitis.

#### IV.—SPORADIC CEREBRO-SPINAL FEVER.

To what extent do isolated cases of cerebro-spinal fever occur in the intervals between the epidemic prevalence?

CASE XVI.—KRATZ—LUMBAR PUNCTURE CHART.

Puncture No.	Day of Disease.	Amount.	Character.	Microscopically.	Cultures.	Leucocytosis.	Temperature.
1	29	Negative	... ..	... ..	...	...	Unchanged.
2	31	100 cc.	Yellow ; turbid.	Pus cells ; intracellular diplococci.	Positive.	17,400	Dropped 2·4°
3	35	125	Yellow ; turbid.		Positive.	25,300	.. 1·0°
4	37	90	Pale yellow ; turbid.	Pus cells ; no cocci.	Negative.	19,900	.. 2·0°
5	40	85	Pale yellow.	Pus cells ; no cocci.	..	28,000	.. 1·0°
6	44	126	Pale yellow ; cloudy.	Intracellular diplococci.	..	15,000	.. 4·5°
7	46	100	Pale yellow ; turbid.	Pus cells ; no cocci.	..	22,000	.. 3·8°
8	48	50	Pale yellow ; turbid.	Pus cells ; no cocci.	..	19,000	.. 4·2°
9	54	30	Pale yellow ; turbid.	Pus cells ; no cocci.	..	23,600	Rose 0·8°
10	59	Negative.	... ..	... ..	...	...	Unchanged.
11	59	100 cc.	Cloudy.	Pus cells ; no cocci.	..	...	Dropped 5·8°
12	62	60	Cloudy ; blood-tinged.	Pus cells ; no cocci.	..	18,000	.. 3·4°
13	68	3	... ..	... ..	..	32,000	.. 5·1°
14	70	75	Cloudy.	Pus cells ; no cocci.	..	47,500	Rose 2·6°
15	73	Negative.	... ..	... ..	...	23,000	Unchanged.
16	75	Negative.	... ..	... ..	...	...	Unchanged.
17	75	8 cc.	Cloudy.	Pus cells ; no cocci.	..	...	Unchanged.

What is the nature of the primary suppurative meningitis which is met with from time to time in all communities? Neither hospital statistics nor the ordinary death returns give trustworthy answers to these questions. The diagnosis of meningitis is often doubtful, and it is very probable that a great many cases are returned as cerebro-spinal meningitis which are the cerebral forms of typhoid fever or of pneumonia. It is surprising how much confusion there is in the diagnosis of the different forms, and the urgent need of a more accurate recognition of the varieties is well shown by the number of terms used in the tabulation of cases. Thus, not to speak of the tuberculous form, which is often spoken of as basilar meningitis, the terms most frequently used are acute meningitis, meningitis simplex, purulent meningitis, and septic meningitis. In a recently issued report on sporadic cerebro-spinal meningitis from the Philadelphia Hospital, by L. N. Boston (*Medical News*, May 20, 1899), exclusive of the tuberculous variety, the following names occur as designating the varieties of acute meningitis: leptomeningitis, basilar meningitis, pachy- and basilar meningitis, basilar and lepto-meningitis, hæmorrhagic meningitis, and purulent meningitis.

To reach uniformity in this matter is not at present possible, but we may welcome the steps which have been taken towards separating the different forms of the disease.

In the last *Census Report of the United States*, the returns for the census year 1890, a year in which cerebro-spinal fever, so far as I know, did not prevail to any extent in epidemic form, the number of deaths reported from cerebro-spinal meningitis were 3,333, a large percentage of these during the first year of life.

From the *Fifty-Ninth Annual Report of the Registrar-General*, 1896, I gather that the deaths from cerebro-spinal fever in England from 1877 to 1896 (inclusive) have only once exceeded 50 per annum. There has been a great reduction in the return since 1887, 233 cases for the ten years ending 1896, against 406 for the previous decade. In Scotland there were only six deaths from cerebro-spinal fever in 1895, and five in 1896. In Ireland there were seventy-six deaths from this cause in 1896, and the same number in 1897.

From the records of two large metropolitan hospitals I

have gleaned the following figures:—At St. Bartholomew's, from 1860, cases with the diagnosis of cerebro-spinal meningitis occur in the years 1872, 1888, 1889, 1890, 1892, 1893, 1895, 1896, 1897—twenty-one in all. In many years the word meningitis alone is used, in others the word spinal meningitis and meningitis simplex. Ormerod (*Lancet*, 1895, I.) gives an exceedingly interesting report on ten fatal cases from this Hospital: four of them occurred between March and June, 1890, at which time epidemic meningitis prevailed in the Eastern Counties. At St. Thomas's since 1873 cases with the diagnosis of cerebro-spinal meningitis occur in the years 1895 and 1896—seven cases in all. In the wards of the Royal Infirmary, Edinburgh, there were in 1891 three cases diagnosed as cerebro-spinal meningitis, in 1892 two cases, in 1893 one case.

In the United States and Canada the occurrence of sporadic cases of cerebro-spinal fever in the intervals between epidemics has long been recognised. In Montreal I performed *post mortems* on at least three cases of acute purulent cerebro-spinal meningitis not associated with pneumonia or endocarditis, and not following otitis media or injury. As illustrating the liability to error, I may mention a case in which the diagnosis of cerebro-spinal meningitis was made in malignant small-pox; in another instance, with the same diagnosis, the case was a very acute typhoid fever, fatal within a week. In Philadelphia I saw only three cases.

At the Boston City Hospital, from 1880 to 1896, there were thirty-nine cases diagnosed as cerebro-spinal meningitis with a mortality of 59 per cent. It is interesting to note that during the first five months of 1897, when the epidemic began, there were forty-two admissions, a larger number than in the previous seventeen years. That the disease lingers in a city indefinitely after an outbreak has been the common opinion of all students of the disease, and anyone who has had a large *post-mortem* experience has met with sporadic instances of extensive suppurative meningitis which he has not been able to regard as secondary to any existing condition. The Philadelphia records are interesting in this respect. As collected by Stillé from 1863 the figures illustrate very well the periods in which there were slight outbreaks; namely, 1864-65 and 1872-73. Pepper ("American Text-book of Medicine," vol. i.,

p. 163) completed the figures to 1892, and Dr. Abbott has sent me the figures up to date. They show from 1884 a progressive decline in the number of cases, which may in part have been due to more careful diagnosis. From this year, when there were 124 deaths, there was a gradual decline, and in 1891 there were only 23 deaths. From that year the figures as sent me by Dr. Abbott are as follows:—1892, 22 cases; 1893, 35 cases; 1894, 18 cases; 1895, 17 cases; 1896, 7 cases; 1897, 10 cases; 1898, 24 cases; 1899 (to and including April 31), 89 cases. Here again it is interesting to see how quickly the epidemic prevalence of the disease is manifest. During 1898 the disease was not recognised as prevalent in Philadelphia. During the present year a number of cases have occurred, and the deaths during the first four months have been 89.

In Baltimore the figures for the past six years are as follows:—1893, 59 cases; 1894, 26 cases; 1895, 27 cases; 1896, 32 cases; 1897, 22 cases; 1898, 70 cases; during this year the prevalence of the disease was recognised as occurring in a mild form through the city. During the first four months of the present year there has been an increase, and the deaths for this period have been 27.

*Sporadic Cerebro-Spinal Fever at the Johns Hopkins Hospital.*—In the spring of 1898 the first cases of the epidemic form were admitted to hospital, and in all eighteen cases have been under treatment. Prior to this date only four cases had been admitted which we regarded as sporadic forms of cerebro-spinal fever, three within a few days of each other in 1893, and one, a chronic case, in 1892, which has been reported.<sup>1</sup>

CASE I.—Patrick R. (Hospital No. 7253), aged 57, admitted May 1, 1893. The patient had been drinking heavily, and when admitted was delirious, mumbling and muttering to himself, and picking at the bed-clothes, and he resisted actively any attempt to examine him. His friends stated that he had been in this condition for about a week. His temperature on admission was 97.5°, pulse 68, respirations 16. He had no skin rash and no symptoms suggestive of meningitis, and we regarded the case as one of delirium tremens. As shown in the annexed chart (Chart VIII.), he had no fever until the 5th, four days after his admission. There was then a rapid rise to 105°; the respirations increased from 28 to 40; the pulse rose to 112. Throughout the 6th the temperature remained high, falling on the morning of

<sup>1</sup> *Johns Hopkins Hospital Bulletin*, 1892.

the 7th to 103°. The respirations rose to 48. He was a little cyanosed, could not be roused, and he died at 8 a.m. on the 7th.

The autopsy (No. 413) showed extensive yellowish purulent exudate over the hemispheres. There was a turbid exudate at the base and along the Sylvian fissures; the ventricles contained an excess of cloudy fluid. The cord was not examined. Cover slips showed

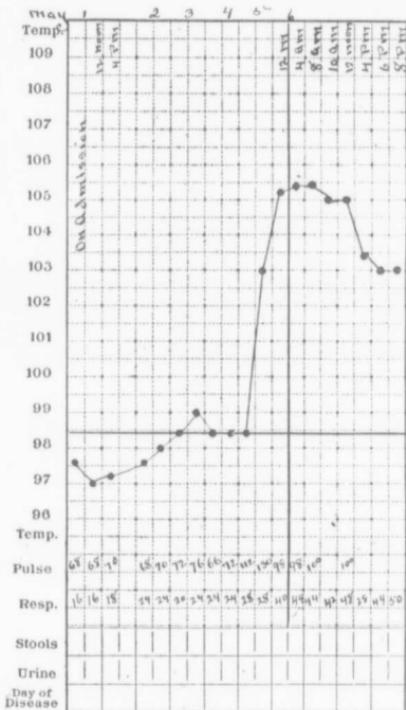


CHART VIII. P. R.

rounded cocci in pairs, chiefly in the mono- and polynuclear cells. Cultures showed diplo-bacilli. The lungs showed slight bronchopneumonia, and the pneumococcus was isolated.

CASE 2.—Wm. F., aged 27 (Hospital No. 7282), admitted May 3, 1893. The patient was apparently very deaf, and was noisy and delirious when admitted, and he had no friends from whom any

history could be obtained. The temperature on admission was 99°, pulse 86, respirations 20. During the night he became very noisy and delirious, and the pulse was irregular. On the following morning examination of the thoracic and abdominal organs showed nothing of any special moment. The spleen was not palpable. The temperature was 99°, pulse 96, respirations 24. On the evening of the 4th

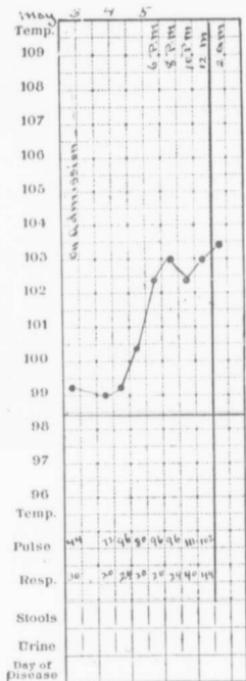


CHART IX. W. F. F.

and throughout the night the patient became very noisy and had to be transferred to the isolating ward. It was noticed on admission that he was very deaf, and this seemed to increase. On the afternoon of the 4th the temperature began to rise, and at 6 p.m. reached 102.5°. The pupils were equal; the pulse was 96, irregular. The patient resisted strongly any attempt to bend the head, and the neck was

held very rigid. There was general hyperæsthesia, and he cried out whenever he was touched. A petechial rash was noticed this afternoon for the first time over the abdomen. At 8 p.m. the temperature rose to  $103^{\circ}$  (Chart IX.). He became very much worse; the pulse became more rapid, 112, very irregular, and he died a little after 2 in the morning.

Autopsy (No. 412). A purulent greyish yellow exudate over the hemispheres, also along the pons and medulla, and the whole length of the spinal cord, which in the lumbar region reached a thickness of 8 mm. The ventricles were distended with a turbid yellowish fluid. In the posterior cornua there was a greenish exudate. Cover slips from the meninges showed numerous leucocytes and large cells containing round diplococci. Pus from the ventricles showed many cocci, single and in pairs, chiefly in cells. Some of the larger cells were packed with these cocci. Cultures were negative. Inoculations of a rabbit and a mouse were also negative. At that time we had not recognised the diplococcus intracellularis of Weichselbaum, but the description of the organism, the position in such numbers within the cells, the failure to grow in cultures and the negative results of experiments on animals, make it more than probable that we were dealing with this organism.

When these cases occurred the disease was not prevailing in Baltimore, and except in New York it was not epidemic anywhere in the country, so far as we could ascertain. Three days after the death of Case 1 a lad was admitted with a most remarkable family history of the disease. The father, a very intelligent man, gave the following details of the cases:—

*Wagner family.*—I. A son, a young man of about 20 years, returned home on Monday, February 7, complaining of a terrible pain in his head. He had fever with much vomiting, and his head and neck were arched. He was very delirious, became rapidly worse, and died on Saturday the 12th. II. A sister, who had helped to nurse her brother, was taken ill on Monday the 15th with similar symptoms, and died in four days. III. A second sister became affected in a few days and for two weeks was desperately ill; she then began to improve and is now well. IV. The mother, who was worn out nursing the children, was taken ill on March 17 and died in two days. She had slept in the same bed with No. V., who was admitted to the hospital.

CASE 3.—W. W., aged 15, No. V. of the Wagner family, was admitted May 12, in the eighth week of an illness which the doctor described as cerebro-spinal meningitis, and of which his mother and a brother and sister had died. The patient presented a dull heavy

appearance, and for some days did not appreciate his surroundings and appeared confused. He had delusions and hallucinations, and thought he saw his mother and sister in the room with him. He had no fever, and there was no rigidity of the head or neck. The optic nerves looked normal. He improved gradually and was discharged well June 10.

I can find no parallel to this record in the history of sporadic cerebro-spinal fever. The figures which I have given for Baltimore show that in the year 1893 a considerably larger number of cases occurred than in the four succeeding years, and the admission of these three cases in rapid succession excited our interest, but from this time until the spring of 1898 we saw nothing further of the disease. In the history of the epidemic form it is not very uncommon to find two or three cases from one house. Netter refers to Sewall's report of six children attacked in one family at the beginning of the New York epidemic in 1872, and he quotes from Thorne Thorne the statement of Morcieca that in Malta seven cases occurred in a family of nine persons. Such facts speak strongly for the contagious nature of the disease. Under ordinary circumstances, however, it is exceedingly rare to find more than one case in a family, either in the sporadic or epidemic form, and I know of no case in our recent American experience in which a physician or nurse has been attacked, or in which cases have developed among other patients in a hospital. We know nothing of the conditions under which the disease assumes this family malignancy, as it may be termed. In this respect it resembles pneumonia, not highly contagious as a rule, but which may at times, in a family or institution, present a high degree of malignancy.

*Bacteriology of sporadic cerebro-spinal fever.*—In a number of cases of sporadic cerebro-spinal meningitis the Weichselbaum organism has been found. The case reported by Stewart and Martin<sup>1</sup> is of peculiar interest, inasmuch as the epidemic form of the disease has not prevailed in Montreal for many years. It is to be noted, however, that the patient prior to her illness had been spending a few weeks in Boston, where the disease had been prevailing. An unusual point in this case was the occurrence of an acute purulent pericarditis in addition to the

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<sup>1</sup> *Montreal Medical Journal*, March, 1898.

usual cerebro-spinal lesions. The cultures showed the diplococcus intracellularis.

By far the most suggestive contribution to this question made of late years is by Dr. George F. Still,<sup>1</sup> of the Great Ormond Street Hospital for Sick Children. In a study of the form of meningitis known as the simple posterior-basis of infants, he isolated from seven of eight cases a diplococcus which conforms in almost every particular with the diplococcus intracellularis. The frequency of this form of meningitis may be gathered from the fact that in ten years there were at this hospital forty-nine fatal cases, verified by autopsy. The smallest number in any one year was two, and the largest number seven. All of the cases were sporadic; none of them formed a part of any outbreak which could be considered epidemic. Clinically the disease presents certain differences from the ordinary type of cerebro-spinal fever, attacking young children, chiefly in the first year of life, and as a rule, is very much more chronic, though there are forms of cerebro-spinal fever which are quite as protracted. Skin rashes are rare, particularly herpes. The most interesting point of similarity determined by Still is the periartritic affection in certain of the cases of posterior meningitis, involving, as in epidemic form, the capsule of the joint, and the sheaths of the tendons. He determined also in one case the presence of the diplococcus in the exudate.

The problem is one which deserves the closest attention, and in every case of sporadic meningitis a careful bacteriological examination should be made for the meningococcus and the pneumococcus, as we are still ignorant of the proportion of cases due severally to these organisms. Two points remain for discussion, viz., the incidence of acute non-tuberculous meningitis in hospital work, and the clinical varieties of the pneumococcic form.

Through the kind permission of my colleague, Professor Welch, one of his assistants, Dr. W. G. MacCallum, has analysed from the pathological department of the hospital the cases of meningitis in which bacteriological examinations have been made.

The twenty-five cases may be divided into four groups:—

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<sup>1</sup> *Journal of Pathology and Bacteriology*, vol. v., 1898.

(a) *Cerebro-spinal fever*—six cases (Nos. 412, 413, 1,104, 1,189, 1,314 and 1,362).

(b) *Pneumococcic meningitis*—eight cases (Nos. 384, 478, 619, 746, 989, 1,082, 1,151 and 1,362).

(c) *Pyogenic meningitis*, in which streptococci or staphylococci, singly or in association, were found—seven cases (Nos. 694, 1,065, 1,092, 1,247, 1,166, 1,363 and 1,364).

(d) *Miscellaneous*—four cases, two of which (Nos. 854 and 1,091) showed peculiar unidentified bacilli.

The pyogenic forms of meningitis do not concern us here; no case of primary streptococcus or staphylococcus meningitis came to autopsy. I have already referred to the chronic forms of cerebro-spinal fever in which the pyogenic cocci may alone be present at the time of death.

The meningitis with which the diplococcus lanceolatus is associated, in many respects the most important variety, deserves a separate consideration.

#### *Pneumococcic Meningitis.*

As the pneumococcus has long been recognised as the most important organism in the production of meningitis, the first question to be considered is how far sporadic cases of cerebro-spinal meningitis are due to it. Of the twenty-five cases of meningitis in the pathological department of the Johns Hopkins Hospital, in eight the pneumococcus was isolated from the exudate. Bacteriological statistics everywhere show the great importance of this organism as a factor in the causation of meningitis. Of twenty cases examined by Councilman, Mallory, and Wright there were ten cases in which the pneumococcus was found, eight of these secondary to other conditions, in two only primary. In eight cases of secondary meningitis the streptococcus was present. Netter's experience is particularly interesting. To April, 1897, he had examined bacteriologically sixty-one cases of meningitis, with the following results:—“Pneumococcus in pure culture thirty-five times, the same associated with the streptococcus and with the staphylococcus each one time, the streptococcus alone thirteen times, the diplococcus intracellularis meningitidis three times, the staphylococcus pyogenes aureus and the bacillus of Friedländer each two times, and the coli bacillus, the influenza

bacillus, a fine bacillus, and a pyocyanic and saprophytic bacillus each one time." We may recognise three groups of cases of pneumococcal meningitis.

I. *The meningitis is a complication of lobar pneumonia.* In Montreal my attention was called to the great frequency of this association, in eight of one hundred consecutive autopsies,<sup>1</sup> and since these observations I have had opportunities of studying a number of cases, though I have never met with so large a proportion. By far the most important contributions to the subject have been those of Nauwerck<sup>2</sup> and Netter.<sup>3</sup> Of the twenty-nine cases analysed by Nauwerck, in four the convexity of the brain was alone involved, in sixteen both cortex and base, and in seven the cortex, base, and spinal cord. Netter's study, the most complete that has yet appeared, contains an analysis of one hundred and twenty-four cases collected from the literature. In the recent monograph on pneumonia by Aufrecht<sup>4</sup> seven cases of meningitis were found in two hundred and fifty-three autopsies, and of one thousand five hundred and one cases of pneumonia in ten the diagnosis of meningitis was made, in three of which recovery followed. Of the eight cases of pneumococcus meningitis in the department of my colleague Welch, in only four was the condition associated with lobar pneumonia.

II. *Pneumococcal meningitis from local infection.*—In this exceedingly important group the infection may come from the nose or the adjacent sinuses, from the ears, or may follow an injury to the skull, or an operation. In two of the three cases in the series analysed by Dr. MacCallum there was fracture of the base of the skull. In the third, a child, aged six, had suppuration of the nasal mucous membrane and adjacent sinuses. In this connection the importance of the pneumococcus is universally recognised, and many cases are on record of infection from an otitis media.

III. *Primary pneumococcal meningitis.*—A number of observers

<sup>1</sup> "The Morbid Anatomy of Pneumonia," *Canada Medical and Surgical Jour.*, May, 1885, and the Gulstonian Lectures on "Malignant Endocarditis," *British Medical Journal*, 1885, I.

<sup>2</sup> *Deutsches Archiv. für Klin. Med.*, Bd. xxix.

<sup>3</sup> *Archives Générales de Médecine*, 1887.

<sup>4</sup> Nothnagel's *Specielle Pathologie und Therapie*, Bd. xiv.

have isolated the pneumococcus in primary suppurative meningitis. The records cannot be regarded, however, as entirely trustworthy, since it is only within the past few years that bacteriologists have learned to recognise the differences between the pneumococcus and the diplococcus intracellularis. Subsequent study must determine in what proportion of cases of sporadic meningitis the pneumococcus exists, and in how many the diplococcus intracellularis.

The primary pneumococcic meningitis may develop in a person in good health, but more frequently there is a general pneumococcus infection in a debilitated individual, or in one with chronic disease. The meningitis may be present alone, or as is so common, in association with endocarditis. Of the cases examined in the *post-mortem* room of the Johns Hopkins hospital, one (No. 989), a man aged 44, had a general infection with the pneumococcus and meningitis. Another case (No. 1,206), with a general infection, acute endocarditis, and meningitis, is not included in this series, as a partial autopsy only was allowed, and but a small portion of the lumbar cord was examined.

*Clinical features of pneumococcic meningitis.*—I shall now refer to certain clinical features of these three groups of cases:—

(a) *Pneumonia with complicating meningitis.*—Is the case one of cerebro-spinal fever with pneumonia or of inflammation of the lungs with an added meningitis? This question does not often arise now at the bed-side, as it is most exceptional for the meningitis of pneumonia to present the symptoms of cerebro-spinal fever, and in a dubious case occurring during an epidemic the lumbar puncture (as in a case to be referred to in a few minutes) may be relied upon to clear up any doubts. The most valuable clinical record of meningitis in pneumonia is to be found in Nauwerck's paper. The histories, seventeen in number, are very full and complete, and in every case accompanied with a *post-mortem* report. He has added a series of twelve cases from the literature, making twenty-nine in all. All of the cases were above the twentieth year of age—a striking contrast to cerebro-spinal fever, in which a large proportion of all the cases are in the young. A second point is the latency of meningitis in pneumonia, which is much more often recognised in the dead house than in the wards. Netter states that fully one-half of the cases are of

this latent type. Of the cases I saw in Montreal I remember but one in which the diagnosis was made during life. Huguenin, referring to this obscurity, says: "We know no symptom which is constant in all cases or which may not be present in an identical manner in other conditions." Headache, early delirium, deepening into unconsciousness, are present in all cases. This is a consequence of the more common involvement of the cortex of the hemispheres. As Leichtenstern remarks, the mind may remain clear throughout the course of a case of cerebro-spinal fever. Spinal symptoms are rare; in only seven of the cases analysed by Nauwerck was there rigidity of the neck muscles. Strabismus was present in one-fifth of the cases, ptosis only once. The importance of lumbar puncture cannot be too strongly emphasised. A recent case, which occurred while cases of cerebro-spinal fever were in the hospital, illustrates this so well that I give an abstract of it:—

Charles E., aged 52 (Hospital No. 26417), was admitted May 6, 1899, with pneumonia of the right upper lobe of about eight days' duration. He was in a semi-comatose condition, with a temperature of only 99°, respirations 32, pulse 108. There was a pneumonia of the apex of the right lung. The day after admission it was noted that his arms and legs were very stiff; Kernig's sign was well marked, and there was some rigidity of the neck. The patient, however, responded to questions. Lumbar puncture was made in the third interspace, and 5 cc. of a perfectly clear limpid fluid obtained. Lumbar puncture was made again on May 10, and 30 cc. of a perfectly clear fluid obtained, negative on cover-slips and culture. For the next three days he had a good deal of tremor. Kernig's sign was present, and there was still some rigidity of the arms and of the neck. The leucocytes ranged from 16,000 to 24,000 per cmm. On the 14th lumbar puncture was performed for a third time, and a slightly turbid fluid obtained, from which on cover-slips the pneumococcus was obtained. The patient died on the evening of the 14th. The autopsy showed a pneumonia of the right apex, a very slight purulent exudate at the base, some turbid fluid in the ventricles, and a small amount of turbid cerebro-spinal fluid, but no positive exudate on the spinal meninges. There was an ulcerative endocarditis of the aortic valve. The pneumococcus was isolated from the meninges, the heart valves, and from the lung. A very interesting feature in this case was the normal temperature on the 11th, 12th and 13th days of the disease, and the high temperature on the 14th and 15th days, ranging to 105° and 106°.

And lastly, a most important difference between the meningitis complicating pneumonia and cerebro-spinal fever is the almost universally fatal course of the former. Nauwerck

describes the complication as invariably fatal, and he was not able to convince himself that in any one of the reported cases of recovery in the literature meningitis was actually present. Netter<sup>1</sup> speaks somewhat more hopefully, and states that recovery may occur. He gives two cases from the literature, both in children. In one, a child of five, in which the crisis occurred on the sixth day; the signs of meningitis were the presence during the first few days of headache, unequal pupils and ptosis. Aufrecht, in his recent monograph, *loc. cit.*, also speaks of the possibility of recovery. Of ten cases of meningitis in 1501 of pneumonia, three recovered. Netter, in his article in "the Twentieth Century Practice," commenting upon the statement by Wentworth that pneumococcal meningitis is always fatal, states that "as early as 1887 I demonstrated, however, that its curability is one of the most evident characteristics of the pneumococcal meningitis." So far as I can gather there is nothing in his essay to justify such a statement, since, as I have mentioned, he gives but two instances of recovery.

Personally I have never recognised recovery in pneumonia complicated with meningitis, and the literature of the subject bears out strongly the view that one of the most striking differences between the meningitis of pneumonia and cerebro-spinal fever is the almost invariably fatal termination of the former.

(b) *Pneumococcal meningitis from local infection.* — Two of the three cases in this group were surgical; one (No. 746), followed removal of the bones of nose and orbit; the other (1151) a fracture of the base of the skull, involving the cribriform plate of the ethmoid. In both the pneumococcus alone was isolated from the exudate in the cerebral meningitis. In two of Councilman's eight cases the infection followed fracture, in one otitis media. Cases of this group do not so often appear in the medical wards, but last year we were particularly interested in a case in which the infection started from the nose and accessory sinuses; though the possibility has to be considered of extension from the meninges. An abstract is worth quoting, and the picture (fig. 2) shows a remarkable condition of cervical opisthotonos:

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<sup>1</sup> *Archives Generales de Medicine*, 1887, I., p. 273.

Anna C., aged 6 (black), admitted March 31, 1898. Her previous history was negative. Five days before entrance, directly after supper, she vomited and complained of headache; later in the evening she became delirious. Two days after the head was held stiffly, and she had much pain in the back of the neck. She had fever, rapid pulse, loss of appetite, and constipation. On admission she was conscious, but very irritable and difficult to examine. The head was arched back and could not be brought forward. The pupils were equal and reacted to light. There was a marked slight internal strabismus. There was nothing of moment found in the examination of the chest and abdomen. She was very tender in the sub-occipital region, but there was no sign of disease of the cervical spine. Lumbar puncture on the 1st was negative. For the first week the condition remained about the same; the child could be roused, and answered



FIG. 2.—A. C. Pneumococcic meningitis—cervical opisthotonos.

questions, the strabismus persisted; there were no changes in the optic nerves. The temperature ranged from  $100^{\circ}$  to  $104^{\circ}$ . The arching of the head and neck continued; the eyes looked directly upwards (fig. 2). On the 17th a rash appeared, a diffuse erythema over the face, neck and chest, with papules. The rash faded in three days. The temperature ranged from  $102^{\circ}$  to  $104^{\circ}$ . On April 19 a profuse purulent discharge appeared from the nose, which showed the pneumococcus on cover-slips, but in cultures only the staphylococcus aureus grew. She could still be roused; the attitude remained as shown in the photograph. No optic neuritis. Throughout the 18th the temperature dropped from  $105^{\circ}$  to  $97^{\circ}$  on the morning of the 19th, and continued about  $97^{\circ}$  until her death on the morning of the 21st. One of the most remarkable features was the retention of consciousness to within a week of her death.

The autopsy (No. 1082) showed exudate over the sulci of the hemispheres. The base, from just behind the optic commissure, over the pons and lateral lobes of the cerebellum, was covered with a soft yellow exudate. The posterior surface of the spinal cord showed the same. The ventricles were much distended with a turbid fluid. There was suppuration of the mucous membrane of the nose, and of the ethmoidal and sphenoidal sinuses. Cultures showed the pneumococcus in the cerebro-spinal exudate, and from the nasal pus the pneumococcus and the staphylococcus aureus.

(c) *Primary pneumococcic meningitis*.—Future investigations will decide the proportion of cases of primary cerebro-spinal meningitis due to the pneumococcus and to the diplococcus intracellularis; and it will be an exceedingly interesting study to determine whether there are clinical differences such as separate so decidedly the meningitis complicating pneumonia from the cerebro-spinal fever. Judging from the bacteriological records given by Councilman, Mallory and Wright, and those of the Pathological Laboratory of the Johns Hopkins Hospital, the primary pneumococcic meningitis is rare in America—certainly much less infrequent than the secondary forms. Two of Councilman's ten cases, both infants, one of ten months, the other of six days, were primary. I cannot gather from Netter's statistics<sup>1</sup> how many of his cases were *primary*; nor without consulting the original can one say how many of the thirteen cases of sporadic meningitis studied by Malenchini (quoted by Netter) belonged to this group. Of our eight cases, as stated, only one was primary, and it is worth quoting:—

G. C., aged 44 (white), admitted at 6.30 p.m. on September 1, 1897, in an unconscious state. When seen by his brother on Saturday, the 29th, he was quite well. After going to bed on Saturday evening, the 30th, he had a severe chill. On Monday he was too ill to go to work. In the evening he became delirious, and ever since has had fever, has been restless, difficult to restrain, and very noisy. On admission the temperature was 105°; the pulse 136 and small. Dr. McCrae saw him a few minutes after he had been put to bed, and took very full and careful notes of the condition. The face was flushed and he looked distressed. There was no strabismus; the pupils were dilated and inactive. The head and neck were held stiffly, and the arms were held firmly flexed on the chest. There were no signs of pneumonia; the heart sounds were clear. The abdomen was not distended, there were no rose spots and the spleen could not be felt; there were no herpes. The skin had a diffuse mottling, but no purpuric spots were seen. There was no urethral discharge. The

<sup>1</sup> "Twentieth Century Practice," vol. xvi., p. 193.

leucocytes were 13,500 per cm., no alteration in a differential count of 500. The Widal reaction was not present. At 10 p.m. the temperature had reached 106° and he was given a bath at 80, with ice frictions, which reduced the rectal temperature to 103°. At 11 p.m. the body seemed to be held much more stiffly. At 12 midnight he was much worse, and at 12.40 a.m. he died, about three days and three hours from the time of the initial chill.

The *post mortem* (No. 989) showed a diffuse purulent meningitis of the hemispheres; the base much less involved and the ventricles not at all affected. The cord unfortunately was not examined. There was a recent diffuse nephritis, and the urine in the bladder contained albumen and tube cases. There was a general pneumococcus infection, no pneumonia or endocarditis, and the pneumococcus was separated in pure culture from the meningeal exudate.

#### V.—NOTE ON THE TREATMENT OF CEREBRO-SPINAL FEVER.

In our series of cases we have used no special drugs. Morphia has been freely given to control the pain. Ice sponging has been employed whenever the temperature reached above 102.5°. Our mortality, considering that the cases were as a rule quite severe, has been low, only eight of eighteen cases in the Hospital, and nine among the twenty-one cases which I have seen.

I have already spoken of the possible benefits in certain cases of the relief of pressure by the withdrawal of cerebro-spinal fluid.

In two of our cases the spinal canal has been opened, drained and irrigated. Winter (*Lancet*, 1891), in tuberculous meningitis, removed the spinal process of the second lumbar vertebra and drained the spinal canal. Von Ziemssen first attempted to use local therapeutics to the membranes of the cord by injecting a weak solution of iodine in a case of meningitis; and later Sahli practised permanent drainage through a canula and catheter. So far as I know, an extensive laminectomy had not been done for acute spinal meningitis until our first case, Nov. 6th, 1898, in which the operation was suggested and performed by Dr. Harvey W. Cushing, the first assistant in the surgical clinic of my colleague, Professor Halsted. The case has already been given in abstract under the section on Bacteriology<sup>1</sup> as the one in which the staphylococci only were present at the time of

<sup>1</sup> And reported in *Boston Medical and Surgical Journal*, December 29th, 1898.

operation. The spinal canal was thoroughly irrigated with salt solution and a quantity of purulent exudate washed out. No change followed in the existing paraplegia. The bladder and kidneys became infected, and he died about two months after the operation. The paraplegia persisted. At autopsy the spinal meninges were smooth and looked perfectly normal. It was impossible to say where the dura mater had been incised, and there were neither adhesions nor areas of the thickening on the pia-arachnoid. There were extensive changes in the cord itself and in nerve roots.

In case 12 laminectomy was performed on the fourth day by Dr. Cushing. The patient was very ill, and the spinal symptoms were especially pronounced. A catheter was passed beneath the dura mater, and the membranes drained and irrigated with salt solution. For several days he seemed much better. He developed a hæmorrhagic cystitis and pyelonephritis, and died on the sixth day after operation.

Dr. Musser, of Philadelphia, has also had an unsuccessful case. Dr. Rolleston and Mr. Herbert Allingham have reported<sup>1</sup> a case of sporadic cerebro-spinal meningitis, in which the patient recovered after laminectomy and drainage. On the principle of a desperate remedy for a desperate disease, the operation (which has been criticised adversely in an editorial note in the *Philadelphia Medical Journal*) seems justifiable in certain severe cases, in which, as in our first case, the spinal symptoms are very marked.

## AFTER TWENTY-FIVE YEARS.

AD ADDRESS AT THE OPENING OF THE SESSION OF THE MEDICAL  
FACULTY, MCGILL UNIVERSITY, SEPT. 21st, 1899.

BY

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## I.

From two points of view alone have we a wide and satisfactory view of life—one, ere the dew of youth has been brushed off, as we stand at the foot of the hill, eager for the journey, amid the glorious tints of the early morn ; the other, wider, perhaps less satisfactory, as we gaze from the summit, at the lengthening shadows cast by the setting sun. From no points in the ascent have we the same broad outlook, as the steep and broken pathway affords few halting places with an unobscured view. You remember in the ascent of the Mountain of Purgatory, Dante, after a stiff climb, reached a high terrace encircling the hill, and sitting down turned to the East, remarking to his good leader—"all men are delighted to look back." So on this occasion, from the terrace of a quarter of a century, I am delighted to look back, and to be able to tell you of the prospect.

Twenty-five years ago this Faculty, with some hardihood, selected a young and untried man to deliver the lectures on the Institutes of Medicine. With characteristic generosity the men who had claims on the position in virtue of service in the school, recognizing that the times were changing, stepped aside in favor of one who had had the advantage of post-graduate training in the subjects to be taught. An experiment on the part of the Faculty, enthusiasm, constitutional energy, and a fondness for the day's work on my part led to a certain measure of success. I have tried to live over again in memory those happy early

days, but by no possible effort can I recall much that I would fain remember. The dust of passing years has blurred the details, even in part the general outlines of the picture. The blessed faculty of forgetting is variously displayed in us. In some, as in our distinguished countryman, John Beattie Crozier, it is absent altogether, and he fills chapter after chapter with delightful reminiscences and descriptions of his experiences and mental states.\* At corresponding periods—we are about the same age—my memory hovers like a shade about the magic circle which Ulysses drew in Hades, but finds no Tiresias to lift the veil with which oblivion has covered the past. Shadowy as are these recollections, which,

“be they what they may  
Are yet the fountain light of all our day,  
Are yet a master light of all our seeing,”

they are doubly precious from their association with men who welcomed me into the Faculty, now, alas! a sadly reduced remnant. To them—to their influence, to their example, to the kindly encouragement I received at their hands—I can never be sufficiently grateful. Faithfulness in the day of small things may be said to have been the distinguishing feature of the work of the Faculty in those days. The lives of the senior members taught us youngsters the lesson of professional responsibility, and the whole tone of the place was stimulating and refreshing. It was an education in itself, particularly in the amenities of faculty and professional life, to come under the supervision of two such Deans as Dr. George Campbell and Dr. Palmer Howard. How delightful it would be to see the chairs which they adorned in the school endowed in their memories and called by their names!

One recollection is not at all shadowy—the contrast in my feelings to-day only serves to sharpen the outlines. My first appearance before the class filled me with a tremulous uneasiness and an overwhelming sense of embarrassment. I had never lectured, and the only paper I had read before a society was with all the possible vaso-motor accompaniment. With a nice consideration my colleagues did not add to my distress by their presence, and once inside the lecture room the friendly greeting of the boys calmed my fluttering heart, and, as so often happens, the ordeal was most severe in anticipation. One permanent impression of the session abides—the awful task of the preparation of about one hundred lectures. After the ten or twelve with which I started were exhausted I was on the treadmill for the remainder of the session. False pride forbade the reading of the excellent lectures of my predecessor, Dr. Drake, which, with his wonted goodness of heart, he had offered.

\* *My Inner Life*, Longmans, 1908.

I reached January in an exhausted condition, but relief was at hand. One day the post brought a brand-new work on physiology by a well-known German professor, and it was remarkable with what rapidity my labors of the last half of the session were lightened. An extraordinary improvement in the lectures was noticed; the students benefitted, and I gained rapidly in the facility with which I could translate the German.

Long before the session was over I had learned to appreciate the value of the position entrusted to me, and sought the means to improve the methods of teaching. I had had the advantage of one of the first systematic courses on practical physiology given at University College, London, a good part of which consisted of lessons and demonstrations in histology. In the first session, with but a single microscope, I was only able to give the stock display of the circulation of the blood, ciliary action, etc., but a fortunate appointment as physician to the smallpox department of the General Hospital carried with it a salary which enabled me to order a dozen Hartnack microscopes and a few bits of simple apparatus. This is not the only benefit I received from the old smallpox wards, which I remember with gratitude, as from them I wrote my first clinical papers. During the next session I had a series of Saturday demonstrations, and gave a private course in practical histology. One grateful impression remains—the appreciation by the students of these optional and extra hours. For several years I had to work with very scanty accommodation, trespassing in the chemical laboratory in winter, and in summer using the old cloak room downstairs for the histology. In 1880 I felt very proud when the faculty converted one of the lecture rooms into a physiological laboratory and raised a fund to furnish and equip it. Meanwhile I had found time to take my bearings. From the chair of the Institutes of Medicine both physiology and pathology were taught. It has been a time-honoured custom to devote twenty lectures of the course to the latter, and as my colleagues at the Montreal General Hospital had placed the post-mortem room at my disposal I soon found that my chief interest was in the pathological part of the work. In truth, I lacked the proper technique for practical physiology. For me the apparatus never would go right, and I had not a *Diener* who could prepare even the simplest experiments. Alas! there was money expended (my own usually, I am happy to say, but sometimes my friends', as I was a shocking beggar!) in apparatus that I never could set up, but over which the freshmen firmly believed that I spent sleepless nights in elaborate researches. Still one could always get the blood to circulate, cilia to wave and the fibrin to digest. I do not think that any member of the ten successive classes to which I lectured understood the structure of a lymphatic gland, or of the spleen, or of the placental circulation. To those structures I have to-day

an ingrained hatred, and I am always delighted when a new article comes out to demonstrate the folly of all preceding views of their formation. Upon no subjects had I harder work to conceal my ignorance. I have learned since to be a better student, and to be ready to say to my fellow students "I do not know." Four years after my college appointment the Governors of the Montreal General Hospital elected me on the visiting staff. What better fortune could a young man desire! I left the same day for London with my dear friend, George Ross, and the happy days we had together working at clinical medicine did much to wean me from my first love. From that date I paid more and more attention to pathology and practical medicine, and added to my courses one in morbid anatomy, another in pathological histology, and a summer class in clinical medicine. I had become a pluralist of the most abandoned sort, and by the end of ten years it was difficult to say what I did profess, and I felt like the man to whom Plato, in *Aleibiades II.* applies the words of the poet :—

" Full many a thing he knew ;  
But knew them all badly."

Weakened in this way, I could not resist when temptation came to pastures new in the fresh and narrower field of clinical medicine.

After ten years of hard work I left this city a rich man, not in this world's goods, for such I have the misfortune—or the good fortune—lightly to esteem, but rich in the goods which neither rust nor moth have been able to corrupt,—treasures of friendship and good fellowship, and those treasures of widened experience and a fuller knowledge of men and manners which contact with the bright minds in the profession necessarily entails. My heart, or a good bit of it at least, has stayed with these treasures. Many a day I have felt it turn towards this city to the dear friends I there left, my college companions, my teachers, my old chums, the men with whom I lived in closest intimacy, and in parting from whom I felt the chordæ tendinæ grow tense.

## II.

Twenty-five years ago the staff of this school consisted of the historic septenary, with one demonstrator. To-day I find on the roll of the Faculty 52 teachers. Nothing emphasizes so sharply the character of the revolution which has gradually and silently replaced in great part for the theoretical, practical teaching, for the distant, cold lecture of the amphitheatre the elbow to elbow personal contact of the laboratory. The school, as an organization, the teacher and the student have been profoundly influenced by this change.

When I joined the faculty its finances were in a condition of delight-

ful simplicity, so simple indeed that a few years later they were intrusted to my care. The current expenses were met by the matriculation and graduation fees and the government grant, and each professor collected the fees and paid the expenses in his department. To-day the support of the laboratories absorbs a much larger sum than the entire income of the school in 1874. The greatly increased accommodation required for the practical teaching has made endowment a vital necessity. How nobly, by spontaneous gifts and in generous response to appeals, the citizens have aided the efforts of this faculty I need not remind you. Without it McGill could not have kept pace with the growing demands of modern methods. Upon one feature in the organization of a first-class school permit me to dwell for a moment or two. The specialization of to-day means a group of highly trained experts in the scientific branches, men whose entire energies are devoted to a single subject. To attain proficiency of this sort much time and money are required. More than this, these men are usually drawn from our very best students, with minds above the average. For a majority of them the life devoted to science is a sacrifice; not, of course, that it is so felt by them, since the very essence of success demands that in their work should lie their happiness. I wish that the situation could be duly appreciated by the profession at large, and by the trustees, governors and the members of the faculties throughout the country. Owing these men an enormous debt, since we reap where they have sown, and garner the fruits of their husbandry, what do we give them in return? Too often beggarly salaries and an exacting routine of teaching which saps all initiative. Both in the United States and Canada the professoriate as a class, the men who live by college teaching, is wretchedly underpaid. Only a few of the medical schools have reached a financial position which has warranted the establishment of thoroughly equipped laboratories, and fewer still pay salaries in any way commensurate with the services rendered. I am fully aware that with cobwebs in the purse not what a faculty would desire has only too often to be done, but I have not referred to the matter without full knowledge, as there are schools with large incomes in which there has been of late a tendency to cut down salaries and to fill vacancies too much on Wall Street principles. From Harvard comes a most encouraging announcement. By the will of the late Dr. Calvin Ellis the Medical School receives nearly half a million dollars, the income from which is to be used in raising the salaries of the scientific chairs to \$5000 per annum. And not for relief of the pocket alone would I plead. The men in charge of our Canadian laboratories are overworked in teaching. A well organized staff of assistants is very difficult to get, and still more difficult to get paid. The salary of the professor should be in many cases that of the first assistant. When the entire energy of a laboratory

is expended on instruction, research, a function of equal importance, necessarily suffers. Special endowments are needed to meet the incessant and urgent calls of the scientific staff. It is gratifying to know that certain of the bequests to this school have of late been of this kind, but I can safely say that no department is as yet fully endowed. Owing to faulty conditions of preliminary education the medical school has to meet certain illegitimate expenses. No one should be permitted to register as a medical student who had not a good preliminary training in chemistry. It is an anomaly that our schools should continue to teach general chemistry, to the great detriment of the subject of medical chemistry, which alone belongs in the curriculum. Botany occupies a similar position.

But *the* laboratories of this medical school are not those directly under its management. McGill College turned out good doctors when it had no scientific laboratories, when the Montreal General Hospital and the University Maternity were its only practical departments. Ample clinical material and good methods of instruction gave the school its reputation more than fifty years ago. Great as has been the growth of the scientific half of the school, the all-important practical half has more than kept pace. The princely endowment of the Royal Victoria Hospital by our large-hearted Canadian Peers has doubled the clinical facilities of this school, and by the stimulus of a healthy rivalry has put the Montreal General Hospital into a condition of splendid efficiency. Among the many changes which have occurred within the past twenty-five years, I would place these first in order of importance, since they assure the continued success of McGill as a school of practical medicine.

Equally with the school as an organization, the teacher has felt deeply the changed conditions in medical education, and many of us are much embarrassed to know what and how to teach. In a period of transition it is not easy to get *orientiert*. In some subjects fortunately there is but the single difficulty—what to teach. The phenomenal strides in every branch of scientific medicine have tended to overload it with detail. To winnow the wheat from the chaff and to prepare it in an easily digested shape for the tender stomachs of first and second year students taxes the resources of the most capable teacher. The devotion to a subject, and the enthusiasm and energy which enable a man to keep abreast with its progress, are the very qualities which often lead him into pedagogic excesses. To reach a right judgment in these matters is not easy, and after all it is in teaching as Izaak Walton says of angling, "Men are to be born so, I mean with inclinations to it." For many it is very hard to teach down to the level of beginners. I was told a good story illustrating this a few weeks ago. One of the most distinguished—no, the most distinguished of Scotch professors had gone off for a few weeks

during the term, leaving his first assistant, named Day, in charge of his work. As is not infrequently the case, the junior caught the ear of the class better than the master. On the blackboard just before the Professor returned one of the students wrote, "Work while it is Day, for the (k)night cometh when no man can work." The old time lecture room teacher is rapidly giving place to the demonstrator and the class instructor. Professors, like doctors, may be divided into four classes. It was a parson (Mr. Ward, Rector of Stratford-on-Avon shortly after Shakespeare's day) who gave the well-known libellous division of doctors :— "first, those that can talk but do nothing ; secondly, some that can do but not talk ; third, some that can both do and talk ; fourthly, some that can neither do nor talk—and these get most monie." Of professors the first is the man who can think but who has neither tongue nor technique. Useless for the ordinary student, he may be however the leaven of a faculty and the chief glory of his university. A second variety is the phonographic professor, who can talk but who can neither think nor work. In the old régime he repeated year by year the same lecture. A third is the man who has technique but who can neither talk nor think ; and a fourth is the rare professor who can do all three—think, talk and work. With these types fairly represented in a faculty, the diversities of gifts only serving to illustrate the wide spirit of the teacher, the Dean at least should feel happy.

But the problem of all others which is perplexing the teacher to-day is not so much what to teach, but how to teach it, more especially how far and in what subjects the practical shall take the place of didactic teaching. All will agree that a large proportion of the work of a medical student should be in the laboratory and in the hospital. The dispute is over the old-fashioned lecture, which has been railed against in good set terms, and which many would like to see abolished altogether. It is impossible, I think, to make a fixed rule, and teachers should be allowed a wide discretion. With the large classes of many schools the abolition of the didactic lecture would require a total reconstruction of the curriculum and indeed of the faculty. Slowly but surely practical methods are everywhere taking the place of theoretical teaching, but there will, I think, always be room in a school for the didactic lecture. It is destined within the next ten years to be much curtailed, and we shall probably, as is usual, go to extremes, but there will always be men who can present a subject in a more lucid and attractive manner than it can be given in a book. Sir William Gairdner once remarked that the reason why the face and voice of the teacher had so much more power than a book is that one has a more living faith in him. Years ago Murchison (than whom Great Britain certainly never had a more successful teacher of medicine) limited the lecture in medicine to the consideration of rare

cases, and the prominent features of a group of cases, and to questions of prognosis which cannot be discussed at the bedside. For the past four years in the subject of medicine I have been making an experiment in teaching only by a weekly examination on a set topic, by practical work in the wards, in the out-patient room and the clinical laboratory, and by a weekly consideration in the amphitheatre of the acute diseases of the season. With a small class I have been satisfied with the results, but the plan would be difficult to carry out with a large body of students.

The student lives a happy life in comparison with that which fell to our lot thirty years ago. Envy, not sympathy, is my feeling towards him. Not only is the *ménu* more attractive, but it is more diversified and the viands are better prepared and presented. The present tendency to stuffing and cramming will be checked in part when you cease to mix the milk of general chemistry and botany with the proper dietary of the medical school. Undoubtedly the student tries to learn too much, and we teachers try to teach him too much—neither, perhaps, with great success. The existing evils result from neglect on the part of the teacher, student and examiner of the great fundamental principle laid down by Plato—that education is a life-long process, in which the student can only make a beginning during his college course. The system under which we work asks too much of the student in a limited time. To cover the vast field of medicine in four years is an impossible task. We can only instil principles, put the student in the right path, give him methods, teach him how to study, and early to discern between essentials and non-essentials. Perfect happiness for student and teacher will come with the abolition of examinations, which are stumbling blocks and rocks of offence in the pathway of the true student. And it is not so Utopian as may appear at first blush. Ask any demonstrator of anatomy ten days before the examinations, and he should be able to give you a list of the men fit to pass. Extend the personal intimate knowledge such as is possessed by a competent demonstrator of anatomy into all the other departments, and the degree could be safely conferred upon certificates of competency, which would really mean a more thorough knowledge of a man's fitness than can possibly be got by our present system of examination. I see no way of avoiding the necessary tests for the license to practice before the provincial or state boards, but these should be of practical fitness only, and not, as is now so often the case, of a man's knowledge of the entire circle of the medical sciences. It is satisfactory to know that close attention is being paid to the problem how to relieve the present congested state of the medical curriculum, and a number of interesting experiments are in operation. Of the special measures of relief which have been proposed the concentration of courses and a wide system of electives in the special branches are the most impor-

tant. A strong feeling prevails that we tie up the student too tightly in leading strings, and do not allow, particularly to good men, sufficient liberty. In our present system we make no distinction whatever between the poor, the mediocre and the good student. It is interesting to note that the question has been dealt with most fully and most warmly in the interests of the practical student by two of the leading scientific teachers in the United States, Dr. Henry P. Bowditch, of Harvard (*Boston Medical and Surgical Journal*, Dec. 29th, 1898), and my colleague at the Johns Hopkins, Dr. Mall (*Philadelphia Medical Journal*, April 1st, 1899). Their papers are to be carefully pondered by all teachers who feel that reform is necessary. I would commend them particularly to the younger men, in whose hands alone such radical changes can be carried out. A man who has been teaching for twenty-five years is rarely in a position to appreciate the necessity of a change, particularly if it touches his own special branch.

(Dr. Osler then referred briefly to the subject of Dominion Registration, and expressed the hope that the necessary legislation would be carried through at an early date. He hoped that it might prove a prelude to a more extensive measure of Imperial Registration which would enable registered graduates of Canadian universities to practice in any part of Her Majesty's possessions.)

### III.

But what is most important in an introductory lecture remains to be spoken, for dead indeed would I be to the true spirit of this day, were I to deal only with the questions of the curriculum and say nothing to the young men who now begin the serious work of life. Personally, I have never had any sympathy with the oft repeated sentiment expressed originally by Abernethy, I believe, who, seeing a large class of medical students, exclaimed, "Good God, gentlemen! whatever will become of you?" The profession into which you enter to-day guarantees to each and every one of you a happy, contented, and useful life. I do not know of any other of which this can be said with greater assurance. Many of you have been influenced in your choice by the example and friendship of the doctor in your family, or of some country practitioner in whom you have recognized the highest type of manhood and whose unique position in the community has filled you with a laudable ambition. You will do well to make such an one your exemplar, and I would urge you to start with no higher ambition than to join the noble band of general practitioners. They form the very sinews of the profession—generous-hearted men, with well-balanced, cool heads, not scientific always, but learned in the wisdom not of the laboratories but of the sick room. This school can take a greater pride in her graduates scattered throughout

the length and breadth of the continent than in her present splendid equipment ; they explain in great part the secret of her strength.

I was much interested the other day in reading a letter of John Locke's to the Earl of Peterborough who had consulted him about the education of his son. Locke insisted that the main point in education is to get "a relish of knowledge." "This is putting life into a pupil." Get early this relish, this clear, keen joyance in work, with which languor disappears and all shadows of annoyance flee away. But do not get too deeply absorbed to the exclusion of all outside interests. Success in life depends as much upon the man as on the physician. Mix with your fellow students, mingle with their sports and their pleasures. You may think the latter rash advice, but now-a-days even the pleasures of a medical student have become respectable, and I have no doubt that the "footing supper," which in old Coté street days was a Bacchanalian orgie, has become a love feast in which the Principal and even the Dean might participate. You are to be members of a polite as well as of a liberal profession and the more you see of life outside the narrow circle of your work the better equipped will you be for the struggle. I often wish that the citizens in our large educational centres would take a little more interest in the social life of the students, many of whom catch but few glimpses of home life during their course.

As to your method of work, I have a single bit of advice, which I give with the earnest conviction of its paramount influence in any success which may have attended my efforts in life—*Take no thought for the morrow.* Live neither in the past nor in the future, but let each day's work absorb your entire energies, and satisfy your widest ambition. That was a singular but very wise answer which Cromwell gave to Bellevire—"No one rises so high as he who knows not whither he is going," and there is much truth in it. The student who is worrying about his future, anxious over the examinations, doubting his fitness for the profession, is certain not to do so well as the man who cares for nothing but the matter in hand, and who knows not whither he is going!

While medicine is to be your vocation, or calling, see to it that you have also an avocation—some intellectual pastime which may serve to keep you in touch with the world of art, of science, or of letters. Begin at once the cultivation of some interest other than the purely professional. The difficulty is in a selection and the choice will be different according to your tastes and training. No matter what it is—but have an outside hobby. For the hard working medical student it is perhaps easiest to keep up an interest in literature. Let each subject in your year's work have a corresponding outside author. When tired of anatomy refresh your mind with Oliver Wendell Holmes; after a worrying subject in physiology, turn to the great idealists, to Shelley or Keats for

consolation; when chemistry distresses your soul, seek peace in the great pacifier, Shakespeare; and when the complications of pharmacology are unbearable, ten minutes with Montaigne will lighten the burden. To the writings of one old physician I can urge your closest attention. There have been, and, happily, there are still in our ranks notable illustrations of the intimate relations between medicine and literature, but in the group of literary physicians Sir Thomas Browne stands preëminent. The *Religio Medici*, one of the great English classics, should be in the hands—in the hearts too—of every medical student. As I am on the confessional to-day, I may tell you that no book has had so enduring an influence on my life. I was introduced to it by my first teacher, the Rev. W. A. Johnson, Warden and Founder of the Trinity College School, and I can recall the delight with which I first read its quaint and charming pages. It was one of the strong influences which turned my thoughts towards medicine as a profession, and my most treasured copy—the second book I ever bought—has been a constant companion for thirty-one years,—comes *via vitæque*.<sup>\*</sup> Trite but true, is the comment of Seneca—“If you are fond of books you will escape the ennui of life, you will neither sigh for evening disgusted with the occupations of the day—nor will you live dissatisfied with yourself or unprofitable to others.”

And, finally, gentlemen, remember that you are here not to be made chemists or physiologists or anatomists but to learn how to recognize and treat disease, how to become practical physicians. Twenty years ago, during the summer session, I held my first class in clinical medicine at the Montreal General Hospital, and on the title page of a note book I had printed for the students I placed the following sentence, which you will find the alpha and omega of education in practical medicine.

“The knowledge which a man can use is the only real knowledge, the only knowledge which has life and growth in it and converts itself into practical power. The rest hangs like dust about the brain or dries like rain drops off the stones.”

<sup>\*</sup> There are two excellent editions of the *Religio Medici* available, the one in the Golden Treasury Series, MacMillan & Co., edited by the late Dr. W. A. Greenhill, the other edited by Dr. D. Lloyd Roberts, of Manchester, Smith, Elder & Co., London.

A movement is on foot to erect a memorial to Sir Thomas Browne in his native city, Norwich, subscriptions towards which will be received by Sir Peter Eade, Norwich.

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## THE DIAGNOSIS OF TYPHOID FEVER.

A DISCUSSION  
AT THE NEW YORK STATE MEDICAL ASSOCIATION,  
OCTOBER 25, 1899.

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"THERE is no one symptom, there are no two or three symptoms, which, in themselves, are characteristic of the disease. There is no one symptom, there are no two or three symptoms, usually occurring in the disease, which may not be absent during its entire progress. Our diagnosis can never be founded here, as it is in many other instances, on a few positive, physical signs. It must always be rational, not absolute. The evidence, upon which our verdict is to be rendered, is wholly circumstantial. Notwithstanding all this, and although cases sometimes occur so enveloped in obscurity as to baffle the skill of the most careful and experienced observers, it is still true that there are few general diseases the diagnosis of which is so well established, and so certain, as that of typhoid fever."

These statements, taken from the remarkable work of Elisha Bartlett, *On Typhoid and Typhus Fevers*, 1842, express, with slight modifications, the position

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of the profession to-day on this all-important problem. I quote it designedly to emphasize at the outset the uncertainty which still besets us in dealing with some cases of this protean disease, notwithstanding the extraordinary advances in our clinical and bacteriological knowledge. In the time at my disposal it will be best to summarize the questions briefly in four divisions, which illustrate the conditions under which difficulty in diagnosis is experienced: First, variations in the intensity of the infection; second, the early and pronounced localization of the infection; third, peculiarities in the symptoms; and fourth, certain diseases which simulate typhoid.

I. VARIATIONS IN THE INTENSITY OF THE INFECTION. (a) *The Mild Cases.*—Every autumn we meet with cases of illness, from five to eight or ten days' duration, sometimes longer, in which, with gastro-intestinal disturbance, indicated by a furred tongue and diarrhœa, or quite as frequently constipation, there is a fever of slight grade. Perhaps on deep palpation the edge of the spleen may be felt. In such a case the appearance of a few rose spots may clear up the diagnosis, but in other instances the practitioner remains in doubt whether the condition is a simple continued fever or a mild typhoid infection. A relapse, with characteristic symptoms, or a well-defined post-typhoid lesion, may give the diagnosis; but most important of all is the presence or absence of the Widal reaction, which is nowhere of greater help than in this group. While it may not be present at first, even not until the fever has disappeared, it has been of very great service, and will be, I am sure, when more widely used, a special boon in these cases. The method should be employed in widespread epi-

demics to help in the diagnosis of the milder forms. I may remind you of the exceedingly interesting account from Professor Sahli's clinic, at Bern, of the outbreak of typhoid fever in an asylum of the canton. In addition to thirty patients who had attacks severe enough to demand hospital treatment, there were twelve who had such slight symptoms as headache, fever, and diarrhoea, lasting only for a few days, and not severe enough to confine them to bed, yet the Widal reaction was characteristic. I am sure that a widespread application of the test will restrict within very narrow limits the cases of so-called simple continued fever.

(b) *Acute Typhoid Septicæmia*.—At the other extreme is the remarkable group in which the patients present the evidence of an acute infection of great severity without any localizing symptoms. For a week or ten days the picture is that of a profound toxæmia, with high fever and early delirium. Death may occur before it is possible to reach a diagnosis; even the Widal reaction may not be present. A post-mortem may show the characteristic enteric lesions, but not always, and the reports of Chiari, Flexner, Hødenpyl, and others have taught us to recognize typhoid fever without intestinal localization. There are cases in which a post-mortem diagnosis is negative, and only a bacteriological study may reveal the true nature of the disease.

II. EARLY AND PRONOUNCED LOCALIZATION OF THE INFECTION.—A majority of the cases of typhoid fever present no symptoms indicative of the special involvement of any organ or group of organs. A large proportion have no intestinal symptoms. Of thirty-five cases which have been under my care during the present month only four have had severe abdominal symptoms. The

profession has had its attention too strongly directed to the enteric character of the disease; hence it not infrequently happens that we are completely taken off our guard when the brunt of a very acute infection falls upon some other system. Of these, the cerebro-spinal, the pulmonary, and the renal localizations are the most deceptive. Agonizing headache, severe neuralgia, delirium, or even furious mania may be the first symptoms of the disease. The so-called brain fever, the acute febrile mania, and cases with symptoms of cerebro-spinal meningitis are not infrequently typhoid fever, and it is important to remember that under the most favorable circumstances death may occur before a positive diagnosis is reached. A post-mortem may alone clear the obscurity, and in its absence the physician can scarcely be blamed when he returns the case to the health board under one of the above designations. Widespread bronchitis, acute pleurisy, with friction and subsequent effusion, early consolidation of a lobe of one lung may mask the true nature of the disease. The early renal localization is almost certainly called (as it is, of course) acute nephritis, of which there may be no single feature lacking, and the suggestion of typhoid fever may be delayed for ten days or more, when enteric symptoms appear, or the fever becomes more intense, or rose spots appear.

These clinical mistakes cause no little mortification to the young practitioner, who has not yet learned to dissociate his *amour propre* and infallibility in diagnosis. Even when hardened—humbled, I should say—by repeated exposure, it is not pleasant to be deceived, and a good rule is: When in doubt, keep your mouth shut. Unless one has a Cassioli-like volubility, in the flow of

which the friends of the patient lose all idea of your true opinion, the gift of taciturnity should here be cultivated.

III. PECULIARITIES IN THE SYMPTOMS. — Elisha Bartlett's dictum, with which I began this paper, must ever be borne in mind. There may be no fever (though afebrile typhoid fever is very rare; I have never seen — to recognize—a case); the onset may be abrupt; there may be no rose spots, no intestinal symptoms; the diazo reaction may be absent; the Widal test may be negative at the height of the disease; there may be leucocytosis, and yet, as Bartlett says, "there are few general diseases the diagnosis of which is so well established and so certain." It is just in these negative cases, with fever alone, that the Widal reaction and the blood count may give us the only positive data, and the practical clinical value of the former, when carefully made, can not be overestimated, and it should be more widely used by practitioners. Wyatt Johnston's method (the dried blood drop) can be utilized, and there are now in almost every State laboratories in which the test can be made. Of positive symptoms which may lead to error I have time to mention only one—viz., chills. How often have I heard the protest, "But, doctor, the patient has had chills, repeated chills; surely he must have malaria"! At the onset of the disease, at the onset of a relapse, as a result of treatment with antipyrine and antefebriin, at the onset of complications, in the typhoid septicaemia, and in the secondary infections of protracted cases and during convalescence, chills frequently occur. Most exceptionally they are due to malaria, which in reality is the last thing to be thought of (except in cases from the tropics), and the nature of which in any given case can

be determined by the blood examination and by the therapeutic test.\*

IV. TYPHOID FEVER AND MALARIA.—I come now, Mr. President, to the only part of the subject worth discussing at the present moment—namely, the diagnosis of typhoid fever from certain other diseases. To gain time I pass by acute tuberculosis, which trips us all at intervals (and I may say I am feeling sore from a fall over it not ten days ago), cerebro-spinal fever, meningitis, typhus, and the other acute infections, to take up the really serious question of the diagnosis of typhoid from the malarial fevers. During fifteen years' practice in the middle region of the Atlantic coast I have had only too forcibly impressed upon me the strange readiness with which physicians diagnosticate a continued fever as malaria. In this period I do not remember to have seen in consultation, in town or country, a single instance of continued fever, diagnosticated as malaria, which did not prove to be typhoid fever. I was fully aware, perhaps few men more so, of the widespread existence of the strong delusion on this subject in the minds of the profession, but neither I nor, I think, you who listen to me now were prepared for such a remarkable exhibition of its strength as that with which the late war presented us. The paper of Dr. Vaughan, based on material collected by the commission appointed by Surgeon-General Sternberg to study the causes and spread of typhoid fever among the troops in the camps of the United States, has been characterized as an indictment of the general efficiency of the men in charge of the camps. A demonstration on a

\* Chills in Typhoid Fever; Studies on Typhoid Fever, ii. *Johns Hopkins Hospital Reports*, vol. v.

wholesale scale was given of the ignorance in a large number of the members of our profession of essential elementary facts concerning these two diseases. While subscribing to the indictment, I feel that the gravity of the charge is less against the physicians than against those of us who occupy teaching positions. Who are the men responsible for this widespread error? Professor Dock, of Ann Arbor, who was on duty at the camp at Chickamauga, tells us in a few words. He says: "It is not necessary for me to defend the army medical service, for what struck me at the camps was the evidence of lack of knowledge of typhoid and malarial fevers in the profession at large. I came into contact with probably from sixty to seventy-five young physicians of a very good class, such as we would take into our hospitals as internes. Most of them, however, had no hospital experience, and very few seemed to have had any clinical experience with typhoid." The fault lies in reality with the system of teaching which permitted these young men to go out into practice without a thorough knowledge of typhoid fever. Here is the kernel of the whole matter. Looseness of diagnosis is inevitable while we send out the members of our graduating classes unfamiliar, by daily routine work in the hospital wards, with the clinical features of typhoid fever. But this is not the occasion on which to dwell further upon this point, while I bring it up only to place the responsibility for an acknowledged widespread ignorance where it should rest.

I have on a recent occasion, Mr. President, paid a tribute to the notable contributions on typhoid fever which have been made by three generations of American physicians. I am sorry that I can not speak in the same

warm terms of the present generation in relation to the study of the modern problems of malarial fever. Fifteen years have passed since Dr. Sternberg's paper introduced to us in this country the brilliant work of Laveran, and in spite of the numerous confirmatory researches which have been made in Philadelphia, Baltimore, New York, and elsewhere, the enormous practical gain—namely, that we are everywhere able under all circumstances to determine the presence or absence of a malarial infection, has not been appreciated fully by the practitioner at large. One has to sympathize a bit with him—clinical fetiches are given up with difficulty and regret! To many good, easy men it came as a shock, to find that malaria was really a well-defined, easily recognizable disease. Naturally, it was hard to abandon a word like *malaria*, which carried with it as much clinical comfort as did that blessed word *Mesopotamia* spiritual unction to the old lady. My sympathies have been deeply aroused by the distress which has been felt in many quarters of this city where you have been, until recently, with some notable exceptions, heretics of the worst kind. Nowhere, perhaps, has malaria ever covered such a multitude of diverse maladies. I came in contact with it first when in Montreal, a city in which malaria is unknown, so that when our patients returned from the hands of Gotham consultants with the diagnosis of malarial neurasthenia, or of latent malarial abscess of the liver, or of malarial headache of obscure origin, we learned to appreciate the mysteries of paludic infection as existing in the imagination of Manhattan practitioners. I have myself been scolded as too shockingly dogmatic on the subject, as some of you may remember, in a paper read a year or so ago by my friend,

Dr. Beverley Robinson; but I protest that dogmatic as I have been, I have not been dogmatic enough. Had we teachers throughout the country been more persistently dogmatic, the profession might have been spared the mortifying exhibition of last year. But as for so many of us, so for Dr. Robinson, there is no possible salvation in this respect until born again of the microscope and a prolonged course of study of the genuine disease.

Two clinical rules should guide practitioners above Mason and Dixon's line:

1. *An intermittent fever which resists quinine is not of malarial origin.* Infection with the tertian organism, producing quotidian or tertian paroxysms, is the only variety of malarial fever prevalent in the Northern and Middle States. This form of the parasite is peculiarly susceptible to the action of quinine, and even a grain or two daily may suffice to clear the blood within forty-eight hours. The constancy, the infallibility of the action of this drug is one of the most remarkable phenomena in medicine. Our clinical charts of simple intermittents, now numbering many hundreds, may be searched through and through without finding an instance in which the paroxysms were not checked by the use of quinine, and usually within thirty-six or forty-eight hours.

2. In these localities *a continued fever is not due to malarial infection.* I am speaking now, remember, of the regions named, in which the astivo-autumnal organism and the graver forms of the disease caused by it are very rare. For remarkable complexity in the clinical manifestations, for variability in mode of onset, in the course, and in the symptoms, the astivo-autumnal infection takes precedence even of typhoid fever. With

a vigilance quickened by repeated surprises, we are yearly made to feel the subtleness of this protozoan Proteus, which rivals "the old sea-tell-truth" of Homer's tale in clinical wiles and sleights.

So exceptional are cases of a continuous fever with tertian infection that they need not be considered, but the aestivo-autumnal fever may simulate typhoid very closely. I shall not detain you with any detailed account of the differentia, which are fully described in recent works, but I may dwell on one or two points. The fever in malaria from the outset is marked by remissions—hence the term remittent fever—of a grade rarely seen in typhoid until the late stages. Once the fastigium is reached, the fever in the latter presents a remarkable steadiness; the two-hour record may show for several days a variation of not more than a degree. The chart has a "Pennsylvania-Railway-like" directness, in marked distinction to the zig-zag "Baltimore-and-Ohio-Railway" chart of aestivo-autumnal fever. The early anaemia, with sallow complexion, often suggests the diagnosis, even when other symptoms are like those of typhoid fever.

It is in these cases that we find the enormous diagnostic value of Laveran's discovery. Unfortunately, the parasite of the aestivo-autumnal fevers is less easily recognized in the acute stages than the larger tertian form, and, moreover, it may be very scanty in the circulating blood. To become an expert in the examination of the malarial parasites requires a long and tedious apprenticeship, and there have been illustrated papers published in this country which make one wonder not less at the brazen audacity of the authors than at the gross ignorance of the editors of the journals. I would urge

most strongly, particularly upon the young house physician beginning the study, in all doubtful cases to keep well-made cover-slip preparations, which can be identified later by proper methods of staining. The recognition of an astivo-autumnal infection of a week or ten days' duration is an easy matter from the presence of ovoids and crescents. Unlike the simple intermittents, the malarial continued fever is more resistant to quinine, and three or four days may elapse before the temperature falls, and the organisms do not disappear from the blood so promptly; indeed, the crescents and ovoids are remarkably resistant in comparison with the tertian form.

Combined infection with the typhoid and malarial germs is excessively rare; so rare, indeed, that only a single instance has been met with in the Johns Hopkins Hospital in ten years among nearly one thousand cases of typhoid fever. When it does occur, quinine readily settles the malarial side of the infection, while the typhoid fever pursues its usual course. It is to be hoped that the pernicious term typho-malarial fever has been forever banished from our nomenclature. Sheltered under it, a fancied sense of security has too often ended in a sad calamity, either to the patient or, in the absence of proper sanitary precautions, to the community.

But after all in any discussion on typhoid fever the appeal must be made to the hard-worked practitioners of the smaller towns and country districts (in which the disease is now most prevalent), who find it very hard, in the conditions of their lives, to take advantage of modern scientific methods of diagnosis. They must rely in great measure on experience and common sense, and to them I would say in conclusion—*learn to suspect*

*typhoid fever, and not malaria, in every case of fever of six or seven days' duration, particularly if it resists the action of quinine. For too long you have employed the Anglo-Saxon method of procedure, and in a given case have assumed innocence of anything so serious as typhoid until in the onset of some serious symptom the guilt was only too evident! It is high time now that you adopt the Gallic usage, and regard every case of continued fever as guilty, that is as a typhoid, until the contrary be clearly demonstrated.*

Two recent works should be on the library table of every physician at this season of the year—Keen's *Surgical Complications* and Hare's *Medical Complications of Typhoid Fever*. They will stimulate that personal progressive education which all of us should seek—an education which carries with it, year by year, as experience widens, not alone a better knowledge of the clinical intricacies, but an ever-ripening wisdom which enables us to be more and more helpful to the pitiable victims of this disgraceful disease.

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CLINICAL REMARKS  
ON  
HYPERTROPHIC CIRRHOSIS OF THE LIVER  
WITH BRONZING OF THE SKIN:  
HÆMOCHROMATOSIS.\*

By WILLIAM OSLER, M.D., F.R.S.,  
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RATHER more than two years ago a man presented himself at the hospital complaining of a gradual darkening of the skin and an eruption on the legs. I do not remember to have seen him, and the diagnosis on his card was Addison's disease with an interrogation mark after it. He returned in May of this year with the bronzing of about the same intensity, but we found in addition that he had a greatly enlarged liver and an enlarged spleen, but no diabetes. Meantime, Dr. Opie, jun., had presented to our Medical Society a paper on Hæmo-chromatosis, and had considered fully the relation of this remarkable condition to hypertrophic cirrhosis and the *diabète bronzé*. I had become familiar in French literature with the latter condition, though I had never met with a case, and until hearing Dr. Opie's paper I was not aware of the significance of the general hæmo-chromatosis in connection with the disease. It called to mind also a remarkable instance of hypertrophic cirrhosis with bronzed skin which not long before had been under my care. As the literature of the subject is almost exclusively in French and German—Dr. Opie's paper will appear in the next number of the *Journal of Experimental Medicine*, vol. iv—I shall refer to a few of the landmarks in the progress of our knowledge. Hanot, whose name will always be associated with one form of cirrhotic liver, had noticed that in some cases the skin became bronzed, and he noticed further that diabetes was an occasional complication.<sup>1</sup> It is true that a bronzed cachexia in diabetes had been previously noted (Troisier, 1871), but Hanot's work began a long series of observations by the Paris physicians, through whose writings we have all become familiar with the subject. This author believed that the liver was the seat of origin of the pigment, but Letulle maintained that the liver cells stored but did not form the pigment, and he regards the cirrhosis as a secondary event. More recently Marie has suggested that the *diabète bronzé* is neither a pigmentary cirrhosis of the liver in diabetes nor a special bronzed cachexia, but a separate clinical and pathological entity—in fact, a new disease.

While the French observers had been studying the problem almost exclusively in connection with diabetes, in Germany

\* Read in the Section of Medicine at the annual meeting of the British Medical Association, Portsmouth, 1899.

it was approached from a different standpoint. In the Haller *Festschrift* (1877) Quincke had described a case of widespread pigmentation in anæmia. In 1889 von Recklinghausen described under the name hæmochromatosis a condition of pathological pigmentation either local or general. To the local condition, which is met with in the heart and sometimes in the intestine, I need not here refer. The generalised pigmentation described by von Recklinghausen involved the skin, the liver, the spleen, the pancreas, and most of the glands of the body. In some of his cases of generalised hæmochromatosis there was cirrhosis of the liver, which von Recklinghausen suggested was the result of "eine hæmorrhagische Hepatitis." The German observers separated two forms of the pigment, one containing iron, hæmosiderin, and, a second, hæmofuscin, which does not give the iron reaction. In the general hæmochromatosis associated with cirrhosis of the liver, the pigment is the hæmosiderin and has an ochre yellow colour, which gives to the organs, affected a most remarkable and characteristic appearance.

In this country very little attention has been paid to the question. Saundby, in Allbutt's *System of Medicine*, vol. iii, in speaking of the liver, states that in diabetes it may be distinctly cirrhotic, and this form is sometimes associated with bronzing. Williamson, in his monograph on diabetes, gives Hanot's clinical description, but, so far as I can gather, the condition has not received special study either in England or in the United States.

Two cases of this remarkable hæmochromatosis have been under my care within the past few years. Both are of special interest, from the fact that there was no associated diabetes, only the general hæmochromatosis with enlargement of the liver, and in one of them the condition was diagnosed during life.

*CASE I. Clinical Summary.—Good General Health; Alcohol in Moderation; Progressive Bronzing of the Skin; For three years Numerous Attacks of Purpura and Urticaria on the Skin of the Legs; Enlargement of the Liver and Spleen; No Diabetes.*—J. A. M., aged 45, a pilot, was admitted May 1st, 1899, complaining of a stitch in the right side over the liver.

*Family History.*—The father died at the age of 73 of paralysis; mother died at 25 in childhood. His brothers and sisters are living and well.

*Personal History.*—When 7 years of age he had a severe illness, the nature of which he does not know. He had measles at 12, malarial fever at 14, with dumb chills and night sweats. With these exceptions he has been a very healthy man. He has been a pilot on the Chesapeake Bay. He has used alcohol ever since he can remember, but only takes a glass of whisky once or twice a week. He has never been a daily drinker, and never gets on sprees. I asked his wife particularly about his alcoholic habits, and she says he rarely touches whisky. He has smoked and chewed tobacco for many years. He had gonorrhœa ten or twelve years ago; he has not had syphilis. He has been a moderate eater. He has not lost in strength or in weight, and has not had to give up work.

*Present Illness.*—Three years ago he had the first attack of red blotches on the feet, and before this he had noticed that he had slight swelling of the ankles and feet, so that he had often to loosen his shoes and sit down. The spots turned purple and remained about three days. During the past three years he says he has had scores of these outbreaks of red blotches on the feet and ankles, sometimes on the legs. In February, 1897, he had a severe attack of pain on the right side, between the costal margin and the crest of the ilium, which lasted for about a week. On the day following the beginning of the illness his feet became swollen. He forgets whether he had the blotches.

In October, 1897, he had a second attack of pain in the right side, with high fever, and his right eye became inflamed and swollen. During this attack he had red welts on the legs as far as the groin. They turned purple and left areas of discoloration. During the past year and a-half these outbreaks of purpura and urticaria on the legs have been very much more frequent. His friends have noticed that his face has become darker in colour, and his hands, too, he thinks are very much darker.

**Present Condition.**—The patient was a sparely-built, healthy-looking man, weight 146 lbs. The skin of the face was slightly bronzed, not very intense, but his wife insists that his complexion has become very much darker during the past two years. There was no pigmentation of the mucous membranes of the lips or mouth. The general surface of the skin was slightly pigmented, that about the areole of the nipples and about the genitalia very much pigmented. The skin of the hands and wrists and of the legs as high as the knees was very deeply bronzed. The heart sounds were everywhere clear and strong. The pulse was regular in force and rhythm. The radial arteries were a little stiff, easily rolled under the finger. The abdomen looked natural, with the exception of a little fulness in the upper zone. On palpation the liver could be easily felt extending in the median line 8 cm. below the ensiform cartilage, between 6 and 7 cm. below the costal margin in the nipple line. The surface was everywhere smooth; the edge could be very distinctly felt. It was hard and firm and rounded. The absolute hepatic fatness in the nipple line began on the fifth rib, on the sixth rib in the mid-axillary line. On auscultation over the liver there was heard a distinct friction on deep inspiration. The gall bladder could not be felt. There was a fulness visible in the left hypochondrium, which altered on deep inspiration. On palpation this was found to correspond to a greatly-enlarged spleen, the border of which could be readily felt nearly 6 cm. from the costal margin. The axillary glands were enlarged. The patient had no fever. The urine was dark in colour, specific gravity 1014, reaction acid; no albumen, no casts, no sugar. There was no bile. Indican was present. There was a distinct reaction for iron. As the pigmentation, the enlarged liver and spleen, with recurring attacks of purpura, suggested the bronzed form of hypertrophic cirrhosis of the liver with which diabetes has been so often associated, the patient on May 5th, at 4 P.M., was given 75 grams of glucose, and the separate specimens of urine saved as voided until 8 A.M. on the 6th, and carefully tested for sugar. Each one of the four specimens was negative.

**Blood.**—The red blood corpuscles were above the normal number. There were no pigment granules seen either in the blood or in the leucocytes. The blood platelets were apparently diminished. The differential count of the leucocytes was as follows:

Polynuclears	...	...	131	...	65.0 per cent.
Small mononuclears	...	...	35	...	17.7 "
Large mononuclears	...	...	17	...	8.2 "
Transitionals	...	...	6	...	2.9 "
Eosinophiles	...	...	16	...	7.9 "

A portion of the skin of the leg was excised, and in it Dr. Opie determined the presence of the characteristic ochre-coloured pigment granule in the cells of the sweat glands.

**CASE II. United States.**—*History of Malaria and of Attacks of Continued Fever in the Tropics; No Alcoholic History; Enlargement of Upper Part of the Abdomen due to Hypertrophic Cirrhosis of the Liver; Progressive Pigmentation of Face and Hands; Enlargement of the Spleen; Suspected Tumour of Liver; Laparotomy; Large Red-brown Liver; Erythema Nodosum; Hemorrhage from Stomach; No Diabetes; Death; Duration of Illness about Five Years.*—G. M., aged 34, referred to me on January 18th, 1905, by Dr. MacMeans, of Monterrey, Mexico. The patient complained of an enlarged liver and a gradual alteration in the colour of his face.

**Family History.**—His mother died in childhood; his father died suddenly, from what cause he did not know. He has had four brothers; one died of dropsy at the age of fifteen, the others are healthy and well.

**Personal History.**—Patient was born in the United States; was very healthy as a young man, with the exception of "chills and fever" at 10 and of small-pox at the age of 12. He has lived in Mexico for the past twelve years. He has travelled in the country a great deal but has enjoyed good health. He has never had yellow fever. Dr. MacMeans writes: "He has suffered from attacks of mild continued fever, very common in this locality, running a course of about fourteen days, and when uncomplicated by medication it is usually a very mild disease. I also might add it is commonly called malaria, but I am convinced that there is nothing malarious about it." Dr. MacMeans did not think that these attacks had any special connection with his present trouble. He has not had syphilis; of this he is quite certain. He has been a temperate man, taking wine and spirits only occasionally; he has used tobacco in moderation.

**Present Illness.**—For at least three years and a half the patient has noticed that he has been growing larger in the upper part of the abdomen. His general health has been very good, and he has been able to be at work. During this time he has had one or two febrile attacks such as described by Dr. MacMeans. A year and a half ago he was slightly jaundiced; has not had an attack since. There was no itching of the skin. He does not know when he began to change in colour but he thinks it

was several years ago. The enlargement of the abdomen has been progressive, and lately he has had to have the waist band of his trousers let out. As stated he has been at work and has had a fairly good appetite and good digestion. Within the past year the enlargement has been much more noticeable in the epigastric region, and Dr. MacMeans and others have regarded the condition as one of tumour of the liver.

*Present Condition.*—The patient was a medium-sized man, well nourished, lips and mucous membranes of a good colour. Tongue clean and red. The most noticeable feature about him was the peculiar bronzing of the skin, a somewhat leaden hue suggestive of argyria. On the face it was very deep, and at once attracted attention. It was uniform, but along the roots of the hair there was a line of about half an inch on which the skin was normal. The skin of the hands and wrists was also very pigmented. That of the general surface of the body was only a little increased. There was no pigmentation of the mucous membranes. The chest was well formed; there were no changes noticed in the heart and lungs.

*Abdomen.*—The whole upper zone looked enlarged, and a prominent mass filled the entire space between the costal borders. On palpation, this was found to be a firm solid mass which below reached to within exactly 2 inches of the navel. Here a rounded edge could be felt very readily, and it could be traced to the right, where it passed beneath the costal margin in the mid-axillary line. It could also be readily traced to the left. The edge was rounded and very hard and resistant. The general surface of the enlarged mass was smooth, but in places in the position of the right lobe it felt a little rough and irregular. The upper limit of hepatic flatness began in the mid-sternal line at the level of the fifth rib and extended to within 6 cm. of the navel. In the nipple line on the upper border of the sixth rib it extended a little below the costal margin. The edge of the spleen could be distinctly felt, and on deep inspiration came down 2 inches below the costal border. There were no changes in the blood; the urine was high-coloured, but contained neither bile pigments nor sugar. I was by no means certain as to the condition, but suspected a syphilitic liver, and ordered large doses of iodide of potassium.

I heard from the doctor again on November 21st. Mr. M. had been doing very well and keeping at work, though the mass was increasing in size.

The patient returned to see me on March 11th, 1896. The bronzing of the skin was more marked and more diffuse. He had been taking 30 gr. of iodide of potassium three times a day. The abdomen showed a very positive increase in the size of the mass in the epigastrium, which had tilted the tip of the ensiform cartilage, from which it extended exactly 11½ cm. The fingers could be placed under the edge of the liver readily from one costal border to the other. The surface was uniform, and there was a distinct prominence for the first few inches below the ensiform cartilage. It was very firm, but painless. There was no friction over it. The spleen had increased somewhat in size. When he stood up the mass made a prominent bulging in the epigastrium. The superficial veins were not enlarged. The conjunctivae were not jaundiced. There was neither bile, albumen, nor sugar in the urine.

I was still very uncertain as to the nature of his trouble, and suggested an exploratory operation, to which he consented. This was performed by Dr. Halsted. The liver was enlarged, particularly the left lobe, which was very prominent. The capsule was not thickened. The surface was a little irregular, and the colour was of a deep brownish red. I was present at the operation, and noted the peculiar colour, but did not at the time realise its significance. The gall bladder was enlarged, and contained a light-coloured bile. There was no fluid in the peritoneum. The patient recovered rapidly from the effects of the operation, but two months later there was no change in his condition.

On December 22nd, 1896, Dr. Crouse, of Rockport, Texas, wrote as follows: "In his present condition the liver is five fingers' breadth from the navel. There is commencing dropsy of the feet and abdomen. He has had a very bad attack of erythema nodosum, involving both legs. Ten days ago, after a very wearisome boat trip, he had a hemorrhage from the stomach, after which he passed tarry stools for three days. He died in May, 1897. His brother states that the abdomen increased in size, and that he lost flesh and strength.

The clinical features of the 24 cases of the so-called bronzed diabetes have been carefully analysed by Anschutz.<sup>3</sup> No case has occurred in a female, and in a discussion at the Societ e M dicale des H pitaux (1897) Letulle stated that of the 30 known cases all were in men. Pigmentation was present in 14 of the 24 cases. The melanoderma may be the first symptom noted, and may precede the diabetes for several years. It is some-

times of a peculiar leaden tint, and in Hanot's original description he speaks of "une teinte plombée." The diabetes, the symptom which has attracted special attention, is of the ordinary form; the amount of sugar is often considerable. In 6 cases the diabetes ceased under observation. Only a few instances have been reported—5 of the 30—(Lettulle) without diabetes. The general opinion is that the diabetes is secondary to a disease of the pancreas, which in 18 cases has been found deeply pigmented and cirrhotic.

The pathology of the process is still very obscure. The present state of our knowledge is perhaps best expressed by the conclusion in Opie's paper already referred to:

"1. There exists a distinct morbid entity, hæmochromatosis, characterised by the widespread deposition of an iron-containing pigment in certain cells, and an associated formation of iron-free pigments in a variety of localities in which pigment is found in moderate amount under physiological conditions.

"2. With the pigment accumulation there is degeneration and death of the containing cells and consequent interstitial inflammation, notably of the liver and pancreas, which become the seat of inflammatory changes accompanied by hypertrophy of the organ.

"3. When chronic interstitial pancreatitis has reached a certain grade of intensity diabetes ensues and is the terminal event in the disease."

To one additional point I may refer. In Case 1 the hæmorrhages into the skin of the legs, which occurred so frequently, might be regarded as the cause of the general hæmochromatosis. Though experimentally Hunter and others have caused accumulation of large quantities of iron-containing pigment, particularly in the spleen, I believe no widespread hæmochromatosis has ever been produced.

I happen to have had under observation within the past two years a case of hypertrophic cirrhosis in a hard-working farmer who had been a very temperate man, and whose trouble began in 1895 with jaundice associated with urticaria and extensive subcutaneous ecchymoses and purpura. Dr. Tompkins, of Charleston, W. V., noted at that time a large, hard tumour-like mass in the epigastrium. I saw him first on December 23rd, 1897. He then had jaundice, a large, smooth liver, and an enlarged spleen. He had had during the two years innumerable attacks of purpura, and when I saw him there was a fresh crop, with large irregular wheals. In 1898 I saw him again and heard of him repeatedly. The special feature was the recurring attacks of purpura, very much of the same character as those noted in Case 1. Towards the end of the year he became more jaundiced and dropsical. He died in coma early in January of the present year. The point of special interest is that the liver, which was much enlarged and very cirrhotic, presented a totally different appearance from that of the liver in hæmochromatosis. There was none of the ochre-yellow pigment, and it could be seen at a glance that the condition was entirely different from that presented by the remarkable sections which I here demonstrate, and which were kindly loaned to me by Dr. Opie.

#### REFERENCES.

- <sup>1</sup> Hanot and Chauffard, *Revue de Médecine*, 1882. <sup>2</sup> *Deut. Arch. f. Klin. Med.*, Bd. lxii.

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### ON SPLENIC ANEMIA.

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UNDER the names of splenic pseudoleukæmia, anaemia splenica, lymphadénie splénique, and the splenic form of Hodgkin's disease is described an idiopathic enlargement of the spleen with anaemia. I prefer the name splenic anaemia, which indicates the two essential features.

From Griesinger's clinic, in 1866, Gretzel<sup>1</sup> described a case of enlargement of the spleen with anaemia in a child of ten months. Griesinger, who termed the condition anaemia splenica, had many such cases in adults which had terminated fatally. He recognized the condition as a non-leukæmic counterpart of the ordinary splenic leukæmia.

In 1871, H. C. Wood,<sup>2</sup> of Philadelphia, in a paper on the relations of leukæmia and pseudoleukæmia, brought the subject to the notice of the profession in this country. After speaking of the two forms of the latter, in which the lymphatics are involved alone, or the lymphatics with the spleen, he says: "I now desire to show that there is still a third form of pseudoleukæmia—a splenic variety. Under the names of tumor of the spleen, splenic cachexia, etc., from time far back, medical records furnish accounts of cases which I believe represent this affection." The case which he reported was very characteristic; the spleen was enormously enlarged and the anaemia extreme, without any increase in the leucocytes. Usually described with Hodgkin's disease or pseudoleukæmia, splenic anaemia has not received until lately widespread recognition. Thus while familiar with the papers of Wood, Strümpell and others, and although I had had cases under my care, I did not discuss the diseases in a separate section in Pepper's *System of Medicine*, 1885, vol. iii., but only referred to it under the differential diagnosis in pernicious anaemia and in leukæmia. The critical summary of the literature, by Dr. Sippy, in the November number of this JOURNAL (in which, by the way, Dr. Wood's paper is overlooked) makes superfluous any additional references to the literature of the subject. I give here, as briefly as possible, my experience with this condition, limiting the cases strictly to those which have presented a primitive splenomegaly and anaemia without enlargement of the lymph-glands.

<sup>1</sup> Berliner klinische Wochenschrift, Band iii.

<sup>2</sup> THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES.

I purposely have not spoken of anæmia with enlarged spleen in very young children, a subject which requires separate consideration.

• CASE I. *Malaria in India some years previously; no syphilis; recurring attacks of hemorrhage from the stomach; enlarged spleen; progressive anæmia; ascites; death from hæmatemesis.*—This patient, a man, aged thirty-six years, was admitted to the Montreal General Hospital, September 2, 1879, with anæmia. He had a very much enlarged spleen, which extended to the navel, and the lower edge was below the transverse navel line. There was no enlargement of the lymph-glands. The red blood-corpuscles were under 2,000,000 per c.mm. The hæmoglobin unfortunately was not estimated. There was no leukiæmia. He had served with the army in India, and had had intermittent fever. He had had recurring attacks of hæmatemesis. Two months before admission he began to have dropsy of the legs and abdomen.

CASE II. *Severe hæmatemesis at the ninth year, again at the eleventh year; anæmia; swelling of the feet; enlarged spleen.*—Girl, aged eleven years, seen August 13, 1879. Two years before she had had a very severe hemorrhage from the stomach, from which she recovered, though she remained somewhat pale. A month before I saw her she had a second attack, in which she lost, the mother said, nearly three quarts of blood in thirty-six hours. She was very anæmic. The red blood-corpuscles were 2,250,000; leucocytes, 7120 per c.mm.

These two cases were reported in full in the *Canada Medical and Surgical Journal*, vol. xi.

• CASE III. *Recurring attacks of hæmatemesis and melæna between 1885 and 1897; excellent health in the intervals; chronic enlargement of the spleen; death in an attack. Anatomical summary: Chronic hyperplasia of the spleen; liver smooth, macroscopically showing no signs of cirrhosis; microscopically showing only fatty changes.*—W. M., aged thirty-five years, seen on December 9, 1892, complaining of hemorrhage from the bowels. This patient was very anæmic after each hemorrhage. When I saw him first he was only slightly anæmic. The blood was examined, but unfortunately the slip with the count was mislaid. There was no leucocytosis, no enlargement of the lymph-glands.

CASE IV. *No history of malaria or of syphilis; nearly ten years ago first attack of hæmatemesis; since then, at intervals of about a year, very severe attacks, in which he vomited blood and passed blood in the stools; enlarged spleen; exploratory laparotomy; stomach and duodenum normal; liver smooth, not cirrhotic; removal of enlarged spleen; recovery.*—C. D. B., aged thirty-three years, of Fincastle, Va., farmer, admitted on March 9, 1898, complaining of hemorrhages from the stomach and bowels, and pain, with enlargement in the left side of the abdomen. On his first admission, four months after the last hemorrhage, the red blood-corpuscles were 3,000,000, the leucocytes 2800 per c.mm., and hæmoglobin 25 per cent. Differential count: polymorphonuclears, 84.4 per cent.; small mononuclears, 4.4 per cent.; large mononuclears, 5 per cent.; transitionals, 3.4 per cent.; eosinophiles, 2.8 per cent. There was no enlargement of the lymph-glands. This patient has been heard from a year subsequent to the removal of the spleen, and he continues well.

CASE V. *No malaria; no syphilis; eleven years ago first attack of hæmatemesis; for four or five years recurring attacks of melæna; in 1892*

*second attack of hæmatemesis; an occasional attack of melæna; January, 1898, severe hæmatemesis and melæna; great enlargement of the spleen; marked anaemia of the chlorotic type*—A. B., aged thirty-eight years, of Durham, N. C., admitted to Ward C, on November 10, 1898, complaining of hemorrhages from the stomach. In this very remarkable case the hemorrhages have recurred for nearly twelve years, as I have heard within a few weeks (November, 1899) that he has had another severe attack. He had been persistently pale for many years. The blood on admission gave hæmoglobin 30 per cent.; red blood-corpuscles, 4,000,000; leucocytes, 6500 per c.mm. Differential count: polymorphonuclears, 73; small mononuclears, 10; large mononuclears, 12; transitionals, 3; eosinophiles, 2.

Cases III., IV., and V. have been reported in full in the *Edinburgh Medical Journal*, May, 1899.

• *CASE VI. Hæmatemesis and melæna in April, 1898; enlarged spleen; second attack of hæmatemesis in October, 1889; swelling of abdomen and feet; melanoderma.*—W. H., aged twenty years, admitted to Ward F, January 14, 1890, complaining of swelling of the abdomen.

*Family History.* Mother died, aged forty-six years, of disease of the lungs; father died at thirty years, cause unknown; one brother has had malarial fever.

*Personal History.* Until 1887 he lived at Centreville, Md., which is in a malarial district. For the past five or six summers he has had attacks of what was called bilious fever, with vomiting for a few days, but no jaundice or pain. The first attack was the most severe, and in it he became very pale and sallow, and had oedema of the legs. He does not think he has ever had malaria; he is sure that he has never had ordinary ague.

In April, 1889, after feeling wretchedly for a month, he vomited a good deal of blood, and passed dark blood in the stools. He was in bed at this time for three or four weeks. In May there was first noticed an enlargement in the left side of the abdomen. In June the patient applied at the out-patient department, complaining of uneasy feelings in the abdomen, headache, and weakness. At that time the spleen was noticed to be very large, and the notch was distinctly felt. He got better throughout August and September, and was able to work for three weeks. Early in October he had a second and more severe attack of vomiting of blood. This recurred on three successive days. It was dark-colored, and the stools again became bloody as before. He had slight fever, headache, and increasing swelling of the abdomen and of the feet.

On admission the patient had a very remarkable mottling of the face, with brown pigment. There was a good deal less pallor than when he was seen in June. There was a general brownish discoloration of the skin everywhere; no pigmentation of the mucous membranes. The conjunctivæ were very pearly. The examination of the abdomen showed a greatly enlarged spleen, which toward the middle line reached to within an inch and a half of the umbilicus, and below to within three inches of the crest of the ilium. It was smooth and not painful. The liver was not enlarged. The superficial lymph-glands were not enlarged.

*Blood.* On admission, January 14th, the red blood-corpuscles were

2,187,000; leucocytes, 12,497. There were no microcytes, no poikilocytosis. He was placed upon Fowler's solution, and he improved rapidly. The color got better, and on January 23d the red blood-corpuscles had risen to above 3,000,000. He progressively improved, and on February 5th the red blood-corpuscles were 3,912,500 and the leucocytes 18,720. He left the hospital on March 24th greatly improved, his weight having risen from 140 pounds on admission to 154 pounds. While in the hospital he had slight fever—99° to 100°, and it once rose to 102°. I have not been able to learn the subsequent history of this case.

CASE VII. *Residence in a malarial district; no attacks; no syphilis; progressive enlargement of the spleen, with anemia; melanoderma.*—W. R., aged forty years, of Port Antonio, Jamaica, referred to me on May 18, 1895, by Dr. Henderson, of Kingston.

*Personal History.* A native of Jamaica, he had malaria when a boy, and has lived in Port Antonio and the neighborhood for some years (which is a very malarial district), but has never had chills or fever, and has never been laid up in bed. He has at times had slight febrile attacks. He has not had syphilis.

The present trouble dates from about two years ago, when he began to get pale and lost his weight—from about 165 to 148 pounds. He has worked steadily until April of this year, when he consulted Dr. Henderson, of Kingston. The doctor writes that he found him suffering from anemia, with considerable enlargement of the liver and great increase in the size of the spleen, which came down nearly to the iliac crest, and extended inward to within one inch and a half of the umbilicus.

*Present Condition.* Patient was remarkably bronzed on the face and hands, and there was a diffuse pigmentation of the whole skin. The mucous membranes were not anemic; not pigmented. There was an old scar on the left ankle, and a small fresh abrasion on the right shin, in the neighborhood of these there were remnants of extensive fresh hemorrhages; a similar very large one existed over the dorsum of the left foot. He said there had been recurring hemorrhages in the skin of the legs. The pulse was steady and strong—80 to the minute. The heart-beat was in the fourth interspace; the sounds were everywhere clear.

The abdomen was prominent. An enormous spleen occupied almost the entire left side, extending to within three finger-breadths of the pubes and about two finger-breadths beyond the middle line, just below the navel. The lower and anterior borders were felt readily; the notch was just at the navel. The surface was smooth; pressure was not painful. The flatness extended to the upper border of the eighth rib in the mid-axillary line. The liver was not so much enlarged as at the time of Dr. Henderson's examination. It extended only two finger-breadths below the costal margin in the nipple line.

Blood count (Dr. Thayer): red blood-corpuscles, 4,816,000; white blood-corpuscles, 5000; hemoglobin, 55 per cent. There were no nucleated red blood-corpuscles; there was no poikilocytosis. The large mononuclear elements were more numerous than the small; the eosinophiles were also slightly increased.

CASE VIII. *Recurring attacks of diarrhoea; tumor in the left side noted three years ago; no hemorrhages; progressive anemia, with greatly enlarged spleen*—Mrs. Phoebe N., aged fifty-six years, admitted on

October 15, 1896, complaining of diarrhoea and swelling of the abdomen. There was nothing of any moment in her family history. She has had six children; has always been very well and strong. She has not had malaria.

She dates her present illness from three years ago, when, after an attack of diarrhoea, she noted a swelling in the left side beneath the costal margin. From the onset she noticed that her color was bad, of a grayish-brown, unhealthy tint. The diarrhoea had been a very persistent feature in her case, and she had to exercise the greatest caution in diet, and sometimes had as many as six to twelve greenish-watery stools in the twenty-four hours. She has never passed any blood or mucus. There had been intervals of from one to three weeks when the diarrhoea would stop entirely. The tumor which she had felt in her left side had increased, and it caused a dragging, uneasy sensation. She has had no hemorrhages, no œdema, no ascites.

*Present Condition.* The patient was a small woman, not specially emaciated, but of a very pale, gray, pasty-brown color; mucous membranes pale; tongue slightly coated; no special pigmentation. There were hemic murmurs at the base of the heart.

The abdomen presented a marked prominence on the left side and a bulging just to the left of the umbilicus. This area was occupied by a large solid mass, with sharp border and two well-defined notches, one above the navel and one a little to the right and below. The whole mass was readily movable on bimanual palpation. On percussion the flatness extended from the sixth rib in the nipple line.

*Blood.* Hæmoglobin, 60 per cent.; red blood-corpuscles, 3,600,000; white blood-corpuscles, 3000 per c.mm. There was a slight poikilocytosis; the corpuscles looked pale. No nucleated red blood-corpuscles. A differential count of the leucocytes gave: polymorphs, 66; small mononuclears, 25; large mononuclears, 7; transitionals, 2; eosinophiles, 1.

The feces were of a greenish-brown color, contained no blood, no mucus, no parasites, no ova of parasites. They were repeatedly examined.

The patient remained in the hospital until October 21st. She improved; the red blood-corpuscles rose to 4,300,000, hæmoglobin 60 per cent., leucocytes 6000 per c.mm. There was no change in the differential count of leucocytes. The urine had a specific gravity of 1022; contained no tube-casts or albumin. The patient had no fever during her stay in the hospital.

*CASE IX. Chills and fever when a child—febrile attacks in 1892, six years before death, in which enlargement of the spleen was noticed; gradual anæmia; in May, 1895, ascites; recovery; in May, 1897, again ascites; recovery; progressive anæmia; greatly enlarged spleen; early in 1898 again ascites; repeated tapplings; death; spleen enormously enlarged; no cirrhosis of the liver.*—D. S. C., aged fifty-eight years, a physician from Illinois, consulted me on October 29, 1897, complaining of anæmia and an enlarged spleen. He had had chills and fever as a child of seven, inflammatory rheumatism at ten years of age. In 1872 had a bad attack of erysipelas. He has been a temperate man and a very hard worker.

The present illness began in the winter of 1892-1893 with a fever, which recurred at intervals for six weeks, but which seemed to be

checked easily with doses of quinine and atropine. He did not feel very ill and kept at work. Toward the end of this attack there was a slight swelling and redness of the right ankle. He noticed now for the first time that the spleen was enlarged, but it was not very prominent. In 1893 and 1894 "he worked along," not feeling very robust, and he thinks that the spleen continued enlarged all this time. In May, 1895, he became very anæmic and weak, and, not improving through the summer, he gave up work for eight months. In this attack, in addition to the anæmia and enlargement of the spleen, he had ascites. In January he felt better and went home and began work again, and continued to practice during the winter of 1896-1897. He says the spleen was at this time enlarged. In May of that year he again became very anæmic and pale, and took much iron and arsenic. The abdomen also became swollen, but was not so large as in 1895, and he had œdema of the feet; both disappeared. The blood count, which he had made at that time, showed 4,400,000 red blood-corpuscles; 5100 white blood-corpuscles per c.mm.

*Present Condition.* He looked a little pale, was not specially emaciated. Tongue was of good color, pulse of good volume, superficial bloodvessels not specially full.

The abdomen was large and the navel projected, and to the left of it there was a very marked prominence, which descended with each inspiration, and in it a distinct notch could be seen. A second prominent mass was seen just below the left costal margin. On palpation these two masses were found to be continuous, evidently a very greatly enlarged spleen, firm and hard, with rounded edges; the notch, which was visible, could be readily felt. The edges were singularly rounded; the surface was smooth. The edge of the liver could be felt just two finger-breadths below the costal margin outside the right rectus. The outlines on percussion did not show any enlargement. There was a small ecchymosis just to the left of the navel; the superficial veins were not distended; the superficial glands were a little enlarged.

*Blood* (Dr. Fitcher): moderate poikiloeytosis, slight increase in the average size of the red corpuscles, a few microcytes and macrocytes, apparent diminution in the number of leucocytes. Blood count: red blood-corpuscles, 4,788,000; white blood-corpuscles, 5200; hæmoglobin, 60 per cent. The percentage of the different leucocytes was as follows: Small mononuclears, 52; large mononuclears, 2; transitionals, 4.8; polynuclears, 40; eosinophiles, 1.2. In stained specimens the same poikiloeytosis was noted, and variations in size, as in the fresh specimens. There were no nucleated red blood-corpuscles.

On January 4, 1898, the swelling became so great that he had to be tapped, and an enormous quantity of fluid was withdrawn. The operation was repeated again in four weeks. Early in February he had a very severe attack of sciatica, hiccough developed, and he became greatly enfeebled. He sank gradually, and died on the 12th of February. The spleen was enormously enlarged. There was no cirrhosis of the liver.

*CASE X. Residence in a malarial region; occasional attacks of chills and fever; chancere, no symptoms; progressive weakness and anæmia; epilepsy for years; greatly enlarged spleen; anæmia; melanoderma.*—Cornelius B., aged thirty-nine years, of Port Royal, S. C., admitted to Ward C, June 15, 1898, complaining of epilepsy, hemorrhages, and progressive weakness. There was nothing of any moment in his family

history. He has always lived in a malarial district, and nine years ago had two congestive chills, and following this for three years he had occasional attacks of malarial fever. He had gonorrhoea ten years ago, and a non-indurated sore three years ago, not followed by symptoms. For five or six years he has had hemorrhoids. He is a moderate drinker. He has had epilepsy for nearly eighteen years; the attacks now recur about once a month. The patient has been growing progressively weaker for the past six or eight months. He has never noticed anything in the abdomen. He came to consult me, complaining of epilepsy and a nervous breakdown.

*Present Condition.* His face had a sallow look, which he attributed to his occupation, as he had been out in the open air fishing a great deal. The lips and mucous membranes had a good color. The general surface of the skin had a slight degree of dark brownish pigmentation, with here and there little patches of leucoderma. His weight was 138 pounds. He had no fever, and the pulse was of good volume, 92 per minute. The superficial lymph-glands were easily palpable, perhaps in places a little enlarged. With the exception of a soft apex systolic murmur there was nothing of note in the examination of the chest.

*Abdomen.* The spleen was greatly enlarged, reaching 7 cm. below the costal margin in the parasternal line. Above the flatness began in the sixth interspace; anteriorly the margin could be felt close to the navel. The edge was sharp, easily felt, the surface smooth and painless. The liver flatness began at the fifth space in the nipple line, and extended 3½ cm. below the costal margin, 12 cm. in vertical extent. The edge of the organ was distinctly palpable and felt normal.

*Blood.* A fresh specimen showed considerable poikilocytosis, with megalocytes and microcytes; no nucleated red corpuscles were seen. There were no malarial organisms and no pigment. Blood: red blood-corpuscles, 4,128,000 per c.mm.; white blood-corpuscles, 2800 per c.mm.; hemoglobin, 45 per cent.

The urine was of a low specific gravity, 1010 to 1014; there were no tube-casts, no albumin.

The patient remained under observation for two weeks, during which time he improved, and was then transferred to the surgical side for operation on the hemorrhoids.

An interesting point was the fact that this patient did not know that his spleen was enlarged. He had had no treatment, and consulted me for the epilepsy.

*CASE XI. In 1891 obscure abdominal attack, thought to be peritonitis; color not good since; April, 1898, spleen found to be greatly enlarged; progressive anemia; persistent enlargement of the spleen; stone in the bladder; operation; death.*—J. K. E., aged fifty-seven years, seen early in September, 1898, with Dr. Graham, of Toronto, and he was under my subsequent care through January and February, 1899. The patient has always been a strong, healthy man, high-strung and nervous, actively engaged in political and legal work. His habits have been good; he has taken alcohol in moderation; has never been what would be termed a heavy drinker. In 1891 he had an obscure abdominal attack, the nature of which was never very clear. His doctor at that time thought it was possibly peritonitis. He does not think that he has ever been quite the same since, particularly in the matter of color, though he has of late years been able to attend to a great deal of work. In the early

part of 1898 his wife and others noticed that he was becoming very pale, and in April he discovered that he had a lump in the left side of the abdomen. The first blood count was made in June by Dr. Harold Parsons, when the hæmoglobin was found to be 37 per cent, and the red blood-corpuscles somewhat under 2,500,000; the leucocytes were normal. Throughout the summer he did not do well. The pallor persisted; he had a little swelling of the feet, and he also had dyspepsia. In August, a little before I saw him, he had 45 per cent of hæmoglobin, and the corpuscles were rather more than two millions and a half; leucocytes normal. In September, when I examined him with Dr. Graham, the pallor was marked; he had lost about fifteen pounds in weight. The spleen was considerably enlarged, extending more than a hand-breadth below the costal margin. The superficial glands were not enlarged; liver was not enlarged. Dr. Graham regarded the case as one of anemia splenica, in which opinion I concurred. All through the summer he had at intervals attacks of slight fever; sometimes the temperature would go as high as  $101^{\circ}$ ; more frequently it would be an afternoon temperature of  $100^{\circ}$ .

On admission to the private ward there was no special change since I saw him in September; no loss in weight. Pulse was 72, regular, good tension. The abdomen looked full in the left flank and under the left costal margin. The spleen extended to about the level of the navel, to the right about three finger-breadths from the middle line; it felt round and firm; the notches were not distinct. It extended deep in the flank below the level of the anterior superior spine. The edge of the right lobe of the liver was readily felt just below the costal border on deep inspiration; left lobe of liver could also be felt two finger-breadths below the ensiform cartilage. There was no enlargement of the superficial lymph-glands.

Repeated very careful blood counts were made in this case by Dr. McCrae through January and February. The hæmoglobin was at about 40 per cent. It rose on February 10th to 50 per cent. On January 15th and 29th it was 40 per cent. The red blood-corpuscles were 3,328,000 per c.mm. on the 15th, and they had gained only a few hundred thousand on February 10th. The highest leucocyte count was 4000 per c.mm. on February 4th. On January 29th it was 2000. The differential count was as follows: Polynuclear, 78; small mononuclear, 6; large mononuclear, 13; transitional, 2.5; eosinophiles, 0.5 per cent. There was no poikilocytosis, but an occasional nucleated red blood-corpuscle was seen.

The patient improved somewhat through the spring, then symptoms of stone came on. Death followed the operation of lithotomy.

CASE XII. *Dyspepsia for many years; July 9, 1899, profuse hemorrhage from the stomach, again on the 16th and 26th; marked anemia; ascites; paracentesis; greatly enlarged spleen.*—L. F. W., aged forty years, was referred to me on October 18, 1899, by Dr. Moran, of Roxbury, Mass. Up to eight years ago he was a very healthy man. He had not had malaria. No history of syphilis. Had been a temperate man. For the past eight years he had had dyspepsia, and on several occasions had vomited. He had had no pain, and had kept at work. During the first week of July of this year he did not feel very well; then on the evening of July 9th he had a profuse hemorrhage from the stomach, in which he brought up, he says, four quarts in three separate

attacks. On the 16th he had a second hemorrhage, and on the 26th two more, one of which was very severe. Naturally the bleeding was thought to come from an ulcer, and he was kept very quiet and had rectal feeding for many weeks. He gradually began to improve, although he was very weak and debilitated. The abdomen became progressively larger, owing to dropsy, and he was tapped about five weeks ago, and six quarts of fluid drawn off. On his way to join relatives in Baltimore he consulted Dr. Vickery, of Boston, who found a greatly enlarged spleen.

*Present Condition.* He was not emaciated; still looked pale. The abdomen was full, and under the left costal border there was a slight prominence. On palpation the spleen was found to be greatly enlarged, the lower border extended exactly to the level of the navel. Anteriorly it reached to the parasternal line. The border could be distinctly felt. The liver was not enlarged. The ankles were not swollen. There was a soft hæmic murmur over the base of the heart. There were no retinal hemorrhages.

*Blood.* Hæmoglobin, 45 per cent.; red blood-corpuscles, 4,208,000; white blood-corpuscles, 4000 per c.mm. A differential count of 300 white blood-corpuscles gave: polynuclears, 65.6 per cent.; small mononuclears, 15 per cent.; large mononuclears, 12.6 per cent.; transitional, 3.3 per cent.; eosinophiles, 3.3 per cent.; no nucleated red blood-corpuscles or myelocytes were seen.

*CASE XIII. Failing health; vomiting and diarrhoea; profound anæmia; greatly enlarged spleen; rapid improvement under treatment.*—Mrs. C., aged forty-four years, colored, laundress, admitted to Ward O, on October 12, 1899, complaining of great weakness, nausea, and vomiting. Her husband died of tuberculosis. She has three children, one now tuberculous. She has had the usual disorders of childhood; has never had typhoid fever or malaria. She has had no miscarriages. She has had indigestion all her life; has been a hard-working woman, and has had to support her children for many years.

*Present Illness.* For the past three months she has been failing in health, has had loss of appetite, progressive weakness, and for the past six weeks much nausea, vomiting and diarrhoea. She gave up work about September 1st, and has been in bed ever since. She has felt giddy at times, and her eyesight has been dim. She has lost about fifteen pounds in weight. She has been short of breath on the slightest exertion.

She was a slenderly-built, fairly well-nourished, light mulatto woman; the mucous membranes very pale. There were all the objective features of extreme anæmia.

The abdomen looked full and prominent, particularly in the left half, and the left subcostal groove was obliterated. On palpation a large tumor was felt in the left hypochondriac region, extending into the epigastric region as far as the middle line. The border reached 7 cm. from the left costal margin. The edge was rounded. On bimanual palpation the mass could be grasped between the hands, and the posterior edge could be well felt. The surface was smooth, and there was no pain. There was no friction over it; no bruit. The liver flatness began at the sixth rib, and extended 7 cm. below the costal margin in the nipple line. The edge of the left lobe could be well felt 5 cm. above the navel. The surface was smooth. The superficial lymph-

glands were not enlarged. The posterior cervicals were perhaps a little larger than normal. No retinal hemorrhages.

*Blood.* Hæmoglobin, 23 per cent.; red blood-corpuses, 1,540,000; white blood-corpuses, 3300. Differential count of 300 leucocytes gave: polymorphonuclears, 74; small mononuclears, 19.6; transitionals, 2.6; large mononuclears, 1.6; eosinophiles, 1.5; myelocytes, 1.5; forty-five nucleated red blood-corpuses were met with in counting 300 leucocytes, thirteen of which were megaloblasts. (Miss Reed.)

On October 17th a blood count was made by Dr. McCrae. Hæmoglobin, 20 per cent.; red blood-corpuses, 1,380,000; white blood-corpuses, 3250. Differential count showed no special changes from that previously noted. In 400 leucocytes there were 1.25 per cent. myelocytes. In counting the 400 leucocytes there were 75 nucleated reds, 21 of which were normoblasts, 19 megaloblasts, and 35 intermediate. Three was very marked poikilocytosis. There were some enormous nucleated red blood-corpuses 12 x 15 microns in diameter.

The patient was kept in bed, had a good diet, was put out of doors every day, and given arsenic and iron. She improved with great rapidity, gaining in weight and in strength.

A very careful study of the blood was made in this case by Miss Reed, and counts were taken twice a week. On November 10th the following: Hæmoglobin, 55 per cent.; red blood-corpuses, 3,120,000; leucocytes, 4500. No nucleated red blood-corpuses were seen. The most remarkable change was in the reduction of the size of the spleen, the edge of which was now felt 5 cm. from the middle line. She had increased in strength, her color was good, and she had gained thirteen pounds in weight.

The patient was discharged November 20th. The hæmoglobin was 54 per cent.; red blood-corpuses, 3,680,000; white blood-corpuses, 4300.

CASE XIV. *Enlarged spleen; anæmia of chlorotic type; recurring attacks of hæmaturia; melæoderma; diarrhoea.*—E. W. S., aged thirty-five years, lawyer, of West Virginia, seen with Dr. Thayer and admitted to Ward C, October 31, 1899.

His family history was good. When fifteen years old he had typhoid fever, and following it a great deal of rheumatism. At eighteen he had a primary sore, followed by pharyngitis and skin rash. He was very thoroughly treated. He is married and has three healthy children.

Until five years ago he was well. In the summer of 1894 he had an attack of diarrhoea, which lasted on and off for several weeks, and at this time he first noticed a sallowness of the complexion, and he had itching of the skin. In the following summer he had a return of the diarrhoea, but less intense, but with it the itching of the skin returned. He does not think that he was jaundiced. In the summer of 1896, while electioneering, the diarrhoea returned, and persisted on and off through the winter and spring, and through the summer of 1897. Then until July, 1898, he was quite free from it. He then had it for nearly four months. Last winter he was well until March, when the old trouble began, and since then he has lost forty pounds in weight. During these five years the movements have always been the same, watery at first, followed by much mucus, and at the end of the movement a little fresh blood. Parasites have been carefully looked for by Dr. Thayer on several occasions.

In the intervals between the attacks of diarrhoea he regained strength

quickly. The sallowness year by year became more marked. During the past summer for the first time he had three attacks of hæmaturia, each one followed by colic; no rigor; no fever. He was considered to have malaria, and given quinine. He had no hemorrhages from the stomach or bowels. He has never lived in a malarial region; has never had a chill. He had taken much arsenic during his illness.

*Blood.* Hæmoglobin, 55 per cent.; red blood-corpuscles, 3,856,000; white blood-corpuscles, 4500. Differential count: Polymorphonuclears, 73.7; small mononuclears, 14; large mononuclears, 8; transitionals, 3.3; eosinophiles, 1. No nucleated reds, no myelocytes. In the fresh specimen the red blood-corpuscles looked rather pale, slight poikilocytosis, numerous endoglobular degenerations; no malarial parasites.

The pigmentation of the skin was fairly uniform on the face. On the trunk it was deepest in the groins and flanks, the folds of the arms and in the axilla. There was some roughness of the skin and ankles; no nodes.

*Abdomen.* A prominent mass below the left costal margin descended with inspiration, reaching almost to the navel. On palpation this corresponded to a greatly enlarged spleen. The notch was not very distinct. The splenic dulness began at the upper border of the seventh rib. There was no enlargement of the lymph-glands. The liver was slightly enlarged. In the parasternal line it could be felt 6 cm. below the costal border. The edge could be felt. He had had no pain in either liver or spleen. The heart and lungs showed no special signs. The stools contained fatty debris and a few small blood clots; no parasites. There was no fever.

The patient remained in the hospital until November 23d. He was out of doors, in bed, all day, and improved rapidly. The diarrhoea stopped; he took his food, and seemed very comfortable.

On November 16th: hæmoglobin, 60 per cent.; red blood-corpuscles, 3,692,000; white blood-corpuscles, 3500 per c.mm. The spleen seemed to have reduced somewhat in size.

On November 19th he had an attack of hæmaturia which continued for nearly thirty-six hours; no pain. He passed several long clots. On the morning of November 21st the urine was perfectly clear.

The patient left on the 22d. There was no essential change in the condition of the blood. The hæmoglobin was between 55 and 60 per cent. No nucleated red blood-corpuscles were seen at any time. A portion of skin was excised in this case. The pigment was distributed in the cells of the corium and in the subcutaneous tissue. It gave no iron reaction.

• CASE XV. *Recurring hemorrhages from the stomach in 1891 and 1892; some abdominal pain; enlarged spleen; anæmia.*—John F., Pennsylvania farmer, aged forty-three years, was seen on November 18, 1899, complaining of pains and uneasy sensations in the abdomen. He was at the hospital on October 8, 1895.

His family history was good. His personal history was excellent. He had had typhoid fever twenty years ago. He was a temperate man; said that he did not drink at all. Has not had syphilis. He has had psoriasis from his eighteenth year. He had fever and ague in 1885 when in Ohio. For two or three years he has had dyspepsia.

About Christmas, 1891, he vomited a large quantity of blood, as much as half a gallon. On January 1, 1892, he had a second hemor-

rhage, again bringing up about half a gallon. These attacks left him very anæmic and exhausted. In August, 1892, he had two profuse hemorrhages from the stomach, six days apart. At that time a lump was noticed in the abdomen.

At his first visit, in 1895, he was examined by Dr. Thayer, who found a spleen which reached 10 cm. below the costal margin, and in which two notches could be felt. The liver-dulness began on the seventh rib, and the vertical area seemed reduced. The border of the liver could be felt below the costal margin.

November 18, 1899. The patient returned to-day for the first time. He has remained in good condition, has never had any return of the hemorrhages, but has had more or less uneasiness in the abdomen, sometimes pain in the left side. He was robust, well nourished, looked a little pale. The abdomen was protuberant. There was no pigmentation of the skin. On examination the left side of the abdomen looked prominent, and on palpation the spleen was felt extending into the umbilical region, to within an inch of the navel, and below reaching nearly to the crest of the ilium. The notches could be plainly felt. It was not painful. The liver seemed slightly reduced in volume since the first examination. The edge, which could be felt, appeared normal. The blood examination showed: Hemoglobin, 45 per cent.; red blood-corpuscles, 4,270,000; leucocytes, 2500. Differential count: Polymorphonuclears, 80.3; small mononuclears, 8; large mononuclears, 4; transitionals, 2; eosinophiles, 5; mastzellen, 6.

From a study of this series I find nothing to throw light on the nature or origin of the anæmia, which remains quite as obscure as in pernicious anæmia, as in the latter disease males appear to be more frequently affected than females—twelve to three in this series. With one exception all of the cases were in adults above the age of thirty-five. The youngest was a girl of eleven years. Three of the patients were above fifty years of age. Four patients had had malaria. Case IX. had chills and fever when nine years old. Only in Cases VII. and X. is this disease a possible factor, as the patients had lived all their lives in very malarial regions. Locality has nothing to do with the number of cases here reported. Only four of the patients were natives of Maryland; three came from Canada, and the others from various States. Two of the patients had had syphilis. In four dyspepsia was a special feature, and in two there had been recurring attacks of diarrhoea of great severity.

CLINICAL FEATURES. Before referring to these we may speak of one of the most interesting points brought out by this series—namely, the long duration of the affection. Samuel West, in the article on "Anæmia Splenica" in Allbutt's *System*, states that the disease is not of long duration—from six months to two years. In several of the cases the symptoms had lasted more than five years. Case V. has probably had the condition for at least twelve years, and in Case XV. the spleen was as much enlarged four years ago as it is now.

*The Spleen.* In all the enlargement of the spleen appears to have

preceded the anæmia. The patient suffered no inconvenience from it, and, as a rule, until discovered by the physician, did not know of its existence. In one case there were recurring attacks of pain in the region of the spleen. In all the spleen was large, reaching nearly to the navel, but only in Case VII. was it of maximum size, equalling the largest spleen of leucæmia. No case presented any difficulty in the diagnosis of the character of the tumor in the abdomen.

*Hemorrhages.* I have already called attention to the remarkable attacks of hæmatemesis in cases of enlarged spleen, whether simple or in leucæmia.<sup>1</sup> In the series here reported eight had hemorrhage from the stomach, and usually after it malaria. In seven cases this was the feature for which the patients sought relief. In Case V. the hemorrhages have recurred over a period of twelve years. Watson's explanation of the hæmatemesis in enlarged spleen is probably the most correct. "The stress of the congestion is continually felt in the submucous capillary system, and the hemorrhage, which is apt in such cases to occur from the loaded membrane, receives a simple solution upon principles almost purely mechanical." The vasa brevia, passing from the fundus, which empty into the splenic vein, drain a large section of the stomach. From estimates of Mall and Krauss 40 per cent. of the blood of the splenic artery goes to the stomach, so that one may reasonably conclude that a similar percentage of blood in the splenic vein is derived from that organ. The amount of blood brought up may be enormous, and the patient may be rendered exsanguine. Only in Cases I. and III. did the fatal termination follow hemorrhage. In a majority of the cases the diagnosis of ulcer of the stomach has been made. Hæmaturia occurred in Case XIV. It was probably not connected with stone, as it never came on with colic, but on several occasions was followed by pain and the passage of moulds of the ureter. Case VII. had on several occasions purpuric attacks.

*Ascites,* which was present in three cases, may be due, as in leucæmia, directly to the enlarged spleen, or it may be in part associated with the anæmia. It is important to bear in mind that ascites does not necessarily indicate cirrhosis of the liver. In Case IX. the patient had three severe attacks of ascites, and the liver at autopsy showed no trace of cirrhosis.

*Lymphatic Glands.* In no case in the series were the external lymphatic glands specially enlarged.

*Anæmia.* The patient may present only a very slight pallor, but there may be all grades of anæmia to a form as intense as that met with in progressive pernicious anæmia (Case XIII.). At least one-half of the patients when they came under observation did not present the

<sup>1</sup> Canada Medical and Surgical Journal, vol. xi., and Edinburgh Medical Journal, May, 1899.

objective features of a very profound anæmia. One of the most striking features on first inspection was the melanoderma, which was present in six cases. In Case VII, the pigmentation was as dark as in the most advanced cases of Addison's disease. In Case XIV, a portion of the skin was examined and showed none of the ochre-brown pigment of hæmochromatosis. In some of the cases the pigmentation may have been arsenical.

*Blood.* The following are the most striking features of the blood in this series:

1. The relatively high blood count: Of the fourteen cases the corpuscles ranged above 4,000,000 per c.mm. in six cases; between three and four millions in three; under three millions in four, and below one million in only one case. The average blood count of the fourteen cases was 3,336,357 red blood-corpuscles per cm.

2. The relatively low hæmoglobin: The estimate was not made in four cases; in the remaining eleven the ratio of hæmoglobin to corpuscular richness was low. In Case XIII, the hæmoglobin was 23 per cent., with the corpuscles above 30 per cent.; and in Case IV, the hæmoglobin was 25 per cent., with corpuscles at 60 per cent. Of the six counts in which the corpuscles were above four millions (80 per cent.) the hæmoglobin was 45 per cent. in three, 30 in one, 55 in one, and 60 per cent. in one.

3. The low leucocyte count: Of the thirteen cases in which the leucocytes were estimated there were nine with white blood-corpuscles below 5000 per c.mm. In six cases extreme leukopenia existed. In one case the count was 12,497.

The following table gives the result of the blood examinations in the series:

Case I.—Hæmoglobin, — per cent.; red blood-corpuscles, 2,000,000; white blood-corpuscles, —.

Case II.—Hæmoglobin, — per cent.; red blood-corpuscles, 2,250,000; white blood-corpuscles, 7120.

Case III.—No count.

Case IV.—Hæmoglobin, 25 per cent.; red blood-corpuscles, 3,000,000; white blood-corpuscles, 2800.

Case V.—Hæmoglobin, 30 per cent.; red blood-corpuscles, 4,000,000; white blood-corpuscles, 6500.

Case VI.—Hæmoglobin, — per cent.; red blood-corpuscles, 2,187,000; white blood-corpuscles, 12,497.

Case VII.—Hæmoglobin, 55 per cent.; red blood-corpuscles, 4,816,000; white blood-corpuscles, 5000.

Case VIII.—Hæmoglobin, 60 per cent.; red blood-corpuscles, 3,600,000; white blood-corpuscles, 3000.

Case IX.—Hæmoglobin, 60 per cent.; red blood-corpuscles, 4,788,000; white blood-corpuscles, 5200.

Case X.—Hæmoglobin, 45 per cent.; red blood-corpuscles, 4,128,000; white blood-corpuscles, 2800.

Case XI.—Hæmoglobin, 37 per cent.; red blood-corpuscles, 2,500,000; white blood-corpuscles, 3000.

Case XII.—Hæmoglobin, 45 per cent.; red blood-corpuscles, 4,208,000; white blood-corpuscles, 4000.

Case XIII.—Hæmoglobin, 23 per cent.; red blood-corpuscles, 1,540,000; white blood-corpuscles, 3300.

Case XIV.—Hæmoglobin, 55 per cent.; red blood-corpuscles, 3,856,000; white blood-corpuscles, 4500.

Case XV.—Hæmoglobin, 45 per cent.; red blood-corpuscles, 4,270,000; white blood-corpuscles, 2500.

Some additional points may be referred to.

*Red Blood-corpuscles.* Poikilocytosis was present in five cases. Marked endoglobular degeneration was noted in two cases. Nucleated red blood-corpuscles were met with in two cases; in Case XIII. in enormous numbers, both normoblasts and megaloblasts.

*White Blood-corpuscles.* As already mentioned, marked leukopenia was present in six cases. Differential counts of the leucocytes were made in ten of the cases. In the following cases there were changes in the proportion of the large and small mononuclears; in Case VII. the large mononuclears were more numerous than the small; in Case VIII. the small mononuclears were 25 per cent.; in Case IX. the small mononuclears were very high, 52 per cent.; in Case XIII. the small mononuclears were 19 per cent.; in Case XIV. the small mononuclears were 14 per cent. Altogether there was nothing in the differential count of any special moment or significance.

*DIAGNOSIS.* I have considered in this series only cases which presented idiopathic enlargement of the spleen (primitive splenomegaly) with anemia and without enlargement of the lymph-glands. In this locality enlargement of the spleen from malaria is exceedingly common, and it will be noted that there is no case included which could be called paludal cachexia. I have not included a few cases of idiopathic enlargement of the spleen in persons who appeared perfectly healthy and in whom this was found accidentally, or in whom the organ was enlarged and displaced. Two cases presenting this latter condition have been operated upon by my colleague—Halsted—who packed the spleen into position with gauze. Both were seen more than two years subsequent to the operation, and had remained perfectly well. In a third case, a young woman with an enlarged and floating spleen had a twist of the pedicle with necrosis of the organ and intense splenitis. Dr. Halsted operated, scraped out a large quantity of necrotic material, and she made a good recovery.

The following conditions are those in which there has been in my experience a difficulty in the differential diagnosis.

(a) From *pernicious anemia*. In Case XIII., for example, in which the spleen was very large, reaching to the navel, there were three points

very suggestive of pernicious anæmia—namely, the very low blood count, the extraordinary number of nucleated red blood-corpuscles, and the remarkable way in which the blood improved and the spleen reduced in size under the use of arsenic, iron, good food, and fresh air. While sometimes a little enlarged, the spleen in pernicious anæmia is more commonly small, and I do not remember ever to have seen it so large as in Case XIII. A relatively low hæmoglobin percentage is rare in this disease. Another case, in which there was a doubt, was a Mr. C., aged sixty-one years, admitted July 6, 1892. He had a profound anæmia (under 1,000,000 per c.mm.), and the spleen was three finger-breadths below the costal margin. He had at first a slight leucocytosis and a remarkable increase in the number of lymphocytes, without any special sign of lymphadenitis. Two weeks before his death the condition changed from one of anæmia to that of leukaemia, and in a count of 1000 leucocytes there were 841 lymphocytes.<sup>1</sup> This was probably an anomalous case of leukaemia. It was very thoroughly studied by Dr. Thayer and Dr. Barker, who will subsequently publish the case in detail.

(b) From certain cases of *splenic leukaemia*. There are cases of splenic leukaemia in which the leucocytes gradually diminish and remain at the normal number for protracted periods. In my text-book I give a chart of a case, in which, from February 6th to the end of April, the leukaemia had disappeared. For the greater part of the time there was leukopenia. The myelocytes, however, were still present, and from them a suggestive diagnosis, at least, might have been made. Bennet also refers to a case of this kind in his clinical lectures.

A very remarkable case came under observation in September, 1898. The patient at the time presented the features of a splenic anæmia, while a few months previously leukaemia had been diagnosed. As the case will be reported in full by Dr. McCrae, I shall give only the briefest abstract. Man, aged twenty-eight years, never very strong, but of good habits; no malaria or lues. He came complaining of weakness and of swelling of the abdomen. During the summer he had been under the care of Dr. Lichty, who had diagnosed a splenomyelogenous leukaemia. The hæmoglobin was 45 per cent., the reds about 50 per cent., and the leucocytes 1 to 4. He had improved very rapidly, and when he first came under our observation the leucocytes were only 9250 per c.mm. The spleen was greatly reduced in size, and there were no nucleated reds, no myelocytes. Fortunately, Dr. Lichty had kept slides, which he was kind enough to send us. The blood was that of an ordinary splenomyelogenous leukaemia. The patient was under observation again in April, 1899, and the leucocytes were only 5000 per c.mm.; hæmoglobin, 70 per cent.; red blood-corpuscles above 5,000,000.

<sup>1</sup> Such cases are exceedingly rare.

(c) From cases of *Hodgkin's disease with enlarged spleen*. There is no warrant for the opinion that these cases of anæmia splenica have anything to do with Hodgkin's disease (anæmia lymphatica) from which the clinical picture is very different. Slight enlargement of the spleen is common enough in Hodgkin's disease, but it rarely attains a large size, and I do not remember an instance in which it caused, *per se*, special symptoms.

In not one of the series of cases of which I have notes have the lymphatic glands been enlarged at any stage of the disease. So, also, in splenomyelogenous leukaemia there is rarely any great enlargement of the lymph-glands. In an interesting case, seen recently, the spleen and lymph-glands were enlarged without any anæmia or leukaemia.

William W., aged sixty-four years, referred to me by Dr. Wolfe, of Roanoke, November 13, 1899, complaining of pain in the side and swelling of the lymph-glands. He had not had syphilis; no malaria; was a very moderate drinker. He was a very healthy, robust-looking man for his age. There was general enlargement of all the external lymphatic glands; in the neck they were as large as hazel-nuts. The inguinal groups were uniformly enlarged, as big as cherries; the epitrochlears slightly enlarged. The spleen was three finger-breadths below the costal margin; the edge and the notch were easily felt. The edge of the liver could be felt below the costal margin. It was not specially firm nor painful. The inguinal glands above Poupart's ligament were enlarged. He had had no fever, no sweating. The red blood-corpuscles were 5,500,000, the leucocytes 10,000, hæmoglobin 87 per cent. The differential count by Dr. Thayer of the leucocytes showed a normal relation of the different forms.

(d) From *cirrhosis of the liver with enlarged spleen*. Banti has described cases with a triple combination of anæmia, enlarged spleen, and cirrhotic liver. Some of these cases he thinks represent the terminal stage of a splenic anæmia. From the history of recurring attacks of ascites, in Case IX. I thought it possible that the liver was cirrhotic, but the autopsy showed that it was normal. In Case XV., though the patient had been a temperate man, he had a reduced area of liver-dulness, and when we examined him in November, 1899, we might have laid some stress upon this had not the same condition been noted by Dr. Thayer four years previously, and it is not likely that he would have enjoyed continuous good health and to-day show no signs of trouble with a progressive cirrhosis of the liver. I have no personal knowledge of the interesting condition described by Banti.

There are three varieties of cirrhosis of the liver with which enormous enlargement of the spleen may be associated, and which may lead to doubt in diagnosis.

(a) *Alcoholic cirrhosis*. In long-standing cases the spleen may be

enormously enlarged, and if ascites be present, or there have been recurrent hemorrhages, the clinical picture is very like that of primary splenic anæmia. The history, the facies, the more moderate enlargement of the spleen, and the whole course of the disease should enable one to make a diagnosis.

(b) *Syphilitic cirrhosis.* Enormous enlargement of the spleen may be secondary to gummosis hepatitis, and in children with congenital syphilis this may cause difficulty in diagnosis. The history, the irregularity of the liver, and the more moderate enlargement of the spleen would be the important point. Illustrating the association of anæmia with enlarged spleen in syphilitic liver, there was admitted to my ward in 1891 a girl, aged twenty-three years, with signs of hereditary syphilis. She had trouble in the abdomen eight years ago, since which time it had been enlarged. She had a chronic pleurisy on the right side. When admitted she had fever—temperature 103°. The abdomen was greatly enlarged, and the whole of the left side was occupied by a greatly enlarged spleen. The right epigastric and upper umbilical regions were occupied by a second firm, irregular mass. There was slight enlargement of the lymph-glands. The blood showed: red blood-corpuscles, 2,234,000 per c.mm.; leucocytes greatly increased; a ratio of 1 to 25 red blood-corpuscles; hæmoglobin, 28 per cent. She died four days after admission. There was found a greatly enlarged spleen, measuring 23 x 16 cm., and weighing 1510 grammes; a syphilitic liver, much divided by fibrous bands, and necrotic gummata throughout its substance. The mesenteric and peritoneal lymph-glands were slightly enlarged. This was the largest spleen I have ever seen in cirrhosis of the liver.

Another case was that of C. A. H., aged thirty-four years, admitted December 11, 1897, with anæmia and an enormously enlarged irregular spleen. He had been a very heavy drinker; had a well-marked history of syphilis. Jaundice when seventeen. Three years ago he had jaundice and dropsy, which gradually disappeared. Eighteen months ago he noticed the mass in the left side of the abdomen, and he has gradually been becoming anæmic. Blood on admission: Hæmoglobin, 28 per cent.; red blood-corpuscles, 1,400,000; leucocytes, 7500 per c.mm. The spleen was enormously enlarged and irregular, and the liver could also be felt as an extremely irregular mass in the right hypochondrium. He had several attacks of colic while in the hospital, and was jaundiced. He improved very much, the spleen diminished in size, and he left the hospital with the hæmoglobin at 65 per cent., red blood-corpuscles 3,000,000, leucocytes 8370. In this case the history of syphilis, the previous attack of jaundice, and the irregular condition of the liver left no question, I think, as to the presence of syphilitic hepatitis with secondary enlargement of the spleen.

(c) *Hypertrophic cirrhosis.* Hemachromatosis, that remarkable condition of hypertrophic cirrhosis with melanoderma, enlarged spleen, and diabetes as a terminal phenomenon, may simulate anemia splenica. The spleen may be very large, and in the later stages ascites and hemorrhages have been noted. Anemia is not often present, and in two early cases which I have examined the blood count was normal. In young persons there is a non-alcoholic hypertrophic cirrhosis of the liver, with very great enlargement of the spleen, in which, when anemia exists, it might be difficult to reach a diagnosis. In not one of the fifteen cases here recorded was the liver greatly enlarged.

Doubt has been expressed as to the existence of a separate and distinct disease to which the term splenic anemia should be given. We do not know whether the anemia is the result of the enlarged spleen, or whether, as seems more probable, both are secondary to some cause as yet unknown. Provisionally, until we have fuller knowledge, it is useful to group together, as I have done here, cases of idiopathic enlargement of the spleen with anemia and without lymphatic involvement, and to label the condition splenic anemia. There are borderline cases difficult to classify, but, on the whole, the composite picture, as obtained by grouping the fifteen cases here recorded, has tolerably definite outlines.

The treatment is that of the severe types of anemia. Case XIII. illustrates how rapidly improvement may follow under iron, arsenic, sunshine, and good food. In the chronic cases with recurring hemorrhages the question of removal of the spleen should be considered. It was successfully carried out in Case IV., and the patient has remained well for more than a year.

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## THE HOME TREATMENT OF CONSUMPTION.

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READ AT THE SEMI-ANNUAL MEETING OF THE MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND AT WESTMINSTER, NOV. 11TH, 1899.

In the city, from the country or from small towns, I not infrequently see persons with pulmonary tuberculosis whose circumstances are such that change of climate or life in a sanitarium is out of the question; and when we reflect for a moment on the enormous number of cases of phthisis and the trifling accommodation offered in sanatoria, the practical problem which confronts us is, how best to treat the 95 per cent. of cases necessarily confined to their homes. Cannot these poor victims reap some benefit from the recent experience of the profession?

The usual surroundings of a consumptive are only too well known to all of us. In a majority of cases the treatment is desultory, unsystematic and directed to symptoms alone. It is not too sweeping an assertion to say that of the 8000 or 10,000 cases of consumption in the city of Baltimore today, few live under a definite regime. Last spring I saw in rapid succession two cases which impressed upon me forcibly the familiar fact that our theoretical knowledge of this disease has, as is so often the case, not reached a practical working basis. In a small house in South Baltimore I saw a young man, aged eighteen (one of five children), who had had tuberculosis for at least nine months. Nothing could have been more unfavorable than his surroundings, though the people were of the mechanic class, and of good intelligence. The room was stuffy, ill-ventilated, with both windows closely shut, and the temperature of the room, heated by a small stove, was nearly 80°. He had been in bed for at least three months, with much cough and a great deal of expectoration, some of which was visible on the floor, as it did not always reach the spittoon. He had high fever, loss of appetite, and was being fed on panopeptone and beef extracts. The room had a good exposure, and I suggested to the young man to have the bed moved to the window, to be well covered up, and to rest in the sunshine during part of every day. The reply was that it would kill him, and I could see by the mother's looks that she was of the same opinion. The doctor, too, I am afraid, regarded me as a fanatic. In the same week I saw a similar picture in a different setting, a young girl, who had been in bed for many weeks, with high, irregular fever and a rapidly-progressing disease. I could see that the suggestion of an open-air course of treatment was extremely distasteful, but she was induced to go to the Adirondacks, where she has done very well.

Arrest or cure of tuberculosis is a question entirely of nutrition, and the essential factor is so to improve the resisting forces of the body that the bacilli cannot make further progress, but are so hemmed in that they are either prevented effectually from breaking through the entrenchments, or, in rare cases, they are forced to capitulate and are put to the sword. Of the measures by which

the general nutrition of the body may be encouraged and improved, the first and most important is:

*Fresh Air.*—For more than two centuries the clearer-headed members of the profession have known that an open-air life sometimes cures a case of phthisis. One of the earliest and most interesting cases of this kind is reported by John Locke, the philosopher, in his "Anecdota Sydenhamiana." "Mr. Lawrence, Dr. Sydenham's Nephew after a fever fell into a Cough, & other signs of an incipient Phthisis, (the Morbific matter being violently translated in upon his Lungs) and at length the Diarrhoea colliquativa came on; then ye Dr sent him into ye Country on Horseback, (tho he was soe weak yt he could hardly walk) & ordered him to ride 6 or 7 miles ye first day, (wch he did) and to encrease dayly his Journey as he shd be able, untill he had rid 150 miles: When he had travell'd half ye way his Diarrhoea stopt, & at last he came to ye end of his Journey, & was pretty well (at least somewhat better) & had a good appetite; but when he had staid at his Sister's house some 4 or 5 days his Diarrhoea came on again; the Dr had ordered him not to stay above 2 days at most; for iff they stay before they are recovered this spoils all again; & therefore he betook himself to his riding again, and in 4 days came up to London perfectly cur'd. The same course hath ye Dr put others upon, especially in Pulmonick Diseases, & wth ye like Success when all things elee had faild him; & he was not ashamed to own yt he was fain to borrow a cure from this way now & then when he found himself puzzled with some lingering Distemper not reducible to a common & known (sic) Disease."

This reminds one of Dr. H. I. Bowditch's description of the ride which did him so much good when as a young man he was supposed to have lung trouble.

The quality of the fresh air in our large cities may not be very good, but it is the best a large proportion of our patients can possibly get to breathe, and it is a great deal better than the atmosphere of the overheated, ill-ventilated rooms in which a majority of them live.

I give the following directions: Take the almanac and count off the hours of sunshine. In winter cut off two hours in the morning and an hour in the evening, and for the rest of the day the patient is to be out of doors. If there is no possible arrangement for life out of doors, the patient is to be in a room with a southern exposure with the windows wide open. The bed is to be moved into the sunshine. If there is a balcony or a veranda with a good outlook towards the south, it should be arranged for the patient; if not, a sheltered protection can be put up in the yard at a very moderate cost. On a well-padded lounge, covered with a couple of thick blankets, well wrapped up, the patient sits or reclines all day, coming in only to attend to the calls of nature. Only on blustering, stormy or very rainy days is the patient to remain in the house. No degree of cold is a contraindication. This continuous open-air life, at rest, is the most powerful influence we possess today against the fever of tuberculosis. It may take a month, it may take two or even three months before the temperature reaches normal, but it has been one of the many valuable lessons which we have learned from Dr. Trudeau, that in the fever of consumption the patient should not only be out of doors, but at rest, taking no exercise. The bedroom of the patient should be

thoroughly ventilated, and the patient should be accustomed gradually to sleep with the window open.

Secondly, *Food*.—The stomach controls the situation in pulmonary tuberculosis. In any long series of cases the patients who do well are those who can take plenty of food. An important cause of the lack of appetite and feeble digestion is the persistent fever, and we often find that as the temperature falls the appetite improves. It is easy to lay down rules; very hard to carry them out. Each case must be dealt with separately, but as large a quantity of food as possible should be given. Overfeeding or stuffing, when possible, should be practised, and the patient should be encouraged to pay as little attention to his subjective gastric sensations as possible. We rarely can carry out the autocratic, cast-iron method followed at Nordrach, which insists that a patient who has vomited a meal shall, *volens volens*, eat another very shortly of the same character. For some time I have been urging the patients to accustom themselves to taking raw eggs, beginning with one three times a day, and increasing one a week until they took, if possible, twenty or twenty-four daily. For the hyperalimination this is probably the simplest and most satisfactory diet. It has been carried out with marked success by Dr. Ely of Rochester, who literally prescribes eggs by the dozen. Broken into the egg-cup, sprinkled with a little pepper and salt, the egg can be readily swallowed without breaking the yolk. It is most important to get the patient accustomed to taking the natural foods. Milk and cream and butter, meat and eggs and oysters should constitute the main part of the diet.

The medicinal treatment of cases may be divided into—first, the use of stomachics, bitter tonics and certain digestives; secondly, remedies such as codliver oil, hypophosphites and creasote, the benefits of which are chiefly in promoting general nutrition, and, thirdly, remedies for the relief of certain symptoms, as cough, pain, night sweats, etc.

In December last a young woman came to me from one of the towns in the State with well-marked tuberculosis. Her grandmother and two of her father's brothers had died of consumption. She had a cough off and on for three years, and for more than a year she had a great deal of fever, had lost very much in weight and had had profuse night sweats. She never had had any vomiting. When I saw her she had high fever (temperature  $103^{\circ}$ ), and there were signs of extensive disease at the right apex—flattening dullness on percussion with resonant rales as low as the fourth rib. There were signs of involvement of the right apex behind, and there were a few crackling rales at the apex of the lower lobe on the left side behind. She was short of breath, and looked thin and pale. Her weight was 100 pounds. I gave her directions such as I have indicated, and she has given me a brief statement in her own words of her progress in the eleven months. She writes as follows (November 10): "When I begun treatment the first day I sat out was December 11, 1898; don't know just how cold it was, but could see the river from our porch and they were skating. In winter usually had breakfast about 8 and went outdoors about 9. When I begun was not well enough to walk much, was so short of breath; after sitting out for some weeks would walk up and down porch an hour before sitting down. I spent a good deal of my time reading; became so interested in my book at times forgot how cold it was.

The first two weeks I took three eggs a day, one at 10 A. M., another at 3 and another before going to bed; then six a day, two at a time, and continued to increase till I got up to fifteen a day; continued that number for two months or more, then took twelve a day for three months, then nine. For breakfast I had oatmeal and cream and toast, or small piece of beefsteak and coffee; dinner at 12, drank one glass of milk and ate anything that was on the table in the line of meats or vegetables (provided I liked them); seldom if ever eat desserts. Went out immediately after dinner and remained there until sundown; more eggs at 3 and supper at 6; another glass of milk, and with that a small piece of meat, as a rule, and bread. Eggs again at 9, and go to bed between 9 and 10. Was sitting out one day when the thermometer registered 10° below zero. When it felt like snow or rain remained indoors. I kept this up till the weather was warm and then went driving, took eggs along and stayed out in country till dinner time; drove out again late in evening, and after my return home would sit out till after 10 o'clock. When I began treatment had bad cough, expectorated a great deal and no appetite. The cough begun to get better, and after about four months I coughed very little; now, so rarely and expectorate so very seldom that it is hardly worth mentioning. When I consulted you last December weighed 109 pounds; now tip the scales at 132 pounds. I have improved steadily and gained in flesh gradually from the above date.

This very practical story illustrates what could be done by many patients. Last spring I happened to be in the town in which this girl lived, and I fortunately thought of her and paid her a visit. She lived in a small two-story house, with a narrow balcony on the first story behind, and here at half-past eleven one morning I found her carefully wrapped up. She looked a different girl, and the report indicates that she has done remarkably well. At the time of my visit she was without fever, but there were still numerous moist rales at the right apex.

Since writing the above I have seen this patient (December 1), who looks remarkably well, has a good color, is free from fever, has no cough, no expectoration and weighs 133 pounds. Luckily I dictated a note on the condition of the lung at the time of her first visit, otherwise I should not have believed the extent of the change. The resonance is still impaired, the flattening is marked beneath the right clavicle, the breath sounds are harsh, the expiration prolonged, but there are only a few dry crackling rales on coughing or on deep breathing. There were no signs at the apex of the lower lobe of the left lung behind.

Two additional points of interest may be mentioned. She has not had a doctor, and she has not had a dose of medicine except an occasional dose of paregoric for the cough. She took creasote for a short time, but afterwards gave it up. Shortly before she visited me her physician died, and I did not know, until my visit to her, that she had not been under any professional care. She could not have done better had she been at the Adirondacks under Dr. Trudeau.

A rigid regimen, a life of rules and regulations, a dominant will on the part of the doctor, willing obedience on the part of the patient and friends—these, with the conditions we have discussed, are necessary in the successful treatment of pulmonary tuberculosis.

No. 22  
No. 211

[FROM THE JOHNS HOPKINS HOSPITAL BULLETIN, No. 107, FEBRUARY, 1906.]

## A CASE OF MULTIPLE GANGRENE IN MALARIAL FEVER.

(WITH ILLUSTRATIONS.)

BY WILLIAM OSLER, M. D.,

*Professor of Medicine, Johns Hopkins University.*

There are three groups of cases of multiple gangrene:  
(1.) *Raynaud's disease.*—There have been previous well-marked vascular disturbances in the extremities (syncope, asphyxia or hyperæmia), the gangrene is very often symmetrical, is usually slight in extent and limited to the fingers or toes, more rarely to the ear-tips or nose.

(2.) *Multiple spontaneous gangrene of limbs.*—In young or middle-aged persons, without any obvious cause, massive gangrene of one, two or three extremities occurs. Many illustrations of this are recorded in the literature.

(3.) *Multiple spontaneous gangrene in association with the acute infections.*—In measles, typhoid fever, typhus fever, scarlet fever, diphtheria and malaria, local gangrene may occur. There are multiple patches, not symmetrical, and the skin and subjacent tissues are more frequently affected than the extremities. While of course the phenomena of Raynaud's disease may occur as a sequence of any of the specific fevers, a large proportion of all the cases of local gangrene occurring during or after one of the fevers have nothing whatever to do with this affection.

The relationship between malarial fever and Raynaud's disease is believed to be very close. Many references are given to cases (a majority from French sources) by Barlow in his article in Allbutt's System, and more fully by Monro in his excellent monograph on the disease. (Glasgow, James Maclehose & Son, 1899.) Altogether, in the cases he has collected, there were only 8.3 per cent. with malarious antecedents.

I have looked over the notes of cases of Raynaud's disease which I have seen in Baltimore, nine in number, and I do not find malaria to be related as an etiological factor in any one of them, nor, so far as I know, in our very large series of cases of malaria during the past ten years has there been a single instance of Raynaud's disease.

The following case is a very remarkable illustration of multiple gangrene occurring in a case of æstivo-autumnal malaria. Similar cases have been reported in the literature, and are referred to by Monro in his monograph (page 96), but they seem to be exceedingly rare.

CLINICAL SUMMARY.—*Malaria when six years old—typhoid fever twice—last attack four months before onset of present illness—illness in the middle of October, supposed to be influenza, but more probably malaria—on November 2nd, onset of spots of gangrene in various parts—rapid extension—condition on admission as shown in the figures—complexion muddy—spleen enlarged—blood showed very many æstivo-autumnal organisms—temperature slightly elevated at first—subsequently no fever—rapid recovery.*

P. W. B., aged 23, bar-tender, admitted to Ward E, Thursday, November 29, 1899, complaining of sores on various parts of his body.

*Family history.*—Mother died of consumption. No history of rheumatism or of any special disorders of the skin.

*Personal history.*—As a child he had measles, mumps and whooping cough. When six years old he had malaria. Five years ago he had a very severe attack of typhoid fever, after which he had an abscess in the abdominal wall, which opened spontaneously and discharged for two months, leaving a large scar. He had at the same time many boils. Last year he went south with the Fifth Regiment, and in August he had a second attack of typhoid fever, and was ill for two months. He has had gonorrhœa twice; has never had lues. He has used tobacco freely; whiskey and beer in moderation.

*Present illness.*—The patient has been living in Baltimore this autumn, and has been very well until the middle of October, when he was ill in bed for nearly two weeks with pains in the back and general weakness; no fever, no chills, no herpes. The doctor called it influenza. The patient got



FIG. 1.

To illustrate Dr. Osler's Case of Multiple Gangrene in Malarial Fever.



FIG. 2.



FIG. 3.



FIG. 3.



FIG. 3.

up and was about for a few days, when, on November 2nd, just twenty-seven days ago, he noticed blebs about half an inch in diameter on both hands, which were slightly swollen. The next day a mottled area appeared on the instep of the left foot. It had a bruised appearance. A similar one appeared on the buttocks and on the dorsum of the right foot. Other spots came in the situation to be subsequently mentioned.

The hands and feet became very much swollen. The blebs broke and discharged a dark fluid; the skin around the affected areas was very red. There was no itching. He had some pain at night. Ten days ago he had slight chilly feelings. There had been no redness, nor swelling, nor blueness of the fingers or toes, and there had been no numbness or tingling. The urine had been clear. Dr. Fatcher made the following note on the day after his admission.

"The patient is a large-framed, well-nourished man; complexion rather sallow. The skin of whole body is pigmented, markedly so about nipple and umbilicus, to slight extent about genitalia; no increase in either axilla. The lips and mucous membranes are of fairly good color; no pigmentation of mucous membranes. Over dorsum of left hand, just behind knuckles, there are four whitish scars, the result of healing vesicles. Over the ring, middle and little fingers there is a brownish-yellow discoloration of the skin which is gradually peeling off where the blebs are healing. On palmar surface of same fingers the skin is raised in large blebs. The skin has a brownish-yellow color, and over the ring finger is quite gangrenous, and there is involvement of the subcutaneous tissue. The thumb and index finger are not involved.

"*Right hand.*—The dorsum of hand is unaffected. On the dorsal surface of first and second inter-phalangeal joints of index, middle and ring fingers the skin is thickened, brownish in color, no vesicles. Over the hypothenar eminences on palm is a large area, measuring  $5 \times 6$  cm., in which the skin is loosened from the subjacent tissue, markedly discolored, and at one point a serous fluid is exuding. The palmar surface of all four fingers shows a gangrenous condition of the skin with vesiculation and oozing of fluid, most extensive on ring finger, where the process invades the palm of the hand.

"*Right foot.*—Over dorsum of foot, below ankle, is an area,

5x3 cm., in which the skin is gangrenous and exceedingly black; slough still adherent to adjacent tissue; surrounding skin, slightly pigmented. Over the heel there is an area of brown, discolored, thickened skin, measuring 5x6 cm.; this area is sensitive to the touch.

"*Left foot.*—Below external malleolus is an area, 5x3 cm., of gangrenous and sloughing black skin.

"*Left buttock.*—Just over the spine at the junction of the dorsal and lumbar regions there is a patch of dry gangrenous skin  $1\frac{1}{2}$ x2 cm. Over left gluteal region there is an irregular gangrenous patch, quite dry, measuring  $4\frac{1}{2}$ x2 cm., slightly sensitive to pressure.

"*Occiput.*—Over the lower part of occiput, on each side, there are two areas in which the scalp has a gangrenous appearance, slight oozing of fluid causing matting of hair."

Though the history did not suggest malaria, as in the routine examination of the abdomen the spleen was found to be considerably enlarged, the blood was at once examined, and very large numbers of estivo-autumnal organisms were found. The crescents were in unusually large numbers. Cultures taken from the blood proved negative. There was no leucocytosis, and the differential count was practically normal. The eosinophiles were only 2 per cent. The patient was at once given quinine in full doses, and he began to improve rapidly. The larger sloughs were treated with linseed poultices made with bichloride solution. Crescents and ovoids persisted in the blood for some time, though by December 15th they were rapidly disappearing. On December 14th, the gangrenous patches on both hands had healed. On the feet the sloughs had separated, leaving deep ulcers, the sheaths of the tendons being exposed. The urine examinations were negative throughout. The patient had a slight rise of temperature ( $100^{\circ}$ ) at first; subsequently none at all. The figures from photographs, by Dr. Brownell, illustrate the condition on admission.

### LATENT CANCER OF THE STOMACH.

By WILLIAM OSLER, M.D., AND THOMAS McCRAE, M.B.,  
of Johns Hopkins Hospital.

In a study of 150 consecutive cases of carcinoma of the stomach in the medical department of the Johns Hopkins Hospital, we have been very much interested in a group in which the disease was unsuspected during life. As Welch remarks, it is rare to find cancer of the stomach in an apparently healthy man dying of accident. The latent cases are most frequently met in old persons, in whom the symptoms may be very slight, or absent, or they are mistaken for the ordinary dyspeptic complaints of the aged. Even after the most thorough examination it may not be possible to reach a diagnosis. In obscure cases, particularly with dyspepsia and emaciation, the possibility of latent carcinoma should be borne in mind.

There are three groups of cases of latent carcinoma of the stomach:

1. A very small one in general hospitals, a very large one in almshouses and asylums, comprising cases in which the symptoms are those of a gradual enfeeblement without any indication of local disease—as Oliver Wendell Holmes puts it, in the "One Hoss Shay," "a general flavor of mild decay, but nothing local."

2. Cases in which, with an absence of gastric symptoms, the lesions of associated disease seem sufficient to account for the condition. In this group were 4 of our cases. In 2 the diagnosis of nephritis was made; 1 had advanced pulmonary tuberculosis with pneumothorax, and the fourth showed profound anemia with multiple venous thrombi. The following is a summary of these cases:

CASE I.—*Diagnosis of nephritis, arteriosclerosis and pleurisy; no gastric symptoms.*

No. 22. A. G., Hospital Nos. 2454 and 3251, male, aged 61 years, first admitted January 22, 1891, complaining of short-

ness of breath. A history of dyspnea, for some years. He had frequent attacks at night, and any ordinary exertion was difficult. With this he has had frequent cough. He had little appetite and the bowels had been loose.

Examination: Dyspnea, cyanosis, and edema. The arteries were very sclerotic. There was fluid in the left pleural cavity; over 600 cc. were withdrawn. The heart's action was rapid, with gallop rhythm; on January 20, 900 cc. were withdrawn from the left pleura, and the following day a friction-rub was heard in the left axilla. There were albumin and tube casts in the urine. The dyspnea gradually lessened, and by February 16 his condition was much improved.

The patient remained in the hospital until April 29; on discharge he was still slightly cyanotic, but the dyspnea had gone. There was slightly impaired resonance on the left side of the chest. There was nothing noteworthy about the abdomen. During his stay there were no gastric symptoms and the general condition of the patient improved.

*Second admission*, May 19, 1891, three weeks later. He looked very ill, cyanosed, and with dyspnea and hiccough. The pulse was scarcely perceptible. On May 23, 250 cc. of fluid were withdrawn from the left pleural cavity. His condition remained much the same until death on June 5, 1891. There was no complaint of any gastric symptoms. The temperature was practically normal during both admissions. There was no loss of weight on the second admission, and the nephritis and arteriosclerosis seemed to account for the symptoms, and no stomach-symptoms were present to draw attention to that organ.

*Autopsy* showed carcinoma of the stomach and esophagus, there being an elevated tumor-mass 7 by 2 cm., which was half in the stomach. The center was ulcerated. There was chronic diffuse nephritis, arteriosclerosis, aortic and mitral insufficiency, and chronic pericarditis. There was pleural exudate with a fibrinous pleurisy over an infarction in the right lung. There were no metastases. Thrombi were present in both sides of the heart and in the pulmonary artery.

*CASE II.—General edema; albumin and granular and hyaline tube casts in urine, rapid emaciation; vomiting at onset, but none during his stay in hospital; diagnosis of nephritis.*

No. 73. T. C., Hospital No. 10,234, male, aged 61, admitted June 26, 1894, complaining of swelling of the legs. His family history was negative. He gave a history of an attack like the present 20 years ago, which lasted for 2 months. He then had both edema and dyspnea. In the last 5 years he had gradually lost over 40 pounds. His present illness began about 5 weeks before with persistent vomiting which lasted for one week. Swelling of the legs then appeared, and the vomiting stopped. He was able to keep at work until 4

days before admission. His appetite has been good, and the bowels regular. Examination showed marked emaciation and fairly general edema. There was slight dulness over the right base. The abdomen was distended, tympanitic in the elevated and dull in the dependent portions, but it was held so tensely that attempts at palpation were not satisfactory. The urine was of dark color. Specific gravity 1012, showed a faint trace of albumin and contained hyaline and granular casts. The temperature was slightly elevated. The edema increased and the patient died on July 4.

*Autopsy* showed a large scirrhus cancer involving nearly the whole of the stomach, and extending to the esophagus. The stomach was adherent to all surrounding structures. The growth extended through to the peritoneum at places. There were secondary growths in the glands and liver.

CASE III.—*Tuberculosis and pneumothorax, all the symptoms those of chronic consumption; no stomach symptoms.*

No. 71.—J. A., Hospital No. 10,050, male, aged 41 years, admitted June 7, 1894, complaining of pain in the chest and cough. His family history was tuberculous. He had been very healthy previously. His present illness dated back about six months, though for some time before he had been troubled with a cough. This became worse, he had sharp pain in the left chest and several attacks of hemoptysis. For five months he had diarrhea, with the passage of mucus and blood in the stools. He has not had any appetite. There has been much loss of flesh. There was no history of any stomach-symptoms.

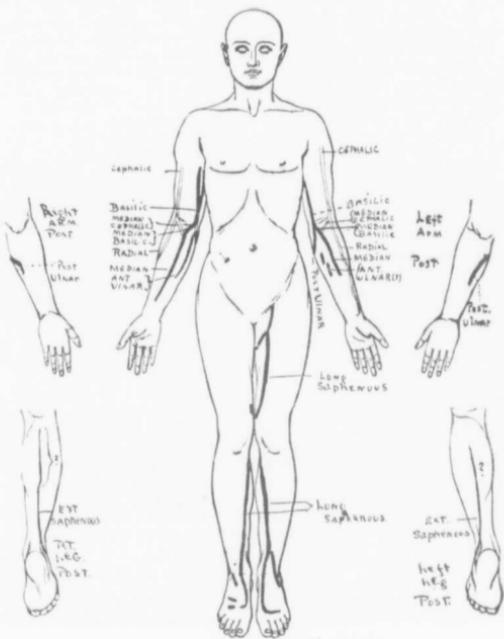
*Examination* showed great emaciation. There was clubbing of the fingers. There were marked signs on both sides of the thorax, both on percussion and auscultation. Pneumothorax was present on the left side. The abdomen looked natural, was nowhere tender and was negative on palpation. The temperature was only slightly elevated. The patient rapidly sank and died on June 11.

*Autopsy* showed cancer of the lesser curvature of the stomach with secondary growths in the lymph-glands and liver. The mass measured 6 by 5 cm. It was soft and fungoid in character. The pylorus was free. There was tuberculosis in both lungs and pneumothorax on the left side. Tuberculous ulceration of the large and small intestine was also found.

CASE IV.—*Multiple thrombi of superficial cutaneous veins; profound and progressive anemia; no gastric symptoms.*

No. 64. G. N., Hospital No. 9131, male, aged 50, admitted January 31, 1894, complaining of weakness and pains in the arms and legs. His family and previous history were normal. The present illness, which began four weeks before, he attributed to exposure, wet and cold. He had a chill fol-

lowed by fever, which lasted some days. Pain then began in each leg and then in the arms. These were sharp, made worse by movement and there was a great tenderness of the muscles on pressure. There was not any edema, but great weakness. The appetite was poor. The bowels were regular. Examination showed no marked general change, except



pallor and sallowness. The thorax was normal. On examination there was epigastric tenderness and marked resistance of the abdominal walls. Neither the spleen nor liver was enlarged. Many of the superficial veins of both the arms and legs were represented by firm hard cords. These thrombosed veins were somewhat sensitive. A portion of

one of these veins in the arm was removed. The thrombus was soft and could be squeezed out. Cultures made from it were negative. The chart shows the remarkable extent of the thrombosis:

Blood—Hemoglobin .....	39%.
Red corpuscles.....	2,300,000.
White corpuscles .....	6,000.

On February 10 edema appeared in the left leg. Very many of the superficial veins showed thrombosis. The left foot felt as warm as the right. On February 15 edema began in the right leg. The left femoral vein could be felt as a firm cord.

The anemia increased, the blood-count on February 16 being:

Hemoglobin .....	22%.
Red corpuscles.....	1,716,000.
White corpuscles.....	29,000.

The differential count showed 89% of polymorphonuclears. No nucleated red corpuscles were seen.

The patient gradually sank and died on February 18, 1894. His temperature was constantly somewhat elevated. There were no stomach-symptoms.

*Autopsy* showed cancer of the pylorus with secondary involvement of lymph-glands, gastrohepatic, anterior mediastinal and subclavicular, and the liver. The mass occupied the lesser curvature and did not involve the whole pylorus, so that the orifice was not narrowed. There were also multiple venous thrombi.

This remarkable case excited very special interest, more particularly the unusual number of thrombi in the superficial veins, and their association with great tenderness in the muscles. Though we spoke of the possibility of malignant disease, yet there was no positive evidence obtained. He was not given a test-meal, as there were really no features whatever pointing to the stomach.

3. Cases in which the metastases completely mask the primary disease.

*CASE V.—Paraesthesia in feet; symptoms of ataxia; gradual paraplegia; headache; marked pain in neck; development of a tumor in the right side of the pelvis; no stomach symptoms. Autopsy; primary carcinoma of lesser curvature of the stomach; secondary masses in the abdominal glands, the right ilium and the femur.*

No 106. J. W., male, white. Hospital No. 14,944. Aged 40 years. Admitted January 10, 1896, complaining of inability to walk and pain in the neck and legs. His history

was negative and he had been healthy until his present attack.

*Present illness* began about 8 months before with peculiar sensations as of "pins and needles" in the feet. In about 2 months the weakness in the legs had so increased that he was unable to walk. Sensation was almost absent in the feet. Headache and pains in the neck had been severe. There had not been any special stomach symptoms, although he had vomited occasionally.

*Examination* showed emaciation and marked pallor. The abdomen was practically negative in the upper part. A mass was felt deeply in the right iliac fossa, which was palpable per rectum and involved the bony parts of the pelvis. There was great wasting of the legs with absence of the kneejerks. Blood examination showed hemoglobin 48%; red corpuscles, 2,432,000.

The patient had severe pain which required large amounts of morphin. The tumor of the right pelvis increased in size. He lost ground in every way. In February he developed marked mental symptoms with ideas of persecution, etc. Death followed on March 14, 1896.

*Autopsy* showed primary carcinoma of the lesser curvature of the stomach. The stomach was of normal size and on the anterior wall in the region of the lesser curvature was an area of new growth 6 cm. in diameter. There was no ulceration. Histologically, the growth was a colloid carcinoma. There were secondary growths in the abdominal glands and in the right ilium and femur. Unfortunately, the spinal cord was not examined.

*CASE VI.—Pains in the right arm and right side of neck, with wasting of the muscles of the right arm; inequality of the pupils; development of nodular masses on the ribs; diagnosis of cancer, but primary disease not suspected; no gastric symptoms. Autopsy showed cancer of lesser curvature of the stomach; a nodular mass compressing the brachial plexus; metastases in tenth dorsal and first lumbar vertebrae.*

No. 124. G. K., Hospital No. 17,993, male, aged 39 years, admitted December 1, 1896, complaining of pain through the right shoulder and back, with loss of sensation in the right forearm. His family-history was negative. He had had malaria every year for eight years past and pains in the shoulders and back, thought to be rheumatic. The most severe of these attacks was 18 months before, during which he spent two weeks in bed. Since then he has been very well and able to work. His occupation, an ironfitter, involved much heavy lifting. He never had any stomach or bowel trouble; at times for many years he has had shortness of breath on exertion.

The present illness began in August, 1896, with coughing and profuse expectoration. Pain soon came on in the right

side, close to the shoulder, and was severe enough to make him give up work. The cough soon left him, but the pain remained. It gradually went down the right arm. It was constant and described as boring in character. It was worse on movement. About one week before admission he noticed a loss of sensation in the forearm, and at the same time he lost power in the right arm, so that since then he has not been able to use it. The pain and weakness has also extended to his back, so that he had difficulty in raising himself up in bed. The legs were not affected. There was no history of any injury. There had not been any stomach-symptoms. The bowels had been constipated. He had lost nearly 20 pounds in weight and much strength.

Examination showed fair nutrition. The patient remained usually on the left side, he seemed to suffer much pain and objected to changing his position or sitting up, on account of the pain it caused. There were prominences on the 4th, 5th, 7th, 8th, and 12th ribs, not attached to the skin, but to the bones. They were very tender, had a slightly elastic, but not fluctuated feeling. Examination of the thorax was negative. There was no dullness over the manubrium. The abdomen was flat, the muscles were held somewhat rigidly, so that palpation was difficult. There was marked wasting of the muscles of the right arm, and loss of power. There seemed to be some disturbance of sensation over the ulnar surface of the left arm, but the results were not constant. There was distinct inequality of the pupil, the left being larger. They both reacted to light and on convergence. Ophthalmoscopic examination was negative. The patient held himself very stillly when asked to sit up, and the mobility of the head downward was much impaired. There was no pain on pressure over the spine. There was no general glandular enlargement.

Blood—Hemoglobin.....	92%.
Red corpuscles.....	5,752,000.
White corpuscles.....	13,000.

The patient had severe pain, and frequently required morphin hypodermically. He lost weight and strength. The masses on the ribs gradually increased in size, and became more tender. On December 26 it was noted that the abdomen was very tense, and moderately distended. No other abdominal symptoms were present. The leukocytes increased and were 22,000 on the 26th. A differential count showed 85% of polymorphonuclear. The patient generally sank, and died on December 30. During his stay he took nourishment fairly well. There was no complaint or sign of any gastric trouble.

The case was regarded as probably one of primary neoplasm in the thorax with secondary deposits on the

ribs and probably in the vertebrae. The absence of history of any gastric trouble and of any signs during his stay in the hospital, did not call for special attention to the stomach, and no test-breakfast was given. The abdominal examination was always negative, except that the muscles were held tensely. As the patient was difficult of examination this did not perhaps arouse the attention it should have done. The true condition was not suspected.

*Autopsy* showed cancer of the stomach. The lesser curvature was converted into a rigid mass over which the omentum was closely bound. The growth extended along the posterior wall. It did not involve the cardia or pylorus. On section all the coats were infiltrated. The mucous membrane was smooth, white, and opaque. Near the pylorus was an ulcerated area 3 by 3 cm. on the posterior wall. There were metastases in the lungs, bronchial, pericardial axillary and abdominal lymph-glands, ribs, skull, and vertebrae. There was compression of the bronchial plexus by a tumornodule. The vertebral metastases were in the first and tenth dorsal and first lumbar.

CASE VII.—*Onset of illness with ascites; two months later aspiration of bloody fluid; recurrence of ascites with swelling of the legs; drainage of peritoneum; recognition of malignant disease of the stomach. Autopsy showed extensive cancer of the stomach.*

No. 141. A. H., male, Hospital No. 21,173, aged 59 years; admitted November 9, 1897, complaining of 'dropsy.' His family history was negative. He had been a moderate drinker and denied syphilis.

*Present illness* began four months previously with swelling of the abdomen. This increased gradually and at the end of two months he was tapped by his physician, who drew off a large amount of bloody fluid. Soon after the abdomen began to enlarge again and this continued until the present admission. With this swelling of the legs came on. There had been some pain in the lower abdomen. His appetite had varied. He had occasional vomiting of mucus but no blood. The bowels had been irregular. There had been great frequency of micturition.

*Examination* showed emaciation but not cachexia. The thorax was negative. The abdomen was distended symmetrically. Movable dullness and fluctuation were obtained. The liver-dullness began at the fifth rib in the right nipple line and only extended a distance of 4 cm. Its edge could not be felt. There was edema of the legs, genitalia and lower trunk.

The case was suggestive in some ways of cirrhosis of the liver, although the history of bloody fluid being obtained on previous tapping pointed to malignant growth. The absence of any stomach-symptoms seemed against a primary growth there. The patient required tapping and it was thought best to do this by an exploratory exploration.

*Operation.*—On the abdominal cavity being opened a bloody turbid fluid was obtained. A mass was found in the stomach and secondary deposits over the peritoneum. The fluid showed numerous red corpuscles and leukocytes. There were also large cells many times the size of a leukocyte, some of which contained more than one nucleus. No signs of karyokinesis were seen. Certain groups of cells were found which were very suggestive of masses of cancer-cells. After the operation a firm mass was to be felt in the left hypochondrium. In the right hypochondrium several nodules were felt. The patient was much easier after the operation, but died suddenly on December 5, 1897.

*Autopsy* showed colloid carcinoma of the stomach along the lesser curvature from the cardia to the pylorus. The pylorus was converted into a dense ring and the growth extended for a short distance into the duodenum. The esophagus was invaded but the cardiac orifice was not narrowed. The omentum and peritoneum were involved. The stomach was adherent to the liver, spleen and diaphragm. The growth extended through the diaphragm to the pleura.

In reviewing this interesting series of cases, and particularly in the study of the autopsy records, one is astonished to notice how extensive and widespread the disease may be with practically no symptoms. In three of the cases a very large part of the stomach was involved, in two the cardiac orifice, and in two the pylorus. In one instance the growth involved the esophagus, and in one to a slight extent the duodenum. In three instances there was ulceration, and in five metastases were present.

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THE  
VISCERAL LESIONS  
OF  
THE ERYTHEMA GROUP.\*

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In December, 1895,† I published a series of eleven cases characterised by—

I. Polymorphous skin lesions: (a) acute circumscribed œdema; (b) urticaria; (c) purpura; and (d) ordinary exudative erythema.

II. Polymorphous visceral lesions: (a) local serous or hæmorrhagic exudate in the walls of stomach or bowels, causing (1) crises of pain and (2) hæmorrhages; (b) acute nephritis; and (c) certain rare pulmonary and other lesions.

III. Infiltration of synovial sheaths, peri-articular tissues, and arthritis.

It would have been better, as some of my dermatological friends suggested, not to have described the cases under the name erythema exudativum multiforme, the term which has been used to designate the so-called pure type of polymorphous erythema, but it was really very difficult to find a name under which to group the cases. Duhring has suggested that the majority of them should be regarded as purpura rather than erythema, but in only Cases 6, 7, and 11 was purpura the sole lesion, while in the remaining cases there was exudate (either serous or hæmorrhagic or both), with swelling.

In the following communication I shall give the subsequent history

\* Paper prepared for the Jacobi Festschrift, New York, 1900.

† *American Journal of the Medical Sciences: cf. Brit. Journ. of Dermat. Vol. VIII., p. 55.*

of Case 2 of the first series, details of seven additional cases, an analysis of the symptoms of the whole series, and shall then discuss briefly the relations of certain members of the erythema group of skin diseases.

I will first call attention to the extraordinary series of symptoms presented by Case 2, the condition of which was reported on to the end of 1895. Briefly summarised: in his tenth year this lad had severe attacks of colic, a very barking cough, and one attack of urticaria. In his eleventh year he had colic with an outbreak of urticaria and purpura; later a well defined localised oedema on the back of one hand, marked signs at the apex of the right lung, and an enlarged spleen. In his twelfth year he had one severe attack of colic, and the pulmonary features became more pronounced. In his thirteenth and fourteenth years he began to present the picture of emphysema, and the pulmonary symptoms were dominant. In his fifteenth year he had pronounced emphysema, dilatation of the heart, and pericarditis, of which he died. So far as the skin lesions in this case were concerned, successive physicians in the series of attacks might have diagnosed urticaria, purpura with urticaria, angio-neurotic oedema, and well defined exudative erythema.

CASE 2 (of Series 1, continued).—W. E. B.\* *Colic with urticaria in tenth year. In eleventh year attacks of colic, urticaria with purpura, angio-neurotic oedema, exudative erythema, enlarged spleen, cough with local signs at right apex. In twelfth year colic, enlarged spleen, cough. In thirteenth year colic, cough. In fourteenth year pulmonary symptoms dominant, signs of emphysema. In fifteenth year emphysema well marked, broncho-pneumonia, pericarditis, death.*

*Good Family History.*—No rheumatism; healthy, well grown, active and intelligent; no serious illness; fairly good digestion.

*Tenth Year (1893).*—Attacks of severe colic, of such intensity that he would roll on the floor. Several attacks of epistaxis. In the summer of 1893 an attack of urticaria. In the latter part of the summer a very barking cough, suspected to be whooping-cough.

*Eleventh Year (1894).*—First seen by me, March 10th. Well nourished boy, a little pale; no skin lesions. The spleen was enlarged and extended in the para-sternal line nearly to the level of the navel. There was moderate anæmia, 4,000,000 red blood corpuscles, hæmoglobin about 80 per cent. The urine was normal. At the right apex and in the right upper axillary region there were medium sized moist râles; no change in the percussion note. When I first saw the case I was completely puzzled. The enlarged spleen, with a slight anæmia, raised the suspicions of some primary blood affection, but the cough, which had been an important feature, and the localised signs at the right apex, suggested with

\* The early history of this case is given fully (Case 2) in the paper referred to.

the anemia, the onset of tuberculosis. The sputum (which was muco-purulent) was examined carefully, but no bacilli were found. In the middle of April the cough became much aggravated. Throughout May he improved very much. In the middle of the month he had slight pains about the knees, and on the 18th there were one or two bluish stains of fading *purpura*. On May 22nd, when I saw him, he was in the midst of an attack of *urticaria* and *purpura*. This, with the colic, gave me a clue to the possible nature of the case. Early in June he had an oedematous swelling, without redness, on the back of the left hand, like the ordinary lesion of *angio-neurotic oedema*. On June 6th both ankles were swollen, and the skin of the legs presented the remains of *purpura* with *urticaria*. On the back of one hand there were patches of *erythema with exudation*. The spleen was smaller. The patient had a good summer. I saw him October 30th, and he looked very well. The râles had disappeared at the right apex.

*Twelfth Year* (1895).—March 9th. He had been at school and very well through the winter. Last night he had a very severe attack of colic. He had a good deal of cough, and there were numerous piping râles at the apex of the right lung. The edge of the spleen could be felt. There were no skin lesions. Early in June the cough became very much more troublesome, with severe paroxysms at night. Over the apex of the right lung in front and behind the percussion note was of higher pitch. There were numerous moist râles over the whole infra-clavicular, mammary, upper axillary, and suprascapular regions. The breath sounds were harsh, not tubular. The spleen could be felt a full hand's breadth below the costal margin. Throughout the summer he remained very well. On October 21st the spleen was only just palpable. The cough, which had almost disappeared, had recently returned. The right apex had become much clearer; there were a few râles in the right lower axillary region, and also in the left lower mammary region. He had not been a month-breather and the nostrils were wide and normal.

*Thirteenth Year* (1896).—This was marked by only one attack of severe colic in April, of great intensity, requiring morphia for its control. He went north for the summer. In October he had a recurrence of the cough, more severely perhaps than ever before. It was chiefly nocturnal, though sometimes of such severity in the morning that he would vomit his breakfast.

*Fourteenth Year* (1897).—January 22nd. He looked well and had grown. I had not seen him for nearly eight months, and I was much impressed with the change in the shape of his thorax, which had become more rounded, looked like a typical emphysematous chest, and the neck muscles stood out prominently. The resonance was impaired on and below the right clavicle. There were a great many coarse, mucous râles in front and behind at right apex, and the breath sounds were harsh, and had lost the breezy quality. Expiration everywhere was somewhat prolonged. The left lung was clear. He had had no fever. For the first time since I had seen him the edge of the spleen could not be felt. I was impressed with the condition of the lung, as the local signs at the apex seemed so pronounced. Dr. Futeher reported that the sputum, which was muco-purulent, contained no tubercle bacilli. The urine showed no change. He spent February and March in North Carolina, with great benefit. The cough disappeared entirely, and he came back looking very well. He had grown and thriven in every way. Though he was free from cough, there were very well defined signs in the lungs, numerous crackling râles at both apices, most extensive on the right side. In the

right axillary region there was a friction sound. The summer was spent at Martha's Vineyard. He had no cough, gained in weight, had a good colour, and a good appetite. In October, November, and December the condition of emphysema progressively increased. I saw him again December 13th. There was elevation of the chest during inspiration and the neck muscles stood out prominently. Expiration was everywhere prolonged at the right apex. There were numerous bubbling râles, very similar indeed to those heard on the occasion when I first examined him. There were piping râles on expiration at the left apex. At the bases of the lungs the breath sounds were clear and breezy.

*Fifteenth Year (1898).*—During February I attended the patient with Dr. Lockwood for two weeks in a severe attack of diffuse bronchitis with areas of broncho-pneumonia. The temperature ranged from 101° to 104.5°, and for two days he was very ill. The heart was not affected. The fever gradually subsided, and he convalesced very slowly. The attack left him with a very weak, feebly-acting heart. In April he was able to go to Pinehurst, where he remained for a month, and returned in much better condition. In May, shortly after his return, he became very short of breath. There were signs of advanced emphysema; the percussion note was very low on the right side, the heart dulness was obliterated and there were loud, piping râles with inspiration and expiration. He passed very restless nights, and would frequently have to sit up in bed for hours at a time. During the last week in May dropsy began—swelling of the feet and legs, which gradually increased, and in the first week in June ascites. The pulse was very rapid and feeble, and there was a systolic murmur at the apex. The urine was scanty, but contained neither albumin nor tube casts. On June 16th Dr. Lockwood detected an acute pericarditis. On the following night he was very restless, and could only breathe comfortably with the head held far forward. On the following day when I saw him there was a very loud pericardial friction over the whole cardiac region. He was much cyanosed. The pulse was extremely rapid and irregular, and he died that night.

#### SECOND SERIES.

*CASE 12.—Neurasthenia; dilatation of the stomach; colic for two years at intervals; exudative erythema; leucocytosis.*

Berta L., aged 24 (Hospital No. 18,151), admitted December 19, 1896, complaining of pain and soreness in the abdomen. She had been a very nervous girl, and had had a good deal of uterine trouble. For four years she had had dilatation of the stomach, for which she had used the stomach tube. She had lost much in weight.

The patient was extremely neurotic, and impressed us as a case of very severe neurasthenia with dilated and depressed stomach. She was thin and sallow, the face pigmented. On admission she had a most extreme grade of dermatographia. The slightest scratch was followed by intense erythema and sometimes urticaria. Two days after admission, on the morning of the 22nd, she had an extensive erythematous rash over the face, arms, and thighs. Upon the skin of the thighs and arms there were large raised red areas in places diffuse, in others isolated, like big wheals. In the afternoon she had a violent attack of abdominal colic without nausea or vomiting, which lasted for about half an hour. The temperature on admission was 102°, and for four days ranged from 99° to 102°. She had no chills.

There was considerable increase in the area of splenic dulness. The leucocytes were 13,450. There was no albumin in the urine; no tube casts. On questioning the patient, she says that for two years she had been liable to these attacks of colic, which came on with great suddenness. This was the first one in which it had been associated with any skin lesions. The erythema persisted for about two days and then disappeared. It did not extend to the face or hands.

CASE 13.—*Attacks of colic every week or ten days for six months; on admission typical lesions of erythema exudativum multiforme; high fever; improvement; recurrence; pains in the joints; arthritis in one joint of finger.*

Ruberta F. B., aged 49 (Hospital No. 19,713), admitted June 14, 1897, complaining of pains in the hands and a skin rash. There was no rheumatism in the family.

*Personal History.*—She had had the ordinary diseases of childhood and once urticaria. No rheumatism. When twenty-six years old she had severe diarrhoea with bloody stools; was ill five weeks. She has had six children. In November, 1896, she was operated upon successfully for an ovarian tumour.

*Present Illness.*—One week after the operation she had an attack of severe abdominal pain, limited to the epigastrium, which came on very suddenly. While in hospital she had three attacks, all requiring morphia. Since dismissal she has had an attack every week or ten days. Twice she has had two attacks in a week. She has had no vomiting, but she is always slightly nauseated. The intensity of the pain is such that she cries out at the top of her voice. She always has fever with the attacks. The pain comes on, she says, "as suddenly as one could blow out a light," and leaves her just as quickly.

On June 3rd she had a slight chill, and has not been well since. On the morning of June 12th she noticed a few small red papules on the left hand. About 2 p.m. she had a slight chill, followed by fever, with sudden pains about the joints, and an eruption appeared in many regions of the body. Her eyes became red and painful. On the 13th the eruption became more raised and confluent. She had considerable pain at the onset, no vomiting, but some nausea, no diarrhoea.

On admission she was a well nourished, stout woman; conjunctivae deeply injected; temperature, 104.5°; tongue coated. The skin presented most extensive lesions of erythema multiforme. Face and neck presented many raised, red, infiltrated areas, some of which were surmounted by small vesicles. On the legs and thighs there were deep red blotches, the smallest about 1 cm. in diameter, the largest about 2 cm., raised and in places looking like erythema nodosum. On the hands and forearms the rash was infiltrated, the spots less red than those on the legs and face, and surmounted by large, clear vesicles. On the hands there were large, confluent, indurated, deep red areas, which were capped in places with hæmorrhagic vesicles. The first phalanx of the right forefinger was swollen, deeply cyanotic, and surmounted by many vesicles. The skin of the thumb of the right hand presented a few hæmorrhages. The fingers were excessively tender. It was noted as an interesting point that with the extensive lesions on the hands there was no tenderness or swelling of the epitrochlear glands or of those in the axillæ.

During the first two days the temperature ranged from 102° to 103°. The rash persisted; many of the infiltrated areas on the hands and arms became capped with small blebs, the contents of which in places became purulent. The hands and fingers were greatly swollen. The legs showed fresh outbreaks of erythema;

no vesicles. The edge of the spleen was palpable. There was no involvement of the heart. The temperature fell on the 19th. Fresh crops appeared on the 17th and 18th, and on the former date she complained of much soreness in the joints. Unfortunately the urine chart was mislaid.

CASE 14.—*Man aged 57; from twentieth year every few months attacks of nausea, vomiting, and abdominal pain associated with outbreaks of urticaria; no hæmorrhages from the mucous membranes; final attack with purpura and urticaria; much vomiting and profuse and fatal hæmorrhage from the stomach, with blood in the urine and the passage of blood from the bowels.*

This very remarkable case in a physician, aged 57, I saw on May 31st, 1898, with Dr. Wilkins. He had been a temperate man, of good family history. He had worked hard, and had been singularly free from diseases, except the one to be described. He had never had rheumatic fever.

From his twentieth year he had had attacks of urticaria of the greatest intensity. As a young man they occurred at long intervals, but during the past five years he has rarely passed three months without an attack. Each one was associated with nausea, vomiting, and great pain and tenderness in the epigastric region. The eruption usually appeared in broad patches, and covered almost the entire surface of the body. It persisted from the outset to the close of the attack, which lasted usually from a week to ten days, or even two weeks. After the outbreak the vomiting and pain would subside, but the urticaria would persist. Subcutaneous or mucous hæmorrhages did not occur until the last attack. No microscopical examination of the urine was made until the summer of 1897. For the past two or three years the attacks have been associated with great depression of the circulation. The temperature rarely rose above normal. In July, 1897, Dr. Wilkins found albumin and tube casts in the urine, and detected marked sclerosis of the peripheral arteries.

Dr. Wilkins, who attended him for years, said that it was impossible to appreciate the intensity of the attacks without seeing them. The nausea, vomiting, and abdominal distress, the itching of the skin, and the persistence of the attacks for a week or ten days, made his life wretched; yet he bore up bravely and attended to a large practice.

The final attack began April 25th, and followed the usual course until May 1st, when it was complicated with a bronchitis. On May 20th he went to Atlantic City, and while there, May 26th, for the first time he vomited blood. He returned home May 30th, and at 1 A.M. on the 31st he had a profuse hæmorrhage from the stomach.

I saw him on the morning of the 31st with Dr. Wilkins. He was well nourished, but looked pale and sallow. On the left ear there was a small tophus. The tongue was clean, but presented on the right margin two spots of hæmorrhage, one of which had broken and was oozing blood. Beneath the skin of the arms, trunk, and legs, were many bluish-black subcutaneous hæmorrhages. On the back there were at least a dozen, ranging from 2 to 5 or 6 mm. in diameter. On the outer surface of the right thigh there was a localized solid infiltration of both skin and subcutaneous tissues, forming a hæmorrhagic nodule the size of a walnut. On the radial side of the left arm there was a very extensive fading ecchymosis. On different parts of the body there were small petechiæ. The apex beat was outside the nipple line. There were marked hæmic murmurs. The urine showed a

moderate amount of albumin and a few tube casts. The radials were sclerotic; pulse a little rapid.

On Wednesday, June 1st, he became very much worse. He had epistaxis; the purpuric spots increased; he had vomiting of blood, hæmorrhage from the bowels, and blood appeared in the urine. He became very feeble, and died early on the morning of June 2nd. There was no autopsy.

CASE 15.—*When a lad one attack of hemiplegia with aphasia lasting for a week; within a year five or six attacks of transient hemiplegia; history of migraine in 1896, and a mild attack of rheumatism; angio-neurotic œdema of the upper lip; outbreaks of urticaria; in 1897, attack of abdominal colic, with pains in the legs and an outbreak of purpura and urticaria; in 1898, hæmaturia and albuminuria.*

C. A. R., physician, aged 29, a large, robust man, weighing above two hundred pounds, consulted me February 10, 1898, and gave a long history of himself, of which I give an abstract.

From childhood, indigestion. When 12 or 13 years old, after a hearty breakfast, he had right hemiplegia and aphasia, which lasted for a week or ten days. Within the year he had five or six attacks of hemiplegia, each successive one less severe, and not accompanied by aphasia. From that time until the present he occasionally feels a numb, tingling sensation in the side. In 1893 he had lumbago of a severe type. In 1895 a severe attack of *grippe*. At this time he began to suffer badly with attacks of migraine, which he has had at intervals for some years. In 1896 he had a mild attack of rheumatism, confined to bed only two or three days. In February, 1897, while in New Orleans, he had a sudden attack of swelling and pain in the feet. About the same time he began to suffer with soreness at the ends of the fingers. The upper lip would frequently swell, and he would have outbreaks of urticaria, associated with darting pains in the legs of very great intensity. In May, 1897, after exposure to a draught when heated, he had an attack of great soreness in the right iliac fossa, supposed to be appendicitis, temperature 102°, with some colic. While convalescent from this he had another remarkable attack of pain in the calves of the legs. They became so sore and tender that he could only walk with a cane, and was afraid that abscesses were beginning to form. Associated with it, however, there were large wheals of extravasated red blood. On May 26th he had another attack of nettle-rash.

When I saw this patient in February, 1898, his general condition was good, he had no arthritis, and there were no signs of appendicitis.

In May, 1898, the patient had a chill, followed by hæmaturia and albuminuria, which had disappeared by June 1st. With this there was a return of the pain in the right side.

The doctor writes: "I am convinced that this attack of nephritis is only a part of my old trouble."

CASE 16.—*For three months, attacks of pain in the abdomen, with vomiting; swelling of the joints; purpura; recovery.*

Harry L., aged 11, applied at the Out-Patient Medical Department March 23rd, 1899, complaining of indigestion, pain in the stomach, and vomiting.

*Family History.*—Father and mother living and well; one sister living who has indigestion; one brother died of dysentery. No members of family have suffered with rheumatism.

*Personal History.*—He was delicate as a baby. Has had measles, chicken-pox, and whooping-cough. When 9 years old he had some stomach trouble of doubtful nature.

*Present Illness.*—In January, just about two months ago, the patient was taken ill suddenly with pain in the abdomen and vomiting; the attack was attributed to the food which he had eaten the night before. The symptoms persisted for nearly a week, and the patient could only retain diluted milk. The pain came in paroxysms of great severity. From this time the patient has been ill off and on, frequently having had to remain in bed with the attacks of pain, and particularly if he took any extra food. He has been weak and nervous, and has lost in weight. During the first attack in January an eruption was noticed on the legs, and at this time one ankle was considerably swollen, and later one knee.

When seen March 23rd, he was just recovering from an attack. He looked pale and weak, and a little anæmic. There was nothing of note in the examination of the chest. Neither the spleen nor the liver was enlarged. The abdomen was not swollen, nowhere tender on pressure. On both thighs and legs there were recent purpuric spots, varying in size from a pin head to a split pea. They were not raised. The left ankle still looked a little swollen. The right knee was slightly flexed and still a little stiff. The urine showed no trace of blood or albumin.

The blood coagulation time was three minutes. He was ordered Fowler's solution, and the mother was given very specific instructions with reference to the diet of the patient.

*April 10th.*—The patient has improved very rapidly. He has had no gastrointestinal symptoms, the joints are now quite well, and the purpuric spots have disappeared completely.

*CASE 17.*—Following influenza, in January, attacks of arthritis with cramps in the abdomen and an outbreak of urticaria; eight attacks between January and May; during stay in hospital, swelling of wrists and back of hand; erythema; urticaria, spontaneous and factitious; no purpura; recovery.

Geo. K., aged 18, admitted to Ward F, May 17th, 1899, complaining of pains in the joints, shortness of breath, and pains in the abdomen.

*Family History.*—Father died of an accident. Mother is living and well. There are two sisters and one brother. No similar troubles in the family. No rheumatism.

*Personal History.*—Measles and mumps when 7 years old. Never ill again until last summer, when he had chills and fever, but, on inquiry, there is no history of any definite chills. In December he had an abscess on the back of the hand. In January of this year he was ill with influenza. He has worked hard for a year making confectionery. He does not use alcohol or tobacco. His general health has been excellent; he has never had rheumatism or chorea.

He has always bled easily from the nose, and last year, during the very hot weather, he bled almost every other day.

*Present Illness.*—While in bed in January with what was called the influenza the patient had swelling and pain in the feet and hands. He has not been able to work since the middle of January, except for two weeks. During the first week in January he noticed on his legs and on the arms "lumps" like those following the bites of insects, about the size of a quarter of a dollar (2.5 cm.) in diameter. They burned and itched, and gradually disappeared. As many as a hundred came out

in a crop together. With this there was some swelling of the arms and legs. At the same time he had attacks of cramps in the abdomen. He has had in all about eight of these attacks since January. They were usually very severe, causing him to cry out, and he was doubled up in them. He has noticed that he has been short of breath for nearly a month. He has had no fever.

*Condition on Admission.*—The patient was a well nourished, healthy-looking young man. The tongue was clean; pulse regular, 80, of good volume.

The arms looked natural; no pain or swelling about the shoulders or elbows. The right wrist was somewhat swollen and painful. Both hands were swollen; looked a little cyanotic, cold, and were slightly tender on pressure; there were no urticarial wheals. No swelling over the metacarpal or phalangeal joints. There was slight tenderness of the right knee; no swelling. There was no purpura.

*Heart.*—The maximum impulse was in the fifth interspace, outside the nipple line. There was no thrill. At the apex there was a loud, rough, blowing murmur, propagated into axilla, and heard distinctly over the whole back of the chest. At the aortic area there was a rough systolic murmur of less intensity than at the apex. The spleen was not palpable. There was no fever. The specific gravity of the urine was 1.107; no albumin, no tube casts.

*May 18th.*—On the backs of both arms I noted a slight erythema with a few wheals of urticaria. They were present also on the outer side of the left thigh. Over the back of the left hand there was a swelling without special redness. The patient had improved very much.

On May 23rd he complained of pain in the first phalangeal joint of the left ring finger, which was reddened and swollen, not tender. There were two urticarial wheals on the right forearm, and one on the left. Factitious urticaria was readily produced. The blood coagulation time was four minutes fifty seconds.

*May 26th.*—The patient had a severe attack of colic to-day at 12.30. It passed off in a few hours. There was no rise in temperature. The abdominal pain persisted at intervals for a few days.

On June 4th the dermatographia was not so marked. There were still some urticarial blotches.

*June 9th.*—The patient had been up and about. The joint pains had subsided. The urticaria still came out at times about the joints.

*June 19th.*—Condition very good. Patient discharged. During his illness this patient had no purpura.

*CASE 18.*—*During first year swelling of knees; from second to seventh years frequently recurring attacks of pain in the abdomen with vomiting and with swelling of the knees, but no skin rash; following vaccination, attack of great severity with extensive lesions of erythema, purpura, and urticaria; melæna; recovery; recurrence of the skin lesions; enlargement of the spleen.*

Barbara P., aged 7, admitted to Ward G, March 28th, 1899, complaining of pain in the abdomen and high fever.

*Family History.*—The parents are living and well. There are three brothers and three sisters. No history of rheumatism; no similar cases have occurred. It seems in all respects to be an exceptionally healthy family.

*Personal History.*—The child has had measles, mumps, chicken-pox, and whooping cough. When three months old she had swelling of the knees, which the doctor called acute inflammatory rheumatism, and which lasted on and off for

five months. No other joints were affected. The condition has recurred occasionally. She never had any breaking out upon the body; never had bleeding from any mucous membranes. Since her second year she has had at intervals of a week or two gastro-intestinal attacks, characterised by vomiting and severe cramp-like pain about the navel, which would cause her to cry out. The attacks lasted for one or two days. At times during these attacks the legs would become swollen to the ankles, and the knees were tender, the left always worse than the right. They were never reddened. The mother, who seems an intelligent woman, was questioned very carefully as to these attacks, and gave always the same account. She was positive that not a month had passed since the child's second year without an attack of this cramp colic and vomiting. She has never noticed any blotches or redness of the skin.

*Present Attack.*—Three weeks ago the patient was vaccinated, and two days later was unable to go to school on account of loss of appetite and pains in the limbs, which lasted for two or three days, and have recurred at intervals. She had no cramps, no vomiting. The present attack dates from four days ago, when she began to have fever and vomited a good deal, chiefly the food she had eaten. With this there was much pain in the abdomen. The left leg became swollen from the knee down, and a dark eruption appeared upon the skin of the legs in the form of dark brown spots about the size of a quarter of a dollar (2.5 cm.) in diameter, raised and capped with small blisters. The spots were painful. The next day the eruption had faded, but other red spots came out about the knees, and yesterday they appeared on the back and elbows. The pain has persisted during the past four days, and she has vomited at intervals. The mother says it is the same sort of painful attacks that she has had so frequently.

*Present Condition.*—Dr. Fitcher dictated the following note: The child is fairly well nourished. Lips and mucous membranes are of a good colour. The teeth are discoloured, but not decayed. The tongue is coated with a slight brownish fur. Pupils equal and of normal size, react to light and on accommodation. Pulse, 108, of fairly good volume and tension, regular in force and rhythm. Vessel wall not felt. Temperature on last admission at 10.30 last night was 99.5°, since when it has not been higher.

On left upper arm is a very large scab, the result of vaccination sixteen days ago. The skin is slightly reddened and infiltrated about the crust. The glands in the axilla slightly enlarged. Over the right elbow are a number of slightly elevated papules which are somewhat hæmorrhagic in character. The redness does not disappear on pressure. There is one small hæmorrhagic papule on the left elbow-joint. Over the right knee-joint are a number of purpuric spots. Some of these are about three-quarters of a cm. in diameter. A few pin-head purpuric spots over left knee-joint. There are no urticarial wheals on the body. Vaso-motor skin reflex active, but no factitious urticaria. None of the joints are swollen, nor are any of them painful this morning; no stiffness of the cervical muscles. Post-cervical glands slightly enlarged: left epitrochlear gland distinctly enlarged and easily palpable: inguinals very slightly enlarged.

*Thorax.*—Well formed and symmetrical. Lungs clear over fronts and backs on auscultation.

*Heart.*—Point of maximum impulse visible and palpable in fourth interspace, A cm. from mid-sternal line. Impulse forcible; no thrill. Cardiac dulness not

increased. Auscultation—first sound very loud and booming at apex; both are clear at aortic and pulmonary areas, and of normal relative intensity. No murmur in vessels of neck.

*Liver.*—Is not enlarged.

*Abdomen.*—Looks natural, symmetrical. Respiratory movements present. General abdominal tenderness. The pain is most severe in the umbilical region; no localizing symptoms in region of appendix. Patient says it is a little more tender in the right than left iliac fossa. There is no muscular spasm. Spleen not palpable.

*March 30th.*—Her temperature is normal. There is a diffuse erythematous rash over the right cheek and the lower jaw, and a few discrete erythematous raised patches on the neck. The redness does not entirely disappear on pressure. On the upper and lower lips are small patches of a cherry-red colour, which partially disappear on pressure. No pain or swelling of the joints. Blood cultures made by the usual method negative. The urine has a specific gravity of 1.027, no albumin, no tube casts.

*March 31st.*—There are a few new purpuric spots over the left knee-joint. Those on the right knee and right elbow are gradually clearing. She still complains of pain in the region of the navel. On examination there is a little blood in the stools to-day.

*April 1st.*—Tongue still very heavily coated. Over the left elbow there is a fading crop of purpura. On the right elbow there is patch of erythematous infiltrated nodules of a deep red colour, capped with dried vesicles. On the right knee I noted that there were several infiltrated patches looking like purpura urticans.

*April 2nd.*—Patient cries if the abdomen is touched. There are a few fresh raised purpuric spots on both elbows.

*April 3rd.*—Fresh purpuric spots in both gluteal regions, many of them slightly elevated.

*April 4th.*—Fresh spots on knees, elbows, and buttocks. Yesterday the child complained much of pain. She still vomited occasionally after taking food. A few flecks of blood in the stools.

*April 5th.*—Fine small purpuric spots appeared since yesterday on the left elbow. No abdominal pain to-day. The heart sounds are quite clear.

*April 6th.*—Yesterday the child began to pass more blood in the stools. During the night she had several evacuations of bloody mucus and of a thin bloody fluid. She had slight pain in the abdomen. She has had about a dozen small stools this morning, all with blood and mucus.

At the bend of the left elbow there appeared since yesterday subcutaneous hæmorrhages from 5 cm. to  $2.5 \times 1.5$  cm. in diameter. They are tender to the touch and resemble recent bruises. A number of smaller patches are scattered along the extensor surfaces of the forearm. Fresh purpura about the left elbow.

*April 7th.*—Patient does not look so well this morning. Complains of severe pain in the abdomen. She looks a little anæmic from the intestinal bleedings, which continued throughout yesterday and last night, but are less frequent to-day.

*April 9th.*—She had seven stools in the past twenty-four hours; fluid, greenish-black, with a small amount of thin fluid blood. Very little abdominal pain.

*April 10th.*—Fresh hæmorrhages on both surfaces of the forearms, a few on the

right hand. Bruise-like ecchymoses on the palm of the right hand, and a large one on the left.

From the 12th the patient improved. There were a few fresh purpuric spots on the 14th and on the 16th, on which date too there were noticed several small ulcers over the tongue and inner surface of the right cheek.

*April 22nd.*—The patient has been doing remarkably well. On the 29th she was discharged.

*Blood.*—A very careful study of the blood in this case was made by Dr. Gwyn, of which the following is a summary:—

*Red Blood Corpuscles.*—On admission they were nearly 6,000,000 per c.mm. After the hæmorrhages from the bowels they were reduced, but did not fall below about 4,800,000.

*Hæmoglobin.*—Eighty per cent. on admission, falling after the hæmorrhages, and was only 60 per cent. on April 24th.

*Leucocytes.*—There was pronounced leucocytosis from the onset: on March 29th, 18,800; on March 31st, 37,000; on April 2nd, 45,000. Then they gradually fell and were normal on April 27th. The differential count at the height of the leucocytosis (500) gave polynuclears 86 per cent., small mononuclears 6·2, large mononuclears 2·6, transitionals 2·8, eosinophiles ·4, nucleated red blood corpuscles 1.

*Coagulation Time,* April 7th, from 1 minute 30 seconds to 1 minute 55 seconds; April 23rd, 2 minutes to 2 minutes 15 seconds.

*Blood Platelets,* April 13th, 122,000 per c.mm.; April 23rd, 230,000 per c.mm.

*Blood Cultures,* made twice, were negative.

The temperature range was between 99° and 100·5°; even when she was quite convalescent her temperature was between 99° and 100°.

*May 8th.*—The patient returned to-day complaining of a breaking out of spots on the legs, which came the day after her discharge. She looked a little pale, and she had numerous purpuric spots over the ankles, legs, knees and lower thighs. Over each elbow on the olecranon there was an erythematous spot about 2 cm. in diameter, pale red, raised, with a tendency to clear in the centre. An identical spot almost completely surrounded the tip of the little finger of the right hand. The edge of the spleen was distinctly felt. There were no urticarial wheals, and no abdominal tenderness.

#### ANALYSIS OF THE SYMPTOMS.

##### I.—THE VISCERAL MANIFESTATIONS.

(a) *The Gastro-Intestinal Crises.*—This special feature in the entire group of cases presents the most distressing, though not the most dangerous, of the visceral complications. The attacks may be characterized by colic alone, more frequently colic and vomiting, colic with vomiting and diarrhœa, and lastly colic with vomiting of blood, or the passage of blood in the stools. As a rule, with the gastro-intestinal crises there are cutaneous manifestations, but not

invariably. In Case 2 there were severe attacks of the most agonizing colic without any other symptoms. Cases 1 and 18 are particularly interesting as illustrating the nature of certain obscure forms of gastro-intestinal colic, particularly in children. Case 1 consulted me for remarkable attacks, which recurred every two months, lasting for from six to ten hours, accompanied with fever and remarkable delirium. These had recurred for nearly eight years. For the first six years, with the attack he had an outbreak of what he called big liver-spots. For two years there had been no skin complications. In Case 18, for five years the child had been plagued with attacks of colic and vomiting, for which the mother had consulted many physicians. When she came under my observation the nature of the trouble was made evident by the concurrent outbreak of an exudative erythema. These crises are identical with those which occur in the angio-neurotic œdema. Several members of the family with this disease which I have described\* had had urticaria, and the patient who came under my care had coincidentally with the angio-neurotic œdema characteristic urticarial wheals on the chest and thighs.

Case 14 illustrates the remarkable relationship which exists between urticaria and the gastro-intestinal crises. The association of digestive disturbance and hives is common enough, but these cases are, I think, somewhat different, and it is reasonable to suppose that the lesions causing the pain in the abdomen are associated with the formation of wheals and swelling in the mucous membrane of the stomach and intestines. F. A. Packard† has recently considered the question of urticaria of the mucous membranes in an exhaustive paper, in which many references are given to the formation of wheals in the throat and mouth. Though writers speak of involvement of the stomach and intestines, I know of no instance in which the lesions have been actually seen in these parts. Colcott Fox, in his article on "Urticaria," in *Albutt's System*, states that wheals have been seen in the stomach of a rabbit and dog and cat. In Case 14 the patient had for years recurring attacks of severe pain in the stomach, with coincident urticaria, the skin lesions lasting for a much longer period than the abdominal symptoms. Packard refers to

\* *American Journal of the Medical Sciences*, April, 1888.

† *Archives of Pediatrics*, October, 1899.

a case of Lemonnier, in which there had been giant urticaria and an attack of vomiting of blood, which was attributed to urticaria of the stomach. Both Pringle\* and Chittendent† have reported cases of recurring attacks of hæmatemesis with urticaria. It is interesting to note that in Case 14 the patient had hæmorrhage from the stomach as a terminal symptom. In the series of eighteen cases, urticaria was present at some time or other in eight cases, not including the three cases in which acute circumscribed œdema was present.

(b) *Hæmaturia and Nephritis*.—Acute nephritis occurred in cases 3, 4, 5, 6, 8 and 15. Chronic nephritis occurred in Case 14, and hæmaturia at the close. In a case referred to in my previous paper, reported by Dr. Prentiss, of Washington, a chronic nephritis of several years' duration followed an attack of arthritis, with purpura and gastro-intestinal crises.

To two of the instances of nephritis I may call particular attention, as death directly occurred from this complication. In Case 3, a boy of six years, the onset was with pains in the ankles, colic and urticaria. The colic recurred with great severity. It was not until the fifth week of his illness that the urine became scanty and albuminous, and showed red blood corpuscles and many tube casts. He died with dropsical symptoms in three months. In Case 8 the disease set in with pain in one ankle and urticarial rash. Within a month the child had anasarca, with albuminuria and tube casts in the urine. The patient died in uræmic coma.

(c) *Hæmorrhages from the Mucous Surfaces*.—These occurred in six cases; from the bowels in Cases 3, 6, 11, 14 and 18; from the nose and gums in Case 10; from the stomach in Cases 11 and 14; from the kidneys in Cases 11 (not associated with nephritis) and 14. Several of the cases of acute nephritis had a few red blood corpuscles in the urine.

(d) *Cerebral Symptoms*.—In two cases in the series there were remarkable symptoms pointing to involvement of the brain. In Case 1, a man aged 27, who during six years had recurring attacks of gastro-intestinal crises, with the onset of the symptoms he had fever and became delirious and talked nonsense. In Case 15 it seems highly probable that the recurring attacks of hemiplegia, five

\* *Clinical Society's Transactions*, Vol. XVIII.

† *British Journal of Dermatology*, 1898.

or six within a year, were associated with changes in the brain of essentially the same nature as those which subsequently occurred on the lip and in skin. They remind one somewhat of the attacks of recurring aphasia with paralysis in cases of Raynaud's disease.

(c) *Pulmonary Complications.*—Only one case of the series (2) presented marked pulmonary symptoms, to which I have referred in the supplementary history of the case.

In erythema nodosum and in urticaria, asthmatic attacks have been described, due, it is thought, to changes in the mucous membranes of the bronchi of a nature analogous to those in the skin.

Packard, in the paper already referred to, reports cases of the coincidence of asthmatic attacks with urticaria, and gives a very full consideration of the literature. The two conditions have occurred coincidentally, or an outbreak of urticaria may replace an asthmatic attack. In Case 2, without positive asthmatic attacks, there were constant signs of bronchial trouble, but it was not until the emphysema was well established that there were bouts of nocturnal dyspnoea.

It is interesting to note that in not one of the series of eighteen cases was there acute endocarditis, a not very infrequent lesion in certain forms of polymorphous erythema.

## II.—SKIN LESIONS.

An analysis of the lesions of the skin in this series is of interest. In four (Cases 6, 8, 11 and 16) purpura alone was noted. In the remaining fourteen cases the lesions were characterized by erythema with exudation, either urticaria or urticaria with purpura, acute circumscribed œdema, or the lesions of a typical erythema multiforme. Acute circumscribed œdema occurred in Cases 2, 7, and 15, all in association with other exudative lesions. It is interesting to note that the skin lesions may be absent for a protracted period as in Case 1 for two years with recurring crises of great severity, or in Case 8, severe attacks for five years before any skin lesions appeared.

One of the most interesting features in these cases is the inconsistency of the character of the skin lesions; thus in Case 2 the lad had urticaria in his first outbreak, subsequently urticaria and purpura, and later an area of angio-neurotic œdema of the most

characteristic form, and still later, on one hand, very typical lesions of an exudative erythema.

Case 14 illustrates an extraordinary recurrence of urticarial attacks for many years. No cutaneous hæmorrhages appeared until his final and fatal illness, in which there were hæmorrhages into the skin and from the mucous surfaces. In some cases urticaria has existed with the purpura, and in some, simple purpura in one place and purpura urticans in another. I have not seen the co-existence of urticaria with angio-neurotic œdema, which has been referred to recently by Oppenheimer (*Lancet*, 1898, Vol. I. p. 570), but in one case of the hereditary form, which I described some years ago, urticaria had preceded the outbreaks of œdema.

This great variability in the character of the skin lesions is of considerable moment, and it is quite possible that within a year in an individual case the diagnosis might be given of simple purpura, peliosis rheumatica, angio-neurotic œdema, exudative erythema, and simple urticaria.

### III.—ARTHRITIS.

Swelling of the joints or of the synovial sheaths or peri-articular tissues occurred in ten of the cases in the series. The joint trouble may be transient, and, as in Case 2, may occur but once in a prolonged illness. There may be a polyarthritis of great intensity simulating acute rheumatic fever, as occurred in Case 4. Infiltration of the peri-articular tissues and of the subcutaneous structures over the joints may simulate a genuine arthritis. In some of the cases the swelling was chiefly along the tendons, as on the backs of the hands. In one case (5) there were swelling and pain in the left biceps muscle. In other instances, as in Cases 7 and 18, there may be swelling of the foot and ankle joint and of the leg, due to extensive infiltration, œdematous or hæmorrhagic. In Case 18, the attacks of swelling of the knees and legs, without any skin rash and in connection with the recurring cramp-colic, were due, in all probability, to infiltration about the joints. I have not seen subcutaneous fibroid nodules in any of the cases.

And lastly a few remarks on *the mutual relations of the members of the erythema group.*

That there is a close affinity between exudative erythema, Henoch's

purpura, peliosis rheumatica, urticaria, and angio-neurotic œdema, is shown by, first, the similarity of conditions under which they occur; secondly, the identity of the visceral manifestations; thirdly, the substitution of these affections for each other in one and the same patient at different times. The student is, however, at the outset confronted by this interesting feature. On the one hand, similarity of lesions may result from a variety of causes. The purpuric rash of iodism, of endocarditis, of scurvy, and of small-pox are identical. The wheals of urticaria from nettles, of an acute gastric toxæmia, and from the poison of the malarial parasites are indistinguishable. A typical acute exudative erythema may result from several causes. On the other hand, unity of cause may be associated with a variety of lesions. In one and the same person within a few months, presumably under the same ætiological conditions, there may be a multiplicity of skin lesions; and, as in several of the cases here described, four or five separate diagnoses would be required to cover the cutaneous lesions at different periods. We cannot say why in one case there is exudate of red blood corpuscles without erythema (purpura), in another a serous exudate with hyperæmia (urticaria), in a third serous exudate with hyperæmia and hæmorrhage in varying degrees (erythema exudativum multiforme), in a fourth serous exudate alone (localized œdema). Two or three of these lesions may co-exist or may rapidly succeed each other during the same attack, or in succeeding attacks the skin lesions may vary, urticaria in one, purpura in another, and so on.

Ætiologically the cases here reported are very difficult to group. Cases 1 and 15 are peculiarly obscure, and suggest a relationship with migraine. In Case 12, associated with a dilated stomach, the cause could be looked for in all probability in the products of gastric fermentation. Case 14 belongs to that remarkable group, comprising many cases of localised œdema (as well as ordinary urticaria), in which we must suppose that during long periods of years, in association with a special vulnerability, inherited or acquired, of the vaso-motor system, there is manufactured some poison, either endogenous or exogenous (gastro-intestinal). Case 5 followed an acute infection (gonorrhœa), and comes in the category of the acute infectious erythemas, of which two forms may be recognised, a specific independent malady, which has been met with in epidemic form, and a variety which may occur

in any of the acute infectious diseases. It is quite possible that some of the cases were of rheumatic origin, though I hold with those who do not look upon the arthritis, so commonly present, as necessarily indicating the presence of a rheumatic poison.

A point of special interest is the relationship of certain forms of purpura to the erythemas. Schönlein's peliosis rheumatica may be regarded as a hæmorrhagic type of an exudative erythema, and Hensch's purpura, which is characterised specially by the occurrence of gastro-intestinal crises, belongs to the same group.

Several interesting communications have of late dealt with this question. The case reported by Dr. J. Fayer\* illustrates the sequence of arthritis, œdema, erythema exudativum purpuricum, and finally sloughing of the affected areas. The illustration suggests peliosis rheumatica. A very important paper "On the Relationship of Purpura Rheumatica to Erythema Exudativum Multiforme,"† after describing several interesting cases of purpura rheumatica and giving an analysis of those under his care, forty-two in number, Mackenzie says: "I now come to the *nosological position* of purpura rheumatica. The prevailing view is that purpura rheumatica is a variety of erythema multiforme, and Schönlein's original description of the disease certainly is in accordance with this conclusion. With this view I do not altogether agree. I admit its very close alliance, and that the various forms of erythema are almost as closely associated with rheumatism as is the form of purpura, to which I should restrict the term purpura rheumatica. But in e. multiforme the hæmorrhage is only incidental, whilst in purpura it is primary and essential, and in the majority there is no co-existing erythema. Still in a small minority we find some form of erythema co-existing. In erythema nodosum we see precisely the same thing. In the majority of cases we find the eruption limited to the nodose form, though more rarely we have other forms of erythema associated with it. Thus, admitting that e. nodosum is a variety of polymorphic erythema, we recognize it as a distinct type. Some would go so far as to call it a distinct disease, but in this I do not concur. Similarly I claim p. rheumatica, such as I have sketched, as a distinct clinical type which deserves recognition, and I have endeavoured to indicate the class of cases to which I think the term should be restricted." He very correctly

\* *British Journal of Dermatology*, Vol. VIII.

† *Ibid.*

concludes that it is undesirable to consider all cases of purpura to be essentially of the nature of polymorphic erythema.

Certain French writers, as Thibierge, in the recently issued second edition of the *Traité de Médecine* (Vol. III.), group under the erythemas both the purpuras and the urticarias, describing only three principal types of the former—the rheumatic and infectious purpura, and the purpura hæmorrhagica of Werlhof.

The relation of the so-called angio-neurotic œdema to the other members of the erythema group is, I think, less doubtful. That it is essentially of the same nature as urticaria, and should be grouped with it, is shown by their simultaneous outbreak, by their substitution one for the other, by the identity of the visceral complications, and by the peculiar local limitation occasionally seen in both, as to the face or hands. I do not know if the simple urticaria has ever been described in members of the same family through a series of generations, but, as I have already mentioned, a patient under my care with the hereditary form also had urticaria. A very interesting paper on this affection has recently been published by Schliesinger, under the name of "Hydrops hypostrophos" (*Münchener med. Woch.*, August 29th, 1899). He groups together the various manifestations of angio-neurotic œdema—the acute recurring œdema of the eyelids or of the lips, the acute recurring exophthalmos, certain forms of nervous coryza, the hydrops articulorum intermittens, the acute œdema of the tongue, of the pharynx, and of the larynx, certain forms of nervous asthma, the acute œdematous swelling in the stomach and the intestines (causing recurring attacks of colic and the intermittent vomiting of Leyden), intermittent forms of nervous diarrhœa, and, lastly, certain affections of the kidneys causing polyuria or hæmoglobinuria. There is really no warrant for separating too sharply angio-neurotic œdema and urticaria: Oppenheimer has seen them occur together, and many observers have noticed the interchange of urticaria with acute localised œdema.

What is needed, in truth, is a dermatological Linnæus, to bring order out of the chaos at present existing in the group of erythemas. While I feel that in bringing together a somewhat motley series of cases I may only have contributed to make the "confusion worse confounded," on the other hand there is, I think, a positive advantage in recognizing the affinities and the strong points of similarity in affections usually grouped as separate diseases.

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An Address  
ON  
THE IMPORTANCE OF POST-  
GRADUATE STUDY

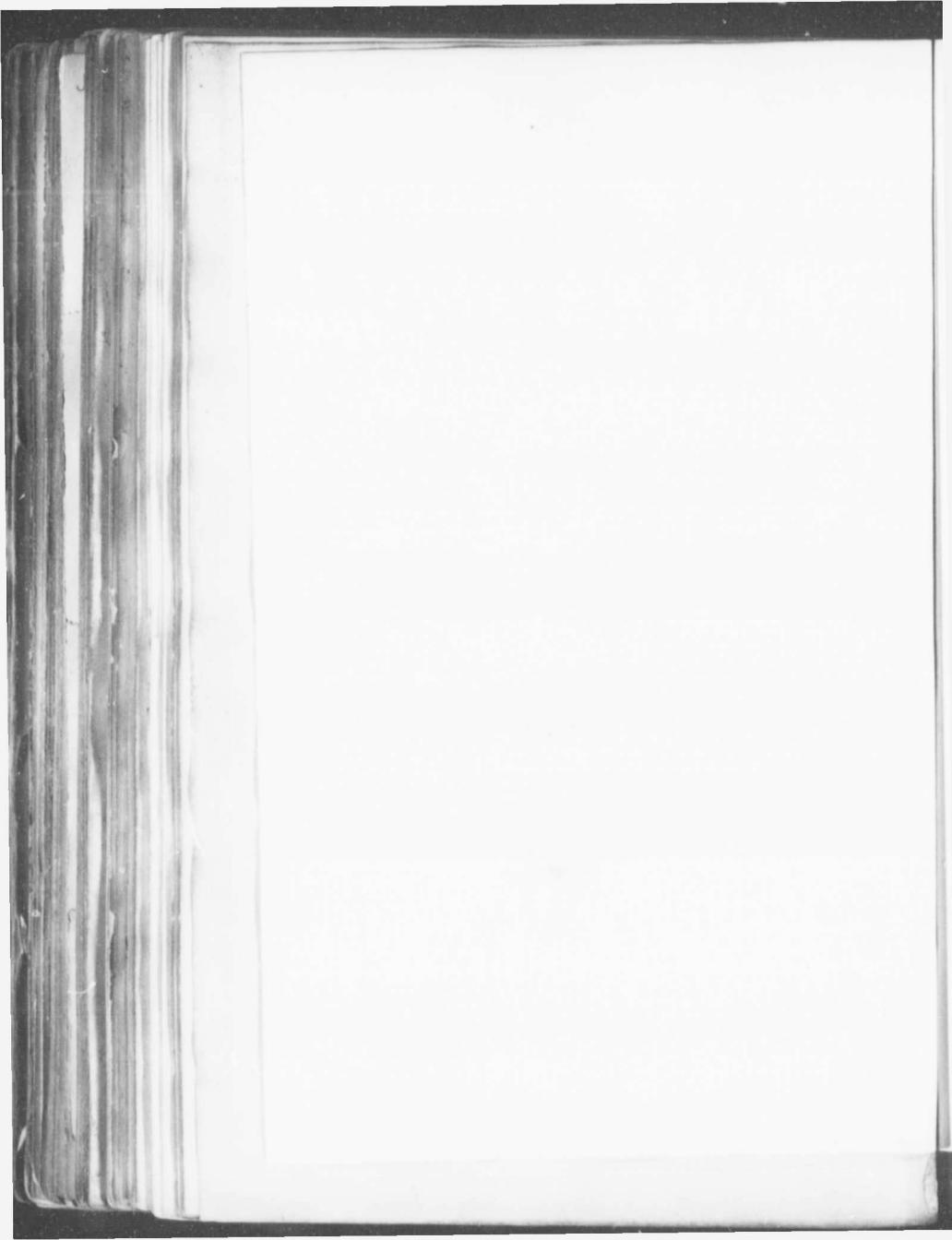
*Delivered at the Opening of the Museums of the Medical Graduates College  
and Polyclinic on July 4th, 1900*

BY

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## An Address

ON

### THE IMPORTANCE OF POST- GRADUATE STUDY.

MR. PRESIDENT AND GENTLEMEN,—If the licence to practise meant the completion of his education how sad it would be for the practitioner, how distressing to his patients! More clearly than any other the physician should illustrate the truth of Plato's saying that education is a life-long process. The training of the medical school gives a man his direction, points him the way and furnishes a chart, fairly incomplete, for the voyage, but nothing more. Post-graduation study has always been a characteristic feature of our profession. These 300 years the schools of Italy, Holland, France, Austria, and Germany have in turn furnished instruction to the young English practitioners who believed in the catholicity of medicine and who felt the sharp sting of the remark which associates homely wits with home-keeping youths. At first it was the grand tour, and many of the masters spent years in foreign study. In spite of our journals and international societies and increased facilities for travel I am not sure that among the teachers in our art the world over medicine to-day is more cosmopolitan than it was in the seventeenth and eighteenth centuries. We now spend a few months or a year in foreign study, whereas our great-grandfathers thought nothing of two and three years. I have seen the MSS. Journal of Dr. John Morgan (a Pennsylvania colonist), the founder of the first medical school in America (University of Pennsylvania), who, after graduation at Edinburgh, spent three years on the continent and became thoroughly familiar with Italian, Dutch, and French medicine, reaching such distinction as a student that he took his seat as a corresponding member of the Paris Academy of Surgery and was elected a Fellow of the Royal Society. Linnæus, Celsus, and Harvey remain to-day the models for all students in foreign lands, but the pace they set is a hard one to keep up. In the rapid extension of methods and subjects in medical education during the past quarter of a century post-graduate teaching has come in for a full share of attention. In the United States many special

schools have been organised and perhaps more systematic attention has been paid to the subject than anywhere except in Germany. In New York, in Philadelphia, and in Chicago, the polyclinics and post-graduate colleges have been widely appreciated by practitioners and have done much good. Less successful attempts have been made by some of the ordinary medical schools, but the leading ones have now abandoned in great part the teaching of graduates. Personally, I have been engaged in the work for the past 11 years. For the first five years of the organisation of the Johns Hopkins Hospital we admitted only physicians, but since the medical school proper began we have had courses for graduates in the months of May and June. At any time during the year, at the discretion of the professor, a few special students may enter the classes or work in the laboratories. So far as the subject of medicine is concerned it is easy to arrange very attractive courses in routine ward instruction, in physical diagnosis, and in clinical microscopy. I have just finished a six weeks' course of clinical instruction to a class of about 30 general practitioners, and to meet these good earnest students from all parts of the country, some of whom have been in practice 15 or 20 years, stimulates one's optimism as to the outlook in the profession.

Upon the advantage which London offers for graduate study it would be superfluous to dwell, since here is collected a larger number of sick people than in any city in the world. The special hospitals offer unequalled facilities for the study of diseases of the eye, of the skin, of the nervous system, and of the diseases peculiar to women and to children. The absence of concentration of material so convenient in Vienna is counterbalanced by the much more elaborate equipment to be found in the special hospitals. There has been but one thing lacking—the organisation necessary to bring patients and students into intimate association, for which purpose this college for graduates was started. Until recently the physician who came to London felt lost and perplexed, and even if he took out three or four hospital tickets there was but little systematic teaching and he had to pick up information as best he could. Here he finds a local habitation with a comfortable reading-room, a good library, and a well-arranged curriculum embracing all the practical branches of medicine and surgery.

The value of a Museum as a means of practical instruction was first practically demonstrated by John Hunter whose magnificent collection is in itself a college for graduates. So extensive is the material, so admirably arranged, and so well catalogued that to the general practitioner and to the special student it offers a unique field for study. I am surprised that a larger number of physicians do not take advantage of the opportunity there offered to study accurately and systematically the manifold manifestations of disease. To Hunter's example is owing the place which the museum occupies in the medical schools of this country.

You have been fortunate in having associated with your College a man with a truly Hunterian mind. In the broad scope of his work, in the untiring zeal with which he has studied the natural phenomena of disease, in his love for specimens and collections, Mr. Jonathan Hutchinson, bears a strong likeness to the immortal Hunter. No individual contributor in this country has made so many careful observations upon so many diseases. He is the only great generalised specialist which the profession has produced, and his works are a storehouse upon which the surgeon, the physician, the neurologist, the dermatologist, and other specialists freely draw. When anything turns up which is anomalous or peculiar, anything upon which the text-books are silent and the systems and cyclopædias are dumb, I tell my students to turn to the volumes of Mr. Hutchinson's "Archives of Surgery," as if it is not mentioned in them we surely have something very much out of the common. It is very fortunate that the collection which he has made will be kept together, as it will be of great service to students from all parts of the world. In one respect it is unique, pictorial and clinical, not anatomical and pathological, and it will remain a worthy monument to the zeal and perseverance of a remarkable man, a man who has secured the homage of a larger number of clinical workers than any Englishman of his generation.

Post-graduate instruction is needed in all classes among us. The school for the young practitioner is a general practice in which the number and variety of cases will enable him at once to put his methods into daily use. A serious defect may warp his course from the outset. Our students study too much under the one set of teachers. In English and American schools they do not move about enough. At a tender age, four or five years give a man a sense of local attachment to place and teachers which is very natural, very nice, but not always the best thing for him. He goes out with a strong bias already in his mind and is ready to cry "I am of Guy's," "I am of Bart's," or "I am an Edinburgh man." To escape from these local trammels, which may badly handicap a man by giving him an arrogant sense of superiority often most manifest when there is least warrant, is very difficult. I knew three brothers, Edinburgh men, good fellows at heart and good practitioners, but for them the science and art of medicine never extended beyond what their old teachers had taught. A Guy's man they could just endure, for the sake, as one of them said, of Bright and Cooper and Addison, but for men of other schools they entertained a supreme and really ludicrous contempt.

There are two great types of practitioners—the routinist and the rationalist—neither common in the pure form. Into the clutches of the demon routine the majority of us ultimately come. The mind, like the body, falls only too readily into the rut of oft-repeated experiences. One evening in the far North-West, beneath the shadows

of the Rocky Mountains we camped beside a small lake from which diverging in all directions were deep furrows, each one as straight as an arrow, as far as the eye could reach. They were the deep ruts or tracks which countless generations of buffaloes had worn in the prairie as they followed each other to and from the water. In our minds countless, oft-repeated experiences wear similar ruts in which we find it is easiest to travel, and out of which many of us never dream of straying. Year by year we follow the same plan in practice, give the same drugs, and settle down into routinists of a most commonplace type. Last year I was called to a town in Pennsylvania and having to wait until late in the evening for the return train, I insisted, as is my wont, that the medical man should carry on his daily work and allow me to help him if possible. An afternoon round among patients chiefly of the mechanic class showed me a shrewd cheery man who in 20 years had gained the confidence and esteem of his patients. Kindly, hopeful words, very sensible directions about diet, and some half-dozen drugs, seemed the essential in his practice. In the evening I saw him dispose of a dozen patients at an out-door dispensary rate; the examination was limited to the pulse, the tongue, and sometimes the throat. The dispensing, which was of the most primitive sort, was done at the table, on which stood four or five tin and paper boxes containing large quantities of calomel, soda, antipyrin, and Dover's powder. Other drugs, he said, were rarely necessary. He never used a stethoscope, he had no microscope or instruments of precision other than the thermometer. In reply to my questions he said "that he rarely had to make an examination. If the patient has fever I send him to bed, if there is oedema I ask for the urine. Of course, I make many mistakes and I sometimes get caught, but not oftener than the other fellows, and when I am in serious doubt I ask for a consultation." This was a man of parts, a graduate from a good school, but early in his career he had become very busy, and gaining the confidence of the people and having much confidence in himself he had unconsciously got into a rut, out of which at 40 only one thing could lift him—a prolonged course of additional study. This is by no means an exaggerated picture of a routinist in general practice. We all have our therapeutic ruts and we all know consultants from whom patients find it very difficult to escape without their favourite prescription, no matter what the malady may be. Men of this stamp gain a certain measure of experience, and if of a practical turn may become experts in mechanical procedures, but to experience in the true sense of the word they never attain. In reality they suffer with the all-prevailing vice of intellectual idleness. It is so much easier to do a penny-in-the-slot sort of practice, in which each symptom is at once met by its appropriate drug than to make a careful examination and really to study the case systematically. Much depends on a man's mental constitution, but much more on the sort

of training he has had. If when a student good methods are not acquired it is very hard to get into proper habits of work in practice.

The rationalist, on the other hand, always approaches a patient as a mathematician does a problem. There is something to be found out; in each case, however trivial, there is something novel, and the problems of causation and the question of relief, while not perhaps of equal importance, are of equal interest. He may be just as busy as his idle brother, but he finds time to keep up a technical dexterity in the use of instruments of precision and the stethoscope and the microscope are daily helps in diagnosis. These men are the delight of the consultant. To go into the country and find the diagnosis made in a case of mitral stenosis, a Friedrich's ataxia, a case of leukemia, or one of myxoedema gives a man a thrill of pleasure such as Comte says he always felt when a student gave him an intelligent set of answers in an examination. It is this class of practitioners for whom the post-graduate courses are helpful and necessary. They alone feel the need of keeping abreast with the times, and men of this type will return every few years, finding that a three months' course of study not only improves and helps them personally but is most beneficial in their practices.

The members of no class in our ranks travel to the waters in deeper or straighter ruts than the specialists. To work for years at diseases of the skin, ophthalmology, gynaecology, &c., necessarily tends to make a man narrow not only as a practitioner but in other relations. One of the best features of British medicine has been the practice of specialties by general surgeons and physicians. It has been better for the men themselves perhaps than for the patients and for the particular branch practised. Nowadays, to master even the smallest specialty requires concentrated effort of years' duration, and to counteract the benumbing influence of isolation a man must scan the wide horizon of pathology and must cultivate ardently the general interests of his profession. The degree of advancement of the specialties in different countries must be borne in mind by our friends and there are few who have been in practice for five or ten years who would not be benefited by a course of study in some foreign country.

After all, no men among us need refreshment and renovation more frequently than those who occupy positions in our schools of learning. Upon none does intellectual staleness steal "with velvet step, unheeded, softly," but not the less relentlessly. Dogmatic to a greater or less degree all successful teaching must be, but year by year, unless watchful, this very dogmatism may react upon the teacher who finds it so much easier to say to-day what he said last year. After a decade he may find it less trouble to draw on home supplies than to go into the open market for wares, perhaps not a whit better, but just a wee bit fresher. After 20 years the new even when true startles, too often repels; after 30, well, he may be

out of the race, still on the track perhaps, even running hard, but quite unconscious that the colts have long passed the winning post. These unrefreshed, unregenerate teachers are often powerful instruments of harm and time and again have spread the blight of a blind conservatism in the profession. Safely enthroned in assured positions, men of strong and ardent convictions, with faithful friends and still more faithful students, they too often come within the scathing condemnation of the blind leaders of the blind, of those who would neither themselves enter into the possession of new knowledge nor suffer those who would to enter. The profession has suffered so sorely from this blight of intellectual old fogyism that I may refer to the most glaring instances in our history. In the scientific annals of this great metropolis there is no occasion more memorable than April 16th, 1616, when Harvey began his revolutionary teaching. Why the long, the more than Horatian delay in publishing his great discovery? He knew his day and generation and even after 12 years of demonstration, which should have disarmed all opposition, we know how coldly the discovery was received, particularly in certain quarters. Harvey, indeed, is reported to have said that he did not think any man above 40 years of age had accepted the new truth. Many of us have lived through and taken part in two other great struggles. The din of battle over the germ theory of disease still rings in our ears. Koch's brilliant demonstration of the tubercle bacillus had a hard up-hill fight for recognition. The vested interests of many minds were naturally against it, and it was only the watchers among us, men like Austin Flint, who were awake when the dawn appeared. It is notorious that the great principles of anti-septic surgery have grown slowly to acceptance, and nowhere more slowly than in the country in which they were announced, the country which has the great honour to claim Lord Lister as a citizen. Old fogyism of the most malignant type stood in the way, and in some places, strange to say, still stands. Mentally it is possible that surgeons age earlier than physicians. I remember as a student, listening to the introductory lecture of a distinguished surgeon at one of the metropolitan schools the burden of whose discourse was the finality which had been reached by modern surgery. In boldness of conception and in precision of execution, he said, we could scarcely hope to see any further progress. Poor man! Cerebral, renal, and hepatic surgery, to say nothing of other operative advances, followed in rapid succession, and I only quote this as illustrating the state of mental blindness with which we teachers may be smitten.

As Locke says: "Truth scarce ever yet carried it by vote anywhere at its first appearance," and these well-known examples illustrate a law in human knowledge that a truth has to grow to acceptance with the generation in which it is

announced. Progress is an outcome of a never-ending struggle of the third and fourth decades against the fifth, sixth, and seventh. Men above 40 are rarely pioneers, rarely the creators in science or in literature. The work of the world has been done by men who had not reached *la crise de quarante ans*. And in our profession wipe out, with but few exceptions, the contributions of men above this age and we remain essentially as we are. Once across this line we teachers and consultants are in constant need of post-graduate study as an antidote against premature senility. Daily contact with the bright young minds of our associates and assistants, the mental friction of medical societies, and travel are important aids. Would you know the signs by which in man or institution you may recognise old fogyism? They are three: First, a state of blissful happiness and contentment with things as they are; secondly, a supreme conviction that the condition of other people and other institutions is one of pitiable inferiority; and thirdly, a fear of change, which not alone perplexes but appals.

Conservatism and old fogyism are totally different things; the motto of the one is "Prove all things and hold fast that which is good," and of the other "Prove nothing but hold fast that which is old." Do not suppose that you have here a monopoly of the article, which is a human, not a national, malady, for we see a very virulent type in America. In its illisiveness and in the disastrous consequences which have often followed its hunting, old fogyism is a sort of Snark in the medical profession. Before the Boojum, in the form of an entrenched variety, many good men and true have softly and silently vanished away like the beamish nephew of the bellman, sacrificed to intellectual staleness in high places. One of the best correctives is the plan followed at Harvard which compels (?) every teacher to take the Sabbatical year, ensuring in this way rest of the mind if not refreshment. To maintain mental freshness and plasticity requires incessant vigilance; too often, like the dial's hand, it steals from its figure with no pace perceived except by one's friends and they never refer to it. A deep and enduring interest in the manifold problems of medicine and a human interest in the affairs of our brotherhood - if these do not suffice nothing will.

As I stated at the outset, during the past three centuries English students have frequented in turn different countries, drinking deep, deep draughts at the great fountains of learning. Think of the debt we owe to these men and to their foreign masters! Linacre and his successors, Caius, Harvey, and Glisson, brought the new learning from Italy and, moreover, gave to English medicine that smack of culture, that tincture so peculiarly its own. From Holland a succeeding generation drew rich stores of knowledge, and the methods of teaching of the great Boerhaave were quickly adopted by English and by Scotch students. From France came next the new science of Bichat, the new art of Laennec, and

the new methods of Louis. To another group the great teachers of Austria contributed accuracy in clinical methods, a zest for the study of special branches and a much-needed, at the time, therapeutic nihilism. The debt of the present generation to Germany can never be paid. Think of the scores who have found inspiration in our common master Virchow; and in the scientific study of disease the Fatherland is still in the van. The great Republic of Medicine knows and has known no national boundaries, and post-graduate study in other lands gives that broad mental outlook and that freedom from the trammels of local prejudice which have ever characterised the true physician.

The course of Empire has opened new fields in which problems new and old have been presented for solution, some of which are of great interest to you "on this side of the water." In any comprehensive survey of the educational field in medicine perhaps the most important single event during the past quarter of a century has been the silent revolution which has taken place in the United States, a revolution which has a direct bearing upon the matter in hand. Everywhere in the schools the entrance requirements have been strengthened, the course of study has been prolonged, and the character of the examinations changed. The hospital equipment has been enormously improved and the clinical facilities have been correspondingly increased. But a still more striking change has been the cultivation of the scientific branches of medicine. 25 years ago physiological laboratories were few and far between; now the output of a score of well-established laboratories supports one of the best journals of physiology in the world. The study of pathology has shown a corresponding growth. The most hopeful feature is a restless discontent which, let us hope, may not be allayed until the revolution is complete in all respects. Meanwhile, to students who wish to have the best that the world offers, let me suggest that the lines of intellectual progress are veering strongly to the West, and I predict that in the twentieth century the young English physicians will find their keenest inspiration in the land of the setting sun.

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ELISHA BARTLETT,  
A RHODE ISLAND PHILOSOPHER,

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AN ADDRESS DELIVERED BEFORE THE RHODE ISLAND  
MEDICAL SOCIETY, DEC. 7TH, 1899,

BY  
WILLIAM OSLER, M. D.,

PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY.

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With an Appendix containing Dr. BARTLETT'S  
sketch of Hippocrates.

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ELISHA BARTLETT,  
A RHODE ISLAND PHILOSOPHER.

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Rhode Island can boast of but one great philosopher, — one to whose flights in the empyrean neither Roger Williams nor any of her sons could soar, — the immortal Berkeley, who was a transient guest in this State, waiting quietly and happily for the realization of his Eutopian schemes. Still he lived long enough in Rhode Island to make his name part of her history; long enough in America to make her the inspiration of his celebrated lines on the course of empire. Elisha Bartlett, teacher, philosopher, author, of whom I am about to speak, whom you may claim as the most distinguished physician of this State, has left no deep impression on your local history or institutions. Here he was born and educated, and to this, his home, he returned to die; but his busy life was spent in other fields, where to-day his memory is cherished more warmly than in the land of his birth.

I.

Born at Smithfield in 1804, Bartlett was singularly fortunate in his parents, who were members of the Society of Friends, strong, earnest souls, well endowed with graces of the head and of the heart. The gentle life, the zeal for practical righteousness and the simplicity of the faith of the followers of Fox, put a hall-mark on the sensitive youth which the rough usage of the world never obliterated. No account of Bartlett's early life and school-days exists — an index that they were happy and peaceful. We may read in his poem called "An Allegory," certain autobiographical details, transferring the

BIRTH AND  
BOYHOOD.

"Meadow and field, and forest, dale and hill;  
Orchards, green hedgerows, gardens, stately trees,"

from the old England which he describes to the banks of Narragansett Bay. Paraphrasing other parts of the poem, we may say that auspicious stars shone over his cradle with the

kindest light and promise, and amid the genial air of a New England home, goodness, truth and beauty were his portion. He tells of the wonder and delight stirred in his young soul by the thousand tales of "fairies and genii, giants, dwarfs and that redoubtable and valiant Jack who slew the giants." Then, as the days lengthened, he came under the spell of "The Arabian Nights" and of "Robinson Crusoe." Looking back in after years, he compared this hearty, wholesome life to some bounteous spring that wells up from the deep heart of the earth. Addison, Goldsmith and Washington Irving filled his soul with freshness like the dawn,

"And led by love and kindness, ran the hours  
Their merry round till boyhood passed away."

In the ruder discipline and strife of school and college he grew to manhood with (as he expressed it) "a fine free healthfulness," and with faculties self-poised and balanced.

At Smithfield, at Uxbridge, and at a well-known Friends' institution in New York, Bartlett obtained a very thorough preliminary education. Details of his medical course are not at hand, but after studying with Dr. Willard, of Uxbridge, Drs. Greene and Heywood, of Worcester, and Dr. Levi Wheaton, of Providence, and attending medical lectures at Boston and at Providence, he took his doctor's degree at Brown University in 1820, a year before the untimely end of the medical department.<sup>1</sup>

Medical  
education  
and gradu-  
ation.

Life in  
Paris.

In June, 1826, Bartlett sailed for Europe, and the letters to his sisters, which, with other Bartlett papers, have been kindly sent me by his nephew, the Hon. Willard Bartlett, of the New York Court of Appeals, give a delightful account of his year as a student abroad. He remained in Paris until December; then, in company with his fellow-student, Dr. South-

<sup>1</sup> Parsons closes his *Historical Tract on the Brown University Medical School* with the sentence, "Whether this city, the second in New England, shall become the seat of such a school (that is, a revived department of medicine) must depend very much on the zeal, persistence and ability of its physicians." May I be permitted to remark, Mr. President, that the existing conditions are singularly favorable for a small first-class school. Here are college laboratories of physics, chemistry and biology, and here are well equipped hospitals, with some three hundred beds. What is lacking? Neither zeal, persistence nor ability on the part of the physicians, but a generous donation to the University of a million of dollars with which to equip and endow laboratories of anatomy, physiology, pathology and hygiene. These alone are lacking; the preliminary scientific school is here; the clinical school is at your doors; the money should be the least difficult thing to get in this plutocratic town. The day has come for small medical schools in university towns with good clinical facilities.

wick, he visited the chief cities of Italy, returning to Paris early in March. The month of May, 1827, was spent in London, and he sailed from Liverpool June 8th. Unfortunately the letters to his sisters contain very few references to his medical studies, but I have extracted a few memoranda from them.

Writing Aug. 24, 1826, he says: "The celebrated Laennec died at his country residence on the 13th of the present month. The publication in 1819 of a new method of ascertaining diseases of the chest forms an era in the history of medicine. M. Laennec fell a victim to one of those diseases the investigation of which by himself has enriched the field of science, contributed to the alleviation of human suffering, and giving his own name a high rank among the great and the good men of his age." He asked that this memorandum should appear in the Providence papers.

Writing September 4th, he speaks of attending every day at the Jardin des Plantes to hear the lectures of Cloquet and Cuvier.

One of the professors at the medical school, he says, looked more like a jolly stage driver or a good-natured, blustering butcher than anything else. "He lectures sometimes standing, and sometimes leaning against a post, or straddling over a high stool, flourishing a lancet in one hand and a snuff-box in the other, on the contents of which he is continually laying the most inordinate contributions. He wears during the time an old rusty looking black cap. The familiarity of the distinguished surgeons and physicians with their students struck me at first sight very forcibly, being in such perfect contrast to the proud port and haughty carriage of some of our New England professors. I wish they might step into the Hotel Dieu and La Charité and take a lesson or two of Boyer and Dupuytren, barons of the Empire, and two of the most distinguished surgeons in the world."

In the letter of October 10th, he says: "The public lectures opened this week, and we are continually engaged from half past six in the morning till bed time. Visits are made at all the hospitals by candle light, and a lecture delivered at most of them immediately after the visit."

He speaks of attending the lectures of Geoffroy St. Hilaire, who, he says, "lectures very badly; his gestures, though he is a Frenchman, are exceedingly awkward, and he has a

sing-song tone like that which one often hears in a Methodist or Quaker preacher."

Like Oliver Wendell Holmes, Bartlett probably acquired in Paris three principles: "Not to take authority when I can have facts; not to guess when I can know; not to think a man must take physic because he is sick."<sup>2</sup>

Strangely enough I find no reference in these Paris letters to the man of all others who influenced Bartlett most deeply. In Louis, even more than in Laennee, the young American students of that day found light and leading. The numerical method, based on a painstaking study of all the phenomena of disease in the wards and in the dead-house, appealed with peculiar force to their practical minds, and Louis's brilliant observations on phthisis and on fevers constituted, as Bartlett remarked, a new and great era in the history of medical science. I cannot find any definite statement of Bartlett's relations with Louis in 1826-27, at which period the latter was still working quietly at La Charité. His monograph on phthisis had been published in 1825, and had at once given him a reputation as one of the great lights of the French school. He was at this time very busy collecting material for his still more important work on typhoid fever, and it is scarcely possible that Bartlett could have frequented La Charité without meeting the grave, unobtrusive student, who, with note book in hand, literally lived in the wards and in the dead-house. Secluded from the world, living as a voluntary assistant to Chomel in this quiet haven of observation, apart from the turbid seas of speculation which surged outside, Louis for seven years pursued his remarkable career. Whether or not Bartlett came into personal contact with him at this time I do not know, but, however, this may be, subsequently the great French clinician became his model and his master, and to him he dedicated his first edition of the "Fevers," and his "Essay on the Philosophy of Medical Science."

For a young man of twenty-two, these letters — written off-hand — show an unusually good literary style, and many incidental references indicate that he had received a general education much above the average. The strong Christian spirit which he felt all through life is already manifest, as may be gleaned from one or two expressions in the letters.

<sup>2</sup> Morse's Life of Holmes, vol. I., p. 109.

Writing Sept. 4, 1826, to his sisters, he refers to the death of a dear friend and her little sister: "There is a cheering consolation in the reflection that 'of such is the kingdom of heaven,' and that their spirits have gone in perfect and sinless purity to their home of bliss, and we may believe that they in their turn have become guardian angels to those who cherished and protected them here:

'They were their guardian angels here,  
They guardian angels now to them.'

In 1827, shortly after completing his twenty-third year, Bartlett settled at Lowell, then a town of only 3,500 inhabitants, but growing rapidly, owing to the establishment of numerous mills. This was his home for nearly twenty years, and to it, and later to Woonsocket, he returned in the intervals between his college work in different sections of the country. As Dr. D. C. Patterson remarks, "He became at once the universal favorite, and began to take a deep interest in the physical welfare of the townsmen." In 1828 he delivered lectures before the Lowell Lyceum on contagious diseases, and he gave frequent popular lectures on sanitation and hygiene. In 1828 he was the orator on the Fourth of July. In 1836 he delivered a course of popular lectures on physiology.

In practice  
at Lowell.

Evidently Bartlett had the "grace of favor" in a remarkable degree. Bishop Clark pictures him in those days in the following words: "Some twenty-five years ago, I used to meet a young man in the town of Lowell, whose presence carried sunshine wherever he went; whose tenderness and skill relieved the darkness of many a chamber of sickness, and whom all the community were fast learning to love and honor. Life lay before him, full of promise; the delicate temper of his soul fitting him to the most exquisite enjoyment of all the pure delights of nature, and his cheerful temperament giving a genial and generous glow to the refined circles of which he was one of the chiefest ornaments."

When only thirty-two, before he had been in Lowell ten years, he was elected by a respectable majority as the first mayor of the city, and he was re-elected the following year. A letter from the Hon. Caleb Cushing, dated April 20, 1841, gives us an idea of the estimate which a clear headed layman

placed upon him. "Dr. Bartlett enjoys in the city of Lowell the unqualified respect of that community, and its affectionate esteem, — respect and esteem due alike to his public relations to that city, as formerly its popular and useful chief magistrate, and at all times one of its most patriotic and valued citizens; to his unblemished integrity of character and amenity of deportment; to his eminence in his profession; to the endearments of private friendship; and in general to his talents, accomplishments, manners and principles."

Defence  
of the  
"mill  
girls."

To two interesting episodes in his life at Lowell I may refer at greater length. The rapid growth of the industries in Lowell had brought in from the surrounding country a very large number of young girls as operatives in the mills, and their physical and moral condition had been seriously impugned by writers in certain leading Boston papers. These charges were investigated in a most thorough way by Bartlett, who published in the *Lowell Courier* in 1839, and republished in pamphlet form (1841) his well-known "Vindication of the Character and Condition of the Females Employed in the Lowell Mills." This very strong paper, based on careful personal investigations, really proved to be what the title indicated. It did not, however, escape adverse criticism, and among the Bartlett papers there is a review of the "Vindication" by a citizen of Lowell in 1842, which presents the other side of a picture, by no means a pleasant one, of the prolonged hours of the operatives and their wretched life in boarding-houses.

Visit of  
Dickens.

One of the most interesting incidents of his life at this period was the reception to Dickens, whose visit to Lowell occurred during Dr. Bartlett's mayoralty. In the "American Notes" Dickens speaks of the girls as "healthy in appearance, many of them remarkably so, and had the manners and deportment of young women, not of degraded brutes of burden." Oliver Wendell Holmes says, referring to this occasion: "I have been told a distinguished foreign visitor (Charles Dickens), who went through the whole length and breadth of the land, said that of all the many welcomes he received from statesmen renowned as orators, from men whose profession is eloquence, not one was so impressive and felicitous as that which was spoken by Dr. Bartlett, then mayor of Lowell, our brother in the silent profession, which he graced with these unwonted accomplishments."

In 1840 he was elected to the Legislature of the State of Massachusetts and served two terms. In 1845 he was nominated by the Governor a member of the Board of Education of the State in the place of Jared Sparks. Holmes, who was familiar with Bartlett in this period of his career, has left on record the following charming description: "It is easy to recall his ever-welcome and gracious presence. On his expanded forehead no one could fail to trace the impress of a large and calm intelligence. In his most open and beaming smile none could help feeling the warmth of a heart which was the seat of all generous and kindly affections. When he spoke his tones were of singular softness, his thoughts came in chosen words, scholarlike, yet unpretending, often playful, always full of lively expressions, giving the idea of one that could be dangerously keen in his judgments, had he not kept his fastidiousness to himself, and his charity to sheathe the weakness of others. In familiar intercourse — and the writer of these paragraphs was once under the same roof with him for some months — no one could be more companionable and winning in all his ways. The little trials of life he took kindly and cheerily, turning into pleasantry the petty inconveniences which a less thoroughly good-natured man would have fretted over."

Oliver  
Wendell  
Holmes'  
description  
of  
Bartlett.

## II.

For many years there was in this country a group of peripatetic teachers who like the Sophists of Greece, went from town to town, staying a year or two in each, or they divided their time between a winter session in a large city school and a summer term in a small country one. Among them Daniel Drake takes the precedence, as he made eleven moves in the course of his stirring and eventful life. Bartlett comes an easy second, having taught in nine schools. Dungleison, T. R. Beck, Willard Parker, Alonzo Clark, the elder Gross, Austin Flint, Frank H. Hamilton, and many others whom I could name, belonged to this group of wandering professors. The medical education of the day was almost exclusively theoretical; the teachers lectured for a short four months' session, there was a little dissection, a few major operations were witnessed, the fees were paid, examinations were held — and all was over. No wonder, under such con-

TEACHER.

ditions, that many of the most flourishing schools were found amid sylvan groves in small country towns. In New England there were five such schools, and in the State of New York the well-known schools at Fairfield and at Geneva. As there was not enough practice in the small places to go round, the teachers for the most part stayed only for the session, at the end of which it was not unusual for the major part of the faculty, with the students to migrate to another institution, where the lectures were repeated and the class graduated. T. R. Beck's introductory lecture, in 1824, at Fairfield, "On the Utility of Country Medical Institutions," pictures in glowing terms their advantages. One sentence brought to my mind the picture of a fine old doctor, on the Niagara peninsula, a graduate of Fairfield, who possibly may have listened to this very address. Dr. Beck asks: "What is the clinical instruction of the country student? It is this — after attending a course of lectures on the several branches of medicine and becoming acquainted with their general bearing, he during the summer repairs to the office of a practitioner; attends him in his visits to his patients; views the diseases peculiar to the different districts; observes the treatment that situation or habits of life indicate and from day to day verifies the lessons he has received. Here, then, is a direct preparation for the life he intends to pursue." And I may say that it was just this training that made of my old friend one of the best general practitioners it has ever been my pleasure to know.

In the letters we can follow Bartlett's wanderings during the next twenty years, from the time of his appointment to one of the smallest of the schools to his final position as one of the chief ornaments of the leading school of New York. In 1832 he held his first teaching position, that of professor of pathological anatomy and of materia medica in the Berkshire Medical Institute, at Pittsfield. The following is an extract from a letter to Dr. John Orne Green, dated Pittsfield, November 25, 1833: "The character of the class is said to be superior even to that of last year. We have a large number of excellent students. Parker is as popular as ever, and Professor Childs has the credit of having improved very much in his manner of teaching. The members of the class are attentive to their studies, eager for knowledge, and regular in their attendance on the lectures. I have lectures,

At  
Pittsfield.

most of the time, twice a day, at 10 A. M. and at 2 P. M. I shall finish my course on materia medica by the middle of this week, and the remainder of my time will be occupied with lectures of medical jurisprudence and pathological anatomy. The commencement will be on Wednesday of week after next."

He held the chair at Pittsfield for eight sessions. Among his colleagues were Childs, Dewey and Willard Parker, who was a very special friend. In a letter of October 2, 1836, he says: "Parker, with his sunny face and his hearty welcome, was in a few minutes after my arrival. It does one good to meet such men."

In 1839 he was appointed to the chair of practice in Dartmouth College, Hanover, N. H., the school founded by Nathan Smith in 1798. In a letter to his friend, Green, dated September 8th, he gives brief sketches of some of his colleagues, among them a delightful account of Oliver Wendell Holmes, then a young man of thirty. "Dr. Holmes you know something of. As a teacher there is no doubt of his success, although he will not show himself during this his first course. He has his anatomy—some of it at least—to study as he goes on, and he has not yet got the whole hang of the lecture-room—he does not give himself his whole swing. His attainments in medical science are extensive and accurate, and his intellectual endowments are extraordinary. His mind is quick as lightning and sharp as a razor. His conversational powers are absolutely wonderful. His most striking mental peculiarities consist in a power of comprehensive and philosophical generalization on all subjects, and in a fecundity of illustration that is inexhaustible. His talk at table is all spontaneous, unpremeditated, and he pours himself forth—words and thoughts—in a perfect torrent. His wit and humor are quite lost in the prodigal exuberance of his thoughts and language." In this same letter is the following characteristic memorandum, illustrating his desire to see the school-houses beautified and adorned. "One word about the High School House. Pray, don't forget in the planning of the rooms my plan for some embellishments. Even if we should get some busts I do not know that niches would be any better than suitable stands or shelves. I hope we shall raise, by a fair, from five hundred to one thousand dollars for pictures, etc., for ornaments to the two principal

At  
Dartmouth

Bartlett on  
Oliver  
Wendell  
Holmes.

rooms." It is quite possible that Bartlett lectured both at Woodstock and at Pittsfield, as the terms were purposely arranged so as not to clash, and in the catalogue of the Vermont Medical College, 1844, there is an advertisement of the Berkshire school. The names of Bartlett and Holmes occur only in the 1839-40 and 1840-41 announcements.

At  
Lexington.

In 1841 he accepted the chair of the theory and practice of medicine in the Transylvania University, Lexington, at that time the strongest and best equipped school in the West.<sup>3</sup> On his way to Lexington he visited New York, Philadelphia, Washington and Baltimore, and in a letter to Green, of September 7, 1841, he gives an interesting account of the men he met in these cities. One item is of interest to Baltimoreans: "Day before yesterday I spent with Dr. Nathan R. Smith, at Baltimore, on my return from Washington. I found him very attentive and hospitable. He took me into his gig and went to see some of his patients. He has a pretty large surgical practice, and is, I should think, a man of excellent sound sense, industrious and devoted to his profession — not so *great* a man as his father, but a very capital good fellow. He speaks well of Lexington and the school — says it is the best appointed school in the country."

In his letters there are interesting descriptions of his life in Lexington, some of which are worth quoting: "In the school we are getting on very well. The class is of a good size, rather larger than last year, worth a little over \$2,000, intelligent, attentive, well behaved. I have given fifty-eight lectures, and we have just six weeks more. My own success has been good enough, I think. So far as I have means of judging, my instruction is entirely satisfactory, to say the least. My colleagues — Dudley, you know, is the great man here. He has many peculiarities. He is very much pleased with me. He teaches singular doctrines, and follows, in many things, a practice very peculiar to himself. The other day he tied the common carotid before the class in an anastomosing aneurism in the orbit; patient from St. Louis. Day before yesterday he cut for the stone; patient a lad from Mississippi. He has two more cases of stone here for operation. He is exceedingly cautious; sends many patients, of all sorts, away without operation. Uses the bandage for

<sup>3</sup> History of the Medical Department of Transylvania University and its Faculty, by Dr. William J. Calvert, Johns Hopkins Hospital Bulletin, August, September, 1899.

everything almost in surgery — tart. ant. and starvation, or low diet, in most diseases. He had a pretty large property, 'a garden' as he calls it, of 150 acres or so, a mile from the city. Richardson, in obstetrics, boards with me, a plain common-sense man, who fought a duel in early life with Dudley; has made a pretty large fortune here in practice, and now lives in the country eight miles or so from here, on a farm of 500 acres. The style of lecturing here is quite different from what it is in the East — more emphatic, more vehement. It is quite necessary to fall somewhat into the popular style. We stand, in the lecture room, on an open platform with only a little movable desk or table, on which to lay our notes. On the whole I like it better than being seated in a desk, as they are in Boston." (December 21, 1841.)

In March, 1843, he writes to Green that his receipts for the session have been more than \$2,000. "There are a few good families who send for me, and I get occasionally a consultation. We never make a charge less than a dollar; and consultation visits in ordinary cases — the first visit — are \$5.00. These few enable me situated as I am, to make even a small and easy business somewhat profitable. I have made one visit twenty-five miles distant, for which the fee was \$25; and I saw a second patient, at the same time, incidentally, for \$5.00 more. You see from all this, that my place gives me rather more money than I could earn in Lowell, for a much smaller amount of responsibility and labor. I have hardly, indeed, been called out of bed during the winter. In a business point of view I feel quite content with my situation."

From an interesting account of a consultation in the country we can gather how the planters of those days did their own doctoring: "Col. Anderson belongs to a class of men, pretty large, I think, in this State,—rather rough, with a limited school education, but intelligent, shrewd, clear-headed, and enterprising. He has a farm, entirely away from any travelled road, of 500 acres; but his principal business is that of bagging and soap manufacturing, his farm serving only to feed his family. This consists of about one hundred, eighty or more of which are his negroes. He has no physician, whom he is willing to trust, nearer than Lexington; and in nearly all common acute diseases treats the pa-

tient himself. His daughter, Mrs. Breck, was seized with acute pleurisy, soon after miscarriage, and her father had bled her twice, pretty freely, and given calomel and antimony, before any physician had seen her. He had followed the same course a year ago in the case of his wife." (February 18, 1844.)

In the same letter he says: "Typhoid fever has been very widely prevalent in many parts of Kentucky for the past year. There were, it is said, 200 deaths in an adjacent county last summer and fall. It is evidently the common fever of this country, with all the features so familiar to us at the East."

At  
Baltimore.

In the autumn of 1844 he accepted the chair of the theory and practice of medicine at the University of Maryland. Among the letters I find but one from Baltimore, and that is to Oliver Wendell Holmes about a review of his book, "The Philosophy of Medical Science," which had appeared that year.

At  
Woodstock  
Vt.

In 1844 he accepted the chair of materia medica and obstetrics in the Vermont Medical College, the session of which began in March and continued for thirteen weeks. Among his colleagues were Alonzo Clark, Palmer and Edward M. Moore, and later John C. Dalton. Bartlett's name occurs in the catalogues of the school until 1854, the year before his death.

Second  
visit to  
Europe.

In May, 1845, he and Mrs. Bartlett sailed for Europe. In a letter to Green, July 12th, there is an interesting reference to Louis and James Jackson, Jr.: "I have seen a good deal of Louis, who has been very civil and attentive. I dined with him soon after my arrival, and met there, amongst others, Leuset and Grisolle, two of his most intimate medical friends. I never see him that he does not speak of young Jackson — *ce pauvre Jackson*, as he calls him. He told me, with a great deal of feeling, that Jackson, the last night that he spent in Paris, wrote him a letter from his hotel, which was moistened with his tears, and that he thought Jackson was almost as much attached to him as to his father." In another letter he speaks, too, of his very cordial reception by Louis.

They spent the winter on the Continent, traveling about, chiefly in Italy, and in the spring went to London. In a letter dated June 17, 1846, there is an interesting sketch of a magnetic séance at the house of Professor Elliotson,

of University College, who subsequently came to such a grief over hypnotism. "And then he ran full tilt off upon his hobby, 'animal magnetism,' calling it one of the most sacred and holy of all subjects, one of the greatest truths, and so on. Dr. Forbes, the editor, he spoke of as 'a wretch,' all because the doctor has shown up some of Elliotson's magnetic operations. Dr. E. afterwards invited me to see some magnetic phenomena at his house. I went about 3 o'clock in the afternoon, and found his spacious and elegant drawing-room quite filled with well-dressed gentlemen and ladies, assembled for the same purpose. The doctor had two subjects, one a young, delicate looking girl, and the other a damsel of a certain age, upon whom he performed the standard and stereotyped experiments — putting them into the magnetic sleep, stiffening their limbs, leading them round the room with a common magnet, exciting their phrenological organs, and so on. I can only say that I was not specially delighted with Elliotson's manner, and that if I was to choose a man by whom I should swear, without using my own eyes, certainly it would not be him."

In the same letter he speaks of having seen a great deal of Forbes, editor of the *Medico-Chirurgical Review*; of Marshall Hall, of Walshe, "a young man and a good fellow;" of Sir Henry Holland, and of that interesting American physician, who lived so long in England, Dr. Boott, and of Dr. Southwood Smith at the Fever Hospital.

On his return from Europe we find him during the session of 1846-47 in his old chair at Lexington, whence he writes on March 18, 1847, to his friend Green, from which a paragraph relating to the second edition of his book on "Fever" may be quoted: "I have been drudging away all winter at my second edition. I do not feel any great interest in it, though I hope and intend to make a good book of it. The first edition, for a monograph, has sold very well, mostly at the South and West; so well at least that Lea & Blanchard propose publishing the second edition and paying also something for the right to do so."

At  
Lexington  
again.

The sessions of 1847-48-49 were spent at the Transylvania University. In the spring of 1848 there is a letter from Pliny Earle, dated April 16th, saying that he had received a catalogue of the Medical Department of Transylvania University, from which he had received his first inti-

mation of Bartlett's resignation of the professorship. He asks Bartlett's advice as to the propriety of applying for the position.

At  
Louisville.

On March 13, 1849, he received the appointment as professor of the theory and practice of medicine in the University of Louisville. At this time, in a letter from Dr. J. Cobb, we have the first intimation in the letters of ill health, as there is the sentence: "Accept my best wishes for your complete restoration to health." The University of Louisville had drawn heavily upon the classes of the other Western schools, chiefly at the expense of Lexington, and the Faculty when Bartlett joined it was very strong, comprising such well-known men as the elder Gross, the elder Yandell, Rogers, Benjamin Silliman, Jr., and Palmer.

At the  
University  
of  
New York.

The condition of medical politics at that time in the town of Louisville was not satisfactory, and a new school had been started in opposition to the University, and among the Bartlett letters are a number from the elder Yandell which show a state of very high tension. Bartlett spent but one session in Louisville. He and Gross accepted chairs in the University of New York. The appointment of the former to the chair of the institutes and practice of medicine is dated Sept. 19, 1850. From some remarks in a letter from Yandell it is evident that Bartlett did not find the position in New York very congenial. Gross found his still less so, and returned to Louisville the following year. J. W. Draper, the strong man of the University School, had secured Bartlett and in a letter dated Aug. 12, 1850, he promised him a salary of at least \$3,500. The same letter shows how thoroughly private were the medical schools of that day: "It perhaps may be proper to repeat what is the condition of the real estate. The college building is owned equally by the six professors. Its estimated value when Dr. Dickson left us in the spring was \$78,600, and there is a mortgage upon it of \$48,000, bearing interest of six per cent. Excluding this mortgage the share of each professor is therefore \$5,000, and a mutual covenant exists among us that on the retirement or decease of one of the Faculty his investment shall be restored to him or his heirs—the new-comer starting in all respects in the position he occupied."

During these years Bartlett seems to have been very busy at work at the microscope, and there is a letter from Alonzo

Clark, dated June 15, 1848, descriptive of a fine new Oberhauser (the Zeiss of that day), and in 1851 there is an interesting letter from Jeffries Wyman, giving a list of the most important works on invertebrate zoology.

Among his colleagues in the University were Draper, Martyn Paine and Granville Sharp Pattison. Things do not seem to have worked very smoothly. In the spring of 1851 overtures were made to him from the College of Physicians and Surgeons of New York, in which Faculty were his warm friends, Alonzo Clark and Willard Parker, and he was elected to the chair of materia medica and medical jurisprudence in the following year, 1852. Here he lectured during the next two sessions until compelled by ill health to retire.

At the  
College of  
Physicians  
and  
Surgeons,  
New York

I may fittingly conclude this section of my address with a sentence from a sketch of Bartlett's life by his friend Elisha Huntington: "Never was the professor's chair more gracefully filled than by Dr. Bartlett. His urbane and courteous manners, his native and simple eloquence, his remarkable power of illustration, the singular beauty and sweetness of his style, all combined to render him one of the most popular and attractive of lecturers. The driest and most barren subject, under his touch, became instinct with life and interest, and the path, in which the traveler looked to meet with briars and weeds only, he was surprised and delighted to find strewn with flowers, beautiful and fragrant. There was a magic about the man you could not withstand; a fascination you could not resist."

### III.

Bartlett began his career as a medical writer with the *Monthly Journal of Medical Literature and American Medical Students' Gazette*, only three numbers of which were issued. He says in the introductory address, dated Oct. 15, 1831, that there are plenty of practical journals of high character and extensive circulation, but he wishes to see one devoted to "medical history, medical literature, accounts of medical institutions and hospitals, medical biography, including sketches of the character, lives and writings of the chief masters of our art, and of all such as have in any way influenced its destinies and left the deep traces of their labors on its history. . . . To the medical student and the young prac-

AUTHOR.  
The  
Monthly  
Journal.

tioner, to all those who aspire to any higher acquisitions than the knowledge that calomel purges and salivates, and that tartarized antimony occasions vomiting, who are not willing to rest supinely satisfied in a routine familiarity with doses and symptoms — a familiarity which practice and habit render in the end almost mechanical — we cannot but think these matters must be interesting." And he adds: "The devotion of an occasional hour to such pursuits must have a tendency to enlarge and liberalize the mind. It will help to keep alive and stimulate in the young medical scholar the sometimes flagging energies of study. By calling his attention and directing his desires to high standards of acquisition and excellence, it will urge him on towards their attainment. Delightful and fascinating, in many respects, as the study of his profession may be to him, there are many hours which must be occupied with mental and bodily drudgery. He must make what to others would be loathsomeness pleasure to himself. Amid the wear and tear, the toil and fatigue of such pursuits, he needs at times some intellectual recreation and stimulus, and where can he find one pleasanter or more appropriate than in surveying the career, and studying the characters of those who have trodden before him the same laborious path, and who have followed it on to its high and bright consummation? If our profession ever vindicates its legitimate claim to the appellation of liberal, it must be cultivated with some other than the single aim of obtaining patients for the sole purpose of getting for services rendered an equivalent in fees."

In the first number there is a statement that on a future occasion the *Journal* will give a "detailed consideration of the character of the old physician of Cos — the venerable father of physic, and of the reform which he effected in medical science," a promise which was not fulfilled to the profession for many years, as Bartlett's well-known lecture on Hippocrates, the last, indeed, of his professional writings, was not issued until 1852. The literature of science, its philosophy, its history, the history of the lives and labors of the founders and cultivators — these he believed it important for the student to cultivate.

Among the articles in these three numbers there are some of special merit. One signed S. N., *On the Claims of Medicine to the Character of Certainty*, may have suggested to

Bartlett in his well-known essay, "On the Degree of Certainty in Medicine." The enterprise was not a success, and as Bartlett had said in his introductory address, "of all *weakly* things we most heartily pity *weakly* periodicals," he had the good sense after three numbers had been issued to give up a publication which the profession did not sustain.

In July, 1832, he became associated with A. L. Pierson and J. B. Flint in a much more pretentious and important journal, the *Medical Magazine*, a monthly publication which continued for three years. It was a very well conducted periodical, with excellent original articles and strongly written editorials. John D. Fisher's original paper on *The Cephalic Brain Murmur* occurs in Volume II., and in the same one is an excellent paper by E. Hale, Jr., on *The Typhoid Fever of this Climate*, which is of special interest as containing very accurate statements of the differences between the common New England autumnal fever and the typhus as described by Armstrong and Smith. There are also reports of three autopsies giving an account of ulceration in the small intestine, among the first to be published in this country. There are in addition numerous well-written critical reviews. Among the latter is one of the most virulent productions of that most virulent of men, Dr. Charles Caldwell. It is entitled "Medical Language of Literature." I have heard it said in Philadelphia that Dr. Samuel Jackson never forgave the bitterness of the attack in it upon his "Principles of Medicine."

The  
Medical  
Magazine.

In Volume III. there was the interesting announcement that a dollar a page would be paid for all original communications.

In 1831 appeared a little work entitled, "Sketches of the Character and Writings of Eminent Living Surgeons and Physicians of Paris," translated from the French of J. L. H. Peisse. Of the nine lives, those of Dupuytren and Broussais are still of interest to us, and there is no work in English from which one can get a better insight into the history of medicine in Paris in the early part of this century. One little sentence in the translator's preface is worth quoting: "After making all reasonable allowance for natural tact or talent, and for the facilities and advantages of instruction to be had in extensive medical establishments, it will be found that *study*, intense, untiring, unremitted *study*, is the only foundation of professional worth and distinction."

Lives of  
Paris  
Physicians

Phrenology.

Edits  
Paley's  
Natural  
Theology."Bartlett  
on Fevers."

A great stimulus had been given to the study of phrenology by the visit of Spurzheim to this country. He gave a course of six lectures on the anatomy of the brain and spinal cord at one of the apartments of the Medical College in September of that year, and subsequently a popular course of lectures on phrenology. In 1832 he died in Boston of typhus fever. His brain, it is stated, was in the possession of the Boston Phrenological Society, before which, in January, 1838, Bartlett gave an interesting address on scientific phrenology.

In 1839 Bartlett edited "Paley's Natural Theology," that delightful book, dear especially to those of us who were trained in religious colleges. To some of us at least the freshness of the natural theology, which in Paley's hands was really a delightful commentary on anatomy and physiology, was a happy change from artificial theology, or even from the "Horae Paulinae" of the same author.

Bartlett's claim to remembrance, so far as his medical writings are concerned, rests mainly on his work on "Fevers" issued in 1842, and subsequent editions in the years 1847, 1852 and 1857. It remains one of the most notable of contributions of American physicians to the subject. Between the time of Bartlett's visit to Paris and 1840, a group of students had studied under Louis, and had returned to this country thoroughly familiar with typhoid fever, the prevalent form in the French capital at that time. In another place<sup>4</sup> I have told in detail how largely through their labors the profession learned to recognize the essential differences between the two prevalent forms of fever, typhoid and typhus. The writings on fever chiefly accessible to the American reader of that day were the English works of Forlyce, Armstrong, Southwood Smith, and Tweedie, in which, as Bartlett says, "they describe a fever or form of fever (that is typhus) rarely met with in this country," and the writings did not actually represent the state of our knowledge upon the subject. Indeed, for a number of years later a chaotic condition of mind prevailed among the writers in Great Britain, and it was not until 1849-50 that William Jenner, by a fresh series of accurate observations, brought the British medical opinion into line. As the *British and Foreign Medico-Chirurgical Re-*

<sup>4</sup> *Influence of Louis on American Medicine*, Johns Hopkins Hospital Bulletin, August, September, 1897.

*view*, in a most complimentary notice of Bartlett's work, says, "A history of British fevers such as Louis has furnished to France, or such as given in the volume under discussion, did not exist." Still, even at that date, 1844, the *Review* expressed the ultra-conservative opinion held in England, that the common continued fever, or the low nervous fever of Huxham, was only a mild form of typhus fever. The work is dedicated to his friends, James Jackson, of Boston, and W. W. Gerhard, of Philadelphia; as he states, "a history of two diseases, many points of which they, especially among his own countrymen, have diligently and successfully studied and illustrated."

As to the work itself, the interest to-day rests chiefly with the remarkably accurate picture which is given of typhoid fever—a picture the main outlines of which are as well and firmly drawn as in any work which has appeared since. It is written with great clearness, in logical order, and he shows on every page an accurate acquaintance with the literature of the day, and, as the author of the review already mentioned remarks, a knowledge also of that best of books, the book of nature.

The practical character of Bartlett's mind is indicated by the briefness with which he discusses the favorite topic of the day, namely, the theory of fever. He acknowledged at the outset that the materials for any satisfactory theory of typhoid fever did not exist. He went so far as to claim that the fundamental primary alteration was in the blood, and that the local lesion was really secondary, and he refers to the prevalent theory of fever as "wholly a creation of fancy; the offspring of a false generalization and of a spurious philosophy. What then can its theory be but the shadow of a shade?" This work immediately placed Bartlett in the front rank of American physicians of the day. It had a powerful influence on the profession of the country. Among his letters there is an interesting and characteristic one from James Jackson, already referred to in the dedication. Acknowledging the receipt of a copy, he says: "I am now writing to express to you the great satisfaction the book has given me. I think that it entirely answers the end that you proposed. It, in fact, translates to the common reader, in a most clear style and lucid method, the acquisitions which science has made on its subjects within the last few years. Nowhere

else can the same comprehensive view of those subjects be found. What may be the conclusions of medical men in regard to essential fevers twenty years hence I would not pretend to say. It is certain their views have changed very much within a shorter period, and if new discoveries are made in ten years to come I doubt not you will be ready to change yours. We must take to-day the truth so far as we know it, and add to it day by day as we learn more."

It is evident from his letters that the success of the work on fevers was a great gratification to Dr. Bartlett. The second edition was issued in 1847, and while the history of typhoid and typhus fever remained much in the same state, with certain additions and developments, the subject of periodical and yellow fevers were greatly extended. The third edition was issued in 1852. The fourth edition was edited by Bartlett's friend, Alonzo Clark, of New York. The dedication of the second, third and fourth editions was to Dr. John Orne Green, of Lowell, "with whom the early and active part of the writer's life was passed; in a personal friendship which no cloud, for a single moment, ever shadowed or chilled; and in a professional intercourse whose delightful harmony no selfish interest nor personal jealousy ever disturbed."

From every standpoint "Bartlett on Fevers" may be regarded as one of the most successful medical works issued from the medical press and it richly deserves the comment of the distinguished editor of the fourth edition: "The question may be fairly raised whether any book in our profession illustrates more clearly the beauties of sound reasoning and the advantages of vigorous generalization from carefully selected facts. Certainly no author ever brought to his labor a more high-minded purpose of representing the truth in its simplicity and in its fulness, while few have been possessed of higher gifts to discern, and gracefully to exhibit it."

The Phil-  
osophy of  
Medicine.

"An Essay on the Philosophy of Medicine," 1844, a classic in American medical literature, is the most characteristic of Bartlett's works, and the one to which in the future students will turn most often, since it represents one of the most successful attempts to apply the principles of deductive reasoning to medicine, and it moreover illustrates the mental attitude of an acute and thoughtful observer in the middle of

the century. The work consists of two parts: in the first science is defined and its canons laid down. Ascertained facts, with their relations to others, obtained by observation or experience, and generalized into laws and principles — this constitutes science. He dwells upon the hurtfulness of theories, and sketches in an interesting manner Newton's position as an observer and as a theorist: "If he (Newton) bowed at any time or in any degree his strong neck to the yoke of hypothesis, it was always with a perfect consciousness of his ability at will to shake it off, as the lion shakes the dew-drop from his mane." He quotes from Sir Humphrey Davey: "When I consider the variety of theories that may be formed on the slender foundation of one or two facts, I am convinced that it is the business of the true philosopher to avoid them altogether."

The five primary propositions with which the second part opens contain the pith of the argument:

*Proposition First.* — All medical science consists in ascertaining facts, or phenomena, or events; with their relations to other facts, or phenomena, or events; the whole classified and arranged.

*Proposition Second.* — Each separate class of facts, phenomena, and events, with their relationships, constituting, as far as they go, medical science, can be ascertained in only one way; and that is by observation, or experience. They cannot be deduced, or inferred, from any other class of facts, phenomena, events, or relationships, by any process of induction, or reasoning, independent of observation.

*Proposition Third.* — An absolute law, or principle, of medical science consists in an absolute and rigorous generalization of some of the facts, phenomena, events, or relationships, by the sum of which the science is constituted. The actual ascertainable laws, or principles, of medical science are, for the most part, not absolute but approximative.

*Proposition Fourth.* — Medical doctrines, as they are called, are, in most instances, hypothetical explanations, or interpretations, merely, of the ascertained phenomena, and their relationships, of medical science. These explanations consist of certain other assumed and unascertained phenomena and relationships. They do not constitute a legitimate element of medical science. All medical science is absolutely independent of these explanations.

*Proposition Fifth.*— Diseases, like all other objects of natural history, are susceptible of classification and arrangement. This classification and arrangement will be natural and perfect just in proportion to the number, the importance, and the degree of the similarities and the dissimilarities between the diseases themselves.

Bartlett is the strongest American interpreter of the modern French school of medical observation, which "is characterized by its strict adherence to the study and analysis of morbid phenomena and their relationships; by the accuracy, the positiveness, and the minute detail which it has carried into this study and analysis; and by its rejection as an essential or legitimate element of science of all *a priori* reasoning or speculation. The spirit which animates and guides and moves it is expressed in the saying of Rosseau, 'that all science is in the facts or phenomena of nature and their relationships, and not in the mind of man, which discovers and interprets them.' It is the true *protestant* school of medicine. It either rejects as apocryphal, or holds as of no binding authority, all the traditions of the fathers, unless they are sustained and sanctioned by its own experience."

There are weak points in his arguments, some of which are well pointed out in an able article in the *British and Foreign Medico-Chirurgical Review* (July, 1845), but it is the work of a strong and thoughtful mind, and for a time, at least, it had a powerful influence in the profession. A contemporary writer, Samuel Henry Dickson,<sup>5</sup> speaks of it in the following terms: "It was particularly well-timed, and addressed effectively to the requirements of the profession, at the period of its publication. It breathes a spirit of thoughtful and considerate skepticism, which was then needed to temper the headlong habit of confident polypharmacy prevalent over our country.

. . . When addressed, however, by Bartlett, on this side of the Atlantic, and on the other by Forbes, he (the orthodox disciple) stopped to listen and consider. These gifted men spoke with authority; they pleaded impressively, eloquently, wisely. If, in the natural ardor of controversy, they went somewhat too far, let that slight fault be forgiven for the great good they accomplished. Nay, let them be honored for the courage and frankness with which they attacked prevalent error, and risked their popularity and position by

<sup>5</sup> Gross: American Medical Biography, 1861, p. 750.

assailing modes of practice rendered familiar by custom, and everywhere adopted and trusted to."

In 1848 appeared one of Bartlett's most characteristic works, a little volume of eighty-four pages, entitled, "An Inquiry into the Degree of Certainty of Medicine, and into the Nature and Extent of its Power over Disease." The iconoclastic studies of Louis and certain of the Paris physicians, and the advocacy of expectancy by the leaders of the Vienna school, had between 1830 and 1850 disturbed the profession not a little, and in 1846 appeared an article by Dr. Forbes, in which, as Bartlett said, were drawn "in strong and exaggerated colors the manifold imperfections of medical science and the discouraging uncertainties of medical art." These circumstances had combined to shake and disturb the general confidence in the profession, with the effect that "the hold which medicine has so long had upon the popular mind is loosened; there is a widespread skepticism as to its power of curing diseases, and men are everywhere to be found who deny its pretensions as a science, and reject the benefits and blessings which it proffers them as an art." To Bartlett it appeared high time to speak a clear and earnest word for the science which we study and teach, and for the art which we inculcate and practise, and in this essay he set himself the task of vindicating the claims of medicine to the regard and confidence of mankind. In his endeavor "to show how far and with what measure of certainty and of constancy we are able to control, to mitigate and to remove disease" Bartlett occupied at the outset very advanced ground for that date. We must remember that the general body of the profession had the most implicit confidence in drugs, and polypharmacy was almost as much in vogue as in the seventeenth and eighteenth centuries. The reception of the essay in certain quarters indicates how shocking its tone appeared to some of the staid old conservatives of the day. I came across a review of it in the *Medical Examiner*, November, 1848, from which I give the following extract: "This is a curious production, the like of which we have seldom seen from the pen of any one who had passed the age of a sophomore. What makes it the more remarkable is the circumstance that the writer is a gentleman of education and experience and the author of works which have given him a wide reputation." The force of the rebound sufficiently indicates the intensity with which

The  
Degree of  
Certainty  
of  
Medicine.

the attack was felt. Bartlett's position, however, reminds one somewhat of the sermon of the liberal Scotch Presbyterian on "things which cannot be shaken," in which he proceeded at the outset to shake off three-fourths of the cherished beliefs of Evangelical Christianity.

After a preliminary discussion on anatomy and physiology, and on the remarkable rapidity with which these sciences were progressing, he proceeds to speak of the state of pathology and therapeutics as illustrated in the well-known disease pneumonia. Time will not permit me to do more than to refer to the result of his analysis of the evidence. He classifies the cases into, first, those which terminate naturally and spontaneously, quite independent of any active medical treatment, a proportion "probably large"; second, a group which will terminate fatally notwithstanding any assistance which art may furnish; they are, as Sir Gilbert Blane said of the worst forms of yellow fever, "determinedly fatal;" and, finally, a third class "not tending necessarily either in one direction or the other," in which the issue depends upon the treatment of the disease. "In these cases, art, judiciously applied, saves the life of the patient; the issue of the cases, in death or in recovery, is dependent upon the treatment of the disease." Then follows a discussion on the nature and limits of the medical art in the various groups of diseases, and he concludes with a section on the triumphs of preventive medicine.

The initials "A. S." at the end of a review in the *American Journal of the Medical Sciences*, October, 1848, enable us to estimate the impression which the book made upon a kindred spirit. Professor Alfred Stillé, of the University of Pennsylvania (still with us, I am happy to say), wrote, "He has done a good work, a work for which he deserves the respect and gratitude of the medical profession, and of all sound-hearted men, whatever their pursuits, who fight under the banner of truth, and are the sworn foes of all imposture, the determined opponents of all error."

At times, and in degrees differing with our temperaments, there come upon us bouts of depression, when we feel that the battle has been lost, and that to fight longer is not worth the effort, periods when, amid the weariness, the fever and the fret of daily practice, things have gone against us; we have been misunderstood by patients, our motives have been

wrongly interpreted, and smitten perhaps in the house of our friends, the worries of heart to which we doctors are so subject makes us feel bitterly the uncertainties of medicine as a profession, and at times make us despair of its future. In a voice that one may trust Bartlett concludes his inquiry with these memorable words, which I quote, in the hope that they may soothe the heartache of any pessimistic brother: "There is no process which can reckon up the amount of good which the science and art of medicine have conferred upon the human race; there is no moral calculus that can grasp and comprehend the sum of their beneficent operations. Ever since the first dawn of civilization and learning, through

A noble  
tribute  
to our  
profession.

'the dark backward, and abyssm of time,'

they have been the true and constant friends of the suffering sons and daughters of men. Through their ministers and disciples, they have cheered the desponding; they have lightened the load of human sorrow; they have dispelled or diminished the gloom of the sick-chamber; they have plucked from the pillow of pain its thorns, and made the hard couch soft with the poppies of delicious rest; they have let in the light of joy upon dark and desolate dwellings; they have rekindled the lamp of hope in the bosom of despair; they have called back the radiance of the lustreless eye and the bloom of the fading cheek; they have sent new vigor through the failing limbs; and, finally, when exhausted in all their other resources, and baffled in their skill — handmaids of philosophy and religion — they have blunted the arrows of death, and rendered less rugged and precipitous the inevitable pathway to the tomb. In the circle of human duties, I do not know of any, short of heroic and perilous daring, or religious martyrdom and self-sacrifice, higher and nobler, than those of the physician. His daily round of labor is crowded with beneficence, and his nightly sleep is broken, that others may have better rest. His whole life is a blessed ministry of consolation and hope."

The last of Bartlett's strictly medical publications was a little monograph on the "History, Diagnosis and Treatment of Edematous Laryngitis," published in Louisville at the time he held the chair of practice at the University, in 1850. It is a carefully prepared monograph, based largely on the

Edematous  
Laryngitis.

studies of Valleix, and to which a fresh interest had been given him by the observations of Dr. Gurdon Buck, of New York, who had cured several cases by directly scarifying the edematous membranes.

## IV.

ORATOR  
AND POET.

Naturally studious, fond of poetry, history, biography and literature in general, and not for long tied and bound in the chains of general practice, Bartlett had ample opportunities to cultivate his mind. He says in one of his letters to Green (dated Pittsfield, Nov. 1, 1835): "I pass a good deal of my time here quite alone, so that I find myself whiling away the hours in meditation much oftener than when engaged in the more varied and active affairs of business at home. I think that I always leave Pittsfield with the better and purer part of my being somewhat strengthened." Burton concludes his immortal treatise with the advice: "Be not solitary, be not idle," but the true student in some part of his life at least, should know the "fruitful hours of still increase." For many years Bartlett enjoyed a leisure known to-day to few professors of medicine, the fruits of which are manifest in his writings. Among his contemporaries in the profession there were brilliant writers, — Samuel Henry Dickson, Jacob Bigelow, J. K. Mitchell, — but in a style so uniformly high and polished, yet withal so plain, not one of them approached Bartlett. Compare, for example, Samuel Jackson's "Principles of Medicine," written in 1832, with the first edition of the "Fever" (1842) — the one pompous, involved, obscure; the other clear, direct, simple. For style in his medical writings Bartlett may be called the Watson or the Trousen of America.

Bartlett was at his best in the occasional address, and, as we have noticed already, this talent was cultivated very early in his career, since we find him giving the Fourth of July oration before his fellow-citizens when he had been scarcely a year in Lowell. All of the lectures and addresses illustrate, as Holmes said, "that easy flow of language, that facility of expression, that florid warmth when occasion offers, which commonly marks the prose of those who are born poets." Among these addresses there are four or five worthy of a per-

manent place in our literature. Perhaps the most characteristic is one entitled, "The Head and the Heart, or the Relative Importance of Intellectual and Moral Education," which is a stirring plea for a higher tone in social and political morality. In the same clear, ringing accent he speaks in his address on Spurzheim of the dangers of democracy. In a lecture on the "Sense of the Beautiful," delivered in 1843, Bartlett appears as an apostle of culture, pleading in glowing language for the education of this faculty. One short fragment I must quote: "Amongst the Hebrews, and in the age of Moses, it was linked to religion; it dwelt amidst the mysteries of Worship and Faith. It brought costly offerings to the costlier altar; it hung the tabernacle with its curtains of fine twined linen, and blue, and purple, and scarlet; and with cherubim of cunning work; it arrayed the high priest of Jehovah in his gorgeous and consecrated garments, and on the mitre of pure gold upon his forehead, it graved, like the engraving of a signet—Holiness to the Lord. At a later day, and amongst a widely different people, it became the handmaid of a refined and luxurious sensuality. It lapped the soul of Greece in a sensual elysium. Its living impersonations were Pericles and Aspasia. It called the mother of love from the froth of the sea, and bound her zone with its cestus; it filled the hills of Arcady with fleet Oreads; it graced with half naked Naiads the fountains and the rivers. It crowned the Acropolis with the Parthenon, and it embodied its highest conceptions of physical grace and beauty in the Venus and the Apollo. At other periods during the history of our race, it has manifested itself in other forms than these; under other circumstances, aspects and influences, and with other results."

In 1848 he delivered the Fourth of July oration before his old friends in Lowell. At the opening he refers to the fact that twenty years before he had occupied the same position. "It was the dewy morning of my manhood; 'time had not thinned my flowing hair'; life, with its boundless hopes and its golden visions, spread far and fair before me; and cheered by your words of encouragement, and aided by your helping hands,—your associate and co-worker, and in your service; a stranger, but welcomed with frank confidence and trust,—I had just entered upon its arduous and upward pathway."

The Head  
and the  
Heart.

The Sense  
of the  
Beautiful.

Fourth, of  
July  
Oration.

William  
Charles  
Wells.

In 1849 appeared a "Brief Sketch of the Life, Character and Writings of William Charles Wells," the South Carolinian Tory, who subsequently became a distinguished man of science in London, and who was well known for his researches on the phenomena of dew.

Discourse  
on Hip-  
pocrates.

One of the last of Bartlett's publications was "A Discourse on the Times, Character and Writings of Hippocrates," delivered as an introductory address before the trustees, faculty and medical class of the College of Physicians and Surgeons, at the opening of the session of 1852-53. The three pictures<sup>6</sup> which he gives of Hippocrates, as a young practitioner in the Isle of Thasos, at the death-bed of Pericles, and as a teacher in the Isle of Cos, are masterpieces worthy of Walter Savage Landor. In no words of exaggeration the late George D. Prentice said, "There are but few word pictures in the English language that exceed the grandeur and loveliness of that one called into being by Dr. Bartlett in which he imagines Pericles upon his death-bed with Hippocrates in attendance."

It is remarkable how many physicians write poetry, or what passes as such. I have been told of a period in the history of the Royal College of Physicians of London when every elect (censor), as they were called, had written verses. Some begin young, as did Bartlett; others become attuned in the deep autumnal tone of advancing years, when, as Plato tells us in the *Phaedo*, even Socrates felt a divine impulsion to make verses before quitting the prison house. Those of us who have read the epic of the late distinguished Professor George B. Wood, of the University of Pennsylvania, entitled, "First and Last," published when he was sixty-four, will devoutly hope that professors of medicine, when afflicted with this form of madness, will follow his example and publish their poems anonymously and in another country. Jacob Bigelow, too, when nearly seventy, "darkened sanctities with song" with his American "Rejected Addresses" (Eolopoesis).

Dr. Bartlett had poetical aspirations early in life. In a letter to his sister of Dec. 3, 1826, he speaks of having seen in New York, in the *Garland*, "two fugitive pieces which some months before I had made use of to fill up the corner of a newspaper, but what sense they might have contained had

<sup>6</sup> The reader will find these pictures in an appendix to this lecture.

been turned into nonsense, and I blushed for my wandering orphans, notwithstanding they had been so well dressed, and though they had found their way into pretty respectable company. I should have blushed for myself had they been exhibited to the public as my offspring." In another letter of the same period we see how completely he had passed beneath the yoke of Byron.

In December, 1854, Bartlett issued a little volume entitled, "Simple Settings in Verse, for Six Portraits and Pictures from Mr. Dickens's Gallery," the inditing of which had been, as he says, a pleasant occupation which had helped to while away and fill up many an hour which would otherwise have been weary or vacant in his invalid life. I have already spoken of one, "An Allegory," in which are autobiographical details. I cannot do better than to quote from an appreciative notice which his friend Oliver Wendell Holmes wrote of the little volume. "When, to the friends he had loved, there came a farewell gift, not a last effort of the learning and wisdom they had been taught to expect from him, but a little book with a few songs in it, songs with his whole warm heart in them, they knew that his hour was come, and their tears fell fast as they read the loving thoughts that he had clothed in words of natural beauty and melody. The cluster of evening primroses had opened and the night was close at hand."

Of a warm, affectionate nature,—a manhood fused with female grace,—to judge from the statements of contemporaries and friends, to know Bartlett was to love him. Alonzo Clark writes to him always as "Dear Brother," and says in one place, "We all wish that you were among us—not to work unless you choose, but that we might see that face of yours, and feel the influence of the mind that shines through it." His confrères, John Orne Green and Alonzo Clark, are invariably addressed as "Dear Brother." Among the letters is one of sympathy to Dr. Green, the desire of whose eyes had been taken away at a stroke. In it Bartlett unlocked his heart in a most touching and human appeal to the afflicted soul. It seems almost too sacred to quote, but after listening you will forgive me:

"MY DEAR BROTHER: What shall I say to the melancholy allusion, in the close of your letter, to the death of our

Simple  
Settings in  
Verse.

A Message  
of Comfort

dear Minerva? What poor words of mine can be of any service to one on whom the hand of the Great Chastener has been so heavily laid? How shall I, whose life has been comparatively so cloudless and serene, come, with the message of solace and encouragement, into the presence of one whose meridian sun has been shrouded in such utter and dreadful eclipse? But why should I not? Am I not a brother and a man? Has not bereavement been a guest in the dwelling of my childhood; has not death been a familiar visitor amid the scenes of my early friendships and happiness and hopes? And where, too, is the future — for us all — for me, as well as for yourself? We but follow each other through the furnace of affliction, as we follow each other to the grave. Who of us has so hedged in his earthly treasures that the spoiler cannot easily break through the frail enclosure, and rifle him, in a moment, of the choicest and best? The lines of the Christian poet, familiar to me, chiefly, from the lips of a now sainted mother, occur to my memory here :

\* The spider's most attenuated thread  
Is cord, is cable, to man's tender tie  
On earthly bliss; — it breaks at every breeze.\*

We are brothers, then, in all the liabilities and contingencies and uncertainties of the future. Let us be brothers and fellow-helpers, also, in its hopes and its duties. There can be no entire and hopeless wretchedness for the soul of man, except that which arises from its self-inflicted degradation. The sweet sister, the affectionate daughter, the beautiful bride, and the young mother, was taken away in the clear, unclouded morning of her life — taken away, but where? And by whom? The flower was transplanted from an earthly garden — a fair and sunny one, it is true, but from an earthly garden — to be set forever where no worm can feed on its root, where no decay can ever dry up its bloom — in the Paradise of God. By whom? Taken away — by her Father, from a far-off country, where she was only a sojourner or a pilgrim — to her beautiful and eternal home. Take these thoughts into your heart, and they shall lighten up, or drive away, the darkness of the past, and, what is better, they shall again cheer your future with the once familiar forms and faces of Happiness and Hope. How can we know what, even of present good, our indulgent Father may have in store

for us? He may have allotted to you many long years, to be filled up first with duty, and, if filled with duty, to be crowned, also, with the cheerful light of social and domestic joy. You may say, perhaps, that this is all very well for me to say, but that I know nothing about it. But I do know something of the mutability of all earthly things. This uncertainty has long been to me a daily theme of meditation; so I am not wholly a stranger. But I have found an antidote to the gloom and sadness which would otherwise occasion in remembering that all things are in the hands of a Wise Disposer, and the surest way to please Him, as well as to secure our own present as well as future peace, is to submit to His dispensations and to follow on in the course of active and cheerful duty to Him, to our fellows and to ourselves."

When at Louisville some obscure nervous trouble, the nature of which I have not been able to ascertain, attacked Dr. Bartlett. Against it in New York he fought bravely but in vain, and after the session of 1853-54 retired to Smithfield, his native place. The prolonged illness terminated in paralysis, but, fortunately, did not impair his mental faculties in the slightest degree. He died on the 19th of July, 1855.

From the many eulogies which appeared after Bartlett's death, I select a portion of one written by his dearest friend, Alonzo Clark, as the preface to the fourth edition of the "Fever." "Sixteen months ago, he closed his brilliant professional career, after years of growing bodily weakness and pain; his mind not dimmed by his physical infirmities, but bright and comprehensive, glowing with the memories of the past, and the visions of the future. He died too soon for the profession he adorned. The clock had hardly marked twelve at noon, on the dial plate of life, when its pendulum strokes grew faint and gradually fainter to the ear; and now, at length, when all is still, the hand that notes the hours points sadly upward, to indicate how much of daytime still remained to reap the harvest of affection and honor, in those fields from which he had already garnered up so many golden sheaves. He died, alas! too soon. The whole profession are his mourners; for conspicuous as he had become by his medical writings and his extended professional labors, his acknowledged worthiness, his innate gentleness and modesty

Illness and  
Death.

Alonzo  
Clark's  
Eulogy.

disarmed envy. He left no enemies. His mind and purpose were pure, almost beyond example. His high mental endowments were controlled and directed by a considerate judgment and an earnest, benevolent heart: and as the laws of refraction, wrought out into mathematical formulæ, enable the lapidary to construct the facets which open the fountains of the many-colored diamond, so, for him, cultivation and elegant taste had brought out the varied and winning native lights of his rich, intellectual, moral and social nature."

In translating the "Lives of Eminent French Physicians," Bartlett said he had a two-fold object: "First, the delineation of distinguished professional character and attainment, and, secondly, by the influence of such high examples to awaken in the younger members of the medical body a more devoted and worthy emulation of the great masters of our art." In this spirit I appear before you to-day, glad to tell over the story of your countryman — the story of "a life in civic action warm," one that all "the muses deck't with gifts of grace," a distinguished teacher, an author of widespread influence and distinction, a serene philosopher, but above all a man in whom you may recognize, even from the brief and imperfect sketch which I have given,

"A likeness to the wise below,  
A kinship with the great of old."

Do. 2. 2. 2

## APPENDIX.

### A SKETCH OF HIPPOCRATES.<sup>1</sup>

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In one of the years of the 88th Olympiad, in the island of Thasos, fronting the Thrasian city of Abdera, there was sadness in the house of Silenus, for its young master had been seized with sudden and alarming illness—the fiery *causus* of the climate. The year had been marked by some meteorological and epidemic peculiarities. A little before the rising of Arcturus—that is, just previous to the autumnal equinox, and while this constellation was still upon the horizon, there had been heavy and frequent rains, with winds from the north. Towards the equinox, and up to the setting of the Pleiades, there were light rains with southerly winds. During the winter, the winds were cold, strong, and dry from the north, with snow. Towards the vernal equinox, there were violent storms. The spring was cold and rather wet, with winds from the north. Towards the summer solstice, there were light rains and the temperature was cool till near the approach of the dog-days. After the dog-days and until the rising of Arcturus, the summer was marked by great heat; not at intervals, but constantly. There was no water. Summer-etesien-winds were prevalent. From the rising of Arcturus to the time of the equinox, there were rains with the wind from the south.

During the winter, the general health of the Thasians was good, excepting an epidemic prevalence of paralysis. At the opening of spring, the *causus* showed itself, and continued to prevail up to the autumnal equinox. During the early part of the season, the disease was mild; but after the autumn rains, it became more severe, and carried off a great many of its subjects. . . . Dysenteries prevailed also during the summer; and some patients with fever even, who had had hemorrhages, were attacked with dysentery: this happened to the slave of Eraton, and to Myllus. . . . There was much sickness amongst the women. . . . Many had difficult labors, and were sick subsequently; this was the case with the daughter of Telebolus, who died on the tenth day after her confinement. . . . When the *causus*

<sup>1</sup> From a Discourse on the Times, Character, and Writings of Hippocrates, by Elisha Bartlett.

proved fatal, death commonly took place on the sixth day, as in the cases of Epaminondas, Silenus, and Philiscus, son of Antagonas. . . . The parotid glands suppurred in the case of Cratistonax, who lived near the temple of Hercules; and also in that of the servant of Scymmus, the fuller.

But omitting any further details of the prevailing diseases of the year, let us return to the bedside of the young patient in Abdera. It is the third day of his disease; he has had a restless and distressed night, with some wandering of the mind; the symptoms are all worse in the morning, and his family and neighbors are anxious and alarmed. The occupations and order of that old Thasian household are interrupted and broken up. A fresh offering has been placed on the altar of the household Jove, standing in the centre of the inner court. The sound of the flute and the cithera has ceased; there is no animated talk of the last winners at the Isthmian or the Olympian games; the clatter of the loom and the domestic hum of the spinning wheel are no longer heard; the naked feet of the slaves and the women fall carefully and silently upon the uncarpeted floors, and an unwonted stillness reigns throughout the numerous apartments of the dwelling. There is no savory steam of roasting wild-boar from the kitchen, and the fragrant Thracian wine stands untasted on the table, with a few plain barley-cakes and a little salt fish.

Silenus lies in his sleeping chamber, in the quiet interior part of the house, adjoining the apartments of the women, farthest from the vestibule, and near to the garden. By the bed of the sick man, there is a small tripod stand, with a circular top, and upon it there is a statuette of Hercules, a bowl of warm barley-water, and a cup of oxymel.

Leaning her head on the foot of the bed and sobbing, sits, on a low stool, a young Greek woman, beautiful in her features, and graceful in the flowing outlines of her person, as the Thessalian maidens of Homer. There is a picturesque combination of barbarian rudeness and Grecian elegance in her appearance, not an unfitting type and expression of the age and state of society, in the midst of which she lived. Her feet and ankles are bare; she wears only a single garment — the long Ionic chiton of linen — with large sleeves reaching only a little below the shoulders, leaving uncovered, in their snowy whiteness, arms that might have rivalled those of the jealous queen of Olympus. A girdle fastens the robe loosely round a waist, like that of the Medician Venus, innocent of the deformities of buckram and whalebone. The light auburn hair is simply parted and carried back from the forehead, gathered in a knot on the crown of the head, fastened with a golden grasshopper, and held by a coil of golden network.

At the head of the bed, watching steadfastly and earnestly the appearance of the patient, is seated his physician, the already celebrated son of Heraclides and Phenaretos, Hippocrates of Cos. He has just entered the apartment, to make his morning visit. His sandals have been taken off, and his feet washed by a slave in the vestibule. He wears over his linen tunic a large flowing mantle of light fine woolen, suited to the season, not unlike the later toga of the Romans, fastened at the neck with a cameo of Æsculapius, and falling in graceful folds nearly to his feet. His hair is long, and both this and his beard are kept and arranged with scrupulous neatness and care. He is thirty years old, in the very prime and beauty of early manhood. His features, through these misty shadows of many centuries, we cannot clearly distinguish, but we see that his face is dignified, thoughtful and serene; and his whole aspect, manner and expression are those of high, antique breeding, of refined culture, and of rather studied and elaborate elegance.

His examination of his patient was long, anxious and careful. He saw at once that the gravity and danger of the disease had increased since his last visit. He inquired very minutely into the manner in which the night had been passed; and was told by the watchers that the patient had had no sleep, that he had talked constantly, had sung and laughed, and had been agitated and restless. He found the hypochondria tumefied, but without much hardness. The stools had been blackish and watery, and the urine turbid and dark colored. He noticed the temperature and feel of the skin, and he studied for a long time and with great solicitude the general manner and appearance, the decubitus, the breathing, the motions, and especially the physiognomy of the patient. The only circumstance in the examination that would have particularly attracted the attention of a modern witness of the scene, would have been his omission to feel the pulse. With this exception, no examination of the rational symptoms of disease could have been more thorough and methodical.

Having satisfied himself as to the state of his patient, he retired to an adjoining room, followed by some of the attendants, to give directions in regard to the few simple remedies that he intended to use. The patient had already been bled, and had had a purgative of black hellebore. Hippocrates directed, that instead of the strained decoction of barley, which had been the patient's drink, he should now have honey and water—the favorite hydromel—that the bed should be made softer—the windows of the room still farther darkened, and that a warm flax-seed poultice, softened with olive oil, should be applied to the abdomen.

With a sad but decided expression of his fears as to the issue of the case, and a few kindly and pious words to the weeping

wife, about the dignity, the solace, and the duty, in all our trials, of submission to the will of the gods, he gathered his mantle gracefully about him, had his sandals refitted by the slave who waited in the vestibule, and proceeded on his daily round of visits among the houses of the city.

And now, leaving the sterile island of Thasos, let us follow the young physician to another sick chamber — to a scene of domestic life, still further illustrative of that remote and wonderful period, with which we are concerned.

The time is a year or two later — it is the house of Pericles that we enter, and we stand by the death-bed of the great and venerable Archon. Every thing in the spacious apartment indicates the pervading presence — not of obtrusive grandeur, or of showy and ostentatious wealth, — but of stately elegance, and of high, various, many-sided luxury, culture, and refinement. Philosophy, letters, and art breathe in the quiet atmosphere of the room; and the taste of Aspasia sheds an Asiatic grace over its furnishing and its decorations. In one corner stands a statue of Minerva, from the chisel of Phidias; and the walls are covered with pictures, fresh from the pencils of Panaenus and Polygnotus, illustrating the legendary and historic glories of Greece. There might have been seen Thèseus, bearing off from the field of victory, on the banks of the Thermódon, the masculine and magnificent queen of the Amazons — half willing, perhaps, to be the captive of such a victor; Jason, in his good ship Argo, with his fifty selectest heroes, convoyed by the queen of love, the awful Hère, and Apollo, winds his various and adventurous voyage, crowded with poetic imagery and romantic incident, and brings back the golden fleece from Colchis; — Helen, at her loom, is weaving into her "golden web" the story of the Trojan wars; — the chaste Penelope, by the light of her midnight lamp, undoes the delusive labors of the day; — Ulysses, returned from his long wanderings, surveys once more, with boyish pride and delight, the dear old bow, which no arm but his could bend.

The central figure on that old historic canvas that I have endeavored to unroll before you, is that of the dying statesman. Raised and resting, in solemn and august serenity, upon its last pillow, lies that head of Olympian grandeur, which — I may say it without presumption — after the lapse of nearly twenty-three centuries, now finds, for the first time, its fitting representative and likeness — as the character and career of the great Athenian find their counterparts also — in that illustrious orator and statesman, who now walks in solitary majesty amongst us — the pride, the strength, the glory, of the Republic — the Pericles of our

Athens — whose Acropolis is the Constitution of his country — whose Propylæa are the freedom and the federation of the States.

Added to the calamities of that long and disastrous internecine struggle between the two rival cities of Greece, which had just begun, Athens was now afflicted with that terrible visitation of the plague, the history of which has been left to us by Thucydides; and Pericles was sinking under a protracted and wearing fever — the result of an attack of the disease.

His long and glorious life is about to close. He had been, for more than an entire generation — if never the first Archon, and not always the most popular — by common consent the most eminent citizen, statesman, and orator of the republic — the great defender of her constitution — the champion of her freedom and her rights — the upholder and the magnifier of her renown. Political rivals, disappointed partisans, and a few malignant personal enemies, and professional libellers and satirists, had been hostile to his career, and had endeavored to blacken his fair fame; but his strong and unshaken democratic faith — his far-seeing sagacity — his firmness and moderation — his enlarged, liberal, humanizing, conservative, and pacific policy — his moral courage and independence, and his high public probity, had triumphed over them all; and although by braving the prejudices of his friends and supporters, in his devotion to the general weal, he had gathered over his declining sun some clouds of public disfavor — the sense of justice, and the feeling of gratitude in the minds of his countrymen were quick to return — the clouds were already scattered, or they served only to deepen and reflect the setting splendor which, for a moment, they had intercepted and obscured.

Many of his near personal friends and relatives had already fallen victims to the pestilence. Both his sons had perished, and the young Pericles — the child of Aspasia — had been sent away, with his mother, for safety, into Thessaly. Phidias, and his old teacher, Anaxagoras, his

“ Guide, philosopher, and friend,”

had died a little while before the breaking out of the epidemic. Those who were left had now gathered around the bed of the dying Archon, to receive the rich legacy of his parting words, and to pay to him the last solemn and kindly offices of life.

Not often in the world's history has there met together a more august and illustrious company. These are a few of those whom we are able to recognize amongst them. Resting his head on the shoulder of Socrates, and sobbing aloud in unrestrained and passionate sorrow, leans the wild and reckless Alcibiades — just in

the first bloom of that resplendent personal beauty which made him seem to the eyes, even of the Greeks, more like the radiant apparition of a young Apollo, than any form of mere earthly mould — subdued, for the first time in his life, and probably for the last — by the spectacle before him, of his dying relative and guardian — to reverence, tenderness, and truth. Sophocles, his old companion in arms, is there; and near him, in his coarse mantle, and with unsandaled feet, may have stood a grandson of Aristides, still poor with the honorable poverty of his great ancestor.

Conspicuous amidst this group of generals, admirals, statesmen, orators, artists, poets, and philosophers,—in rank and fortune, in social position, in reputation, in learning, culture, and refinement, their equal and associate, sits the young physician of Cos. Already had his rising fame reached Athens, and when the city, overcrowded with the inhabitants of Attica, driven from their homes by the armies of Sparta, was smitten with the pestilence, he was summoned from his island home in the *Ægean*, to stay, if he could, the march of the destroying angel, and to succor with his skill those who had fallen under the shadow of its wings.

On a gentle declivity, looking toward the south-west, in the small island of Cos, lying in the *Ægean* sea, a few stadia from the coast of Asia Minor, stands the temple of *Æsculapius*. Its Ionic columns, and its ornamented friezes of Pentelican marble, glitter and flash in the sun-light, as we watch them through the swaying branches of the ancient oaks, chestnuts, and elms, that make the sacred grove of the temple. In the centre of the principal room, or cella, of the temple, and fronting the entrance, stand statues of *Æsculapius*, and his daughters, *Hygieia* and *Panacea*. On each side of the entrance are marble fountains of lustral water, for the preliminary purification of the sick visitors to the temple.

Near a column of the temple, and holding a roll of papyrus in his left hand, stands *Hippocrates*. Gathered about him, in picturesque little groups, there is a company of Greek youths. Their tasteful and elegant costumes, their earnest and intelligent faces, and their general air and bearing, all show plainly enough the superior refinement and culture of the class to which they belong. They are medical students, young *Asclepiades*, who have assembled here from the several states of Greece, to acquire the clinical skill and experience of the great surgeon and physician of Cos, and to listen to the eloquent lessons of the illustrious professor.

Thirty years have gone by since we met him at the bedside of the dying *Pericles*. The lapse of this generation has thinned his flowing hair, and sprinkled his beard with silver.

It would be gratifying if we could know something of his personal history during this long and active period of his life. We know but little, however, and this little is dim and shadowy. That he had led a life of activity and usefulness, and of growing reputation, and that he had visited various portions of Greece, is certain. What he himself had witnessed, and must have felt, we know well enough. He had seen, for this whole period, his country torn and distracted by civil war—state arrayed against state, city against city; he had mourned over the disastrous expedition of Athens against Syracuse; and shooting athwart all the murky darkness of this troubled and stormy period—instead of the benignant sun of Pericles—the baleful rays of the star of Alcibiades, setting at last, but too late for his country, in ignominy and blood.

I have not departed from the strictest limits of historical probability, in assigning to Hippocrates the high powers of didactic and persuasive oratory. One of the most potent agencies in the development of Greek intellect, and the advancement of Greek civilization, consisted in the general prevalence of public teaching and recitation. For many successive centuries, it was from the living lips of bards and rhapsodists, kindled with coals from the glowing altars of patriotism and religion,—and not through the medium of any cold and silent written records, that the immortal strains of the *Iliad* and the *Odyssey* rang through the land, and were made literally familiar as household words. Even up to an advanced period of Grecian culture, the art of writing was but little practiced; and it was by speech, and not by reading, that statesmen, poets, orators, philosophers, and historians acted upon their disciples and the public. Then, the evidence derived from his writings is full and conclusive, that Hippocrates was not merely a skillful physician, but that he was learned in all the philosophy and literature of his age. Plato speaks of the Asclepiades, his cotemporaries, as men of elegant and cultivated minds, who, in the explanations they give to their patients, go even to the heights of philosophy. It is no violation, then, of historical probability, to presume that the great philosophic and practical physician—who had been trained in this unrivaled school of human speech—who had listened to the eloquence of Pericles in the public assemblies, or been charmed by the “colloquial magic of Socrates,” in the market-place, should have been himself, also, a master of this high power of instructive and persuasive speech. It is by no forced or illegitimate exercise of the fancy, that we look back to the scene I have endeavored to sketch. And with little danger of departing far from the truth, we may imagine what would be likely to constitute the theme of his discourse, especially if the occasion was one of unusual interest or solemnity,

such as the opening or closing of one of his courses of instruction — the Introductory Lecture — or the Valedictory Address to the graduating class of the school of Cos, at the term of the first year of the 95th Olympiad.

The character of Hippocrates, his position, his close observation of nature, his knowledge, his philosophy, the times in which he lived, the circumstances which surrounded him, all conspired to make him a polemic and a reformer. He would probably take such an occasion as that of which I am speaking, to lay down and to vindicate the great principles of his system; and he would be likely to begin with an exposition of the errors of medical doctrine and practice, most important and most generally prevalent. I do not suppose that our illustrious historical father was wholly exempt from the infirmities of our common nature; and it is very possible that in his animadversions upon the system of his Cnidian neighbors, there were mingled some ingredients more spicy than Attic salt; and he may have indulged, perhaps, in some allowable self-congratulation, that the class of Cos was so much larger than that at Cnidus.

I suppose, however, that as President of the college, he would, in a graceful and dignified exordium, give his greeting and welcome to the members of the class; he would express his gratification at seeing so numerous an assemblage from so many of the states of Greece — from the North and the South, the East and the West — from Attica, and Beotia, and the Peloponnesus — from distant Sicily, and even from Egypt.

After this, or some similar appropriate introduction, he would probably continue by warning his hearers against the subtle and dangerous errors of superstition — of the old theurgic faith. He would speak of the great revolution that had so recently taken place in the Greek mind, even then only partially accomplished; he would describe in colors such as only he could use, who had felt this change in his own spirit, and who had witnessed it all about him — the gradual dawn and the final rising of the central, solar idea of a simple spiritual theism, of fixed laws, of invariable relations and sequences of events, in the economy of nature. As he sketched the outlines of this great and pregnant history, he could hardly fail to linger for a moment, with something of the passionate enthusiasm of his early years, and with something also of their strong and simple faith, upon that gorgeous theurgic and mythological creation of the Greek mind, which marked its legendary and religious period. He would speak of this mythology, and its various and beautiful legends, in no cynical or bigoted tone, but with philosophical toleration, and with something even of loving sympathy and admiration. He would say it was the genial and natural product of the quick, susceptible, many-sided Greek

mind, in the period of its childhood and adolescence. Kindling with his old enthusiasm, he would have likened that early age, peopled with its gods and demi-gods, its beautiful women and heroic men, to its own young Apollo — the bloom of immortal youth on his beaming forehead, his flowing locks sweet with the ambrosia of the dewy morning of life, and all his form radiant with a divine beauty. He would have said that the present high civilization of his country was in a great degree the growth of seed planted in that genial soil, and nurtured by that genial sun; that Greek character, and art, and philosophy, are all still steeped in the glorious light of the old Homeric age.

In the third place, he would have warned his hearers against the seductive but dangerous influences of the philosophers. These men, he would have said, are, for the most part, idle dreamers, and they are nothing else. I know them well. They affect superior wisdom, and they look down disdainfully upon the physician, and the patient observer of nature. They seem to think that the economy of the universe, including the human system, in health and disease, can be ascertained and understood by a sort of intellectual divination, which they call wisdom and philosophy, but which is in reality only empty hypothesis and idle speculation. He would then have entered into an examination of these systems; he would have exhibited their radical errors and defects — he would have compared them with the humbler philosophy of observation and experience, and he would have shown that they had accomplished nothing, and that in the very nature of things they could accomplish nothing, for the advancement of real knowledge.

As he gazed upon that most impressive spectacle before him,— so many of his young countrymen, gathered at the peaceful summons of science and humanity from all portions of the Grecian territory, filled with hope, with ardor, with promise, life's full and radiant future stretching far and fair before them,— a cloud of sadness could hardly fail to throw its shadow over his features, as he remembered the long thirty years of civil discord, of deadly internecine strife, through which his country had just passed; and his closing words could hardly fail to rise into a patriotic and Pan-Hellenic hymn, the burden of which should be, that the glory, and happiness, and safety of Greece, were to be found in the union of her states; that they whom he addressed — his young friends and disciples — were the common and equal heirs of the glory of Marathon and Thermopylae; that they all spoke the language of Homer; that while they need not forget, but might be proud even, that they were Spartans, or Athenians, or Thebans, or Thessalians, they ought to remember with a higher pride, that they were also, and more than all, Greeks; that they had a common country, and that a common destiny awaited them.

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An Address

ON

JOHN LOCKE AS A PHYSICIAN

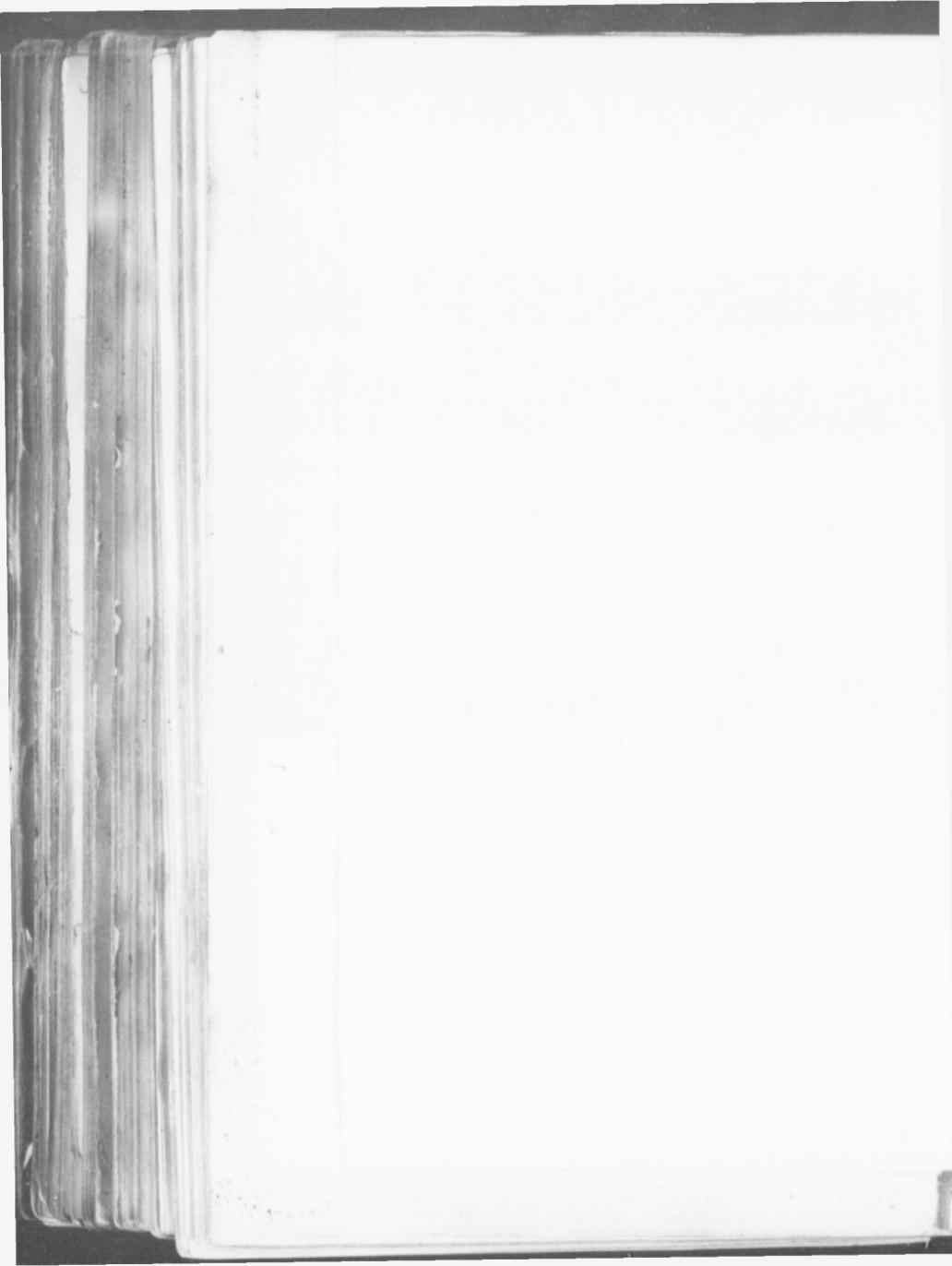
*Delivered before the Students' Societies of the Medical  
Department of the University of Pennsylvania,  
on Jan. 16th, 1900.*

BY

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Do. 22

## An Address

ON

### JOHN LOCKE AS A PHYSICIAN.

GENTLEMEN,—Among the great men of the seventeenth century not one has more enduring claims to our grateful remembrance than John Locke—philosopher, philanthropist, and physician. As a philosopher his praise is in the colleges. As the apostle of common sense he may be ranked with Socrates and a few others who have brought philosophy from the clouds to the working-day world. Of his special virtues and qualifications as the typical English philosopher nothing need be said, but were there time I would fain dwell upon his character as a philanthropist—in the truest sense of the word. The author of the *Epistle on Toleration*, the *Treatise on Education*, and the *Constitution of Carolina*, the man who pleaded for "absolute Liberty, just and true Liberty, equal and impartial Liberty," the man who wrote the memorable words, "All men are naturally in a state of freedom, also of equality," must be ranked as one of the great benefactors of the race.

With the faculty Locke's connexion has usually been described as "loose and uncertain." Indeed, we knew him chiefly as a friend of Sydenham. Until the appearance of Fox-Bourne's "Life" it had not been recognised that he was at times an active practitioner, and that throughout the greater part of his long life he was ready to treat cases and to give advice; still less was it known that he was a writer of medical essays, and that he had left a large body of clinical reports and papers. I had become familiar with his professional relations through John Brown's essay, "Locke and Sydenham," and many additional details are given in the "Life" just referred to, but for the more important facts I have made a careful study of the Locke MSS. in the British Museum and in the Record Office.

## I.—LIFE.

Let me first give a brief summary of Locke's life. He was born in the county of Somerset in 1632, the son of an attorney who at the outbreak of the civil war joined the Parliamentary side. Of his boyhood and early education but little are known. In 1646 he entered Westminster School under the famous Dr. Busby, where he had as fellow students Richard Lower, Walter Needham, and John Wapletoft, who subsequently became well-known physicians. In 1652 he entered Christ Church, Oxford, and received his B.A. degree in 1655 and the M.A. in 1658. In the following year he became senior student or Fellow of Christ Church. In 1660 lecturer on Greek, and in 1662 lecturer on rhetoric. In 1665 he served as secretary to the embassy of Sir Walter Vane to the Elector of Brandenburg. Until 1660 a student of classics and rhetoric, Locke appears to have been at a loss to know exactly what calling to follow. Thoroughly disgusted, he had broken with the old scholastic philosophy and, imbued with the new learning of Bacon and Descartes, felt what Donne calls "the sacred hunger of science." But what probably turned his attention most actively to medicine was the presence in Oxford of the celebrated Robert Boyle, who with his associates had formed a scientific club, the "invisible college," which became the nucleus of the Royal Society. Letters of this period show Locke to have been busy with experimental physics, working at problems suggested by Boyle, taking daily notes on the weather (a practice which he kept up for many years), and gradually becoming well versed in the sciences cognate to medicine. Unfortunately we have very little information as to the character of his medical studies, which seem, however, to have been of a rather desultory nature, as he did not comply with the very easy requirements for the degree. On these Fox-Bourne makes the following comment: "All that was expected from an applicant for a bachelorship in physic was regular attendance during three years at the lectures of the Arabic professor and of the professors of anatomy and medicine, together with participation in a certain number of disputations in the medical school, and after that little more than a delay of four years was necessary to qualify him for the doctorship. The medicine lectures, delivered every Tuesday and Friday morning during term, were limited to an exposition of the teaching of Hippocrates and Galen. For anatomy, the students had in the spring to attend the dissecting of one human body and to hear four lectures, each two hours long, upon it, and in the autumn to hear three lectures on the human skeleton." These requirements, however, were not complied with, and in November, 1666, he attempted to have a dispensation so that he could obtain the doctorship without previously becoming a bachelor. The request of Lord Clarendon, however, was not heeded, owing probably to the fact that Locke belonged to the Puritan party. During these years he seems to have been intimately associated with Dr. David Thomas,

at that time a practitioner at Oxford. He writes to Boyle in February, 1666-67: "Mr. Thomas presents his humble service to you. He and I are now upon a new sort of chemistry; that is, extracting money out of the scholars' pockets, and if we can do that, you need not fear but that in time we shall have the lapis, for he that can get gold and silver out of scholars cannot doubt to extract it anywhere else." Though political influence was unavailing to procure the doctor's degree without complying with the regulations, it was potent enough to secure him in his senior studentship at Christ Church, a position usually held only by persons in holy orders, and this post, with the salary attached to it, Locke enjoyed till his expulsion in 1684.

Locke did not receive the bachelorship of medicine until 1674, in which year he was appointed to one of the two medical studentships at Christ Church, and it was supposed by his friends that this was a step preliminary to taking the doctor's degree, but to this he never proceeded. In 1666, when acting as an assistant to Dr. Thomas, Lord Ashley, afterwards the first Earl of Shaftesbury, the celebrated Achitophel of Dryden's satire, came to Oxford to drink the waters of the Astrop wells. He was the subject of a remarkable malady of which I shall subsequently give a detailed account. Dr. Thomas, to whom he had written to have the waters ready for him, was away but had left word with Locke to get them, and as there was some trouble and delay Locke called on Lord Ashley to apologise. There was a mutual attraction and from this acquaintance began a friendship between the two men which had important results, as in the following year we find Locke installed at Exeter House, the London residence of Lord Ashley, as physician and literary factotum.

From this date until 1675 Locke lived in Lord Ashley's family, occupying himself in all sorts of miscellaneous duties, some domestic, as finding young Anthony Ashley a wife, whom he subsequently attended on several interesting occasions. One duty which interests us in America very much is the share which he took in the Carolina colony. As secretary to the Lords Proprietors he was appointed one of the Landgraves and wrote, it is supposed, the celebrated "Fundamental Constitutions of the Government of Carolina," the original draft of which (in his handwriting), with many alterations and erasures, may be seen in the Record Office. The celebrated clause, "No person whatsoever shall disturb, molest, or persecute another for his speculative opinions in religion or his way of worship," expresses the spirit of toleration for which Locke strove all through his life. Subsequently, after Lord Ashley was raised to the peerage as the Earl of Shaftesbury, Locke became Secretary of Presentations. During all this period he was deeply interested in medicine and was in intimate association with Sydenham, with Mapletoft, and with other well-known physicians of the day, though it was not until 1674 that he took his M.B. at Oxford. About this time he began to suffer much in his health and in 1675 he went to France, where

he remained, chiefly at Montpellier and Paris, for four years. His journals during this period, which are very full, indicate his continued interest in the profession, though, as he writes to Mapletoft, "My health, which you are so kind to in your wishes, is the only mistress I have a long time courted, and is so coy a one that it will take up the remainder of my days to obtain her good graces and keep her in good humor. She hath of late been very wayward, but I hope is coming about again." In another letter he says: "For I doubt whether all the ortolans in France be able to communicate to me one grain of their fat, and I shall be well enough at my ease if, when I return, I can but maintain this poor tenement of mine in the same repair it is at present, without hope ever to find it much better. For I expect not that Dr. Time should be half so favourable to my crazy body as it has been to you in your late disease. 'Tis a good mark, but may have other dangers in it; for usually those whom that old winged gentleman helps up the hill are not yet got out of the reach of the winged boy who does such mischief with his bow and arrows."

From 1679 to 1684 Locke was again with Lord Shaftesbury, busily occupied in public business, though still maintaining an intimate association with Sydenham and his medical friends. After Lord Shaftesbury's death Locke himself fell under suspicion of having taken part in schemes against the Crown and from 1683 to 1689 found it safer to live in retirement in Holland. In 1684, by the peremptory order of the King, he was dismissed from his studentship in Christ Church. At the Revolution he returned to London and became actively engaged in literary and political work. Failing health compelled his retirement to Oates, in the neighbourhood of London, where, with Lady Masham and her daughter, he found a delightful home. He died quietly in 1704.

No member of our profession of any age or any country has made so many important contributions to philosophy and practical politics as Dr. Locke. Professor Fowler remarks that the views published in his treatises on Government, Religion, Toleration, Education, and Finance form new points of departure with which no writer on the history of these subjects can dispense. The same writer says of the effect of his writings on the history of progress and civilisation: "In an age of excitement and prejudice he set men the example of thinking calmly and clearly. When philosophy was almost synonymous with the arid discussion of scholastic subtleties he wrote so as to interest statesmen and men of the world. At a time when the chains of dogma were far tighter and the penalties of attempting to loosen them far more stringent than it is now easy to conceive he raised questions which stirred the very depths of human thought. And all this he did in a spirit so candid, so tolerant, so liberal, and so unselfish, that he seemed to be writing, not for his own party or his own times, but for the future of knowledge and of mankind."

## II—LOCKE AND SYDENHAM.

The story of the friendship of these two great men has been told in a delightful way by the late Dr. John Brown, but he knew nothing of the Shaftesbury papers or of several other important manuscripts which have come to light since his essay was published. Sydenham, eight years Locke's senior, had taken the M.B. of Oxford in 1648, four years before Locke entered Christ Church. There is no evidence to indicate that these well-paired friends, as Fox-Bourne calls them, had met before Locke went to London with Lord Ashley in 1667. In the following year we find them practising together, Locke accompanying Sydenham on his rounds and much interested in the new plan of treating small-pox. In 1668 Sydenham wrote to Boyle: "I perceive my friend Mr. Locke hath troubled you with an account of my practice as he hath done himself in visiting with me very many of my variolous patients especially." But the best evidence of Locke's practice at this time and of his intimacy with Sydenham is found in his own handwriting in the British Museum in a bundle of original medical papers presented by William Seward. They consist of 17 small quarto pages, closely written, containing the reports of interesting cases which have been well summarised as follows by Fox-Bourne: "He was attending a kitchen-maid of the Ashley household who was afflicted with dropsy in September, 1667, and again in January, February, and March, 1667-8, and May and June, 1668. In April and May he prescribed for a hard cough with which one of his cousins, a boy of 14, and the son of his uncle, Peter Locke, was troubled, and he cured one young child of inflammatory fever in June and another of hysterics in November of the same year. He visited a 'sturdy youth' laid up with rheumatism, every day between August 23th and Sept. 19th, when he left him to continue using the medicine he had prescribed for him, and on March 1st, 1668-9, he was able to declare him convalescent. In the same March he treated a girl for fever, besides prescribing for two or three minor maladies; and in May, 1669, he cured a case of angina pectoris. We have no record of any other medical work done by him in 1669; but he had cases of erysipelas and gonorrhoea to deal with in January, 1669-70; one of quartan ague in March, another malady, morbilli, with which William Sydenham, apparently the son of his great friend, was afflicted, in the same month; two of dropsy in April and May 1670; one of inflammatory fever which he treated nearly every day from the 26th of June till its fatal issue on the 11th of July; a case of disease of the kidneys, and another of stricture, in July; one of colic in August, and one of fever which occupied him every day from the 19th of August till the 2nd of September, when the patient died."

The case which Fox-Bourne refers to as angina pectoris may have been of this nature, though the disease was not recognised for a little more than a century later. The phrase is "suffocationem patiebatur et angostiam pectoris et circum

collum." The report on the son of Sydenham, a lad, aged 11 years, who had measles, is very complete. The case seems to have been a very characteristic one: onset with cough, a chill and fever, and with slight running at the nose. On the fifth and sixth days a very abundant rash appeared on the face first, then spread over the whole body. Quite minute details are given—the state of the tongue, the state of the rash, and the condition of the eyes. By the ninth and tenth days the rash had disappeared. The notes are continued until the thirteenth day. Then follows a series of interrogations as to points in the case.

Evidence of their friendship exists in the comments and annotations which Sydenham has made in his own hand on some of Locke's writings, and the great interest which Locke took in those of Sydenham. In the second edition of Sydenham's "Methodus Curandi Febres" there is inserted after the preface a Latin poem of 54 lines signed, "J. Locke." It was Sydenham's purpose at a later date to write a separate work on small-pox, and for this Locke prepared in 1670 a dedication and a preface, neither of which were used, and which will be referred to later. During Locke's long residence in France in his letters there are frequent references to Sydenham and frequent inquiries after his health, particularly in the letters to Mapletoft, who was a mutual friend. He also consulted Sydenham about Lady Northumberland's illness. It was probably before leaving England that Sydenham gave Locke the advice in a letter the original of which is in the Record Office.

*Sydenham to Locke.*—"Your age, ill habit of body and approach of winter concurring, it comes to pass that the distemper you complain of yields not so soone to remedies as it would do under contrary circumstances. However, you may not in the least doubt but that a steady persisting in the use of the following directions (grounded not on opinion but uninterrupted experience) will at last effect your desired cure. First, therefore, in order to the directing and subduing also the ichorose matter 'twill be requisite to take your pills twice a weeke or for example every Thursday and Sunday about 4 o'clock in the morning and your clyster in the intermitting days about 6 constantly till you are well. In the next place, forasmuch as there is wanting in bodies broken with business and dispirited upon the before-mentioned accounts, that stock of naturell heat which should bring the matter quickly to digestion 'twill be highly necessary that you cherish yourself as much as possibly you can by going to bed very early at night, even at 8 o'clock, which next to keeping bed that is impracticable will contributt more to your reliefe than can be imagined. As to diett all meals of easy digestion and that nourish well may be allowed, provided they be not salt, sweet or spiced and altho excepting fruits, roots and such like. For wine a total forbearance thereof if it could possibly be and in its steede the use of very mild small beere, such as our lesser houses do afford,

would as near as I could guess be most expedient, for thereby your body would be kept cool, and consequently all accidents proceeding from hot and strange humors grating upon the part kept off. As to injections, in your case these things dissuade the use of them—First, your more than ordinary bothe naturall tenderness and delicacy of sense. Then the blood that has twice already bin fetched by this operation, which if we are not positively certaine (as how can we be) that it proceeded not from the hurt of the instrument will (if often repeted) endanger the excoriating the part and making it liable to accidents. Besides they have bin already used (perhaps as often as is wont to be don) and this is not a remedy to be long persisted in by the confession of everybody. Sure I am as I have over and over sayd to you and you know it to be true by my written observations which you have long since seen, that I never use any where I am concerned alone, there being noe danger nor less certainty of a cure in the omitting and in relation to this business I have now asked myselfe the question that I would doe and have resolved that I would lett them alone.

"This is all that I have to offer to you and I have thought of it all circumstances relating to your case, with the same intention of mind as if my life and my sons were concerned therein.

"Notwithstanding that by this way the cure is certainly to be effected, yet nevertheless I fear that in ancient bodyes, especially in the debilitating part of the year, some little kinde of glecting or moisture (but void of all malignity) will now and then appear by reason of the weakness of the part and will scarce totally vanish till the return of the warm spring."

Sydenham's chief merit is that he taught the profession to return to Hippocratic methods of careful observation and study. He and Locke were kindred spirits in their manner of looking at the phenomena of disease and in their methods of work. Nothing could be more like Sydenham's plan than that which Locke urges upon his friend Dr. Molyneux, "I perfectly agree with you concerning general theories—the curse of the time, and destructive not less of life than of science—they are for the most part but a sort of waking dream, with which, when men have warmed their heads, they pass into unquestionable truths. *This is beginning at the wrong end*, men laying the foundation in their own fancies, and then suiting the phenomena of diseases, and the cure of them, to these fancies. I wonder, after the pattern Dr. Sydenham has set of a better way, men should return again to this romance-way of physic. But I see it is more easy and more natural for men to *build castles in the air of their own than to survey well those that are on the ground. Nicely to observe the history of diseases in all their changes and circumstances is a work of time, accurateness, attention, and judgment*, and wherein if men, through prepossession or obstinacy, mistake, they may be convinced of their error

by unerring nature and matter of fact. What we know of the works of nature, especially in the constitution of health and the operations of our own bodies, is only by the sensible effects, but not by any certainty we can have, of the tools she uses, or the ways she works by."

In another place he makes use of an apt illustration, saying: "Whether a certain course in public or private affairs will succeed well—whether rhubarb will purge or quinquina cure an ague can be known only by experience." Locke in one place gives an excellent estimate of Sydenham (vol. ii., p. 343, Fox-Bourne): "I hope the age has many who will follow his example, and by the way of accurate practical observation which he has so happily begun, enlarge the history of diseases and improve the art of physic, and not by speculative hypotheses fill the world with useless though pleasing visions."

Locke's personal intercourse with Sydenham came to an end in 1683 and Sydenham's death in 1689 terminated a friendship of 20 years which, as Fox-Bourne remarks, "If it may have done much towards inclining the greatest of English philosophers to pursue his early studies in physic, cannot but have also had a considerable effect in quickening the philosophical temper of the greatest of English physicians." With Boyle, also, Locke's relations seem to have been very intimate from the days when at Oxford he was a member of the "invisible college." Boyle was intensely interested in medicine and was perhaps the best amateur student which the profession has ever had. There is no work from which one can gain a better idea of the state of medicine about the middle of the seventeenth century than the "Experimental Philosophy," the second part of which is a review of the state of medicine with many suggestions for its improvement. In 1683 Boyle dedicated his "Memoirs for the Natural History of the Human Blood" to "the very ingenious and learned Dr. J. L.," at whose request he had undertaken the work.

### III.—LOCKE'S MEDICAL REMAINS.

Locke's medical remains consist of (1) the record of certain remarkable and historic cases; (2) a group of medical essays; and (3) certain journals and commonplace books which contain memoranda and notes of cases. 1. Of the notable medical cases two deserve full consideration, the hydatid of the liver in Lord Shaftesbury and the *tic douloureux* in Lady Northumberland.

*Lord Shaftesbury's case.*—The case of suppurating hydatid cyst of the liver is given with unusual fulness and accuracy. I do not remember in seventeenth-century literature a more accurately reported case. It is one of the first instances of operation on hydatid cyst; the consultation on draining of the abscess and the discussion on the propriety of wearing the silver tube give us a unique symposium of medical opinion among the leading consultants of the day, and,

lastly, Shaftesbury's tap—as the silver tube was called—has an interest in the satirical literature of the day. No single circumstance better illustrates John Locke as a physician than the elaborate details which he has left on record of his most celebrated patient the first Lord Shaftesbury. This remarkable man is satirised by Dryden in the well-known lines:—

"Of these the false Achitophel was first;  
A name to all succeeding ages curst;  
For close designs and crooked counsels fit;  
Sagacious, bold, and turbulent of wit;  
Restless, unfix'd in principles and place;  
In power unpleas'd, impatient of disgrace—  
A fiery soul, which, working out its way,  
Fretted the pigmy body to decay,  
And o'er-inform'd the tenement of clay."

Fox-Bourne, commenting on the physical description of Lord Shaftesbury given by Dryden as a "pigmy body," states that this must have been used by poetic licence, as "he was reckoned a handsome man in his day."

In the fragment of an autobiography<sup>1</sup> there is an account of remarkable attacks of abdominal pain when Shaftesbury was only 18 years of age. "At the hunting I was taken with one of my usual fits, which for divers years had hardly missed me one day, which lasted for an hour, betwixt eleven and one, sometimes beginning earlier and sometimes later betwixt those times. It was a violent pain of my left side, that I was often forced to lie down wherever I was; at last it forced a working in my stomach, and I put up some spoonfuls of clear water, and I was well, if I may call that so when I was never without a dull aching pain of that side. Yet this never abated the cheerfulness of my temper; but, when in the greatest fits, I hated pitying and loved merry company, and, as they told me, was myself very pleasant when the drops fell from my face for pain; but then, my servant near me always desired they would not take notice of it, but continue their diversions, which was more acceptable to me; and I had always the women and young people about me at those times, who thought me acceptable to them, and peradventure the more admired me because they saw the visible symptoms of my pain, which caused in all others so contrary an effect."

Though the special malady which brought Locke and Shaftesbury into the relations of physician and patient has an extraordinarily full history, the statements with reference to it in the authorities are somewhat meagre. Fox-Bourne says ("Life," vol. i., p. 197): "But it would seem that Lord Ashley being himself in bad health and suffering from a malady that no physician could explain, and that was every day becoming more painful ..... and having, moreover, formed a very high opinion of the mental and moral

<sup>1</sup> *Memoirs, Letters, and Speeches of Anthony Ashley Cooper, First Earl of Shaftesbury, Lord Chancellor.* Edited by W. D. Christie, 1859, p. 32.

worth of his new friend—persuaded Locke to reside with him as physician to his family." Then, again (vol. i., p. 200): "The internal malady from which Lord Ashley had been suffering ever since 1661, and which had been the accidental ground of his acquaintance with Locke in 1666, now caused him great agony, and in spite of all Locke's efforts to alleviate it by medicinal treatment, threatened to kill him. 'My Lord Ashley is like to die,' wrote Pepys on the 19th of June, 1668, 'having some imposthume in his breast, that he hath been fain to cut into his body.' That operation was performed, and Ashley's life was saved, by Locke." It is often referred to as an abscess of the side or as an empyema and is spoken of as following an accident.

In the Record Office there are four transcripts of the case in Locke's handwriting. The most complete is in Latin, of which the following is a translation :—

"*The case of the most Noble Lord Anthony Ashley, Baron of Winburne, St. Giles, &c.*—This most noble lord, aged 45, of very slight build and delicate constitution, had been an invalid for many years, and was exceedingly subject, upon the slightest cause, to a recurrent yellow jaundice. There was a painless internal tumour, broad, and slightly projecting, about the anterior region of the liver, and his hypochondria was very apparent to the touch. Although it had been observed 12 years before, the exact time when the tumour first began is uncertain. For since the colour of the skin was unchanged and no swelling was apparent externally, unless the hand were applied it easily escaped the eye; nor through the whole 12 years did it seem to change in the least. The doctors called into consultation on this point, amongst whom were some from the excellent London college, were inclined to the opinion that this firm and unchanging extuberance was not a morbid tumour, but rather some congenital and unusual malformation of the liver. However the patient himself suspects, not without reason, that the tumour first came into existence in the year 1656, especially as at that time ..... he used to fatigue himself overmuch. By too frequent over-exercise his blood became so heated that his skin would immediately be suffused with a deep redness, and his whole body seemed to be inflamed, all which gave rise to a burning fever. From this time on he was conscious of a complete change in the general condition of his body. Whereas before he was troubled more frequently with pains in the left side, and other splenic symptoms, from now on he escaped absolutely free from these troubles, and in their place acquired a constitution prone to other disorders, and especially susceptible to morbus regius.<sup>2</sup> From the prolonged languor brought on by this disease, when his emaciated body and impaired strength would threaten death, he was frequently restored by the timely use of acidulae, by means of which he obtained relief for one or two years, and was carried through so

<sup>2</sup> Jaundice.

many vicissitudes of health, scarcely escaping with his life, until last summer. Then, happily, an internal abscess at last broke out, bringing to a head the source of so many disorders. There is one thing here which I cannot pass by, and that is that the patient's head never once ached though more than fatigued by disease. This, however, is not the only marvel displayed by that head.

During a bad night about the end of May, 1668, he was suddenly seized with excessive vomiting, accompanied by much disturbance. Everything he had eaten in the preceding meal was rejected, still raw and undigested, in repeated vomitings. He was purged next day by Dr. Glisson, the learned physician-in-ordinary. On the following morning he appeared discoloured a rusty red, which the physician tried to remedy with suitable drugs. But although the face seemed to return a little to its proper appearance, so that he could go about the ordinary duties of life, nevertheless, the languor and loss of appetite returned, anti-icterics and chalybeates being administered in vain. Moreover, about the beginning of June, since all the symptoms were running from bad to worse, the physician prescribed a purging pill to be taken at bedtime. When the patient raised himself up in bed to pass his urine about midnight he was suddenly seized about the region of the stomach and liver with a most acute pain which lasted the greater part of an hour and was finally relieved by resting comfortably in bed. When after an hour or two he again sat up in bed the same excruciating pain returned. Again one hour afterwards he got up, and in the same way when he raised himself upon his buttocks the pain attacked him for the third time, and after a like interval left him. Next morning at 8 o'clock, shortly after taking a purging potion he vomited it up mixed with viscid phlegm. After a while he left his bed, his servants taking him in their arms and placing him upright on his feet, so that his body should nowhere be bent. The cathartic had a satisfactory effect and he was purged. However, though he turned his body, he did not dare bend it, lest the severe pain should come on again. In the evening he began to suffer most acute pain in the back about the loins. This ceased after a quarter of an hour, and at the same there suddenly sprung up below the ensiform cartilage a soft tumour the size of an ostrich egg. It was yielding to the touch, but on being compressed it did not for a moment retain any traces of the fingers. The skin was a brown (?) colour. There was hardly any pain, and no inflammation. This tumour could not be broken up by the drugs which were administered for six or seven days. Then physicians and surgeons were called into consultation and on June 12th it was opened by the application of cautery. This fact is worthy of observation: before the opening of the tumour a somewhat tenacious and flexible plaster fastened itself so firmly to the skin at the border of the tumour that it could not be torn away without leaving behind a large part of its substance; while, on the other hand, the top of the tumour, about the width of an English

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half-crown or more, was not even discoloured by it, nor was the plaster at all adherent in that part." The daily record of the case is in English.

"The 12th of June, 1668, in ye morning a caustick was applied and ye same opened in ye afternoon, at wh. dressing besides a large quantity of purulent matter, many bags and skins came away. The like hapned the next day (being Saturday) both in ye fore and afternoon. On Sunday morning (being ye 14th) at ye first drawing out ye tent, a great quantity of yellow choler gushed out and two or three sluffs, wth some tollerable matter at ye latter end, for ye evening only a little matter came forth. And ye like on Monday both morning and evening.

On Tuesday morning a great quantity of matter came forth, with many bags to ye number of at least 80, for ye afternoon little or nothing, and so also on Wednesday.

On Thursday morning we had a new flux, both of matter and skin, in ye afternoon nothing considerable.

A Friday a wax candle was put deep into ye abscesse, and after ye drawing it out some matter and divers sluffs proceeded, in ye afternoon nothing.

20. On Saturday morning and evening some matter followed and above 10 bags. The passage could not be found.

21. On Sunday a wax candle put in of four and three-quarter inches and there left until evening, then drawn out without matter.

22. Monday morning. No running: a sponge tent put in for ye afternoon  $\frac{5}{3}$  iii matter, bags above 20.

23. Tuesday morning. No running,  $\frac{5}{3}$  i of injection for ye evening  $\frac{5}{3}$  iii or liii injection, part whereof wh. some matter came away and about 10 bags. About two hours after more came and so ye next morning, at my Lds. rising and about 10 bags at both times.

24. At ye dressing in ye morning, nothing came. Of injections  $\frac{5}{3}$  v. or vi., about three in ye afternoon a great flush brought away about 50 sluffs, whereof most were bags (but not red as formerly by reason of the injection) and some like jelly. At ye evening dressing no running. A glove thick spung tent left in ye orifice.

25. Morning. It ran of itselfe a little before dressing. Injection being made there came forth much thin digested looking matter, somewhat fetid with about 12 bags, whereof one very large. A spung tent put in. In ye evening injection, which came away next morning before dressing wth four or five sluffs.

26. A Friday morning, injection was made & some thin matter came forth. A short spung tent put in: in ye afternoon some matter, but no sluffs.

27. Upon ye drawing out ye spung tent matter followed wth six or seven sluffs. Of injection being made whereof much stayed behind, in ye afternoon ye spung tent being pulled out, a great flush of matter followed, wth almost 20 sluffs. Of injection was made whereof a great part staid in. A hemp tent was put in. Some matter came out in ye night & left a yellow tincture on ye cloths.

28. Pulling out ye tent, some yellow matter came out with three or four skins. A spung tent put in. The like issued in ye afternoon. Of injection was made & a flax tent put in.

29. It ran in ye night. Next morning after injection a flush of yellowish matter issued with 18 sluffs. A spung tent put in, after injection, whereof a considerable part remained. In ye afternoon upon ye drawing out ye spung tent, much matter gushed forth, being somewhat fetid, with 12 or 14 sluffs and bags. On injection being made ye same came freely forth, tintured with matter. A flax tent was put in.

30. In ye morning little matter came out, yellow tintured, with one or two skins. A spung tent was put in. For ye afternoon a little matter, with two or three small sluffs. A flax tent put in.

July 1st. A Wednesday morning. After a second injection much yellow matter came forth with three or four yellow sluffs, & at last a considerable quantity of whitish well digested matter came out. A flax tent put in. At ye pulling out whereof in ye afternoon some thin matter proceeded & after injection more but little discolored & only two sluffs. A flax tent put in. My Ld. complained of a little paine, lower towards his right side.

2. Upon ye opening on Thursday morning, some little matter came away, but not fetid, rather of ye smell of wine, with one small sluff. A spung tent put in. In ye evening little came forth, no bags. A spung tent put in with one injection.

3. The spung tent being pulled out two yellow bags gushed out, without any considerable injected matter, and afterward five or six small sluffs with a little tinged liquor. Injection was made and spung tent put in.

4. Saturday morning. Upon pulling out ye tent little proceeded. After ye putting in ye small catheter & injection made considerable quantity of matter issued. A spung tent was put in; for ye afternoon a large quantity of well digested matter came out. No injection made. A spung tent put in.

5. Yellow matter came forth with four or five sluffs, whereof one great one sucked into ye end of ye siphon. After injection a spung tent put in, wh. in ye afternoon being pulled out a good quantity of matter followed, well digested, especially through ye small catheter and siphon. A few sluffs came out, one great one. A spung tent put in.

6. In ye morning ye small catheter & siphon were put in; divers sluffs, some after injections, came forth, whereof three or four large ones. A hollow tent was put in upon ye pulling out whereof a sluff came forth, with divers very little ones; more seemed to stop ye passage but could not issue, because ye thinner parts did run out before through ye hollow pipe. Neither did injection promote their coming forth, though some matter of a brownish colour came out.

7. Much yellow matter ran in ye night and some more this morning, with two or three sluffs. Injection was made, whereof ye greatest part came forth. A spung tent was put in. At night a sluff stuck to ye tent at its pulling

out & 4 or 5 more where 2 very yellow came afterwards. No injection. A silver hollow tent put in.

8. It run very much in ye night, ye napkin was stained with yellow and green, one bag. A sprung tent put in. In ye evening 4 or 5 sluffs, some matter. An open pipe put in.

9. Little run all night and sluff stopt ye pipe. One or two more followed, a considerable quantity of atheromatous matter. At night two sluffs; very little atheromatous matter.

10.<sup>2</sup> A great running through ye hollow pipe, two or three sluffs. The matter at last being whiter and more even than before. Much running till night. Some sluffs. Injection made and a hollow pipe put in, after most of ye injection was discharged. After this a pain supervened in my Ld's. back about ye region of his liver, & at night he vomited; and had a cold shivering; wh. seemed to proceed from somewhat too liberal diet that day & catching some cold.

11.<sup>3</sup> After a little sweat in ye morning, my Ld. was better. He was not drest till ye afternoon: ye ulcer having very much discharged itself in ye meantime; with some few sluffs.

12.<sup>3</sup> A little matter wth few sluffs. Injection made. A hollow pipe. At night run very little. Two sluffs.

13. Not drest in ye morning. Ran much. At night little matter, 2 or 3 sluffs.

14. It ran much yellowish gleet and matter in ye night. But upon ye opening no matter nor sluffs issued, though injection were made. At night one yellow sluff & a little good whitish matter.

15. In ye night it ran much yellow matter & about six small sluffs. Injection made. No meeting in ye afternoon.

16. Upon opening much running of yellow matter appeared, with 4 or 5 yellow sluffs.

17. A large flux of yellow liquid, wth 4 or 5 yellow sluffs, whereof two large ones sticking in ye pipe. Injection made.

18. It had run somewhat copiously before dressing, with ye ejection of one very small yellow bag. Injection being made brought forth some matter & a considerable quantity of very yellow liquor.

19. Little running before dressing, after it none, no injection.

20. Small quantity (!) of lesse yellow liquor run before dressing, 4 or 3 sluffs. Injection made.

21. Yellow liquor has continued running. No sluffs nor injection.

22. Some pretty laudable yellowish matter came out upon dressing. Injection was made.

23. A little matter issued upon coughing. No injection.

24. The like today.

25. A few small sluffs. Little matter & not yellowish. No injection."

<sup>3</sup> The sympathetic powder made use of.

From the long-standing character of the tumour and the character of the material which escaped—the innumerable bags—there can be no doubt that the disease was hydatids of the liver, which, remaining quiescent from 1656, had, as is so often the case, suppurated. It is one of the first instances on record in which the abscess was opened. The use of the sympathetic powder on the 10th, 11th, and 12th shows how strongly popular feeling had affected the profession.

Naturally, from the prominent position of the patient and the strange character of the disease, the case attracted unusual attention. The point that concerned Lord Shaftesbury himself most acutely was whether it was better to remove the silver drainage-tube or to keep it in. To get the opinion of the faculty on the subject, he sent, with Locke's assistance, a circular letter containing the following questions:—

“1. Which is most advisable, to resolve to keep it constantly open, or to heal it up as soon as conveniently may be?

2. Whether, if it be healed up at all, one of these two dangers is not like to follow; either a new collection of matter, the imposthume lying below ye orifice by which it vents itself, or a fever upon stopping of so considerable an issue?

3. Whether if it be to be healed up at all it be not necessary to keep it open as long as any flux of matter comes through the pipe more than would be from an issue of the Depth and Bigness of ye pipe?

4. Whether the pipe that is now in be not of the fittest length and bigness to be worn constantly to keep it open.

5. Whether whilst it is best open it be not best to dresse it but once in two days, especially in cold weather?

6. Whether whilst it is best open it be convenient to use any Injection, how often & of what sort & to what purpose?

7. Whether if it be kept long open it will be in danger of growing in a worse condition than a simple issue of that depth, either by turning to a fowle ulcer or a fistula or any other way, and if there be any such danger how to be prevented?

8. Whether the bare keeping in a Silver pipe will, without paine, keep it open as long as one pleases?

9. Whether I may travel in a coach, ride on horseback, boate, or use any such exercise safely with a pipe in of this length?

10. Whether if it be kept long open Nature will not in time so fortify the parts about the end of the Pipe as to make the danger it may bring by rubbing upon them in any exercise, very little or none at all?

11. Whether during the time it is kept open frequent purging be necessary and how often?

12. Whether if it should be kept always open it is not to be feared that a constant flux of matter from it, especially if

it should continue to be of any considerable quantity, may very much weaken and emaciate the body, & how to be prevented." (Handwriting not Locke's.)

To this circular there are among the Shaftesbury papers the replies of Locke, of Sydenham, of Glisson, of Sir George Ent, of Micklethwaite, of Timothy Clark, and of the Abbé Beaupreau of Angers, an eminent French physician. With the exception of Clark, who urged that the issue should be healed, the opinions agree in the main. They are too long to quote at length, but those of Locke and Sydenham are of sufficient historical interest to be given.

*"Consilium Abscessus (Locke).*

1. It is better to heal it up as soon as it may safely be done. Because it is not convenient to have a constant issue of that depth in that place if it might be remedied.

2. To secure from the danger of a new collection of matter I think it will be

3. Convenient not only till the flux of matter be no more than may be well expected from a flesh issue of that depth, but after it hath gradually decreased to that small thing, it be kept open at least three or four months at what time soever the flux come to that low ebb, but if it happen after Xmas, as in the spring, that it be kept open till the beginning of the next winter, that the flux be constantly and warily observed, and that it be sometimes diligently searched, so that by these ways all the security possible may be had that there is not the least sore or hollow left behind unhealed up. And to prevent a fever or other disorder in the blood upon its stopping up, it will be necessary then and sometimes after to use a spare diet with frequent purging, till Nature, used to the convenience of this discharge, may by degrees accustom herself either to master or vent her humors some other way.

4. The pipe now in I conceive to be of the proper length and bigness that may be to keep it open, which is not at all to be altered or shortened till you resolve to heal it up, for if you shorten it sooner you heal it sooner too, for the flesh will certainly grow up still & close the end of the pipe, though all is not secure behind. Nor do I see what harm the pipe can do in touching the bottom of the issue more than the sides, where nature equally endeavors to generate flesh to fill up the cavity as it does at the end. And if the pipe upon any motion of the body should perhaps grab a little (which I believe it will not be very apt to do) all the danger will be the filching a little blood from this new-grown flesh (for there can be no great vessels in that which may be in danger to be broken), which is not of half so much hazard, if any at all more than the pain, as to let it close up but one minute before the time. And to prevent any injury from the stiff silver pipe you may in travel or exercise use a wax candle tent exactly of the length and thickness of the silver pipe.

5. In cold weather once a day at most will be enough to dress it, and then the air of the room where it is dressed to be made as warm as conveniently may be.

6. In cold weather an injection warming and strengthening and resisting of putrefaction to prevent the harm that may come from the cold air may be convenient to be made use of as often as it may be dressed, but in warm weather may be wholly omitted. And certainly all the year once a week or fortnight an injection to prevent the growing of a fistula, putrefaction and a fistula being the two great evils that are to be feared and prevented in the long keeping of it open, which is also an answer to the

7. Seventh.

8. I suppose the silver pipe that is now in may be kept in as long as one pleases without danger or pain.

9. Travel & exercise with a tent of wax, or any such matter as will resist the closing of the sides but be pliant to the motions of the body, may be not only safe but usefull.

10. The longer the parts are used to the pipe the less danger will be from its hurting it, the parts accommodating themselves to the figure of the pipe which it constantly uses, and by degrees growing stronger and harder where they are pressed by it.

11. Whilst there is a design of healing of it up purging once a fortnight may be useful to divert the humors from flowing to that part, but else in respect of the health of the body I suppose there would be less need of purging during this vent (!) than at other times, and perhaps a care of diet will with more advantage to the health subtract the humors than purging, which being constant may have other inconveniency;

Or, 'tis to be hoped that whilst by careful dressing and injecting the wound is kept in good condition, and the constitution of the body in good temper by a regular diet, the flux will rather advantage than injure the health and strength of the body."

Sydenham's opinion is one of the few papers in his own hand. (Some of the words are very difficult to decipher.)

"I recommend it by noe means saff for his Lordshipp to stopp up the abscess, triall having once bin made of the unsuccessfullness of doing it & the flux of matter as yet seeming too much in proportion to the canale, and I judge it better to keepe it open with a silver pipe then a wax candle, in regard that from the use of a candle the matter will have the less opportunity to issue out & consequently the passage choak up. But I think 'twere better that the pipe were shorter because by the present length thereof his Lordshipp is liable to dangerous accidents from any unequal motion of the body which in process of time may easily happen from riding in a coach, stooping or the like: nor does it seeme to be suspected that the matter will not worke itself out when the orifice shall be kept open. I conceive it may somewhat contributt to the discharge of the matter if my Lord shall lie on his left side or much as he can in regard the impostume is depending it he shall

lie with his upper parts low. I hold it very useless to use irrigations of any sort because the cavity being depending, the liquor how agreeable soever in other respects will by lodgng itself in any little cavities beget new impostumortions (?) to which those irrigations administer matter and by this means the cavity still enlarged. I should thinke that a drying drinke, constantly kept to for ordinary drinke would be more conducive to the drying up of this flux of matter and sweetening the whole mass of blood and humors than anything whatsoever. Nor do I conceive that my Lord's spare habitt of body may discourage from this course, but rather contrary when 'tis notoriously known that on drying diett though used with greater severity than 'twill be necessary to put my Lord upon, hath after a while rendered bodies that before were very emaciated now plumper and vigorous. But what 2 draughts in a day can signifie and those too of a liquor so compounded that the greater respect is had to the oncertyne & constituell virtue of & the lesser to the certeyne and sensible qualitie of Driers I cannot imagine.

This therefore with submission to those who know more I should advise.

That nothing be done to the part savinge the use of a pipe that may be made somewhat shorter or to be lengthened with a wan (?) handle, that it be dressed once a day if the matter be much, once in 2 days if little.

That of the stronger sort of liquor halfe a pint be taken hott every morning 1 hour before his Lordship riseth and the same quantity at night as soon as he is in his bedd.

That the smaller liquor be constantly drunke at his meales and at other times.

That he purge or take a clyster every 5<sup>o</sup> or 6<sup>o</sup> day.  
Lett his Lpps. diett be in proportion to this way att least lett be avoided."

Then follow two prescriptions of the stronger and smaller liquors. The French Abbé, whose opinion is also given, was evidently very much impressed with a full report of the case as narrated by Locke. He says: "I can hardly determine myself whether I ought to admire more in it the wise and admirable proceedings of my Lord's physician or the exactness of the author of the relation both for the elegance of his style and his judicious remarks with which he hath illustrated his narrative."

Locke made inquiries everywhere of his professional friends as to the existence of similar cases, and among the papers there are three very interesting reports, one of a case of empyema opened by making an issue; another the case of James Oddy sent on Jan. 22nd, 1668, by F. Batteson, was in all probability a hydatid cyst, as when the side was opened matter like fish skins and white of eggs to the number of 40 and to the amount of one quart came out. The greater ones had lesser ones in them, like the seeds of a lemon. A third report was sent to Locke by Thomas Strickland of a man who fell into a languishing with great pain in his side and stomach, which persisted for a year or

so. When death was expected a great swelling arose in his side with infinite torment. A neighbour cut upon the head of the swelling with a penknife, "then came out several blathers like winde eggs, some as large as turkey eggs, others as hen eggs." It was open for a year, in which time over 400 of these came out. He afterwards regained perfect health.

The satirists of the day made great sport of the silver pipe which Lord Shaftesbury continued to wear for the rest of his life. The wits of the day called a sort of vessel with a turncock constructed for holding wine a *Shaftesbury* and his common nickname was "Tapski." Duke, an imitator of Dryden, describes him under the name "Antonius" in his lines—

"The working ferment of his active mind  
In his weak body's cask with pain confined  
Would burst the rotten vessel where 'tis lent  
But that 'tis tapt to give the treason vent."<sup>4</sup>

In Act III. of Dryden's *Albion and Albanus* the King was represented by a huge drawing of a man (meaning Shaftesbury) and several fanatical heads who sucked poison from him which runs out of a tap in his side. And again, in a mock account of an apparition stated to have appeared to Lady Gray, it says: "Bid Lord Shaftesbury have a care of his spigot; if he is tapt all the plot will run out."

A satire called "The Hypocrite," written by Carryl, concludes thus:

"The silver pipe is no sufficient drain  
For the corruption of this little man."

Shaftesbury appears to have enjoyed very good health and lived a very active, energetic life. I find a statement ("Raleigh Redivivus," page 48) that in the year 1672 it (the abscess) was "opened by Mr. Knolls, the surgeon, under the direction of Dr. Willis, and an issue inserted for the regular discharge of the humor." This probably refers to a subsequent blocking of the tube. As to his death, Christie in his *Life* (vol. ii., p. 455) says: "He was taken ill with the gout, from which of late years he had often suffered, about the end of December. The malady flew to his stomach; he suffered excruciating agonies; and he died in the forenoon of the 21st of January" (1683). Missal "mentions of one of the natural causes of Shaftesbury's death the sudden cessation of the discharge from his internal abscess," from which we may understand that he continued to wear the silver tube.

*Lady Northumberland's case.*—As this has already been published in full in the *European Magazine*, and as there is a note upon it in *THE LANCET*,<sup>5</sup> I will only give a brief abstract. The description is given in letters to his friend Dr. Mapletoft.

<sup>4</sup> Anderson's *Poets of Great Britain*, vi., p. 628.

<sup>5</sup> *THE LANCET*, vol. ii., 1828-29, p. 267.

Letter IX., Dec. 4th, 1677. After an apology for so unwelcome an occasion of writing Locke says: "On Thursday night last I was sent for to my Lady Ambassadrice, whom I found in a fit of such violent and exquisite torment that (though she be, as you know, a person of extraordinary temper, and I have seen her in the course of this distemper endure very great pain with a patience that seemed to feel nothing) it forced her to such cries and shrieks as you would expect from one upon the rack, to which I believe hers was an equal torment, which extended itself all over the right side of her face and mouth. When the fit came there was, to use my Lady's own expression, as it were a flash of fire all of a suddaine shot into all these parts, and at every one of those twitches which made her shriek out her mouth was constantly drawn on the right side towards the right ear by repeated convulsive movements which were constantly accompanied by her cries. This was all that appeared outwards in these fits according to the exactest observation I could make, having had but too many opportunities to do it. These violent fits terminated on a suddaine, and then my Lady seemed to be perfectly well, excepting only a dull pain which ordinarily remained in her teeth on that side and an uneasiness on that side of her tongue which she phansied to be swollen on that side, which when I looked on it, as I often did, had not the least alteration in it in colour, bignesse or any other way though it were one of her great complaints that there was scalding liquor in her fits shot into all that half of the tongue. She had usually a precaution of the fit by a little throbbing in the upper jaw just over against it. In all this time of her being ill she has not found the least pain in all the other side of her face and teeth, which has so wholly possessed the right side that it went even to the very tip of her tongue and the last tooth before on that side. When all this torment was over there was not the least appearance of any alteration anywhere on her face, no inflammation or swelling in her mouth and cheek; very little defluxion of rheum more than what the disturbance of those parts in these fits might cause. Speaking was apt to put her into these fits; sometimes opening her mouth to take anything or touching her gums, especially in the places where she used to find those throbbings, pressing that side of her face by lying on it were also apt to put her into a fit. These fits lasted sometimes longer, sometimes shorter, were more or less violent, without any regularity and the intervals between them at the longest not half an hour, commonly much shorter."

Locke then describes the treatment, topical anodyne applications to the gums, which gave relief. The next day the fits returned and she was purged. Bleeding was considered, but she had been so often and so much blooded on a like occasion this summer without help that Locke thought best not to do so again. The next night she took a quieting cordial, but during the first part had the fits very severely. He says, "I wish with all my heart you were here," as Lady Northumberland had had so little success with the French physicians.

that she would not call them. He asks "whether you do not think this to proceed from some affection in the nerves in the place where the tooth was drawn, which draws all the rest into consent and convulsive motions on this side?" At one o'clock in the afternoon he writes again that a blistering plaster has been placed on the back of the neck (interscapulus). "She has, especially when the fits are most violent a drinnesse in her lips more than ordinary." On Sunday night he writes with great satisfaction telling of her improvement, but he asks for the "best advice you can get." On the 22<sup>nd</sup> he writes: "On reading our friend's [Sydenham's] letter I was ready to cry out, 'The spirit of the Prophets is upon the sons of the Prophets,' I having in what I have done here not only proceeded by the same method, but used the very remedies he directed as to the maine." He speaks of the diet and says that he had advised an open-air life to strengthen the *genus nervorum*, as he thought that hysterical vapours increase the tumult and disorders in the nerves, in which he suspects an ancient fault as she has extreme and violent itching in the gums on that side long before the fits.

#### IV.—MEDICAL WRITINGS.

These consist of fragmentary papers, the chief interest of which to-day, is that they are from the pen of the great philosopher. They are among the Shaftesbury papers in the Record Office and I have had them copied with a view of subsequent publication. They are: (a) *Ars Medica or De Arte Medica*, an introduction to a treatise on the philosophy of medicine. One cannot read the fragment without feelings of deep regret that the design was not carried out. The scope of the intended work may be gathered from the following summary: "But, not to expatiate into the large field of natural philosophy, where perhaps the foundation of the mischief was first laid, I shall, according to my design, confine myself at present to that branch of it which immediately concerns the health of men; and, in physic, shall consider: 1. The present state of the faculty of medicine as it now stands, in reference to diseases and their cure. 2. The several degrees and steps whereby it grew to that height it is at present arrived to, which I suppose are these following: (1) experience; (2) method, founded upon philosophy and hypothesis; (3) botanics; (4) chemistry; (5) anatomy; in all which I shall endeavor to show how much each hath contributed to the advancing the art of physic, and wherein they came short of perfecting it. 3. What yet may be further done towards the more speedy and certain cure of diseases; i. e., by what means and method the practice of physic may be brought nearer to perfection" (b) *Anatomia*, a longer paper, in which Locke contends "that nature performs all her operations in the body by parts so minute and insensible that I think nobody will ever hope or pretend even by the assistance of glasses or other inventions to come to a sight of them." From the gross parts he thinks not

much can be learned. We "see not the tools and contrivances by which nature works." "Though we cut into the inside we see but the outside of things and make but a new superficies for ourselves to stare at." The paper is a forcible statement against the hope that anatomy can ever show the true essential causes of disease. It is quite possible that the article was prepared at Sydenham's suggestion or for his use, as at the top of the page in Sydenham's handwriting is the sentence: "Others of them have more pomposity and speciously prosecuted the promoting of this art by searching into the bowels of dead and living creatures, as well sound as disease, to find out the seeds of discharging them, but with how little success such endeavors have been or are likely to be attended I shall here in some measure make appear." (c) "Respirationis Usus," a short paper on the subject. (d) "Tussis," an essay on coughs, in which subject Locke took a personal interest. Here, again, is evidence of Sydenham's hand in a brief marginal note on cures done by riding in consumption and morbi obscuri. (e) A dedication and preface to a proposed work on small-pox by Sydenham. From the outset of their friendship Locke took a deep interest in the writings of Sydenham, and, as I have mentioned, he contributed a Latin poem in praise of him and of his methods to the second edition of the "Methodus Curandi Febres" (1665). It would appear that about 1670 Sydenham contemplated writing a separate work on small-pox, in the treatment of which he had had great success, but the physicians were at first very hostile to his new plan. Among the Shaftesbury papers are a dedication and a preface written by Locke. Sydenham had shared with his friend the professional care of the family of Lord Ashley and had tried with happy results his cooling regimen in cases of small-pox. In the dedication he (or rather Locke) says: "At least, my lord, I thought it reasonable to let you see that I had practised nothing in your family but what I durst own and publish to the world, and let my countrymen see that I tell them nothing here but what I have already tried with no ill success on several in the family of one of the greatest and most eminent personages amongst them." The preface is a sharp and stout defence of the new method, in which it must be confessed Locke does not spare the colleagues of his friend. "How much some of my own faculty have fomented and increased these reports, they themselves know, and with what design I leave it to their own consciences to tell them, only they must give me leave to say it would have become them out of common charity as good men, as well as out of an obligation to improve their art and save men's lives as physicians, upon the first intimation of an unusual method of curing so common a disease as this is, to have inquired more particularly of the way, observed the circumstances, and informed themselves of the events before they cried it down as dangerous and fatal, and frightened all that came within their reach from an enquiry into or trial of his method by the abhorrency they had given them against so bold and hazardous a practice." Evidently

Sydenham smarted under the calumnies and misrepresentations and the preface speaks of "the greatest indignities beyond almost the sufferance of a man, and the endangering not only of my reputation and livelihood, but even my life itself." The article is chiefly valuable from the account which it gives of the steps by which Sydenham was led to adopt his cooling treatment. Neither dedication nor preface was ever used. The projected work did not appear and many years later the "Observationes Medice," which contained his matured experiences, was dedicated to Mapletoft and another preface was used.

#### V.—JOURNALS, LETTERS, AND COMMONPLACE BOOKS.

A keen observer, a constant note-taker, and of most neat and accurate literary habits, Locke has left a large mass of manuscript, which has been carefully searched and sifted by Mr. Fox-Bourne, in whose life, as well as in that by Lord King, there are many letters and extracts illustrating his work as a physician. The letters to Mapletoft about Lady Northumberland have been referred to. Of the journals those of his Holland sojourn, which are said by Fox-Bourne to contain much of medical interest, I have not yet seen. In the British Museum is a very characteristic journal in which one may follow Locke's medical work for the year 1679. It is bound with an *Ephemera* or Calendar of the year. He was in Paris during the early months. As usual he was interested in bills of mortality and he states (Jan. 16th) that the deaths in Paris were from 19,000 to 20,000 a year. He makes a note to ask if the deaths of Quakers, Anabaptists, and Jews are recorded in London. On April 12th he comments on the handbills set up about town with a receipt to kill lice. There are many notes on the treatment of diseases and receipts, to the collection of which he seemed very partial. He queries whether the sympathetic powder could be of any use in dentium dolor, indicating that he still had a lingering belief in it. There are many notes on various topics and memoranda about books, &c. On May 8th he sailed from Calais. On June 4th are brief notes of a Mr. N., sick of a fever, whom he bled, and afterwards jaundice appeared. Notes on vomiting, diseases of the eye, icterus, hernia, hysteria, hypochondria, rheumatism, mania, and tussis occur in June. On August 18th he was sent for in consultation in the case of Mr. Beavis of Olanligh, Kent, and for the next six weeks the Journal is very full, containing a detailed account of the symptoms of Mr. Beavis and the treatment, many notes on the practice of Dr. Jacob the attending physician, and a characteristic description of two attacks of fever with which he was himself attacked. Mr. Beavis had a long illness, possibly typhoid fever, and it was not until the end of September that Locke left for London.

*The Bodleian Common-place Book with the Anecdota Sydenhami.*—This is a small folio, bound in parchment, which originally contained 400 pages, of which 247 are torn out. Dr. W. G. Greenhill published a part of the manuscript in 1845 as "Anecdota Sydenhami," and the following extract from the preface may be quoted: "They are taken from a MS. in the Bodleian Library at Oxford (Hawl. C. 406), very neatly (and for the most part very legibly) written, apparently about the end of the seventeenth century. The name of the writer is not mentioned nor is anything known of the history of the MS., except that it once belonged to Dr. Richard Rawlinson and forms part of the collection of MSS. bequeathed by him to the University of Oxford about the middle of the last century. At the beginning of the volume (of which about two-thirds have been torn away) are these words: 'Extracts of Sydenham's Physick Books and some good Letters on Various Subjects.' This is the whole of the *external* evidence respecting the genuineness of the following Anecdota; and perhaps, if there were nothing more to say in their favour, it might be doubted how far the editor was justified in giving them to the world under the sanction of the name of Sydenham: the *internal* evidence, however, is much more conclusive, and indeed to his own mind perfectly satisfactory. The writer professes to have been acquainted with Sydenham himself, and to have originally written the following Notes, partly from his dictation in the years 1682 1683, and partly from some of his MSS. written chiefly in 1670. These Notes he appears to have revised and written out correctly in their present form after 1685 (as he refers to the edition of Sydenham's Work published in that year), and (if the editor's conjecture at p. 69 be correct) before 1692, as that is the date of the first edition of the *Processus Integri*."

Apparently it was not until Mr. Fox-Bourne examined the manuscripts that it was recognised as belonging to Locke, whose handwriting is most distinctive. While largely made up of extracts from Dr. Sydenham's physic books, the *excerpta ex ore Sydenhami* dated 1682-83, show the maintenance at this date of an intimate professional relationship between the two great men.

The other medical papers in the volume illustrate the wide scope of Locke's inquiries. There are statements about the Peruvian bark and the best methods of its preparation. But the chief interest after the Sydenham notes relates to a sort of collective investigation which Locke instituted on public health. He seems to have had a deep conviction that much good would follow a careful study of the bills of mortality. His circular letter contains the following inquiries (MS., p. 68): "1. What bills of mortality are kept in foreign countries, either as to the diseases of which persons die, or the number who die weekly or yearly in the most capital cities or towns of Europe or other parts of the world, as Paris, Madrid, Amsterdam, Venice, Hamburg, Rome, Constantinople, Smyrna, Dublin, Edinburgh, &c., as also in New England, Barbadoes, Jamaica, and other Planta-

tions. 2. The aire of different countries, with the temper and alteration of the same at the different seasons of the year, and the diseases those countries are subject to and the time when. 3. The opinion physicians have of Jesuit's bark, and the best account they can give of it. 4. The esteem which physicians have had of Dr. Sydenham and his works. 5. The order observed in foreign countries as to physicians, surgeons, apothecaries and herbalists for the improvement of travellers and young students."

There are answers from several correspondents. Dr. Willoughby of Dublin (April 17th, 1691) gives a tabular account of the bills of mortality between 1682-90 (inclusive), and a description of the air of the country. He speaks of the Peruvian bark as "the only specific I know in nature." Of Dr. Sydenham he says, "he has been very honest in rescinding from Physick all the unnecessary pomp of alteratives and preparatives and reducing it to the use of the grand remedies which in Physick do justly fill both sides of the loafe." In another place is an account of Dr. Willoughby's proposal for the improvement of agriculture in Ireland, the important part of which was that every proprietor who will not improve his waste land shall make over four-fifths of it to the Crown. There is a brief statement of the Amsterdam bills of 1691 and 1693, and an account of Dr. Bett's proposal to the Lord Mayor for the improvement of the returns in London. There are letters from James Young of Plymouth about various diseases, and one from Dr. Eales (!) giving an account of Dr. Morton's books, in which "he has improved the hints of our good friend the great Dr. Sydenham admirably well." Dr. Patrick Dan sends a full statement about the mortality bills of Dublin, and pp. 93 to 96 of the MS. contain *in extenso* the death-rates from Jan. 1695 to April, 1698. Pages 110 to 357 are torn out, but from the index, pp. 369-371, we can glean the contents of the missing leaves—books whose authors are unknown, "books to be wrote," and "books wrote in defence of the murder of King Charles I.," with a long list of the authors, and about the "Eikon Basilike" and the various controversies upon it, extending from pp. 199 to 236.

Though qualified and deeply interested in both the science and the art of medicine Locke never became, as Fox-Bourne says, "in any orderly way a physician." Until he left England in 1683 "he was still waiting for an opportunity of devoting himself steadily to his favourite occupation. He was still generally spoken of by his friends as Dr. Locke, and he still regarded himself as before everything else a doctor." Hereafter questions of philosophy, finance, education, trade, theology, &c., occupied his busy life, but through it all, and to the very end, there are references in his letters and journals to show that his first love was not forgotten. In the memorable and oft-quoted letter to Dr. Thomas Molyneux in praise of Sydenham's method, Jan. 20th, 1692-93, he speaks of himself as one who wishes well to the practice of physic "though he meddles not with

it," yet in the same year we find him prescribing for a friend's wife. In 1694 he is corresponding with Dr. Hans Sloane on medical matters. In January, 1697-98, King William consulted him, believing that they suffered with similar diseases. In 1701 he writes again to Sloane about a patient with an obstinate fever, and in the following year he gives very wise advice to his old friend Lomborch, who was ill. Evidently Locke's clear, strong judgment was valued by his friends in all relations of life, and as Somers and other politicians turned to him for instruction in questions of trade and finance so his friends and others insisted upon utilising his medical knowledge. Sydenham, Boyle, Thomas, Mapletoft, and Molyneaux had been his intimate associates. In Montpellier, in Paris, and in Holland he had been a welcome guest in medical circles, and in London we have met him in consultation with the most eminent practitioners of the day upon a most important case and handing in a written opinion as their colleague and equal.

For each one of us there is still a "touch divine" in the life and writings of John Locke. A singularly attractive personality, with a sweet reasonableness of temper and a charming freedom from flaws and defects of character, he is an author whom, liking at the first acquaintance, we soon love as a friend. Perhaps the greatest, certainly, as Professor Fowler says, the most characteristic, English philosopher, we may claim Dr. Locke as a bright ornament of our profession, not so much for what he did in it, as for the methods which he inculcated and the influence which he exercised upon the English Hippocrates. He has a higher claim as a really great benefactor of humanity, one of the few who, as was so finely said of Isocrates, "reflected the human spirit always on the nobler side." One of Locke's earliest writings was a translation for Lady Shaftesbury of Pierre Nicole's *Essays*, in one of which, on the "Way of Preserving Peace with Men," Locke seems to have found a rule of life which I commend to you: "Live the best life you can, but live it so as not to give needless offence to others; do all you can to avoid the vices, follies, and weaknesses of your neighbours, but take no needless offence at their divergences from your ideal" (Fox-Bourne).

## HEMIPLEGIA IN TYPHOID FEVER.

BY WILLIAM OSLER, M. D.

Of the cases here reported, four in number, two came under observation, having passed through typhoid fever prior to admission. One case, with thrombosis of the middle cerebral artery, did not live long enough to have hemiplegia. The fourth case, also a fatal one, had an area of softening in the internal capsule.

Hemiplegia is very rare in typhoid fever, even in children, in whom the condition is not an infrequent accident in the specific fevers. Of 120 cases forming the basis of my monograph on the *Cerebral Palsies of Children*, no instance occurred during typhoid fever. Of the 160 cases collected by Wallenberg only four occurred during the course of enteric fever.

The most careful study of hemiplegia in the disease has been made by Francis Hawkins,<sup>1</sup> who has collected 17 cases from the literature. Three of these occurred in children under fifteen years of age. In the fourteen cases in which the data were given, the time of onset was in the second week in one case, during the third week in six cases, during the fourth week in two cases, during convalescence in five cases. The right side was paralyzed in twelve of the sixteen cases in which the side was mentioned. Aphasia accompanied the hemiplegia in twelve instances. Of the seventeen collected cases only two died, and in both of these a thrombosis was present in the middle cerebral artery. In typhoid fever, perhaps more than in any other disease, there is a tendency to the formation of thrombi in the arteries. Endocarditis is so rare that hemiplegia from embolism must be very uncommon.

More recently Rolleston<sup>2</sup> reported the case of a man aged 30, who became hemiplegic on the twenty-fourth day of an attack of typhoid fever, and in the same journal, Herringham mentioned the case of a girl nine years old, in whom the hemiplegia supervened in the third week.

<sup>1</sup> Clinical Society's Transactions, Vol. xxvi.

<sup>2</sup> British Medical Journal, Vol. i, 1898.

Thayer, in commenting upon one of the cases here reported (J. H. H. Bulletin, April, 1896), referred to two cases which he had seen in the service of Tarbell at the Massachusetts General Hospital. In one, a man aged 21, on the tenth day of the disease, hemiplegia with aphasia developed; the other, a child aged 10, became hemiplegic and aphasic on the twenty-fourth day of the disease.

The condition is referred to very briefly in the monograph on typhoid fever by Brouardel and Thoinot (1895), and more fully by Eichhorst in Nothnagel's Handbuch.

The hemiplegia may be due to hæmorrhage, embolism, thrombosis, or abscess. Eichhorst gives reference to a number of cases of hæmorrhage into the brain occurring during the course of the disease. The following remarkable case illustrates the occurrence of thrombi in the cerebral arteries. It is given in full in Studies II, page 470, but I give here a brief extract.

*Case I. Very mild attack; on the ninth day severe convulsions; most intense on the right side; death in a convulsion; thrombosis of ascending parietal and parieto-temporal branches of middle cerebral artery.*

The patient was a young man, aged 22, of good family history, who was admitted April 24, 1895, on the fourth day of an illness, in which he had headache, pain, and fever. On admission the temperature was  $104^{\circ}$ , but sank on the following morning to  $100.7^{\circ}$ . For the following three or four days the temperature range did not reach the bathing point,  $102.5^{\circ}$ . On the 27th rose-spots were seen, and the spleen was palpable. On the morning of the 28th the temperature was  $99.3^{\circ}$  and in evening  $100^{\circ}$ , and he seemed to be doing well in every respect. At noon on the 29th, as we were making the visit in the wards, Dr. Thayer was hurriedly called, and he found the patient in some distress, complaining of uneasy feelings in the head. The pupils were dilated, and in a few minutes he had a short, sharp, general, clonic convulsion, beginning almost simultaneously in both arms. The eyes showed marked conjugate deviation to the left and upwards, the head also being drawn somewhat to the left. For about an hour the convulsions were repeated at short intervals. Morphia was given hypodermically, and chloroform administered. They then became

less intense, and finally ceased altogether for several hours. During the convulsions there was profound unconsciousness, and in the severer ones great embarrassment of the respiration, so that he became quite livid. In the interval the patient appeared to be conscious, and spoke to those about him, and seemed to understand questions, though he had a confused, frightened look. At 5 P. M., the convulsions recurred with great severity, and in spite of inhalations of chloroform, they recurred at intervals until ten o'clock in the evening, when in a severe one the patient died. The convulsions were general, but the more intense movements were on the right side.

The autopsy showed a marked hæmorrhagic enteritis affecting the ileum, which presented here and there small ulcers in Peyer's patches. The heart was normal. The following is a description of the lesion in the brain by Dr. Flexner: "There was an area of thrombosis in certain of the vessels on the convolutions of the left side. At the time of the autopsy this was seen to involve the branches springing from the middle cerebral artery; but at this time the dissection was not completed. Subsequently in the formalin-hardened specimen it was seen that the thrombi were situated in the ascending parietal and parieto-temporal branches of the middle cerebral artery. The meninges over these vessels contained small hæmorrhages, and the brain substance corresponding to them, while not softened, showed small extravasations of blood, although the surrounding tissue was quite firm. Small, but quite extensive punctiform hæmorrhages could be seen to occupy the cortex and adjacent white substance in the immediate neighborhood of the thrombosed vessels. These areas extend sometimes for a distance of two cm. (usually toward the convexity) from the vessels.

"The internal carotid artery was free from thrombosis, as likewise the Sylvian branch. The ascending parietal and parieto-temporal arteries, including at the points of their origins in the middle cerebral artery, were occluded by an adherent, partly decolorized, and quite firm thrombus. More recent dark thrombi were traceable into the branches of these arteries; for example, into the branches running in the Rolandic fissure, the sulcus between the ascending frontal gyri and the ascending frontal convolutions, and the branches supplying the temporo-parietal region generally.

The inferior external frontal artery, and the arteries of the anterior perforated spaces were free from thrombi.

"On section of the brain there were no gross anatomical lesions. The ventricles were not dilated.

"Cultures of typhoid bacilli grew from different organs."

The following is a history of the cases which have been under observation:

Case II. *Protracted attack of typhoid fever; in the tenth week, while the fever still persisted, sudden convulsions; hemiplegia, with aphasia.*<sup>1</sup>

Annie F., aged 7, admitted to the medical wards October 3, 1895, complaining of inability to use the right hand.

There is nothing of note in the family history. With the exception of measles at four, she has been unusually strong and well; and has always been a very bright, intelligent child.

During the first week of April of the present year, the patient had much malaise with headache and debility and epistaxis. On the 6th she went to bed, complaining of pain in the abdomen, fever and diarrhœa. She had a slow and protracted attack, the diarrhœa and fever continuing for more than ten weeks. She seemed to be doing well until Sunday, June 3, when she was seized with violent convulsions, which were confined to the head, the right arm and leg. She was unconscious. The attack came on in the morning, and in the afternoon the movements ceased in the head, but movements of flexion and extension continued in the arm for nearly two days. It was then noticed that the right side was completely paralyzed, and the child was unable to move arm or leg. The face was also involved. With the hemiplegia there was total loss of the power of speech, and she remained aphasic for seven weeks. She improved, but very slowly. Voluntary movements were first noticed in the right leg six weeks after the convulsion. She has never regained power in the arm, but she has gradually begun to talk again. The child has now the attitude and gait characteristic of hemiplegia, which has partially recovered. As she walks into a room she limps, the right leg being dragged, with the foot inverted. She has worn away entirely the outer portion of the

<sup>1</sup>This case was shown by Dr. Blumer at the Hospital Medical Society; see Bulletin for April, 1896.

sole of the right shoe. Crippled as she is, she gets along very well and is able to run quite briskly. When she attempts to pick a coin up, the right arm is extended from the side and semi-flexed, but she puts the left arm and side forward, and grasps the coin with the left hand. When in repose the right arm is held close to the side, the wrist flexed, and the fingers also flexed. She can voluntarily flex and extend the arm at the elbow; can lift the hand to the head, but the power of extension in the wrist and the power of extension in the fingers, and of grasping with the hand are almost completely lost. When making any exertion, as in running for an object, the paralyzed arm is held out from the side, but there are no irregular movements in it. The condition of the face has improved very much since I first saw her early in October, but there is still paresis of the muscles.

In one other respect, too, she has got very much better. She can name objects correctly, recognizes a knife, a watch, and a cent, but is confused somewhat between a cent-piece and a five-cent piece. Her sister says that in the matter of speaking the improvement has been quite rapid of late, and, indeed, she says a great many more words now than she did when she came under observation. She looks also bright and intelligent, and evidently understands what is said to her.

Case III. *Severe attack of typhoid fever in March, 1895; at the end of the second week, without convulsion, slight hemiplegia, which persists.*

W. H. B., aged 25, clergyman, was admitted to the hospital November 30, complaining of paralysis of the left arm and leg.

His family history is good. Patient was not at all strong as a child; but was very well as a young man and while pursuing his theological studies.

On March 10, 1895, he went to bed with headache, fever, and diarrhoea. Gradually all the features of a very severe attack of typhoid fever developed, with much delirium.

On March 24th the paralysis developed suddenly without convulsions. There was also, Dr. R. K. Kneass informs me, no aggravation of the delirium following the attack.

He had no difficulty in speaking; there was no trouble with either rectum or bladder. He had a very protracted convalescence.

Throughout the summer there was a gradual improvement, so that about July 1st he was able to stand and began to walk. The power over the leg muscles has returned more rapidly than in those of the arm. He has never regained any power in the fingers. There has been a steady gain in weight since his illness. This is the history of the case as obtained by Dr. Thomas, who first saw him, and from Dr. R. K. Kneass, who kindly wrote to me about the original attack.

He is well nourished, the face looks pale, but the color of the lips is good. There is no trace of paralysis of the facial muscles, and the eyes are normal in every respect. The left arm can be moved at the shoulder and elbow, and slightly at the wrist in flexion. The hand cannot be extended. The power of pronation and supination is lost. There are only very slight movements of extension of the fingers. The muscles of the arm are very thin, and the interossei are wasted. The left leg can be moved freely at the thigh and flexed and extended at the knee. The feet can be flexed and extended slightly. Movements of eversion and inversion are better performed. The deep and superficial reflexes are everywhere exaggerated on the left side. The ankle clonus is very readily to be obtained. Sensation appears to be perfect.

An interesting feature, not noticeable at first, is the occurrence of wide, irregular, choreiform movements on attempting any voluntary effort with the left arm. The patient's mental condition is excellent.

As the condition is one of such interest, and the cases are so unusual, I shall add the following cases recently seen.

Case IV. *In the third week of a moderately severe attack, gradual onset of paralysis of the left side, with Cheyne-Stokes breathing and delirium; sudden death four days later; area of thrombotic softening in the internal capsule.*

Jos. G., aged 46 (Hosp. No. 28,600), admitted November 27, 1899.

*Family history.*—Two sisters died of consumption; otherwise nothing of special moment.

*Personal history.*—Never has had very good health. Has had measles and mumps; no other acute infections. Last year he had slight arthritis of the left ankle. He had syphilis eight years ago; gonorrhœa a year ago.

*Present illness.*—About six weeks ago he had a sudden pain between the shoulders, which made him catch his breath. He had not been exposed to cold or wet. This was followed by a hacking cough and some bloody expectoration. He lost in weight and strength. All this time he did his work regularly until two days ago. Yesterday and Sunday he felt very much worse.

*Condition on admission.*—The temperature in the evening was  $102^{\circ}$ , pulse 88, respirations 36. There were signs of a diffuse bronchitis over the posterior part of the lungs. There was a soft apex systolic murmur. There were no rose-spots; the spleen was not palpable. There was no leucocytosis; red blood-corpuscles just under four millions; no malarial parasites. The sputum was serous, in large amount, and contained many diplococci. During the first week in hospital the temperature ranged from  $101^{\circ}$  to  $103^{\circ}$ , gradually falling so that on December 4th it was below  $100^{\circ}$  all day. The patient looked dull and heavy; his heart's action was somewhat irregular, and the pulse was markedly dicrotic. There was slight impairment at both bases. During the second week the temperature was irregular, ranging from  $100^{\circ}$  to  $102^{\circ}$ . On the 9th, 10th and 11th it was a little higher, reaching  $103^{\circ}$ . Rose-spots were well seen on the 7th.

On December 14th, after the temperature had been between  $100^{\circ}$  and  $101^{\circ}$  for three days, and he had been doing well, at ten in the morning he was slightly nauseated, and said he felt "sick all over." At midday he was a little excited, delirious, and tried to get out of bed. The pulse was 92, respirations 28. The pupils were equal and reacted normally. At 2.45 P. M. his breathing was irregular and had a distinct Cheyne-Stokes character. At 3 P. M. there were a few incoördinate movements of the left arm. At 4 P. M. there was definite paresis of the left side. At 4.15 P. M. Dr. Fletcher made the following note:

"At present patient is quieter than when seen at 1 P. M., is rational, responds to questions. The temperature has fallen at 4 P. M. to  $99.8^{\circ}$ . Pulse, fair volume and tension, regular in force and rhythm, distinctly dicrotic, 26 to the quarter. The respirations are of a definite Cheyne-Stokes type. Not complaining of any headache; no stiffness of any neck muscles. Pupils normal in size, equal, react to light and accommodation; no strabismus; tongue protruded in median line. There is appreciable paresis of

muscles on the left side of face; right angle of mouth drawn upwards and outwards. Slight ptosis of left upper lid. There is distinct paresis of muscles of left arm and lower extremity. Patella tendon reflexes are distinctly increased on both sides, possibly a trifle more marked on right side. Kernig's sign fairly well marked on both sides, angle being about  $165^{\circ}$ . Considerable degree of rigidity of muscles of left upper extremity.

"7 P. M. Paralysis of left side now almost complete; moves left arm and leg slightly, but cannot lift either. Left knee-jerk now definitely more active. Cheyne-Stokes respiration extreme. Slight ptosis of left eyelid; pupils still active and equal."

December 15th. The left-sided paralysis is complete, face, arm and leg. There is no strabismus; slight ptosis of the left side; pupils are equal, react to light. No headache complained of; no stiffness of the neck muscles.

On the 16th I noted that the paralysis of the face was not quite complete; the eyebrow could be lifted a little; still very complete of arm and leg. He had marked Cheyne-Stokes respiration. He responded rationally to questions. On this day a pleural friction was noted under the right nipple.

On December 18th Dr. Fitcher's note was as follows: "Temperature had been a trifle higher during the last three days. It rose last night to  $103^{\circ}$  at 10 P. M. Condition has been distinctly worse in past forty-eight hours. Yesterday the pulse was weak and rapid throughout, responded slightly to infusion of salt solution. Cheyne-Stokes breathing remained marked during the day. This morning his condition has not improved. Cheyne-Stokes breathing present; hemiplegic symptoms have not improved. Cyanosis and œdema of left foot. Pulse is very small in volume, tension low, practically uncountable at wrist, thirty to the quarter over heart, where there is a distinct gallop rhythm. No endocardial murmur, nor pericardial friction rub. Slight impairment of percussion note over lower right back, where fairly numerous moist râles on inspiration; no distinct tubular breathing heard in back. Distinct pleuritic friction rub just below and outside right nipple. Friction rub has a peculiar cardio-respiratory rhythm. Breath sounds rather exaggerated; expiration prolonged. Lumbar puncture performed at 9.15 A. M., 25 cc. of clear fluid obtained."

The patient died suddenly at 8 P. M. on the 19th. He was conscious, and said he felt better five minutes before death.

The urine showed a trace of albumin and latterly a few granular tube casts. The Widal reaction was positive.

*Autopsy.*—Well marked, ordinary intestinal lesions of typhoid fever. Dr. Barker reported that it was not at all easy to make out the lesion when the brain was cut up at first. After the hardening was complete the lesion was perfectly well defined and easily seen, consisting of an area of softening in the upper part of the right internal capsule about the size of a small hickory nut, situated just lateral from the caudate nucleus, and a little medial and slightly dorsal from the upper border of the cortex of the island of Reil. The necrosis must have involved practically all of the fibres of the pyramidal tract of the right side, and was undoubtedly due to a plugging of a branch of the artery supplying the area.



## HEPATIC COMPLICATIONS OF TYPHOID FEVER.

BY WILLIAM OSLER, M. D.

Considering the close connection between the liver and the intestines, and the liability of this organ to be involved in ulceration of the bowel, it is surprising that hepatic complications are not more common in typhoid fever. Long series of cases may be treated without a symptom pointing to implication of the liver, or, indeed, without a single sign indicating enlargement of the organ or disturbance of its function. The complications which arise in the course of enteric fever have recently attracted a good deal of attention.

The question of infection of the bile passages is dealt with in another place by Dr. Camac. I shall here speak only of—

- I. The focal necroses.
- II. Jaundice in the course of the disease.
- III. Abscess.

### I. FOCAL NECROSES.

A few lines must be devoted to this question, though it has, so far as we know, no clinical significance. The subject has been dealt with quite fully by Walter Reed, in a study from the Johns Hopkins Pathological Laboratory, which appeared in the second series in our "Studies in Typhoid Fever," in Volume v. of the Hospital Reports. Small bodies, scattered through the organ and known as the lymphoid nodules, were described by Friedreich and E. Wagner, and have since been very carefully studied by a number of observers. The literature is very fully given in Reed's paper. Macroscopically they appear as small, grayish, opaque areas, sometimes just on the limit of visibility, at others appearing quite distinctly on the cut surface. Reed states that they cannot always be distinguished with the naked eye. Microscopically the size of these areas varies from a spot involving only a few liver cells, to a region involving the half, or even the whole of a lobule. The nodules represent foci of necrosis of the liver cells. The

clumps of typhoid bacilli appear to bear no definite relation to them. Sometimes in the necrotic area there are many polynuclear leucocytes, which almost give the appearance, as Handford states, of a small miliary abscess, or of lymphoid nodules. The foci are subsequently replaced by well-defined areas of connective tissue, which Reed was able to demonstrate in a woman who had died twenty-five years subsequent to the attack of typhoid fever. Experimentally necrotic areas can be produced by the injection of cultures of the typhoid bacillus into the mesenteric vein, and in the human subject they are probably caused by the toxalbumins of the disease. So far as we know these focal necroses cause no symptoms, though it is quite possible that a widespread involvement of the liver lobules may cause the icterus gravis, which occasionally develops in the disease, or, subsequently in their fibrous transformation, lead to cirrhosis.

## II. JAUNDICE.

The extreme rarity of this symptom in typhoid fever may be gathered from the fact that among the 830 cases treated during the first ten years in my wards at the Johns Hopkins Hospital, there were only three cases.

This has been the experience of most writers on the subject. Murchison states that he "met with jaundice in three cases of enteric fever, all of which were fatal, although in two the jaundice had disappeared before death. In two of the cases there was an autopsy, and in both the liver was small, and its secreting cells loaded with oil."<sup>1</sup> Griesinger noted in 10 cases among 600 patients with typhoid fever, and Liebermeister 26 in 1420 cases. These figures are sufficient to show the extreme rarity of this symptom.

The cases of jaundice in typhoid fever may be grouped in four categories: (1) catarrhal; (2) toxic; (3) those associated with abscess; and (4) those associated with gall-stones and cholangitis.

Da Costa,<sup>2</sup> in a most comprehensive paper, has analyzed 52 cases, among which there were 33 deaths and 19 recoveries. The causes so far as could be ascertained were, catarrhal 4; pylephlebitis 3;

<sup>1</sup> On continued fevers, third edition, p. 565.

<sup>2</sup> Amer. Jour. of Med. Sciences, July, 1898.

cholecystitis 5; abscess 6; acute yellow atrophy 5; toxic 24; uncertain 5.

We shall consider, first, the catarrhal and the toxic cases, and then speak briefly of those associated with abscess; while the cases with gall-stones and cholangitis will be dealt with by Camac.

(1) *Catarrhal jaundice*.—It is not always easy to separate the catarrhal from the toxic cases, but it is most likely that the slight jaundice in cases of moderate severity, which do not themselves present symptoms of profound toxæmia, is due to swelling of the ducts in connection with an invasion of the typhoid bacilli. It is surprising, indeed, that this symptom is not more frequent. Griesinger states that it is the form which develops early, is quite mild and transitory, and has no influence on the course of the disease. In the following cases the jaundice was slight, and the general symptoms not aggravated by it.

Case I. *Pregnancy, six months; admitted on the twenty-second day of severe attack of typhoid fever; miscarriage on the fifty-first day; slight jaundice on the thirty-sixth day; recovery.*

Mary B. (Hosp. No. 19,852), aged 26, admitted June 28th, 1897, in the third week of typhoid fever. The temperature did not go above 103.8°. There was moderate diarrhoea on admission. On the thirty-sixth day the conjunctivæ were bile-tinged, and she had a slight tinge of the skin. The jaundice persisted, and on the forty-sixth day it was noticed that the liver was enlarged and tender on pressure. There was no special tenderness over the gall-bladder. The patient was delivered of a still-born child on the fifty-first day. Though she had a protracted convalescence with two recrudescences of the fever, she was discharged well after forty-six days in hospital.

Case II. *Characteristic onset; mild attack; jaundice on the thirty-first day; no pain; rapid disappearance.*

R. G. W. (Hosp. No. 23,957), aged 44, admitted September 3rd, 1898, on the eighth day of illness, in which he had had only anorexia and fever. He had a little looseness of the bowels at onset. There was a characteristic rash. The Widal reaction was positive. On the thirty-first day the patient was noticed to be slightly jaundiced. There had been no nausea, no vomiting, no

aggravation of the symptoms. There was bile in the urine. There was no enlargement of the liver; no tenderness over the gall-bladder. It was a very mild case. The convalescence was uneventful and the jaundice persisted only eight days.

Case III. *Onset with a good deal of nausea and vomiting; moderate fever; characteristic symptoms; on the nineteenth day slight jaundice; intercurrent relapse; recovery.*

C. S. (Hosp. No. 24,299), aged 13, admitted October 5th, 1898, on the twelfth day of illness. He had rose-spots, palpable spleen, and the Widal reaction was positive two days after admission. On the nineteenth day, without any aggravation of his symptoms, he had slight jaundice of the conjunctivæ and of the skin. It persisted for a few days, and was unaccompanied with enlargement of the liver or tenderness in the region of the gall-bladder. During this time his temperature had been ranging from normal to about  $102.4^{\circ}$ . Two days subsequent to the onset of the jaundice it became higher, and ranged between  $103^{\circ}$  and  $104^{\circ}$  for nearly six days. This probably represented an intercurrent relapse. He did well, though on the forty-second day he complained a good deal of pain in the elbows and shoulders and back.

Case IV. *Admission on third day; characteristic and protracted attack; jaundice on the thirty-ninth day.*

Louise H., aged 45 (Hosp. No. 20,433), admitted Aug. 26th, 1897. In this case the patient had done very well. She had constipation, and on the thirty-eighth and thirty-ninth days had fecal impaction in the rectum, which disturbed her a good deal, and was associated with vomiting. This was followed by a slight but well-marked jaundice, which lasted for a few days. There was no swelling of the liver, and no special tenderness over the gall-bladder.

Case V. *Spondylitis deformans; onset of typhoid fever in hospital; severe and protracted case; marked jaundice during relapse.*

John E. H., aged 33 (Hosp. No. 25,631), admitted February 21st, 1899, with spondylitis deformans. He had a very characteristic attack of typhoid fever, though there were no rose-spots until the relapse in the fourth week. On the twenty-seventh day it was noticed that he had slight jaundice. On the twenty-eighth day it became deeper, and he had two slight chills. The tongue

was coated, and the jaundice became quite intense, but there was no pain in the liver or gall-bladder. On the twenty-ninth day he had delirium and seemed seriously ill. The jaundice gradually disappeared, and the fever became normal on the thirty-seventh day.

The following case illustrates the occurrence of jaundice at the onset of a relapse:

*Case VI. Severe gastric symptoms; jaundice at the onset of a relapse.*

Mr. A., aged about thirty years, seen November 9, 1895, with Dr. Reiche. The patient had been ill for five weeks with typhoid fever of moderate severity. On November 1st, 2d, and 3d the temperature had been normal and the patient was doing well. The stomach had been quiet, and he had been taking a little extra food. On the 4th, 5th, and 6th he had a little more fever, was restless, had a great deal of nausea, and at intervals vomiting. On the 7th and 8th these symptoms persisted, and on the former date he became jaundiced. He had constant nausea, a great deal of gagging, with the expectoration of much clear liquid, and after taking food he had actual vomiting.

*Present condition.*—The patient looks thin. The skin is jaundiced, the conjunctivæ stained. The tongue is heavily furred and white. He has a small basin by his side, and every few minutes he gags and brings up a clear, frothy liquid. He has also vomited several times to-day. The temperature this evening is  $103^{\circ}$ ; pulse 120, small in volume. The abdomen is soft, nowhere tender; the liver is not enlarged. Deep pressure just in front of the tenth rib causes him to wince. The urine was very much bile-stained. The patient was ordered oxalate of cerium and small quantities of liquid nourishment.

On the 10th and 11th the vomiting persisted, and the jaundice became much more intense. On the 12th and 13th he was a great deal better. He retained his food, and the distressing gagging had stopped. The temperature range was from  $102^{\circ}$  to  $103.5^{\circ}$ . The pulse was rapid, and he was still excessively nervous.

On the 16th and 17th the temperature was lower and he had profuse sweats. The abdominal symptoms were slight; the stools, which during the jaundice were quite clay-colored, by the 20th

were again bile-stained, and at this date the jaundice had almost disappeared. The temperature on the evening of the 22d was only  $100^{\circ}$ ; general condition excellent.

(2) *Toxic jaundice*.—According to Da Costa's analysis a large proportion of cases of jaundice in typhoid fever are of toxic origin; yet, considering the great frequency of toxæmia in the disease, jaundice from this cause seems rare in this country as no case of the kind has been in my service during ten years. In the following case, which I saw in consultation, the jaundice came on in the second week, with much delirium, and the patient died in a condition of profound toxæmia with low temperature.

Case VII. *Severe attack; jaundice at the end of the second week; much delirium; low temperature; nystagmus; death on the sixteenth day.*

April 8, 1894. I saw to-day, with Dr. Martenet, A. B., aged thirty-five years, a healthy man, who had been attacked two weeks before with typhoid fever, all the symptoms of which had been very well marked. This was the fifteenth day of the fever. The temperature has been high, ranging between  $104^{\circ}$  and  $105^{\circ}$ . The rash was well developed and the spleen enlarged. The general symptoms were of only moderate severity. He had very slight diarrhœa.

For four days the patient has had a falling temperature, and yesterday morning, April 7th, it had reached  $98^{\circ}$ ; last evening it was  $98^{\circ}$ ; this morning it was  $97.2^{\circ}$ . With this the general symptoms have been very much worse. He has been delirious; the abdomen has been distended, and jaundice developed on the evening of the 6th. This morning the patient is delirious, unconscious, and the jaundice is of considerable intensity. The eyes are open, and they are jerked in a quick way from side to side, looking like exaggerated nystagmus. The tongue is dry, the abdomen distended, not tender. The liver-dulness is not obliterated. The heart-sounds are clear. The pulse is 120, full, not dicrotic, and I noted particularly that it was of fairly good volume. On returning home, in the note I made of the case, I added that though he looked so ill, and though the meteorism, jaundice, and low temperature, with the delirium, were unfavorable, yet the pulse-volume was remarkably good.

Death took place at three in the afternoon. There was no autopsy.

There is an interesting group of the toxic cases, in which the disease runs a course like acute yellow atrophy. Sabourin<sup>1</sup> has reported the case of a healthy man, aged 29 years, who was admitted to Jaccoud's service in about the third week of typhoid fever. He had very intense icterus, great prostration and delirium, and with these symptoms frequent epistaxis and hæmorrhages from the intestines. The liver at autopsy was reduced in size, soft, and in a condition corresponding microscopically to acute yellow atrophy.

Jaundice would appear to be more common in the tropics. Alexander Jamieson,<sup>2</sup> in an admirable discussion of typhoid fever as met with in China, cites nine cases in which deep jaundice occurred. Of these four died. He thinks it is more fatal the earlier it develops.

### III. ABSCESS.

Da Costa has collected 22 cases in which the association of abscess of the liver with typhoid fever seemed beyond doubt. Of these seven only had jaundice, but in twelve it was not mentioned at all.

There are three groups of cases—

I. *Solitary abscess*, which may be a direct sequence of the trouble in the bowel, or secondary to the complications of typhoid fever. The abscess directly caused by the intestinal lesion is very much more rare than pyelphlebitis. In about 100 autopsies in the disease I have not the record of a case.

In their monograph on *l'Hépatite Suppurée*,<sup>3</sup> Bertrand and Fontan refer very briefly to this association, and state that it is relatively more frequent in the typhoid fever of the tropics.

In China, Jamieson,<sup>4</sup> in reporting a number of cases of enteric fever with dysentery, mentions a case of liver abscess. It did not seem to me altogether clear on reading his report whether the case was one of typhoid fever, or whether it was not an unusually severe and protracted instance of dysentery. The colon was much ulcerated, and an ulcer had perforated the cæcum. The note on the

<sup>1</sup> Revue de Médecine, 1882.

<sup>2</sup> Imperial Maritime Customs Medical Reports, 37th issue, 1891.

<sup>3</sup> Paris, 1895.

<sup>4</sup> Loc. cit.

small bowel was "the lower end of the ileum was sown with circular ulcers in the midst of infiltrated areas, some of which had not broken down, corresponding to Peyer's patches."

The enormous Munich statistics of 2000 post-mortems in typhoid fever give twelve cases.<sup>1</sup> Other large statistics quoted are those of Dopfer, who in 927 cases of typhoid fever found abscess of the liver in 10 cases.<sup>2</sup> (Probably these cases are included in the other Munich statistics.)

Abscess of the liver secondary to the complications of typhoid fever is an exceedingly interesting form, to which Romberg<sup>3</sup> has referred. He quotes two cases in which the abscess followed the bone lesions of the disease, two which occurred in connection with perichondritis of the larynx, and a case of Louis', in which it followed abscess of the right parotid. A case of this kind is the only instance of abscess of the liver in our service during the ten years. The following is the report:

*Characteristic onset; mild attack; jaundice on thirty-first day; no pain; rapid disappearance. Autopsy; characteristic typhoid ulcers; pleurisy; parotitis; abscess of liver.*

Lee J., aged 21 (Hosp. No. 23,208), admitted June 20th, 1898, on the 11th day of illness, which had come on in a very characteristic way.

The patient had not had chills and fever, and denied syphilis. The illness had come on in a very typical manner. On admission he looked a well-built, well-nourished colored man. The temperature rose a few hours after admission to 106°; pulse was regular, of good volume, very dicrotic. The heart-sounds were clear. There was no tenderness in the abdomen; gurgling could be felt on deep pressure. The edge of the liver was not palpable; spleen not palpable. The leucocytes were 8,200. The Widal reaction was well marked. The temperature kept high, in the neighborhood of 105°, and he was irrational. The abdomen was full and rather tense. The spleen was not felt. From the 22nd to the 25th the temperature was high, reaching 105°. He stood the sponges well, and reacted strongly. He was dull and stupid. There were no rose-spots, and the spleen was not palpable; the liver

<sup>1</sup> Münchener Med. Woch., 1891, Nos. 3 and 4.

<sup>2</sup> Berliner klinische Wochenschrift, March 3, 1890.

<sup>3</sup> Ibid, 1888.

was not tender. On June 26th and 27th the temperature was lower, not reaching above  $103^{\circ}$ . He was still delirious and looked very ill. On June 29th a parotitis developed on the right side, with great tenderness and much swelling. The tonsils were not enlarged, and the throat was normal. The leucocytes were 15,500. On this day the temperature reached at 8 A. M.  $99^{\circ}$ . On the 30th the swelling of the parotid was much increased. The temperature did not rise above  $102^{\circ}$ . The leucocytes were 40,500. On July 1st there was a marked brawny induration, and a good deal of swelling in the neighborhood, and it was opened freely. The temperature rose in the evening to  $104^{\circ}$ .

July 2nd. An unusual feature, which I do not remember ever to have seen before following incision of the parotids, was a great deal of bleeding, which saturated the whole of the dressing by 10 P. M., and this morning at 3 A. M. there was again so much bleeding that the wound was redressed, and several small vessels clamped.

On the morning of the third the patient was very feeble; pulse 136. There was much swelling of the face; the eyelids were œdematous. The leucocytes were 15,700. The swelling of the parotid was diminished; still some induration. The temperature rose through the morning, and at 12 reached  $105.8^{\circ}$ . In the afternoon the patient was rational, and had much distress. He complained of pain in the left side, and there was heard in the axilla a loud to and fro friction, which was also palpable. He became apathetic, dull, and died at 5.45 P. M.

He had no abdominal tenderness, or symptoms to call attention to the liver.

Autopsy, eight hours after death.

*Anatomical diagnosis.*—Swelling and superficial ulceration of follicles in small and large intestines; diffuse hæmorrhagic infiltration of mucous membrane of intestines; suppuration of parotid gland; liver abscess; abscess of gastro-hepatic lymph glands; broncho-pneumonia; multiple lung abscesses.

II. *Suppurative pylophlebitis.* This is an excessively rare sequence of the disease. I have seen one instance of it which is given in full in my "Pathological Report No. 1," from the Montreal General Hospital. I will give here a brief extract:

A man, aged thirty-seven years, had an attack of typhoid fever

three months before, from which he had not recovered. He had empyema and septic symptoms. So far as I could learn, there were no symptoms pointing to any trouble in the liver. He succumbed to an attack of acute peritonitis. The peritoneum contained eighty ounces of turbid fluid and was intensely inflamed, particularly about the appendix vermiformis, the caecal end of which was obliterated, while the wall presented an oval perforation. There were fifty-four ounces of pus in the left pleura; both lungs presented numerous miliary tubercles. The mesentery was greatly enlarged and thickened, and fluctuated like a sac of pus. After incision and washing, it appeared riddled by communicating cavities, some of which could be traced in direct connection with mesenteric veins. The liver was enlarged, and presented, on section, numerous abscesses which were in direct connection with the suppurating portal vein. Outside the liver the vein was represented by an elongated abscess with thick, irregular walls. The splenic vein ended abruptly on the wall of the suppurating vessel, being closed by a thrombus. The branches of the portal vein in the liver were found to be full of pus, in some cream-colored, in others tinged with bile. The main branch passing to the right lobe, at about an inch and a half from the fissure, widened into two large sinuses. The gall-bladder contained three ounces of pus. At the upper part of the opening of the cystic duct there was an irregular, wide sinus leading toward the portal fissure, and along it a probe could be passed for nearly an inch and a half, terminating close to the dilated and suppurating branches of the portal vein.

Lannois<sup>1</sup> has reported an interesting case of pylephlebitis following typhoid fever, in which the Eberth's bacillus was found in the pus. He gives a reference to a number of other cases in the literature.

In a paper by Ernst Romberg,<sup>2</sup> of the Leipzig Clinic, of 88 fatal cases among 677 there was only one instance of abscess of the liver (suppurative pylephlebitis).

A man, aged thirty-four years, with well-developed typhoid fever, was admitted August 14th. There seemed nothing special in the case until September 7th, when he had a chill. On the 8th there was slight jaundice, which increased on the 10th and

<sup>1</sup> *Revue de Médecine*, 1895.

<sup>2</sup> *Berliner klinische Wochenschrift*, March 3, 1890.

12th. There was enlargement of the liver. The patient died on the 15th. There were healing ulcers in the ileum. There was a diffuse, suppurating phlegmon in the mesentery. The liver was enlarged and showed very extensive suppurating pylephlebitis.

This case resembles the one that I have reported, inasmuch as it had the suppuration in the mesentery. Romberg refers to several others in the literature.

III. *Suppurative cholangitis.* Apart from the gall-bladder complications, which will be considered separately, abscess of the liver may be due to suppurative cholangitis. The cases are very rare. Klebs has reported one in his *Handbuch der Pathologische Anatomie*, in which the bile-passages within the liver were dilated into large cylindrical cavities containing necrotic yellowish material. The common duct showed no trace of any change.

70.213

## ANALYSIS AND GENERAL SUMMARY OF THE CASES FROM 1889-1899.

BY WILLIAM OSLER, M. D.

During the ten years, to May 15, 1899, 829 cases of typhoid fever were treated in the medical wards of the Johns Hopkins Hospital. The patients have been under my personal care, or, in my absence, under the care of Dr. Lafleur (to Oct., 1891), Dr. Thayer (Oct., 1891, to Oct., 1898), and Dr. Fletcher, my present first assistant. Not a little of the value of these records is due to a uniformity in the methods of observation, of record and of treatment, which cannot be reached in large general hospitals with four or five different medical services.

The following statistical details relate to age, sex, race, etc.

SEX.—631 cases were males and 198 were females.

RACE.—729 cases were white and 100 were colored.

NATIONALITY.—Of the 729 whites, the nationality was as follows: Americans, 348; Germans, 200; Irish, 39; Bohemians, 30; English, 28; Poles, 21; Russians, 19; Scandinavians, 15; Lithuanians, 5; Scotch, 4; Italians, 3; Finns, 2; French, 2; Danes, 2; Swiss, 1; Austrian, 1; Welsh, 1; Dutch, 1; Hungarian, 1; West Indian, 1; Syrian, 1; not given, 4.

AGE.—Five to fifteen, 99; fifteen to twenty, 159; twenty to thirty, 393; thirty to forty, 125; forty to fifty, 40; fifty to sixty, 6; sixty to seventy, 6; not given, 1.

SEASON.—The admissions in each month were as follows:

January, 37; February, 15; March, 13; April, 27; May, 16; June, 24; July, 91; August, 169; September, 169; October, 122; November, 96; December, 50.

LOCALITY.—From the city of Baltimore, 590 cases; from Baltimore county, 139; from Maryland, outside Baltimore county, 29; from outside Maryland, 60; from steamers, 7; not given, 4.

MORTALITY.—In the 829 cases, there were 63 deaths, a rate of 7.5 per cent. This represents the total death-rate of all the cases admitted to the hospital in which a positive diagnosis of typhoid fever was made. It therefore includes the group of cases met with in all general hospitals, to which patients are frequently admitted in a moribund condition, or so ill that death occurs within three or four days.

TREATMENT.—In the two previous reports I have dealt fully with the method of treatment, and to it I have nothing to add. It consists in:

FIRST, a careful and thorough system of *nursing*, to which, as much as to any other single feature, I attribute the comparatively low rate of mortality for a general hospital. Our proportion of nurses to patients is above the average. We have been fortunate in having as head nurses in the wards unusually able and devoted women, who have made the nursing of the typhoid fever patients their particular study. To Miss Hampton, to her successor, Miss Nutting, to the head nurses, and to their assistants, I am personally under a lasting obligation.

SECONDLY, *diet*. Milk diluted with limewater and egg albumen form the standard diet of the febrile stage. We rarely order artificial foods. The milk has not often to be peptonized, and we have had on the whole singularly few gastric complications, and comparatively few instances of serious bowel trouble. The patients are given in addition an abundance of cold water.

THIRDLY, *hydrotherapy*, either the full tub at 70°, or, if occasion requires, ice-cold sponges. Full details of this are given in Studies No. II.

FOURTHLY, *drugs*. As a rule no medicines are given. If the pulse becomes rapid and feeble we give alcohol in the form of good whiskey, and strychnia, if necessary, in full doses. We use no antipyretics, and no intestinal disinfectants. Special complications, of course, require and receive appropriate treatment.

## SPECIAL FEATURES, SYMPTOMS AND COMPLICATIONS.

BY WILLIAM OSLER, M. D.

### 1.—ANALYSIS OF THE GENERAL SYMPTOMS.

**I. Symptoms of Onset.**—No features are more uncertain and indefinite in hospital histories than those relating to the mode of onset of the disease. The patient is generally brought in by friends or relatives, who know very little about the case; there may be no statement from the doctor, and very often the patient himself is not in a condition to give an intelligent account of how his trouble began. The following is an analysis of the symptoms of onset as presented by the 829 cases: Headache, 595 cases; loss of appetite, anorexia, 414 cases; diarrhœa, without medicine, 322 cases; with medicine, 21 cases; cough, 233 cases; abdominal pain, 227 cases; chilly sensations, 213 cases; vomiting, 209 cases; chills, 200 cases, of which 107 had a single chill, and 93 cases had two or more chills; epistaxis, 182 cases; malaise, 169 cases; constipation, 152 cases; general pains, 128 cases; nausea, 114 cases; sweats, 114 cases; backache, 99 cases; vertigo, 45 cases; delirium, 31 cases; stiffness of the neck, 30 cases; sore throat, 20 cases; pain in the right iliac fossa, 6 cases; 8 complained of deafness at onset; 1 of hicough; in 4, one of the early symptoms was bleeding from the bowels.

**II. The Rash.**—Rose-spots were present in 666 cases, 80 per cent of the 829 cases.

#### PECULIARITIES OF THE RASH.—(a). *Hæmorrhagic.*

Petechial spots were noticed in the following cases of the third series.

Wm. W. K., aged 27 (Hosp. No. 14,453), had an abundant eruption of rose-spots on the chest and abdomen. On the 12th day some of them became hæmorrhagic. The patient probably had perforation; death on the 13th day.

A. L., aged 19 (Hosp. No. 16,373), had a very profuse rash on abdomen, back, chest, arms and neck, some also on face, forehead, scalp and thighs. Very many of them became petechial. There were a few subcutaneous hæmorrhages.

J. K., aged 39 (Hosp. No. 17,393). Numerous petechiæ scattered over the body; no rose-spots. Patient in hospital nine days. When taken away by friends the temperature was  $104^{\circ}$ ; general condition good.

G. R. C., aged 28 (Hosp. No. 17,554). Very severe case, which terminated fatally on the 42d day. Temperature ranged from  $105^{\circ}$  to  $106^{\circ}$ . On the 25th day numerous ecchymoses appeared on the abdomen.

Wm. R., aged 40 (Hosp. No. 19,914). On the day of death, 29th day of disease, there were small petechiæ on the chest and back.

A. T., aged 30 (Hosp. No. 20,814). Case reported in full by Dr. Hamburger at page 310. Case of true hæmorrhagic typhoid fever.

L. S., aged 28 (Hosp. No. 20,884). On the 33d day there were a few subcutaneous hæmorrhages beneath the skin of the left arm.

H. M., aged 34 (Hosp. No. 21,433). Case of moderate severity. Patient had a few hæmorrhagic spots on the right leg.

B. B., aged 2 (Hosp. No. 21,445). A few petechiæ on abdomen; no rose spots.

Kate K., aged 16 (Hosp. No. 17,446), admitted Sept. 30, 1896. A few purpuric spots on the back, and a few urticarial wheals on chest and shoulders.

Rosie K., aged 17 (Hosp. No. 20,349), admitted Aug. 18, 1897. On the 18th day of disease there were a few petechiæ on the shins.

M. L. H., male, aged 36 (Hosp. No. 20,409), admitted Aug. 24, 1897. Severe attack with much delirium and high fever. On the 27th day of illness there were petechiæ on the sacrum and on the skin of the abdomen and back. It was in some places a vesicular purpura, in which there was actual clotting of blood in the vesicles. Pigment remained in places. There were also a few deeper subcutaneous hæmorrhages. Recovery.

Charles D., aged 26 (Hosp. No. 20,456), admitted Aug. 30, 1897. Copious skin rash. On the 15th day of illness there were numerous petechiae on skin of front of chest; raised spots not petechial.

Jos. F. W., aged 7 (Hosp. No. 20,511), admitted Sept. 4, 1897. On the 24th day there was a large hæmorrhagic spot on the skin of the abdomen, 4 by 1½ cm. No other hæmorrhages.

John K., aged 39 (Hosp. No. 17,393), admitted Sept. 25, 1896, on the 5th day a well-characterized attack; spleen enlarged. There were no rose-spots, but scattered over the abdomen there were petechial spots.

M. M., aged 16 (Hosp. No. 21,695). Very severe case; high fever. On the 31st day a purpuric eruption appeared over the sacrum and right buttock. Patient was removed from hospital and died outside.

K. H., aged 23 (Hosp. No. 24,064). On the 23d day of illness of moderate severity, ending in recovery, there were hæmorrhagic areas on both heels, possibly associated with pressure. They did not become vesicular.

J. D. H., aged 20 (Hosp. No. 23,135). Severe attack, recovery. On the 31st day there were ecchymoses on the upper part of the abdomen.

In the previous reports, there were 7 cases with ecchymoses, making in all 25 cases for the series, a percentage of 3. It is to be noted that to only one of these cases, No. 20,814, could the term hæmorrhagic typhoid fever be applied.

*(b). Exceptionally Profuse Rash.*

In 93 cases of the 3d series, the rose-spots were seen in other regions than the chest, back and abdomen.

Arms, 39; forearms, 13; thighs, 19; legs, 8; face, 3; scalp, 2; shoulders, 2; neck, 2; ankles, 1; knees, 1; hands, 1; buttocks, 1; right axilla, 1.

*(c). Rash Present while Patient Afebrile.*

In Studies II we noted this in two cases. This interesting peculiarity was present in the following cases of the present series:

G. L., aged 17 (Hosp. No. 13,554). Fresh crop of rose-spots on 28th day, when patient was afebrile.

J. F. S., aged 26 (Hosp. No. 20,815). On the 29th day, when the patient was afebrile, there was an abundant rash on the abdomen.

R. H. K., aged 25 (Hosp. No. 20,939). Case of moderate severity. On the 22d day, when the patient was afebrile, rose-spots were present on the abdomen. They persisted until the 27th day.

K. S., aged 34 (Hosp. No. 21,088). Rash when afebrile.

J. E., aged 37 (Hosp. No. 21,152). On the 37th day a fresh crop appeared; afebrile for six days; crops persisted; spots last seen on 45th day.

H. M., aged 34 (Hosp. No. 21,433). On the 29th day, when the patient was afebrile, spots appeared.

L. M., aged 30 (Hosp. No. 21,633). On 37th day fresh spots; no fever.

A. G., aged 24 (Hosp. No. 22,664). On the 30th day, after temperature had been normal for three days, rose-spots were still seen.

J. R., aged 22 (Hosp. No. 24,683). On the 23d day spots still visible; patient's temperature normal.

J. G., aged 23 (Hosp. No. 20,512). On the 38th day, after the patient was afebrile, fresh spots appeared on the abdomen.

(d). *Desquamation.*

In the following cases marked peeling of the skin was noted:

W. H. Y., aged 22 (Hosp. No. 21,993). On the 21st day the skin of the abdomen was desquamating.

E. B., aged 24 (Hosp. No. 23,914). On the 19th day a diffuse erythematous blush over whole abdomen and back; desquamation followed it.

O. S., aged 23 (Hosp. No. 25,034). On 30th day, desquamation of skin of abdomen.

J. E. B., aged 13 (Hosp. No. 25,679). On 33d day, desquamation of skin of abdomen.

(e). *Various.*

19,902. On the abdomen there were a number of rose-spots which became surmounted by small vesicles and then scabs.

20,512. Admitted on the 11th day; on the 14th day spots appeared on the flanks; on the 24th day there were fresh spots; on the 35th day again fresh spots; on the 38th day, after temperature was normal, fresh spots appeared on the abdomen.

25,631. No rash until the relapse.

Additional memoranda upon the skin lesions will be found under the cutaneous complications.

**III. The Fever.**—In 592 of the 829 cases the rectal temperature registered  $104^{\circ}$  and over. Between  $104^{\circ}$  and  $105^{\circ}$  there were 329 cases; between  $105^{\circ}$  and  $106^{\circ}$  there were 240 cases; between  $106^{\circ}$  and  $107^{\circ}$  there were 27 cases; at  $107^{\circ}$  and over there were 6 cases.

**IV. The Pulse.**—There were 345 of the 829 cases with a pulse of 120 and over. Between 120 and 130 there were 168 cases; between 130 and 140 there were 72 cases; between 140 and 150 there were 59 cases; between 150 and 160 there were 13 cases; above 160 there were 33 cases.

**V. Diarrhœa.**—We have already stated that there was diarrhœa at onset in 322 cases before the patient entered the hospital. During the stay in hospital, 163 of the 829 cases, *i. e.* 19 per cent, had diarrhœa at some time or other in the course of the disease, and 290 cases, 34 per cent, presented constipation. This remarkably small percentage of cases with diarrhœa may in part, at least, be attributed to our practice of not disturbing the bowels with laxatives or antiseptics.

**VI. Spleen.**—As I stated in Studies II, we place much more reliance upon palpation than percussion in estimating an increase in the size of this organ. The left hand is placed on the side, the fingers well behind on the ninth, tenth and eleventh ribs, the palm of the hand over the splenic region itself. The patient is then asked to draw a deep breath. As he does, the fingers of the hand press forward, the palm of the hand laterally, and the diaphragm during inspiration presses downward and forward, so that by these movements, if the spleen is at all enlarged, the edge appears at the

costal margin, where it can be readily felt by the fingers of the right hand, which are placed just below the costal margin between the parasternal line and the tip of the tenth rib. It is well to make the palpation just as the abdominal walls relax, following their recession quickly. In many cases the edge of the spleen can be seen tilting over the fingers of the right hand. It is well to remember that in children the edge of the spleen may sometimes be felt best as low as the tip of the tenth rib. In 591 of the 829 cases the spleen was palpable, 71 per cent.

**VII. Chills.**—In Studies No. II there is an article on the occurrence of chills in typhoid fever, considered under the headings of (a) at the onset of the disease; (b) at the onset of the relapse; (c) as a result of treatment; (d) with the onset of complications; (e) septic chills during convalescence in protracted cases; and (f) chills due to concurrent malaria. In the third series the following additional cases of chills occurred:

W. F. F., aged 26 (Hosp. No. 13,813). On the 28th day, just a week after the onset of a thrombosis of the left femoral vein, patient had a chill lasting twenty minutes, followed by a profuse sweat.

Walter F. W., aged 40 (Hosp. No. 13,870). Severe attack. On the 21st day of illness a shaking chill at 1 P. M. Temperature at twelve o'clock was 104.2°; at 1.45 P. M. it was 106.3°. The patient was blue, cyanosed, and had much muscular twitching. He died the same afternoon.

Henry V., aged 32 (Hosp. No. 16,794), admitted July 25, 1896. Chill on the 44th day of ten minutes' duration, probably associated with phlebitis.

Oswald T., aged 42 (Hosp. No. 17,310), admitted Sept. 16, 1896. On the 14th day of illness a chill lasting for an hour, followed by sweating.

G. R. C., male, aged 28 (Hosp. No. 17,554), admitted Oct. 11, 1896. Severe, protracted case, with much delirium; repeated hæmorrhages. On the 35th day the patient had a severe chill, followed by sweating. No tubs.

Jas. C., aged 36 (Hosp. No. 22,399), admitted March 24, 1898. Severe attack; much delirium; popliteal thrombosis; onset with a

chill. Repeated chills and drenching sweats. Right leg swollen. Recovery.

Fanny H., aged 9 (Hosp. No. 23,799), admitted Aug. 16, 1898. Severe attack. In the third week, shaking chills, recurring on several days for a week, followed by heavy sweats; no malarial organisms.

Albert A., aged 33 (Hosp. No. 24,062), admitted Sept. 13, 1898. On the 34th day the patient had pain about the rectum from hæmorrhoids. Irrigation with cold water. Patient had a chill; temperature rose to 102.2°; normal ten hours later.

John S. G., aged 22 (Hosp. No. 25,111), admitted Dec. 29, 1898. Severe attack. On the 25th, 26th, 28th and 36th days chills followed by profuse sweats.

Some additional cases of chills will be found under the section on post-typhoid elevations of temperature.

## 2.—RELAPSE.

We recognize two varieties: first, a genuine relapse, in which there is a reinfection after a distinct and definite period of apyrexia; secondly, the intercurrent relapse, in which, after the temperature has fallen nearly to normal, or after the morning temperature has been at 99° or 99.5° for three or four days, and there has been a decided lull in the symptoms, the fever again rises, and the patient goes through all the features of another attack. The conditions under which relapse occurs are not, I think, as a rule, within the control of the physician. The sources of the reinfection are doubtful. The typhoid bacilli linger in the adenoid tissues of the mucous membrane for a long time, and Dr. Mark Richardson has shown that they may be found in the stools even after a considerable period of apyrexia. We know, too, that they remain for a long time in the mesenteric glands and in the spleen. The interesting observations by Chiari, amply confirmed by others, that typhoid bacilli may remain in the gall-bladder for an indefinite period, suggest that this may sometimes be the source of reinfection. Errors in diet may be associated with gastric disturbance, and the passage of a large number of bacilli from the bile-ducts into the intestines.

We are still really without full knowledge of the causes of re-

lapse, but the frequent occurrence is a positive indication that immunity in typhoid fever is slowly acquired, and not reached at the period of apyrexia.

*Incidence of Relapse.*—In the 829 cases there were 86<sup>1</sup> relapses, a percentage of a little more than 10. In this we have included the intercurrent relapse.

The periods of complete apyrexia in the third series were as follows: 3, 9, 7, 5, 3, 5, 10, 4, 7, 8, 9, 4, 4, 23, 8, 1, 6, 19, 8, 4, 16, 15, 11, 10, 7, 4, 1, 36, 4, 7, 8, 13, 3, 3, 2, 8, 11, 5, 8, 8, 11 days.

*Summary of Cases.*—C. E. D., aged 32 (Hosp. No. 12,915), admitted May 30, 1895, on the 12th day of the disease. Primary attack severe, much delirium and tremor; 73 tubs. From the 40th to the 45th days the temperature ranged about 100°. On the 45th and 46th days it was a little higher. Then on the 47th, 48th and 49th days it was below 99.5°, part of this time at 98°. Then the temperature rose progressively, and on the 55th day was 103°. The fever of the relapse lasted from the 50th to about the 75th day. Rose-spots were present during the relapse, and the spleen was palpable. During the relapse the patient had signs of periostitis of the humerus and of the sternal ends of the fourth and fifth ribs.

Chas. H., aged 22 (Hosp. No. 13,769), admitted Sept. 3, 1895, on the 8th day of the disease. Primary attack very mild; temperature only twice reached 103°, and he had but one tub. On the 12th day the temperature touched normal. Then on the 14th and 16th days there were slight elevations to 101°. Between the 16th and 19th days slight elevations. From the 20th to the 29th days the temperature was normal, most of the time subnormal. On the 30th and 31st days the temperature began to rise, and he had fever until the 40th day; highest temperature 103.5°. In the relapse the tongue was furred, the spleen was palpable, and there were rose-spots. During the relapse he had a slight rectal abscess. This case was interesting from the mild character of the primary attack. As stated, the temperature touched normal on the 12th day, and then for the following week he had slight irregular fever, followed by apyrexia for nine days.

<sup>1</sup> This number includes also Cases 7147, 7218, 8448 and 10657, omitted inadvertently in Studies II.

Wm. D., aged 17 (Hosp. No. 13,962), admitted Sept. 22, 1895, on the 5th day of illness. Primary attack mild; sixteen days' duration; 16 tubs. On the 24th day, after 7 days of apyrexia, the fever recurred, and lasted for fifteen days, range to  $104.4^{\circ}$ , higher than in the primary attack. During relapse 23 tubs. Spleen palpable, tongue furred, abundant crop of rose-spots.

Martin D., aged 30 (Hosp. No. 14,051), admitted Oct. 1, 1895, at the end of the third week of illness. Primary attack not severe. Patient was admitted at the end of the primary attack, and on the 4th day after admission the temperature was normal. On the 30th day, after 5 days of normal temperature, a relapse, fever lasting 21 days; temperature range to  $103.8^{\circ}$ . Tongue was furred, spleen palpable, rose-spots present.

Caledonia N., aged 14 (Hosp. No. 14,231), admitted Oct. 17, 1895, on the 14th day of illness. Primary attack mild; temperature normal on the 8th day after admission. Normal temperature for three days; then fever of 11 days' duration, range to  $105^{\circ}$ ; more severe than primary attack. Spleen palpable, rose-spots, furred tongue.

Margaret P., aged 25 (Hosp. No. 16,713), admitted July 18, 1896, on the 18th day of illness. On admission she seemed almost convalescent, and on the 4th day the temperature was normal. After 5 days of normal temperature, a gradual ascent; fever of ten days' duration, range to  $103^{\circ}$ . Spleen palpable, rose-spots, coated tongue.

Christian P., aged 37 (Hosp. No. 16,920), admitted Aug. 8, 1896, on the 20th day of illness. Primary attack of moderate severity, slight delirium. Temperature normal on 27th day; 6 tubs. On the 37th day, after 10 days of normal temperature, relapse lasting for 10 days, range to  $103^{\circ}$ . Patient had recurrent diarrhoea through the relapse. The spleen was not palpable, no rose-spots.

Mary G., aged 15 (Hosp. No. 16,967), admitted Aug. 11, 1896, on 6th day of illness. Primary attack of great severity; temperature range to  $107^{\circ}$ ; 63 tubs; temperature normal on 29th day. On 33d day, after 4 days of normal temperature, relapse lasting 16 days; range  $102.8^{\circ}$ . Spleen not palpable, tongue coated, no rose-spots.

Geo. W., aged 28 (Hosp. No. 17,043), admitted Aug. 18, 1896, on the 9th day. Temperature normal on 27th day. After 7 days of apyrexia, a relapse lasting 9 days; range 102.8°. Rose-spots, palpable spleen.

Bessie M., aged 20 (Hosp. No. 17,101), admitted Aug. 24, 1896, on the 15th day of disease. Primary attack mild; temperature normal on 22d day. After 8 days normal temperature, relapse, mild, fever of 18 days' duration, range to 103°. Tongue coated, abdomen distended, spleen not palpable. General condition looked typhoidal.

Thos. N., aged 37 (Hosp. No. 17,205), admitted Sept. 4, 1896, on the 20th day of illness. Severe attack; temperature 104.5°. On the 52d day, after 9 days of normal temperature, relapse; duration 13 days; range 104.2°. Spleen palpable, rose-spots, coated tongue.

Geo. F. W., aged 32 (Hosp. No. 17,307), admitted Sept. 16, 1896, on the 9th day of illness. On the 18th day, after the temperature had touched normal on four successive days, relapse, lasting 14 days, until death from hæmorrhage. Fever much higher and steadier during relapse than during primary attack. Fatal hæmorrhage occurred on the 31st day, when he was doing perfectly well, and the temperature had not been above 102° for two days.

Chas. H., aged 47 (Hosp. No. 17,319), admitted Sept. 17, 1896, on the 13th day of illness. The patient was admitted with perforation of appendix in typhoid fever, and operated on at once. He did well. On the 37th day, after four days of normal temperature, a relapse lasting 16 days; severe attack; temperature range 104.5°; 38 tubs during relapse.

Kate W., aged 30 (Hosp. No. 17,367), admitted Sept. 22, 1896, on the 8th day of illness. Primary attack of moderate severity; temperature touched normal on the 26th day. Completely normal temperature until 49th day; then characteristic relapse; rose spots, palpable spleen; duration of relapse 11 days. Though the fever was protracted in primary attack, it was moderate and she did not have tubs. In the relapse she had 29 tubs.

Kate K., aged 16 (Hosp. No. 17,446), admitted Sept. 30, 1896, on the 10th day. Primary attack moderate; 29 tubs. On 38th day, after 8 days of normal temperature, a relapse of 9 days' duration; range 101.6°; palpable spleen, rose-spots and coated tongue.

Amos H., aged 21 (Hosp. No. 17,608), admitted Oct. 16, 1896, on the 3d day. Primary attack mild; temperature rarely above 102.5°; only 3 tubs. During third week the temperature fell gradually, and was between 99° and 101°. On the 22d day the temperature was about and below 99° for just twenty-four hours; then gradually rose, and the relapse was much more severe than the primary attack. Temperature rose to 105°; he had 41 tubs and numerous sponges. The relapse lasted 26 days; spleen palpable, rose-spots and coated tongue.

Annie A., aged 17 (Hosp. No. 17,619), admitted Oct. 17, 1896, on the 8th day. Severe attack; temperature range 105.2°, continuously high; 24 tubs, changed to sponges on account of severe cramps. On the 45th day, after the temperature had touched and been below normal for six days, a relapse lasting 19 days; temperature range not high, 102.6°; tongue coated, spleen palpable, fresh rose-spots.

Wm. J., aged 17 (Hosp. No. 20,199), admitted Aug. 4, 1897, on the 17th day. Primary attack moderately severe; temperature 102°; 20 tubs. Temperature normal on 33d day. Then, after 19 days of complete apyrexia, the temperature rose within three days to 105°; relapse of 18 days' duration; tongue coated, rose-spots, spleen palpable.

Ella M., aged 10 (Hosp. No. 20,286), admitted Aug. 12, 1897, on the 4th day. Primary attack mild; temperature normal on the 9th day. Then, after 8 days of normal and subnormal temperature, a relapse lasting 13 days; temperature range to 104°; tongue coated, spleen not palpable, no rose-spots; Widal reaction positive. Onset of relapse abrupt.

Charles D., aged 26 (Hosp. No. 20,456), admitted Aug. 30, 1897, on the 10th day. Primary attack severe; 98 tubs. After 4 days of apyrexia, a relapse of 15 days; range to 103.5°; rose-spots, palpable spleen.

Lewis R., aged 39 (Hosp. No. 20,507), admitted Sept. 4, 1897, on the 7th day. Primary attack mild; highest temperature 103.5°. After 16 days of apyrexia, a relapse of 16 days; temperature range 104°; rose-spots, coated tongue; diarrhoea, palpable spleen.

Ham S., aged 22 (Hosp. No. 20,551), admitted Sept. 8, 1897, on the 6th day. Primary attack short; temperature range 105°; touched normal on 13th day. It remained normal and subnormal until the 28th day; then a mild relapse for 12 days, in which the spleen was felt for the first time; the tongue was coated, no rose-spots.

Mary K., aged 14 (Hosp. No. 20,646), admitted Sept. 18, 1897, on the 8th day. Primary attack severe; three hæmorrhages; temperature normal on the 41st day. After 11 days of normal temperature a relapse, gradual rise, high fever; duration 24 days; range 104°; rose-spots; palpable spleen, coated tongue.

Mary W., aged 11 (Hosp. No. 20,773), admitted Sept. 29, 1897, on the 16th day. Primary attack very mild; temperature reached normal on the 20th day. After 10 days of normal temperature a relapse, severe and protracted, lasting 42 days; coated tongue, rose-spots. Unusually protracted case, owing to the persistence of fever during relapse.

Anton T., aged 30 (Hosp. No. 20,814), admitted Oct. 4, 1897, on the 16th day. Temperature did not rise above 101° in primary attack, and within a few days after admission was normal. After 7 days of apyrexia, a relapse of 22 days' duration; rose-spots, palpable spleen, coated tongue, numerous hæmorrhages. Case is reported on page 310 by Dr. Hamburger.

Raymond C., aged 10 (Hosp. No. 21,060), admitted Oct. 28, 1897, on the 11th day. Primary attack severe; temperature 105.4°. Temperature was normal on the 34th and 35th days, and again for the greater part of the time on the 37th and 38th. Then between the 41st and 47th days it gradually rose to 102.5°, with fever for 16 days; range to 102.5°; tongue coated, spleen palpable, no spots.

Israel N., aged 33 (Hosp. No. 21,116), admitted Nov. 4, 1897, on the 8th day. Mild primary attack; temperature range 103.4°.

On the 14th day the temperature was normal; then for 4 days it ranged from  $99^{\circ}$  to  $102^{\circ}$ ; then remained from  $101^{\circ}$  to  $103^{\circ}$  for 8 days. He had 33 tubs, rose-spots were present and the spleen palpable.

Wm. U., aged 27 (Hosp. No. 21,356), admitted Nov. 29, 1897, on the 6th day. Mild attack, only 5 tubs; temperature normal on 14th day. He was discharged convalescent on Dec. 31, the 32d day. The temperature for all this time had been normal and sub-normal. He was readmitted (Hosp. No. 21,620) on Jan. 3, of the 40th day of illness, with a temperature of  $104^{\circ}$ , having had fever the previous day. He had a relapse of 16 days' duration, complicated with glossitis; spleen palpable, rose-spots present.

Geo. W., aged 37 (Hosp. No. 23,401), admitted July 9, 1898, on the 9th day. Severe attack. On the 38th day, after 4 days of normal temperature, fever rose; relapse of 9 days' duration; temperature range to  $105.2^{\circ}$ ; tongue coated, spleen not felt, no rose-spots.

Thos. B., aged 19 (Hosp. No. 23,643), admitted Aug. 2, 1898, on the 12th day. Primary attack mild; temperature normal on the 18th day. After 7 days of apyrexia, a relapse of 26 days' duration; range to  $103.4^{\circ}$ ; return of rose-spots, spleen palpable, tongue coated; Widal reaction present for the first time.

Maggie C., aged 32 (Hosp. No. 23,692), admitted Aug. 8, 1898, on the 10th day. Primary attack mild; temperature not above  $101.5^{\circ}$  while in hospital. After 8 days of apyrexia, a relapse; temperature range to  $103.5^{\circ}$ ; return of rose-spots, furred tongue and palpable spleen; fever of 8 days' duration.

Maggie P., aged 15 (Hosp. No. 23,702), admitted Aug. 8, 1898, on the 7th day. Primary attack severe; 49 tubs. Temperature touched normal on the 23d, 24th, 25th, 26th and 27th days, ranging to  $101^{\circ}$ ; then 12 days of fever; temperature range to  $104^{\circ}$  (an intercurrent relapse). Then, after 13 days of normal temperature, the patient up and about in chair, she had a second relapse with high fever; temperature between  $104^{\circ}$  and  $105^{\circ}$ . Perforation on the 5th day of relapse; operation; recovery.

Clinton G., aged 30 (Hosp. No. 23,899), admitted Aug. 27, 1898, on the 9th day of illness. Primary attack of moderate

severity; temperature normal on the 18th day. There were 3 days of apyrexia, and then a gradual ascent, relapse lasting 12 days. He had 16 tubs in primary attack and 6 in the relapse; spleen palpable, no rose-spots, tongue furred.

Carroll T. B., aged 25 (Hosp. No. 23,950), admitted Sept. 2, 1898, on the 8th day. Primary attack of moderate severity; fever up to  $104^{\circ}$ ; temperature first reached normal on the 16th day. After 3 days without fever, the temperature gradually rose, reaching  $104^{\circ}$  on the 27th day of illness. The relapse lasted 18 days, and was much more severe than the primary attack. The spleen became palpable; there were no spots. No spots were seen in primary attack.

Egbert J. M., aged 32 (Hosp. No. 23,958), admitted Sept. 3, 1898, at the end of the third week. Primary attack mild; fever dropped to normal on the 27th and 28th days. On the 29th and 30th days the temperature was practically normal, ranging from  $97^{\circ}$  to  $99^{\circ}$ . Then the temperature rose gradually, and by the 33d day reached  $103^{\circ}$ ; fever for 9 days. Only 3 tubs in the primary attack; 6 in the relapse. The spleen was palpable, no rose-spots, tongue coated.

John G., aged 29 (Hosp. No. 24,063), admitted Sept. 13, 1898, on the 8th day. Severe attack; temperature to  $105^{\circ}$ ; 15 tubs. Temperature normal on the 17th day; 8 days of apyrexia; then on the 25th day a rise in temperature; relapse of 5 days' duration; range  $103.5^{\circ}$ . The spleen became palpable again, but there were no rose-spots. The spleen had been easily palpable in the primary attack, and then as the fever fell the edge could not be felt. In the relapse it could be quite plainly felt again. Only suspicious rose-spots in the primary attack.

Kate H., aged 23 (Hosp. No. 24,064), admitted Sept. 13, 1898, on the 17th day. Primary attack severe; temperature range from  $104^{\circ}$  to  $105^{\circ}$ ; 56 tubs. Temperature normal on the 33d day. After 11 days of apyrexia, a severe relapse lasting 16 days, temperature going to  $105^{\circ}$ , requiring many tubs and sponges. Profuse rash, palpable spleen, coated tongue.

Cornie S., aged 13 (Hosp. No. 24,331), admitted Oct. 7, 1898, on the 12th day. Temperature in primary attack ranged to  $104^{\circ}$ ;

normal on 18th day. After 5 days of apyrexia a relapse lasting 11 days; spleen palpable, tongue clean, no rose-spots.

*Case with three relapses: Primary attack in June; First relapse early in September; Second relapse first week in November, onset with arthritis; Third relapse, fever of nine days' duration; Recovery.*

Bessie W., aged 26 (Hosp. No. 24,675), nurse, admitted Wednesday, Nov. 9, 1898, complaining of pains, swelling and redness of the ankles.

There is no history of rheumatism in her family.

She has been very healthy; has had no infectious diseases.

Early in June, while nursing a case of arthritis deformans in Selma, Ala., she was attacked with typhoid fever. She was severely ill, delirious, and was not able to be up until the latter part of August. After being up and about for a few days she went to her home in Dorchester, Mass. Within about a week she began to feel badly and to have fever, and one afternoon found her temperature 103.5°. She then went to bed, and had fever for three weeks. She evidently was very ill, as she knows little or nothing about the attack, except that she was on liquid diet and had her temperature taken every two hours. About the end of September she was able to get up for a few hours each day, and she returned to Baltimore against advice. Not feeling very well on her arrival, she consulted Dr. Thayer. The temperature, taken on several days, was normal. Early in October she took care of a case of typhoid fever in a child of six years. About the middle of the month she noticed that she had fever, varying from 100° to 105°, usually normal in the morning. She kept at work, and on Tuesday, Nov. 6, went to a case of appendicitis, and the next day the arthritic symptoms to be described came on. Evidently since her return to Baltimore she had not been quite well, though she kept up and was at work. She had profuse night-sweats and her feet and ankles had been swollen at times. For two weeks previous to the onset of the present attack she had had severe headache. Dr. Futeher gives the following account of the onset of her present attack. He saw her at the Nurses Club at 4.30 P. M. on the 9th. On the previous day she had begun to nurse a case of appendicitis, and at 2 A. M. had intense pain in the right ankle and over the

dorsum of the foot, and she found these parts both swollen and red. Later in the morning the left ankle became painful and swollen, and she was forced to give up the case and return to the Nurses Club. When seen the patient was suffering great pain in both ankles. The swelling had diminished, but over the dorsum of the right foot there was a reddened area extending from the ankle-joint nearly to the base of the toes, and along both the inner and outer margins. The redness was very intense, and did not quite disappear on pressure. The skin about both ankles was extremely sensitive to the slightest touch. The temperature was  $102^{\circ}$ . There were two ecchymotic areas on the inner surface of the tibia above the ankle-joint. She was removed to the hospital.

On the 10th the temperature ranged to  $103^{\circ}$ . The swelling of the right foot had much diminished. There was no extension of the hyperæmic areas. The left foot, too, was much better. Cold bichloride compresses had been kept on both feet all night, and she had been ordered 15 grains of sodium salicylate every four hours. Naturally the case was regarded as one of acute rheumatism.

On the 11th the swelling and pain and sensitiveness of the joints had improved very much, but her temperature had risen and reached  $104^{\circ}$ . We then ascertained more definitely with reference to her primary attack of typhoid fever in Selma, and the relapse in Dorchester. At 9 P. M. on the 11th, Dr. Fitcher noted rose-spots on the abdomen. The spleen was palpable. On the 12th the Widal reaction was quite positive. The temperature was very steady, ranging from about noon on the 10th to 8 A. M. on the 14th constantly between  $103^{\circ}$  and  $104^{\circ}$ , once reaching  $104.6^{\circ}$ . The temperature gradually fell on the 16th, 17th and 18th, and on the 21st, the 13th day since the onset of the arthritis, became normal. The attack was a very characteristic one, with rose-spots, enlarged spleen, Widal reaction marked, coated tongue and dirotic pulse.

From Nov. 21st to the 28th the temperature was normal; then on the 28th, 29th and 30th it gradually rose, and reached on the evening of the latter date  $102.5^{\circ}$ . On Dec. 1 it was  $103.5^{\circ}$ . The tongue became furred and she felt much worse. This attack of fever persisted for nine days, the temperature becoming normal on Dec. 6, the 10th day. In this attack she had abdominal pain, some tenderness on palpation in the epigastric region. The spleen

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was not palpable. The pulse was slightly dirotic. On Nov. 30 there was distinct tenderness of the abdomen. On Dec. 1, when the fever was at its height, I noted that there were no rose-spots. The spleen was not palpable. There was soreness in the right iliac fossa, but no tension; no tenderness over the gall-bladder. There were no changes in the urine. During this fever of nine days' duration she looked badly and felt badly, and I think it in all probability represented a genuine relapse, though she had no rose-spots, nor was the spleen palpable. She had a tedious convalescence and was discharged well, Dec. 23.

Annie W., aged 29 (Hosp. No. 24,356), admitted Oct. 10, 1898, on the 10th day. Primary attack severe; temperature range to 105°; normal on the 20th day. After 8 days of apyrexia a relapse of 9 days' duration; temperature range to 103.6°; spleen again palpable, return of diazo reaction, no spots.

John S. C., aged 47 (Hosp. No. 25,609), admitted Feb. 20, 1899, on the 6th day. Primary attack of moderate severity; temperature normal on the 19th day. After 11 days of apyrexia, a relapse of 15 days' duration; Widal reaction positive for the first time in relapse; return of rose-spots; spleen palpable.

M. D. M., aged 48 (Hosp. No. 24,042), admitted Sept. 11, 1898. Very prolonged attack, duration of fever 69 days. On the 48th day, after 8 days of normal temperature, fever began to rise again, and until the 69th day it ranged from 99° to 102°. There were no rose-spots. The tongue was a little furred at the onset; no diarrhoea, but on the 66th day the edge of the spleen was felt. This illustrates a type of fever which is very difficult to classify. Had she really a relapse? It is most probable that she had. I think the persistence of the fever is itself a point in favor of a relapse. She was a large, stout woman without anaemia.

## INTERCURRENT RELAPSES.

Henry V., aged 32 (Hosp. No. 16,773), admitted July 25, 1896, on the 8th day. Primary attack severe; delirium; high fever; 105.6°; 72 tubs. On the 29th and 30th days the temperature touched 99°, and from the 29th to the 32d day the range was about 100°. Then for a week the temperature ranged from 100° to 102°, and the patient's condition improved. On the 34th day

he had a phlebitis. On the 39th and 40th days the temperature rose and reached  $107.2^{\circ}$ , persisted very high, between  $105^{\circ}$  and  $106^{\circ}$ , and the patient had a severe relapse, lasting until the 58th day, that is 20 days, counting the beginning of the relapse from the 39th day. There were rose-spots, coated tongue; condition of spleen not noted.

Edward A. F., aged 23 (Hosp. No. 17,118), admitted Aug. 26, 1896, on the 20th day of illness. Primary attack severe; temperature range to  $105^{\circ}$ . On the 30th and 31st days the temperature was lower, and on the 32d day it touched normal. Then for 26 days there was a further period of fever, temperature high at first, reaching  $105^{\circ}$ . In the primary attack the patient had 16 tubs, in the intercurrent relapse 42 tubs. During the intercurrent relapse the spleen was palpable, much delirium, no rose-spots.

Ned. B., aged 26 (Hosp. No. 19,957), admitted July 8, 1897, on the 9th day. Primary attack severe; high fever; 31 tubs. From the 19th to the 25th day the temperature touched normal each day, though it had on several occasions risen to  $101^{\circ}$ . In this period never for more than six hours at a time was the temperature below  $98.2^{\circ}$ . Then on the 26th day the temperature rose; there was high fever, range to  $105^{\circ}$ , requiring numerous tubs, up to 77, lasting 22 days. Rose-spots, palpable spleen, coated tongue.

*Case illustrating the difficulty of judging whether a case is a relapse or a recrudescence.*

Norman H., aged 27 (Hosp. No. 21,256), admitted Nov. 18, 1897, on the 6th day. On the 42d day, after the temperature had ranged from  $99^{\circ}$  to  $100.5^{\circ}$ , it rose to  $104^{\circ}$ . The spleen was not felt, but on the third day of this fever fresh rose-spots appeared. On the 50th day, after 12 hours of normal temperature, the fever rose again and lasted for 5 days. Spleen not felt; doubtful as to rose-spots. On the 57th day, after 24 hours of normal temperature, the fever rose to  $101^{\circ}$  and lasted for two days.

Charles S., aged 13 (Hosp. No. 24,299), admitted Oct. 5, 1898, on the 12th day. Temperature for the first week did not rise above  $102.5^{\circ}$ . Several times it touched  $99^{\circ}$ , and the diurnal range was frequently two and three degrees. On the 20th and 21st days

the temperature became higher, more continuous, and required tubs for the first time, reaching between  $103^{\circ}$  and  $104^{\circ}$ . It did not fall to quite normal until the 36th day. During the first week there were a few suspicious rose-spots; the spleen could not be felt. During the intercurrent relapse there were typical rose-spots and the spleen was distinctly felt.

Chas. R. N., aged 28 (Hosp. No. 24,311), admitted Oct. 6, 1898, on the 10th day. Primary attack mild; spleen palpable, tongue coated, rose-spots doubtful. On the 11th, 13th, 14th and 16th days the temperature touched normal, though there was a daily rise to  $101^{\circ}$ . His general condition was good. Then on the 17th and 18th days the temperature rose, and from this time on his fever was high, constantly reaching  $104^{\circ}$  and a little over. He had to have tubs for the first time. There was rapid pulse, no rose-spots, some rigidity of the limbs. On the 23d day he began to have epistaxis, which was quite severe; no subcutaneous hæmorrhages; slight diarrhœa. He had almost continuous hæmorrhage through the day, very profuse and bright. The nares were plugged. He vomited blood in small amount. At 5 P. M. he complained of pain and tenderness in the region of the gall-bladder. At 9.40 P. M. he passed 300 cc. of port-wine colored fluid; no clots. The bleeding persisted until 3.30 A. M. on the following day. The temperature dropped from nearly  $103^{\circ}$  at midnight to  $95^{\circ}$  at 10 A. M. on the 24th day. On this day he again had recurring hæmorrhage from the right nostril. He had had repeated infusions of salt solution, but the pulse became extremely feeble, and he died at 2 P. M. At autopsy nothing was found to account for the pain in the side. With the hæmorrhage from the nose and much blood being swallowed, it was difficult to know whether the blood which came from the bowel was due to intestinal hæmorrhage, or was swallowed blood. At the autopsy, passing up from below the colon was full of blood, but there was an interval of nearly three feet in which there was no blood. Above this again there was blood through the ileum up to the duodenum.

John A. R., aged 19 (Hosp. No. 24,603), admitted Nov. 2, 1898, on the 5th day. Primary attack mild. During the second week of illness the temperature only rose to about  $103^{\circ}$ , and touched normal on the 11th day, and every day throughout the third week,

sometimes falling to  $97^{\circ}$ . Each day there was an afternoon rise to  $100^{\circ}$ , or sometimes to  $101^{\circ}$ . The patient was doing well; there were a few rose-spots and the spleen was readily palpable. Then, on the afternoon of the 20th day, the temperature rose to  $103^{\circ}$ , and he had a very severe and protracted attack of fever, of 27 days' duration. The temperature was high, and he had four hæmorrhages. The spleen was enlarged; there were no rose-spots.

John E. H., aged 33 (Hosp. No. 25,631), admitted Feb. 21, 1899, on the 1st day. Primary attack of moderate severity. On the 23d day the temperature touched normal, having been between  $100^{\circ}$  and  $101^{\circ}$  for five days. On the 24th day the temperature was normal in six out of twelve observations through the day, rising to between  $101^{\circ}$  and  $102^{\circ}$ . Then, on the 25th day, between midnight and 6 A. M., the temperature rose from normal to  $103.8^{\circ}$ , and the patient had a second severe attack, in which rose-spots were first seen. The spleen became larger and the tongue coated. During the relapse he also had jaundice. The relapse persisted for twelve days.

### 3.—POST-TYPHOID VARIATIONS OF TEMPERATURE.

The special care and the frequency with which the temperature is taken in our typhoid fever patients (every two or every four hours), has brought out some interesting points. These may be considered under the following heads:

**I. The Subfebrile State in Convalescence.**—In children, in nervous patients and in very protracted cases the general symptoms may improve, the tongue become clean, the appetite return and everything may look favorable, but the thermometer may show a daily rise to  $100^{\circ}$  or  $100.5^{\circ}$ , continuing for ten days or even three weeks, and may be a source of no little anxiety. If the spleen is not palpable, if the tongue is clean, the appetite and strength returning, and the urine free from typhoid bacilli, the best plan is to stop taking the temperature, let the patient sit up, and begin to give solid food. In some persons, particularly in children and in nervous subjects, the normal diurnal range of temperature may be between  $97.5^{\circ}$  and  $100^{\circ}$ . In a number of instances of this kind I have never seen any ill effects from the plan suggested.

**II. Hypothermia.**—Our records have taught us that low temperatures are very common in two diseases—malaria and typhoid fever. In the latter we see it—

(a) As an effect of the tub, particularly in the third week. Following the bath for an hour or more the rectal temperature may not be more than  $97^{\circ}$ . This is an every-day occurrence in the wards.

(b) Spontaneously in the third and fourth weeks, at the period of marked remissions, the temperature may sink as low as  $97^{\circ}$ . The lowest temperature I remember to have seen during the spontaneous remissions of the disease was in a case which I saw with Dr. Delano Ames. On the twelfth day of the disease the patient had a very severe hæmorrhage, which had reduced the temperature to  $95^{\circ}$ . He subsequently did well, but the attack was protracted, and in the fifth and sixth weeks there were extraordinary variations in temperature. Thus on the thirty-sixth day the temperature fell from  $102.2^{\circ}$  at 11 A. M. to  $94.5^{\circ}$  at 1 A. M. on the following morning. It then rose  $8^{\circ}$  by 10 A. M. on the thirty-eighth day, but dropped again to  $94.7^{\circ}$  by 6 A. M. on the following day. He made a good recovery.

(c) Following hæmorrhage. Here the temperature drop may be eight or even ten degrees. It rarely falls below  $98^{\circ}$ , though I have one record showing  $95^{\circ}$ . The temperature may remain low for twenty-four or thirty-six hours.

(d) Persistent hypothermia during convalescence. For a week or ten days, or longer, more particularly after protracted cases with great emaciation, the temperature may be  $97^{\circ}$  or  $96.5^{\circ}$ , and for days the maximum may not reach  $98^{\circ}$ . This is quite a common event, which is illustrated by some scores of our charts. It is of no special significance.

**III. Recurring Paroxysms of Chills and Fever.**—In Studies II I have dealt quite fully with the subject of chills in typhoid fever, and have given a number of illustrative cases. It is not sufficiently recognized that in the protracted convalescence paroxysms of fever with chills may recur at intervals for several weeks, and this in the absence of any signs whatever of localized trouble. The following cases illustrate chills occurring after the temperature has become normal:

Frank S., aged 20 (Hosp. No. 14,599), admitted Nov. 26, 1895. On the 36th day, after seven days of normal temperature, when he had been sitting up, he had a chill at the onset of a second recrudescence of the fever. No cause ascertained. The fever persisted for forty-eight hours.

Patrick B., aged 21 (Hosp. No. 16,736), admitted July 1, 1896, on the 22d day of illness. Very protracted case. On the 76th and 80th days he had chills followed by fever; temperature  $104.6^{\circ}$ ; no cause ascertained; much emaciation.

Blanche H., aged 24 (Hosp. No. 23,624), admitted Aug. 1, 1898, during a relapse. Patient had a shaking chill on 19th day after temperature had been normal; no cause to be ascertained.

Edward M., aged 25 (Hosp. No. 23,936), admitted Aug. 31, 1898. After three days of normal temperature a chill, probably urethritis and cystitis.

The following brief abstracts are of the cases with post-typhoid elevations of temperature:<sup>1</sup>

*Case XXX.*—Jos. P., aged 38 (Hosp. No. 7803), admitted July 28, 1893, on the 10th day of illness. The temperature became normal on the 27th day of illness. After the temperature had ranged from  $98.4^{\circ}$  to  $99.5^{\circ}$ , and once  $100.4^{\circ}$ , for four days, there was a recrudescence of the fever for three days, reaching as high as  $103.2^{\circ}$ ; no obvious cause.

*Case XXXI.*—Edward D., aged 34 (Hosp. No. 7928), admitted Aug. 12, 1893, on the 6th day of illness. Mild case. Temperature normal on the 21st day.

*Case XXXII.*—Sophie S., aged 22 (Hosp. No. 8090), admitted Sept. 2, 1893, on the 10th day of illness. Mild case. After two days of normal temperature, a recrudescence lasting 24 hours, temperature reaching  $102.8^{\circ}$ . No obvious cause. Pain in the popliteal region; no definite thrombosis.

*Case XXXIII.*—Aug. K., aged 12 (Hosp. No. 8232), admitted Sept. 22, 1893, on the 21st day of illness. Attack of moderate severity. After 11 days of normal temperature, a recrudescence

<sup>1</sup>Continued from 298, Studies II, vol. v, Hospital Reports.

of fever lasting 6 days; no spots; no enlargement of the spleen. The diet had already been increased.

*Case XXXIV.*—John C. S., aged 20 (Hosp. No. 8878), admitted Dec. 28, 1893, on the 28th day of illness. On the 51st day, after the temperature had been normal for 14 days, there was a recrudescence of the fever with headache; no enlargement of the spleen; no rose-spots. Duration 6 days; maximum temperature  $102^{\circ}$ .

*Case XXXV.*—Henrietta B., aged 40 (Hosp. No. 9921), admitted May 19, 1894, on the 4th day of illness. On the 26th day, after 10 days of normal temperature, recrudescence of fever lasting 4 days; no obvious cause; maximum  $101.8^{\circ}$ .

*Case XXXVI.*—Theodore B., aged 24 (Hosp. No. 10,298), admitted on the 14th day of illness. Severe attack. Phlebitis of right femoral on the 26th day. On the 31st day a chill; rapid rise of temperature to  $105.4^{\circ}$ . Fever of 2 days' duration, probably associated with the phlebitis on the 26th day. On the 36th day another rapid rise of quite transient duration to  $104.2^{\circ}$ .

*Case XXXVII.*—Edward E., aged 21 (Hosp. No. 10,796), admitted Sept. 5, 1894, on the 7th day of illness. Attack of moderate severity. On the 28th day, after 24 hours of normal temperature, recrudescence lasting 2 days, fever reaching  $103.2^{\circ}$ ; no obvious cause.

*Case XXXVIII.*—Homer H., aged 29 (Hosp. No. 11,074), admitted Oct. 8, 1894, on the 8th day. Severe attack.

*Case XXXIX.*—Kate L., aged 30 (Hosp. No. 11,331), admitted Nov. 6, 1894; day of illness doubtful. On the 22d day in hospital, after 3 days normal temperature, a recrudescence of fever lasting 6 days, temperature reaching  $104.8^{\circ}$ .

*Case XL.*—Sewell E. O., aged 20 (Hosp. No. 11,379), admitted Nov. 12, 1894, on the 4th day of illness. On the 26th day of illness, after 10 days of normal temperature, when patient had been sitting up in bed, fever lasting 24 hours, rising to  $104.5^{\circ}$ ; no obvious cause.

*Case XLII.*—A. J., aged 29 (Hosp. No. 12,589). On the 31st day, after 4 days of normal temperature, a recrudescence ranging to  $102.6^{\circ}$ , lasting 6 hours. Leucocytes 13,000, fell to 7200 in 3 days.

*Case XLIII.*—R. A. E., aged 6 (Hosp. No. 12,687). On the 13th day of normal temperature patient sat up in bed. Temperature rose in evening to  $100.4^{\circ}$ ; normal again in 8 hours. After 29 days of normal temperature, he had an evening rise of  $103.6^{\circ}$ , associated with a slight tonsillitis lasting 2 days.

*Case XLIV.*—A. W., aged 20 (Hosp. No. 13,182). On the 59th day a recrudescence lasting 4 days, range to  $101^{\circ}$ ; patient had had 67 baths.

*Case XLV.*—A. G., aged 33 (Hosp. No. 13,501). After 9 days normal temperature, a recrudescence lasting 6 days, range to  $101.4^{\circ}$ . Severe case; duration 51 days; 44 baths.

*Case XLVI.*—Mary C., aged 30 (Hosp. No. 13,524), admitted Aug. 7. She had high fever for a week, then slow defervescence; afebrile on the 27th. Slight attack of pleurisy Aug. 22. On the morning of Sept. 8 the patient's temperature rose to  $103.5^{\circ}$ . She had headache and nausea. The tongue was clean. The patient complained of marked tenderness in the right iliac region and in the region of the spleen. The spleen was not palpable. There was fever from the morning of the 8th until 8 P. M. on the 10th. The highest temperature was  $104.6^{\circ}$ . The bowels were moved by an enema, and she got perfectly well.

*Case XLVII.*—G. L., aged 17 (Hosp. No. 13,554). Protracted and severe case; duration 57 days; 82 baths. Recrudescence on 39th day, after 9 days normal temperature, range to  $101.8^{\circ}$ ; lasted 3 days. On 50th day, after 6 days normal temperature, recrudescence lasting 7 days, range to  $101.5^{\circ}$ . Spleen not palpable; no rose-spots.

*Case XLVIII.*—C. H., aged 22 (Hosp. No. 13,769). Protracted but mild case, with a relapse on the 31st day. After 9 days of normal temperature, recrudescence on 50th day lasting 36 hours. Temperature rose to  $103.5^{\circ}$ , possibly associated with an attack of coryza.

*Case XLVIII.*—W. F. F., aged 26 (Hosp. No. 13,813). Very protracted illness for 59 days with much delirium, pneumonia of the right lower lobe, phlebitis. After normal temperature of 13 days, recrudescence lasting 8 days.

*Case XLIX.*—Sarah H., aged 18 (Hosp. No. 13,919), admitted Sept. 18, 1895, on the 17th day of the disease. The attack was severe, much delirium, high temperature, 107.2° on the 19th day. On the 37th day, after 6 days of temperature ranging about 99°, there was a recrudescence lasting 5 days; temperature range 101.4°.

*Case L.*—S. G., aged 26 (Hosp. No. 14,171). Recrudescence on the 27th day, lasting 3 days, after the temperature had twice touched normal; range 105°. The patient had had 46 baths.

*Case LI.*—J. L., aged 46 (Hosp. No. 14,280). Mild but protracted case, not bathed. After 2 days normal temperature, recrudescence on 31st day, lasting 8 days; range 101°. The rise occurred the first day after taking eggs and toast.

*Case LII.*—E. R., aged 29 (Hosp. No. 14,360). On 55th day, after 11 days normal temperature, recrudescence lasting 48 hours; range to 101.5°.

*Case LIII.*—J. K., aged 36 (Hosp. No. 14,444). Recrudescence on 45th day, after 3 days of normal temperature, lasting 8 days; range to 102.6°. Second recrudescence on 56th day, after 3 days normal temperature, lasting 14 days. Patient very hysterical; 22 baths. Typhoid spine.

*Case LIV.*—F. S., aged 20 (Hosp. No. 14,599). Mild but protracted case with only 3 tubs. After 7 days normal temperature, recrudescence on 21st day, lasting 48 hours; range 99° to 105°. Second recrudescence on 36th day, after 7 days of normal temperature; lasted 48 hours; range 105.8°. This recrudescence was initiated by a chill; no malarial organisms.

*Case LV.*—M. K., aged 21 (Hosp. No. 14,914). Mild case, 9 tubs. Recrudescence on 19th day, after 24 hours normal temperature; lasted 5 days; range 101.8°; no enlargement of spleen; no rose-spots.

*Case LVI.*—T. B., aged 29 (Hosp. No. 15,106). After 5 days normal temperature, fever rose to  $101^{\circ}$  and remained up for a few hours.

*Case LVII.*—M. P., aged 25 (Hosp. No. 16,713). Following a relapse, after 4 days normal temperature, recrudescence lasting 6 days; range  $101^{\circ}$ .

*Case LVIII.*—P. K., aged 16 (Hosp. No. 16,829). Moderately severe case; 26 tubs. After 3 days of temperature at  $99^{\circ}$ , recrudescence lasting 4 days, range  $101.5^{\circ}$ , followed the increase in diet.

*Case LIX.*—H. B., aged 20 (Hosp. No. 16,870). Three days before discharge, when he had been up and about, fever of 12 hours, range to  $103.5^{\circ}$ , which seems to have followed exposure.

*Case LX.*—A. F., aged 27 (Hosp. No. 16,910). Moderate attack; 10 tubs. After 8 days normal temperature, spleen still being palpable, recrudescence of 5 days; range  $103.5^{\circ}$ ; no rose-spots.

*Case LXI.*—O. E., aged 17 (Hosp. No. 17,148). From 32d to 34th day, after patient had been up, recrudescence, range  $103^{\circ}$ , supposed to be due to constipation.

*Case LXII.*—M. L. F., aged 3 (Hosp. No. 17,887). Mild case, duration of the fever 18 days. She had on the 19th, 22d, 23d and 32d days slight recrudescences, fever lasting only a few hours.

*Case LXIII.*—M. B., aged 26 (Hosp. No. 19,852). On the 48th day, after 12 days of normal temperature, recrudescence. Patient delivered of a still-born child on the 51st day. On the 55th day, after two days of normal temperature, slight elevation to  $100^{\circ}$ , lasting for several days.

*Case LXIV.*—S. N., aged 16 (Hosp. No. 20,050). On the 34th day, when convalescence was well established, the temperature rose to  $102^{\circ}$ , lasting 12 hours; no cause.

*Case LXV.*—J. S., aged 28 (Hosp. No. 20,070). On the 41st day, after 6 days normal temperature, recrudescence lasting 7 days, range  $101^{\circ}$ ; no rose-spots; no enlarged spleen.

*Case LXVI.*—J. G., aged 23 (Hosp. No. 20,512). On the 31st day, after 7 days of normal temperature, slight recrudescence lasting 7 days, temperature at about  $100^{\circ}$ . This followed increase in the diet of soft egg.

*Case LXVII.*—H. S., aged 22 (Hosp. No. 20,551). Mild case. Recrudescence on the 22d day, lasting twelve hours.

*Case LXVIII.*—D. G., aged 21 (Hosp. No. 20,602). Severe attack, 95 tubs. Recrudescence on the 42d day, after normal temperature of 5 days, range  $102^{\circ}$ , lasted 4 days.

*Case LXIX.*—G. R., aged 11 (Hosp. No. 20,816). Mild case. On the 38th day temperature rose to  $101^{\circ}$ ; constipation.

*Case LXX.*—J. R., aged 14 (Hosp. No. 21,176). Patient was admitted on the 13th day of illness; condition good. Temperature rose to between  $104^{\circ}$  and  $105^{\circ}$ ; tubs at first. By the 20th day the temperature was normal for a few hours. Then on this day it rose to  $104.5^{\circ}$ , on the 22d to  $103.5^{\circ}$ , on the 23d to  $103^{\circ}$ . On the 24th and 25th it was a little irregular, once rose to  $102^{\circ}$ . On the 26th it rose to  $104^{\circ}$ , on the 27th to  $103.5^{\circ}$ , on the 28th to  $103.6^{\circ}$ , on the 29th to  $102^{\circ}$ , after which it remained normal. These paroxysms in each case did not last for more than from 8 to 10 hours. There was no leucocytosis. The spleen was not palpable. No chills occurred. No malarial organisms were found in the blood.

*Case LXXI.*—A. P., aged 15 (Hosp. No. 23,427). Severe case, 134 tubs. On the 56th day, after 16 days normal temperature, a recrudescence of 48 hours, range  $101.5^{\circ}$ .

*Case LXXII.*—F. H., aged 9 (Hosp. No. 23,799). Moderately severe attack, 23 tubs. Patient was a girl aged 9, who was admitted, as far as we could gather, on the 31st day of fever. The temperature was high, ranging to  $105^{\circ}$  at first. Then it was more moderate and very protracted, and it was not until the 55th and 56th days that the temperature fell to between  $98^{\circ}$  and  $100^{\circ}$ . Then between this date and the 81st day she had a very remarkable series of elevations of temperature, the first lasting 3 days, from the 57th to the 59th, inclusive. The temperature rose to  $103^{\circ}$  each day. On the 60th and 61st days it was normal for the greater

part of the time. The second elevation, also lasting 3 days, occurred from the 62d to the 64th days, inclusive. The temperature rose to nearly  $104^{\circ}$  and she had tubs again. On the 65th and 66th days the temperature was between  $98^{\circ}$  and  $100^{\circ}$ . Then a third recrudescence occurred on the 67th and 68th days, the temperature rising to  $103^{\circ}$  each day. On the 69th and 70th days the temperature was low, for a part of each day subnormal,  $96^{\circ}$ . A fourth recrudescence occurred from the 71st to the 73d days, inclusive. The temperature rose to between  $102^{\circ}$  and  $103^{\circ}$ . After the 74th day she had no further fever, except one day, the 79th, when the temperature went up to  $101.5^{\circ}$ . She had a protracted convalescence, the temperature for a good part of the time being subnormal. No cause whatever could be found for these late elevations.

*Case LXXIII.*—W. L. D., aged 28 (Hosp. No. 23,830). Mild case. After 4 days of normal temperature recrudescence of 5 days' duration, range  $102.2^{\circ}$ ; followed toast and eggs.

*Case LXXIV.*—E. B., aged 24 (Hosp. No. 23,914). Severe case, 60 tubs. On the 64th day, after 16 days normal temperature, recrudescence for 10 days, range from  $97.2^{\circ}$  to  $102.4^{\circ}$ ; no rose-spots; no enlarged spleen. Though the temperature rose occasionally to  $101.5^{\circ}$  and  $102^{\circ}$ , for some part of each day it was at  $99^{\circ}$ . As there were no rose-spots and the general condition was good, except for a bronchitis, we shall place this among the recrudescences.

*Case LXXV.*—M. M., aged 19 (Hosp. No. 23,949). Moderately severe attack, 45 tubs. Recrudescence after 4 days with temperature from  $98^{\circ}$  to  $100.8^{\circ}$ , lasting 7 days, range  $103.2^{\circ}$ ; no spots; spleen not enlarged.

*Case LXXVI.*—R. G. W., aged 44 (Hosp. No. 23,957). Mild case. After normal temperature for 4 days, recrudescence, range  $102^{\circ}$ , which lasted 6 days; no spots; no enlarged spleen.

*Case LXXVII.*—A. A., aged 33 (Hosp. No. 24,062). Moderately severe attack, 25 tubs. After 7 days of normal temperature the fever ranged from the 27th to the 41st day from  $98^{\circ}$  to  $100.5^{\circ}$ , once reaching  $101.2^{\circ}$ .

*Case LXXVIII.*—R. B., aged 17 (Hosp. No. 24,517). Severe attack, 59 tubs, much delirium and rigidity. From the 24th day, when the temperature became normal, to the 39th, the range was from 98° A. M. to 100.4° P. M.

*Case LXXIX.*—J. W., aged 25 (Hosp. No. 25,133). Moderately severe case. After 7 days normal temperature recrudescence on 26th day, lasting 5 days, range 101°; no cause.

#### 4.—COMPLICATIONS AND SEQUELÆ.

### Digestive System.

#### (a). HÆMORRHAGE FROM THE BOWELS.

There were 50 cases in the 829 in which blood appeared in the stools, in large or in small quantities, a percentage of 6. Of these 5 cases died, a percentage of 10. The following is a brief summary of the cases in the third series.

Wallace H., aged 23 (Hosp. No. 13,189), admitted July 1, 1895, in the 2d week of a severe illness. Diarrhœa at onset, which ceased 4 days after admission. He had 44 tubs. On the 20th day after admission, the 34th day of the disease, he had a profuse hæmorrhage of bright red blood, estimated to be as much as a quart. The temperature fell from 103.2° to 96.8°. It was followed in 15 minutes by another small hæmorrhage, which proved fatal.

Geo. K., aged 7 (Hosp. No. 16,648), admitted July 13, 1896. Sharp attack; temperature range up to 105.6°. On the 29th day of the disease the patient had 2 small hæmorrhages of 4 ounces each. He had had no diarrhœa; had had 84 tubs, changed to sponges after the hæmorrhages. Recovery.

Geo. F. W., aged 32 (Hosp. No. 17,307), admitted Sept. 16, 1896. On the 31st day of illness, during a relapse, this patient had 2 hæmorrhages, one 700 cc. and the other 500 cc. The patient died the next day.

Geo. J., aged 27 (Hosp. No. 17,344), admitted Sept. 20, 1896. On the 18th day of illness hæmorrhage of 500 cc.; 20th day hæmorrhage of 310 cc.; 24th day hæmorrhage of 320 cc. They had no effect on temperature or pulse. Recovery. No tubs.

G. R. C., male, aged 28 (Hosp. No. 17,554), admitted Oct. 11, 1896. On the 12th day of disease he had 2 hæmorrhages of 300 cc. From the 12th to the 25th days he had 5 additional hæmorrhages, of 500, 500, 250, 200 and 200 cc. No tubs. Very severe illness. Death.

Henry A. L., aged 22 (Hosp. No. 18,215), admitted Dec. 28, 1896. Patient had a very intense infection, with much delirium. On the day of his death he had a blood-stained stool, and for several hours before death he passed continuously a large quantity of blood-stained fluid with a number of clots.

Jas. J., aged 38 (Hosp. No. 20,482), admitted Sept. 1, 1897, at the end of the 3d week; delirium; high fever. On the 27th day he had a hæmorrhage of 500 cc. after a bath. On the 29th day two hæmorrhages, 200 cc. and 600 cc.; no effect on temperature; recovery.

Mary K., aged 14 (Hosp. No. 20,646), admitted Sept. 18, 1897, on the 18th day of illness. Slight hæmorrhages on the 13th and 14th days. On the 30th day a hæmorrhage of 460 cc. Temperature dropped from 102.5° to 97°. Patient had only three tubs at the outset.

John F. S., aged 26 (Hosp. No. 20,815), admitted on the 31st day of disease. On the day of admission he had a brisk hæmorrhage of 1020 cc. Marked anæmia. Subsequently the patient did well; no further hæmorrhage; recovery.

Michael K., aged 32 (Hosp. No. 24,298), admitted Oct. 5, 1898, on 23d day of disease. On the 38th day he had a hæmorrhage of 300 cc. No effect on temperature or pulse.

John R., aged 19 (Hosp. No. 24,603), admitted Nov. 2, 1898. On the 24th day of a severe attack 500 cc. of bright blood. Temperature dropped nearly 2°. In the afternoon of the same day 350 cc., accompanied with sudden severe abdominal pain. The patient was having sponges when the hæmorrhage came on. From the 36th to the 38th days three hæmorrhages, 410 cc., 600 cc. and 700 cc.

Jeannette J., aged 15 (Hosp. No. 24,048), admitted Sept. 11, 1898, on the 5th day of illness; very ill; not bathed. On the 7th

day she passed 100 cc. of blood; on the 8th day 500 cc. Temperature dropped to 97°. No further hæmorrhage. Recovery.

Jesse E. B., aged 13 (Hosp. No. 25,679), admitted Feb. 24, 1899. On the 13th day he passed 380 cc.; later 150 cc. Temperature fell from 103° to 98.8°. On the 14th day two hæmorrhages, 250 cc. and 60 cc. No effect on the temperature.

*Hæmorrhages following enemata.*—Lena K. (Hosp. No. 17,277). On the 14th day, following an enema, the patient passed 200 cc. of red blood.

Katie K., aged 16 (Hosp. No. 17,446), admitted Sept. 30, 1896. On the 14th day of illness the patient had a soft stool with 150 cc. of fluid blood.

Jos. H., aged 30 (Hosp. No. 18,035), admitted Dec. 5, 1896. On the 13th day of illness, following an injection, there was about 100 cc. of blood in the stool. The patient died on the 24th day.

Louis S., aged 29 (Hosp. No. 20,884), admitted Oct. 11, 1897. Very severe attack with much delirium. On the 28th day of illness he had three stools containing about 50 cc. of blood each; later a little bloody oozing; no effect on the temperature.

Ellen K., aged 6 (Hosp. No. 21,744), admitted Jan. 15, 1898. On the 18th day of illness she had a well formed stool with a few small clots. On the 20th day several large clots after an enema.

C. G. W., male, aged 44 (Hosp. No. 23,850), admitted Aug. 22, 1898. On the 26th day about 50 cc. of blood clots in the stool. Patient had been constipated.

Edward B., aged 24 (Hosp. No. 23,914), admitted Aug. 29, 1898. On the 27th day 200 cc. of blood in the stool. No influence on pulse or temperature. No further hæmorrhages. Sixty tubs.

Thos. J. S., aged 39 (Hosp. No. 24,221), admitted Sept. 28, 1898. Severe attack. On the 19th day 50 cc. of blood passed; on the 20th day 60 cc.; on the 24th day 140 cc.; on the 25th day 100 cc. No influence on pulse or temperature.

Geo. K., aged 7 (Hosp. No. 16,648), admitted July 13, 1896, on the 28th day of illness had two small hæmorrhages of four ounces each.

Michael K., aged 32 (Hosp. No. 24,298), admitted Oct. 5, 1898, on the 38th day, had a hæmorrhage of 300 cc.

(b). PERFORATION.

The question of perforation in typhoid fever is discussed with great fulness in the papers by Dr. Finney and Dr. Cushing in this number of the report. In the series of 829 cases there were 23 instances of perforation, a percentage of 2.7. Of these 3 recovered after operation. The following are the cases of perforation in the third series.

Jas. D. (Hosp. No. 13,485). (Given in full in Dr. Finney's paper.)

Wm. W. K., aged 27 (Hosp. No. 14,453), admitted Nov. 11, 1895. He had been ill for seven days with loss of appetite and epistaxis. Free movement of the bowels after purge. On the day after admission very profuse eruption of rose-spots. Tongue was coated and dry. The temperature ranged from  $103^{\circ}$  to  $105^{\circ}$ . On the 8th day he had a convulsive attack lasting fifteen minutes. There was marked muttering delirium. On the 12th day the abdomen became more distended, the pulse small and rapid. He had involuntary movements. The abdomen was distended, a little tender; the liver dulness was obliterated. The condition became worse and he died on the following day.

Geo. F., aged 18 (Hosp. No. 16,888), admitted Aug. 5, 1896. He had been ill five days with chills, vomiting and diarrhoea; rose-spots on the abdomen; tongue coated thickly. Patient had 45 baths. The fever was moderately high at first, subsequently rose to  $106^{\circ}$ . He seemed doing very well, but on the 25th day the abdomen was full and very tense and tender. The tongue became dry and brown. The temperature rose; the pulse became rapid and exceedingly feeble. The liver flatness was obliterated. He died on the morning of the 36th day.

Richard N., aged 19 (Hosp. No. 18,116), admitted Dec. 14, 1896, after an illness of 8 days' duration. The patient had a very characteristic attack with high fever, between  $105^{\circ}$  and  $106^{\circ}$ . He was bathed and sponged. He had slight diarrhoea. On the 24th he began to have distention of the abdomen. The temperature was

between  $103^{\circ}$  and  $104^{\circ}$ ; he had five stools and did not seem so well. On the 24th and 25th the temperature was more irregular, and once reached  $105.5^{\circ}$ ; there was less diarrhœa. On the 27th he said he felt quite comfortable, though he had had some vomiting through the night and pain in the region of the bladder, which was relieved after catheterization. The abdomen was tense and distended, everywhere tympanitic; the hepatic flatness reached to the costal margin. On the 28th I noted that his pulse was stronger, but very rapid. The abdomen was a little distended and very tense. The respiratory movements were visible. He was sensitive in the lower part of the abdomen. On the 28th of Dec., the 21st day of illness, his temperature rose to  $105.5^{\circ}$ . We were keenly on the lookout in this case for signs of perforation, and in the evening at 8 p. m. the patient had a sudden collapse, the pulse became imperceptible. Hippocratic facies, respirations 40. He had vomiting; the liver dulness was not wholly obliterated; tympanitic note uniform over the abdomen. He failed rapidly and died at 10.15 P. M. The autopsy showed typhoid fever (ileo- and colo-typhus); clean, deep ulcers; perforation of ulcer in ileum; general fibrinopurulent peritonitis; cloudy swelling of the viscera; lymphomata in the liver; necrosis of the mesenteric glands; acute splenic tumor; œdema of the lungs.

*Bacteriological Examination.*—The bacillus typhosus was isolated from the gall-bladder, kidney and peritoneal cavity, the bacillus coli communis from the kidney, the streptococcus pyogenes from the peritoneal cavity.

Frances K., aged 29 (Hosp. No. 21,656), admitted Jan. 6, 1898, on the 13th day of the disease. She was delirious, had high fever,  $104^{\circ}$  to  $105^{\circ}$ ; no diarrhœa. Twenty-three tubs. On the 17th day the abdomen was full and painful and tender. On the 13th day the leucocytes had only been 7500; on the 17th they were 22,600. She was very delirious, had profuse perspiration. The respirations became rapid. The abdomen was much distended; the liver flatness was obliterated. The pulse rose to 140, very small and irregular. She died on the 18th day of illness.

The autopsy showed typhoid fever (ileo-colo-typhus). Large, spreading, sloughing ulcers in the lower end of the ileum. Hæmorrhage; perforation; fibrino-serous peritonitis. Splenic tumor. Con-

genital malformation of the heart (patent foramen ovale and aneurysm (?)—pars men. sept.).

*Bacteriological Examination.*—*Bacillus typhosus* was obtained from the bile, spleen, mesenteric gland and kidney. *Bacillus coli communis* was obtained from the lung, peritoneum, kidney, spleen and liver.

Charles H., aged 47 (Hosp. No. 17,319). See Dr. Finney's paper in this report.

P. Benjamin B., aged 31 (Hosp. No. 23,987). See Dr. Cushing's paper in this report.

Herbert H., aged 7 (Hosp. No. 23,698). See Dr. Cushing's paper in this report.

Maggie P., aged 15 (Hosp. No. 23,702). See Dr. Cushing's paper in this report.

Wm. N., aged 18 (Hosp. No. 23,970). See Dr. Cushing's paper in this report.

(c). PAROTITIS.

In the 829 cases parotitis occurred in 12, a percentage of 1.4.<sup>1</sup> Of the 12 cases 4 died, a percentage of 33. The two most interesting cases in the series are those in which the submaxillary glands were involved, a very unusual complication.

Emma B., aged 23 (Hosp. No. 14,243), admitted Oct. 16, 1895. In the third week a right parotitis developed, which suppurated and was opened. *Streptococcus* grew from the cultures. Death.

Mary W., aged 11 (Hosp. No. 20,773), admitted Sept. 29, 1897. Attack of moderate severity. On the 16th day of disease the right *submaxillary glands* became enlarged and tender, but did not suppurate. The patient subsequently had a relapse.

Lee J., aged 21 (Hosp. No. 23,208), admitted June 20, 1898. Severe attack. On the 19th day of illness he had parotitis of right side. On the 21st day the swelling was incised; no suppuration. Much œdema about the eyes. Death.

<sup>1</sup>In addition to the case referred to in Studies II, Hosp. No. 10,599 had parotitis.

Albert E., aged 14 (Hosp. No. 24,101), admitted Sept. 16, 1898, on the 12th day of fever. General features of the disease well marked; temperature range moderate; ice sponges instead of baths. On Sept. 28th, after his temperature had been falling, he complained of soreness over the right parotid and swelling began. By evening his temperature rose to 103°. Leucocytes only 3000. During the next day the swelling increased and was very tender. On the 30th the leucocytes were not increased, only 3000; temperature had ranged between normal and 101°. On Oct. 1st the lad's condition was good; parotid swelling was less marked and was softer. During the next week the swelling gradually subsided and by the tenth day was gone. The case is interesting, as showing no marked increase of fever, and no leucocytosis with the parotitis.

Jesse E. B., aged 13 (Hosp. No. 25,679), admitted Feb. 24, 1899. Severe attack; 18 tubs; then sponges. On the 27th day double *submaxillary bubo*, which persisted, was not very painful but very large. They were opened on the 41st day, and about an ounce of greenish pus withdrawn from each side. *Streptococcus pyogenes* in cultures. Recovery.

(d). VARIOUS COMPLICATIONS.—(1). *Pharyngitis*.

J. D. M. (Hosp. No. 12,320) had about the end of the 7th week well marked pharyngitis, swelling of the uvula, pharynx, and tonsils, with redness and soreness; no membrane.

Wm. F. D., aged 27 (Hosp. No. 23,960), admitted Sept. 3, 1898. Severe attack; 50 tubs. On the 25th day membranous pharyngitis; small patches, greyish in color; some on the hard palate. Cultures gave staphylococci; no diphtheria bacilli.

Walter T., aged 26 (Hosp. No. 20,622), admitted Sept. 15, 1897. About the 18th of September his throat began to be very sore; then a couple of superficial ulcers were noted on the uvula. This was followed by a large greyish patch of exudation behind the pillar of the fauces on the right side. It did not extend over the whole throat. Cultures were repeatedly taken, in which there were no diphtheria bacilli.

In addition the following cases had pharyngitis sufficiently severe to cause annoyance and to require local treatment.

Israel N., aged 33 (Hosp. No. 21,116), admitted May 4, 1897.

Thos. J. S., aged 39 (Hosp. No. 24,221), admitted Sept. 28, 1898.

(2). *Diphtheria of Mucous Membrane of Lip.*

Raymond S., aged 22 (Hosp. No. 17,419), admitted Sept. 28, 1896, on the 8th day of illness. Moderate fever. On the 16th day the patient presented a remarkable patch on the mucous membrane of the lower lip, 2 by 3 cm. It was covered with a fibrinous membrane, which when removed left a raw surface. The throat looked red and inflamed, but presented no membrane. Cultures from the membrane showed the bacillus of diphtheria. On the 16th day he was given 600 units of antitoxine. The membrane cleared off within a few days, and the condition did not seem to influence the typhoid fever in any way. No diphtheria bacilli were found in the mouth or the throat.

(3). *Glossitis.*

W. A. (Article by Dr. McCrae.)

(4). *Hæmatemesis.*

F. R. H., male, aged 22 (Hosp. No. 14,933), admitted Jan. 9, 1896. Vomiting of blood on 20th and 21st days. (Case reported in Dr. Mitchell's paper, Lesions of the Oesophagus, page 301.)

(5). *Enlarged Liver.*

John S., aged 32 (Hosp. No. 16,635), admitted July 11, 1896, on the 14th day of illness. Marked diarrhoea; pasty thick tongue; temperature 103°. On admission there was moderate enlargement of the liver with marked pain over it on pressure; no jaundice. He improved rapidly and the pain disappeared.

Other complications are given in separate articles.

### Circulatory System.

(a). *PHLEBITIS.*

There were 16 cases of phlebitis of the veins of the leg in the 829 cases, a percentage of 1.9. Of these only 2 occurred on the right side, in both in the popliteal vein. Of the 16 cases of phle-

bitis 7 occurred in the femoral vein, 4 in the popliteal, 4 in the long saphenous, and 1 in a superficial varicose vein of the left thigh. The following are the cases occurring in the third series:

W. F. F., aged 26 (Hosp. No. 13,813), admitted Sept. 9, 1895. Severe attack. On the 21st day of illness a thrombosis of left femoral vein and of left saphenous vein. With the phlebitis much swelling and pain in the calf and on the inner side of the thigh and in the groin. On the 7th day after the thrombosis the patient had a chill lasting twenty minutes, followed by profuse sweating. In the fifth week after the thrombosis the swelling had all gone from the leg.

Henry V., aged 32 (Hosp. No. 16,733), admitted July 25, 1896. Severe and protracted attack. On the 34th day of illness swelling of the left leg; thrombosis of internal saphenous vein. On the 43d day the swelling had lessened, but there was a good deal of pain. On the following day he had a chill of ten minutes' duration. When I returned I noted, on Sept. 7, that the man had very little power in the left leg. The color was good, but there was tenderness with a great deal of swelling in the upper part of the thigh, and still very much tenderness in the region of the femoral vein. On Sept. 12 and 18 there was again noted the same condition of swelling of the leg, particularly of the thigh. It was not until October 15 that the patient was able to walk a little. The leg was bandaged and carefully massaged.

Henry T. H., aged 28 (Hosp. No. 17,936), admitted Nov. 22, 1896. Severe case. On the 35th day of illness acute pain in the left leg along the course of the femoral vessels. On the 36th day pain in the right leg along the course of the femoral vessels. On the 37th day the left leg to the knee was swollen; much pain along the course of the saphenous vein. The œdema of the leg persisted, and on discharge the circumference of the left calf was 2 or 3 cm. larger than the right.

Chas. H., aged 47 (Hosp. No. 17,319), admitted Sept. 17, 1896. Phlebitis of popliteal vein; pain in right leg behind the knee, which persisted until discharge.

Peter Z., aged 22 (Hosp. No. 18,156), admitted Dec. 19, 1896. On the 34th day pain in the left calf with swelling of the leg as

high as the knee. The superficial veins of the leg were sclerotic. By the 36th day the pain was gone, but the leg was cold and swollen. Femoral vein not felt. Patient flinched much on pressure on the calf and in the popliteal space. Left calf 28.8 cm.; right calf 26 cm. An interesting point in this case was that the patient complained so much of subjective sensations of cold in the leg. There was no leucocytosis following the thrombosis, 5000 per cm.

Sarah A. L., aged 55 (Hosp. No. 19,310), admitted April 29, 1897. Very stout woman; attack of moderate severity. On the 14th day a thrombus was noted in a large varicose vein of the left thigh. It caused no swelling and no pain.

Jos. S., aged 21 (Hosp. No. 20,563), admitted Sept. 9, 1897, on the 7th day; 36 tubs. On the 20th day onset of sudden pain in the left iliac fossa while at stool. Swelling of the leg began three hours later, much pain and tenderness on pressure in the inguinal region. Pulsation of femoral artery hard to feel; cord-like swelling in the vein. The leg remained swollen; right calf 26.5 cm.; left calf 33.5 cm. On the 33d day the inguinal glands were swollen. Patient recovered.

Jas. C., aged 36 (Hosp. No. 22,399), admitted March 24, 1898. On admission in the 8th week, during what was probably a relapse, there was phlebitis of the right popliteal vein with swelling of the leg, which persisted.

Maggie P., aged 15 (Hosp. No. 23,702), admitted Aug. 8, 1898. On Sept. 3, the 33d day of illness, at the height of the first relapse, the patient complained of pain in the left leg in the popliteal space, which was tender to touch. There was no swelling in the femoral region. The left leg became swollen and painful, particularly in the popliteal region. A good deal of fullness persisted. The patient had perforation and was operated upon. With the onset of the abdominal symptoms the right calf was painful and tender, and after the operation the foot became swollen.

John S. G., aged 22 (Hosp. No. 25,111), admitted Dec. 29, 1898. Severe attack. On the 18th day phlebitis of femoral vein; swelling of left leg; much pain. On 25th, 26th, 28th and 36th days chills followed by profuse sweats.

(b). PERICARDITIS.

Jacob D. H., aged 20 (Hosp. No. 24,135), admitted Sept. 20, 1898. The patient had pronounced nervous symptoms, much delirium, general tremor, and the condition was very grave. He had during the first three days repeated cold packs. Even as late as the 29th day his temperature rose to  $105.6^{\circ}$ . His heart-sounds had been clear; the pulse had ranged from 112 to 120. On Oct. 5, the 29th day, Dr. Fletcher noted in the second and third right interspaces at the sternal margin that there was a leathery friction rub. Outside of the point of maximum impulse in fifth interspace there was a to-and-fro superficial friction rub. At 10 P. M. in the evening the temperature rose to  $105.6^{\circ}$ ; pulse 138. Pericardial friction rub was well marked. There was no effusion. The temperature on Oct. 6 and 7 did not rise above  $102.5^{\circ}$ . By the 8th the pericardial friction had disappeared. The patient made a good recovery.

### Respiratory System.

(a). PLEURISY.

In the series are illustrated very well the various forms of pleurisy met with in connection with the disease. By far the most common.

(1) Simple fibrinous pleurisy. The patient has a friction rub at one side, or at the base, but no effusion follows. The following are illustrative cases:

Mary C. (Hosp. No. 13,524). On the 22d of August, 15 days after admission, just as the fever was falling in a moderately severe attack, complained of great pain in the lower part of the left axilla, and on auscultation there was heard a superficial leathery friction, with numerous coarse moist and dry râles.

J. K., aged 36, male (Hosp. No. 14,444), admitted Nov. 9, 1895. On the 48th day a pleuritic friction developed at the right base; no exudate; persisted for five days.

Michael M., aged 50 (Hosp. No. 16,794), admitted July 28, 1896. On the 20th day of illness a pleural friction developed over both lower bases; no pain; no effusion followed. Patient recovered.

Peter Z., aged 22 (Hosp. No. 18,156), admitted Dec. 19, 1896. On the 12th day a friction rub at the left base with slightly tubular breathing, and on the 19th the sputum was a little rusty. Recovery.

Wm. G., aged 68 (Hosp. No. 21,058), admitted Oct. 28, 1897. On admission, 14th day, friction rub in the right axilla, tubular breathing, râles at the left base, slight cyanosis. No tubs. Death three days later.

Wm. N., aged 18 (Hosp. No. 23,970), admitted Sept. 3, 1898. On the 31st day of illness patient had a friction rub in the right axillary region.

John W., aged 25 (Hosp. No. 25,133), admitted Dec. 31, 1898. On the 11th day a friction rub on the right side; on the 15th day friction gone.

In addition the following cases during the course developed slight pleurisy, as indicated by a positive friction rub: Hosp. Nos. 16,532, 17,319, 17,554, 17,758, 20,655, 24,062, 24,944, 23,208, 25,679.

(2). The form of typhoid fever which sets in with acute pleurisy, the so-called pleuro-typhoid of the French. Of this No. 8226, given at page 307 of Studies II, is a good example.

(3). Simple pleurisy with effusion, occurring in the course of the disease, not infrequently latent, of which a very characteristic example is given at page 310 of Studies II.

(4). The typhoid empyema, of which the following is the only case which has occurred in the series, and is particularly interesting from the fact that the typhoid bacillus was isolated from the pus in pure cultures.

Jos. G., aged 33 (Hosp. No. 25,249), admitted Jan. 12, 1899. Entered hospital for hysterical bradypnoea. Fifteen days later developed typhoid fever. He had a severe attack; temperature range up to 105.2°. Much albumin and typhoid bacilli in urine. Fifty-three tubs. As early as the 20th day there had been a friction rub, which had disappeared. Patient was convalescent and doing well. On the 50th day he had a chill, rise of temperature to 105.2°, with impaired resonance at the right base. Slight fever persisted. On the 25th day he had much pain in the splenic region, probably a diaphragmatic pleurisy. On the 70th day opaque fluid was drawn off from the left chest. On the 77th day

he was aspirated again. On the 79th day nearly 800 cc. of purulent fluid were drawn; pure cultures of the bacillus typhosus obtained from it. On the 81st day the eighth rib was resected and the side thoroughly drained. The patient recovered.

(b). PNEUMONIA.

One may divide pneumonia in typhoid fever into two groups, according to its appearance with the onset, during the course, or towards the termination of the disease.

*Pneumonia at Onset.*—The interesting feature of this form, the so-called pneumo-typhoid of the French, is that the cases may present all the characteristics of ordinary croupous pneumonia, no other diagnosis may be reached, and it may not be corrected until autopsy. In Studies I, page 29, the history is given of a remarkable case of this character, in which clinically we had no suspicion that there was any other disease than pneumonia, but the autopsy showed characteristic typhoid fever. The following case is very similar, occurring in a man aged 68, who died within the first forty-eight hours without any suspicion having been entertained that he had typhoid fever.

Wm. G., aged 68, admitted Oct. 28, 1897, complaining of shortness of breath, weakness and pain in the back. There was nothing of any moment in his family history. He had never had typhoid fever, pneumonia or malarial fever. He had not had syphilis; had been a moderate drinker. For two months past the patient had not been in very good condition. He had loss of appetite, and his son thought he had lost in weight. Two weeks ago he began to have pains in the back, had indigestion, became very thirsty and was short of breath. He kept up and about, however, but on Tuesday, the 26th, while undressing to go to bed he fell over. His son did not notice anything particular, except that he seemed rather prostrated and weak, and on the following day he did not feel able to get out of bed. He had not noticed any cough. On the following day, the 27th, the son said it was evident that his father was very ill, and he then sent for a physician.

The patient himself could give no history, and it was evident that the son knew very little about him further than the fact that he had been complaining very much for two weeks.

On admission at 4 P. M. on the afternoon of the 28th, the temperature was  $97^{\circ}$  and rose to nearly  $104^{\circ}$  at 8 P. M. After putting the patient to bed he seemed to be suffering a great deal of pain and groaned with each inspiration. The breathing was 44 to the minute. The patient was very dull and listless, and no satisfactory answers to questions could be obtained. He did not seem to understand them fully. The pupils were equal, reacted to light and on accommodation; lips and mucous membrane were of good color. The tongue was dry and coated with a heavy black fur. The pulse was large in volume, of low tension, and rapid, 128. There were no rose-spots.

In the chest the right front was somewhat hyperresonant, a little defective in the upper part of the axilla, and there was a friction in the lower axilla and over the right back. On the 29th Dr. Thayer noted that the respirations were rather shallow, 40 to the minute, and there was an expiratory grunt, with slight cyanosis; right cheek a little flushed. There was lack of mobility on the right side, and from the fourth interspace the respiratory murmur was distant and slightly tubular in quality. The leucocytes were 15,500. There was no expectoration. On the 29th the patient was very dull, rested chiefly on his left side, the breathing was laborious, he was quite cyanotic, and there was a distinct expiratory grunt. There was tubular breathing in the lower part of the right lung, with small and medium sized râles. He sank and died at 10 A. M. on the 30th, within forty-eight hours of his admission.

The autopsy showed the lesions of typhoid fever. An interesting point is that this patient, had the autopsy not been performed, would not have gone in our list as typhoid fever, but as one of pneumonia.

In the following case for nearly eleven days the symptoms were chiefly pulmonary, and we did not recognize the case as one of typhoid fever.

Eleanor W. W., aged 26 (Hosp. No. 24,692), admitted to Ward C Nov. 11, 1898, complaining of cough, headache and pain in the back.

Her mother had died of typhoid fever, and one sister of tuberculosis.

As a rule she had been well, and had led a fairly active life.

For six months she had been a student in the training school of the Hospital. She had been on duty in Ward G for about ten days, nursing medical cases, and for the first few days typhoid patients. On Nov. 3 she had a cold in the head, with some sneezing. On the following day she had a slight sore throat and swelling of the glands of the neck. On Nov. 7 she had headache of great severity. On the 8th she felt better in the morning and kept at work, though the headache returned at noon. On the 9th she had severe diarrhoea, ten movements before noon; headache also quite severe. She went to bed at 1 P. M.

She was seen first by Dr. McCrae on the evening of the 10th, when she had a temperature of  $103^{\circ}$ , and the tongue was coated. The spleen was just palpable, and he thought there were one or two suspicious spots. On the following day she was admitted to Ward C. The temperature was  $100^{\circ}$ . The lungs were clear on percussion. On auscultation there were no râles. On the 12th feeble breathing was noticed at the right axilla and right back, but no change in percussion note, and no râles. The temperature on the 12th was not above  $102.5^{\circ}$ ; respirations not increased. There was no leucocytosis. On the 14th the spleen was just palpable, and there was a slight friction rub at the angle of the right scapula, with a few fine râles. The breath-sounds were enfeebled, and impaired resonance in the right infra-scapular region. She had a good deal of cough and muco-purulent expectoration, which contained diplococci but no tubercle bacilli.

From the 13th to the 21st the temperature was low, not above  $101^{\circ}$ , and frequently below  $99^{\circ}$ . There were no rose-spots; the spleen could just be felt. The features seemed entirely pulmonary. There was impaired resonance in the right infra-scapular region, with numerous medium and coarse moist râles. Expiration was prolonged and had a tubular quality. The left lower lobe was also involved by the 21st. Vocal fremitus was felt, and there was flatness and tubular breathing. As she had been a rather delicate girl, and her sister had died of tuberculosis, we were naturally apprehensive. There were no bacilli in the sputum. She had at times a great deal of cough. The leucocytes on the 22d were 10,200. Though at first when she entered the ward we had suspected typhoid fever from the history and the enlarged spleen, and as she had at first a couple of suspicious looking spots, the subse-

quent course seemed rather against this view, particularly the low temperature. Then in the two following weeks the picture changed entirely. She had a continuously high temperature, ranging constantly between  $102^{\circ}$  and  $104^{\circ}$ , palpable spleen and numerous typical rose-spots. The impaired resonance with tubular breathing persisted at the bases, but gradually cleared, first at the left back. She improved slowly, and the temperature became normal first on Dec. 12.

There are three interesting points about the diagnosis in this case. There was no leucocytosis at first. On the 13th there were 7600 white corpuscles; then on Nov. 22, 23 and 24 they increased to 22,000. On Nov. 28 there were 12,500. She had no diazo reaction throughout. The Widal reaction was taken repeatedly and it was not until Nov. 24 that it could be said to be fairly positive. Then on the 26th a crop of rose-spots and the general features clinched the diagnosis. On Dec. 3 and subsequently the Widal reaction was quite positive.

*Pneumonia During the Course.*—This forms a frequent and very serious complication of the disease, of which there were 15 cases in the 829. The following is a list in the third series of cases:

Henry J., aged 21 (Hosp. No. 23,965), admitted Sept. 3, 1898. Pneumonia of right lower lobe.

W. F. F., aged 26 (Hosp. No. 13,813), admitted Sept. 9, 1895. Very severe attack. Pneumonia of the right lower lobe.

G. E. J., aged 39 (Hosp. No. 14,000), admitted Sept. 25, 1895. Case of great severity; temperature range  $105.8^{\circ}$ . On admission impaired resonance and feeble respiratory sounds at both bases behind. On the 9th day of disease respiration much hurried, marked expiratory grunt, high-pitched tubular breathing over the right lower lobe; respirations 60. Death on the 10th day of disease.

A. U., aged 32 (Hosp. No. 14,188), male, admitted Oct. 14, 1895. In the 3d week of disease dulness and tubular breathing at the right base, with diminished fremitus, medium fine râles and bloody sputum. Cleared four days later; recovery.

Wm. T., aged 40 (Hosp. No. 15,015), admitted Jan. 17, 1896. Very severe case. On the 12th day of illness impaired resonance, feeble breath sounds at left lower lobe. Death on 15th day.

P. L., aged 36, female (Hosp. No. 16,927), admitted Aug. 8, 1896. Flatness, increased fremitus at the right apex behind, cough, rusty tenacious sputum. Death on the 26th day.

G. R. C., male, aged 28 (Hosp. No. 17,554), admitted Oct. 11, 1896. On the 31st day pneumonia of the left lower lobe developed.

Patrick D., aged 32 (Hosp. No. 17,952), admitted Nov. 25, 1896, on the 4th day of illness. On the 9th day flatness at the right base, tubular breathing, no cough, no expectoration, friction rub. On the 16th an exploratory needle inserted; no pus. Diplococcus lanceolatus cultivated from the blood drawn at point of needle. Recovery.

Wm. R., aged 40 (Hosp. No. 19,914), admitted July 5, 1897. Two days before death friction on the right side, impaired resonance at right base with feeble respiration. Death on 29th day.

### Renal System.

#### URINE.

*Albumin* was present in 616 of the 829 cases, 74 per cent.

*Tube casts* were present in 391 of the 829 cases, 47 per cent.

*Diazo reaction* was present in 543 out of 796 of the cases, 68 per cent. The test was not made in the first 33 cases treated in hospital.

#### ACUTE NEPHRITIS.

Although albuminuria is so common in typhoid fever, accompanied also by tube casts, it rarely is a serious condition, and indicates only the mildest possible grade of disturbance in the function of the kidney. In a more aggravated condition where the albumen is in larger amount, hyaline and granular casts and red-blood corpuscles are abundant, we have to consider it an acute nephritis. There are two interesting features of the typhoid nephritis. There is rarely dropsy, and it clears up as a rule completely. We have had no instance in the series, nor do I remember in my experience a single case, in which a chronic nephritis followed the acute attack. The following are some interesting cases of acute nephritis occurring in the third series.<sup>1</sup>

<sup>1</sup>Additional cases of acute nephritis are Nos. 14,000, 23,028, 25,349. Other features of great interest in connection with the urine will be found in Dr. Gwyn's paper in this volume.

Mr. P., a student (Hosp. No. 12,590), was admitted April 22, 1895, having had headache, loss of appetite and nosebleed for several days. On admission his temperature was  $103.5^{\circ}$ . He looked ill, and in a couple of days characteristic rose-spots developed. The spleen was not palpable. The urine of the first 24 hours had a specific gravity of 1008, contained a comparatively large amount of albumin and hyaline and granular casts. The temperature for the first week kept between  $102.5^{\circ}$  and  $104^{\circ}$ . He was very dull and heavy. The amount of urine ranged from 800 to 2000 cc. daily. It was always a little cloudy, contained a comparatively large amount of albumin, and microscopically red-blood corpuscles with hyaline and granular casts and leucocytes. The casts were very numerous. No blood casts were seen. There was a heavy brownish-red sediment in the urine until May 8. There was no drowsiness. He had neither nausea nor vomiting. The temperature fell very slowly and reached  $99^{\circ}$  about the 21st day. It remained between  $98.5^{\circ}$  and  $100^{\circ}$  until the 32d day. He recovered without any bad symptoms. On his discharge the urine still contained a trace of albumin and a few hyaline and granular tube casts.

The case is interesting from the severity of the renal symptoms, the absence of dropsy or of any serious general symptoms and the favorable course.

Patrick B., aged 21 (Hosp. No. 16,736), admitted July 21, 1896. He had been ill three weeks, and when admitted he was in a typical condition of typhoid fever. He had 57 baths, the last on the 50th day of fever. Very protracted attack. From the 76th to the 80th days, chills followed by fever. From the 71st to the 83d days he had albumin in large amount in the urine with hyaline, granular and fatty casts, and epithelium and pus, and some red-blood corpuscles. There was no dropsy. On discharge the patient had still a very small amount of albumin in the urine, with many hyaline and epithelial casts.

P. L., female, aged 36 (Hosp. No. 16,927), admitted Aug. 8, 1896. Very severe attack; temperature range from  $102^{\circ}$  to  $107^{\circ}$ ; much delirium. She had a large amount of albumin in the urine with blood cells and hyaline and granular casts.

Ella B., aged 29 (Hosp. No. 16,987), admitted Aug. 12, 1896, at the end of the second week. Severe attack; temperature range

to 105.4°. She had 13 baths. On admission she had a large amount of albumin in the urine; specific gravity 1017; there were many epithelial and granular casts and red-blood corpuscles. This condition persisted throughout the third week. The fever lasted for just 22 days. She convalesced rapidly. On the 31st day, before she went out, she still had a trace of albumin in the urine.

T. J. S., male, aged 39 (Hosp. No. 24,221), admitted Sept. 28, 1898, on the 5th day of illness. He had a well marked trace of albumin, numerous hyaline and granular casts on admission, and for the first week.

B. M., aged 31 (Hosp. No. 24,402), admitted Oct. 14, 1898. Severe attack; temperature up to 105°; 24 tubs. The temperature fell to normal on the 25th day. On the morning after admission there was an abundance of albumin in the urine, filling half the urine in the test-tube. There were hyaline and epithelial casts and abundant red-blood cells. On the 17th of Oct. the condition was about the same, an abundance of albumin and many coarse and granular casts. On the 20th and 25th and 27th the amount of albumin was smaller, numerous hyaline, granular and blood casts. On the 28th only a slight trace of albumin and a few casts, a good many red-blood corpuscles. A trace of albumin persisted, and the finely granular and hyaline casts. A point of interest is that this woman during the entire time had no features indicative of any special renal trouble. The specific gravity always ranged from 1015 to 1024.

**ORCHITIS.**

One of the rarest complications of typhoid fever is orchitis, of which only 2 cases occurred in the series of 829 cases. Eshner<sup>1</sup> has collected 42 cases, a large majority of which, 29 cases, occurred during convalescence.

Wm. F. D., aged 27 (Hosp. No. 23,960), admitted Sept. 3, 1898. On the 41st day swelling of the epididymis and testes. No urethral discharge. Good deal of swelling and pain, which gradually subsided, but still slight swelling as late as the 51st day.

Chas. H. B., aged 24 (Hosp. No. 26,296), admitted April 25, 1899, on the 5th day of a mild attack, with very slight diarrhoea,

<sup>1</sup> Philadelphia Medical Journal, 1888, I.

pulse not above 100, highest temperature range 105°. On admission he had parotitis involving both of the parotid glands; the submaxillary glands were also enlarged. Subsequently he had double epididymitis and orchitis. Slight chill and headache. The swelling both of the parotids and of the testicles subsided rapidly. He made a quick recovery and was discharged on May 9.

### Cutaneous System.

#### HERPES.

The statement is usually made that herpes is very rare in typhoid fever, but it was noted in 29 of the 829 cases, and probably occurred in a great many more. So frequent is herpes in malarial fever that its presence is often an important diagnostic suggestion.

Hyla M., aged 16 (Hosp. No. 14,071), admitted Oct. 2, 1895. On 15th day herpes on lower lip; later two herpetic patches, one on upper and one on lower lip, appeared.

Willie H., aged 6 (Hosp. No. 14,217), admitted Oct. 16, 1895. Herpes at angle of mouth during the first week. Blood negative for malarial organisms.

Mary G., aged 15 (Hosp. No. 16,967), admitted Aug. 11, 1896. Outbreak of herpes on lips on 31st day.

Lena K. (Hosp. No. 17,277), admitted Sept. 12, 1896. On the 5th day herpes developed on the lower lip.

Mina F. N., aged 33 (Hosp. No. 17,239), admitted Sept. 9, 1896. On the 10th day of the disease herpes appeared on the lower lip.

Michael M., aged 50 (Hosp. No. 16,794), admitted July 28, 1896. On the 23rd day there was an outbreak of herpes on the upper lip. Blood negative for malarial organisms.

Maggie L., aged 27 (Hosp. No. 16,850), admitted Aug. 1, 1896. On the 4th day of illness herpes developed on both lips. Blood negative for malarial organisms.

Katie W., aged 30 (Hosp. No. 17,367), admitted Sept. 22, 1896. On admission herpes on both lips. Blood negative for malarial organisms.

John K., aged 39 (Hosp. No. 17,393), admitted Sept. 25, 1896. Herpes on admission. Blood negative for malarial organisms.

Agnes H., aged 25 (Hosp. No. 19,940), admitted July 7, 1897.  
Herpes on lips on admission.

Frieda H., aged 26 (Hosp. No. 20,446), admitted Aug. 27, 1897. On the 15th day of disease herpes on lips.

Ellen K., aged 6 (Hosp. No. 21,744), admitted Jan. 15, 1898.  
Herpes on lips on admission.

Kate K., aged 16 (Hosp. No. 17,446), admitted Sept. 30, 1896.  
On admission herpes on lower lip. Blood negative for malarial parasites.

Ham. S., aged 22 (Hosp. No. 20,551), admitted Sept. 8, 1897.  
Herpes on lips on admission. Blood negative.

Mary W., aged 11 (Hosp. No. 20,773), admitted Sept. 29, 1897.  
On the 23d day herpes on the nose.

Maggie M., aged 25 (Hosp. No. 21,349), admitted Nov. 28, 1897. Herpes on lips.

Jeannette J., aged 15 (Hosp. No. 24,048), admitted Sept. 11, 1898. Herpes on admission.

Nellie F. M., aged 21 (Hosp. No. 24,689), admitted Nov. 10, 1898. Herpes on admission. Blood negative for malarial organisms.

#### ERYTHEMA.

##### *Erythema Typhosus.*

In the following cases of this series there was a bright erythematous redness of the skin of the trunk, followed usually by desquamation.

Charles L., aged 19 (Hosp. No. 17,969), admitted Nov. 27, 1896.  
Erythematous rash over the back on the 47th day, lasting for six days. The temperature had been normal for some time.

Wm. J., aged 17 (Hosp. No. 20,199), admitted Aug. 4, 1897.  
At the onset of a relapse the patient had a universal erythema, which lasted for a couple of days, and was followed on Sept. 14 by a desquamation of the skin, which in places peeled off in large flakes.

F. E., aged 30 (Hosp. No. 13,974). Marked erythema of face and upper thorax on 10th day.

E. B., aged 24 (Hosp. No. 23,914). Erythema on the 19th day; a diffuse erythematous blush over whole abdomen and back; desquamation followed it.

G. R. N., aged 28 (Hosp. No. 24,311). On the 22d day diffuse erythema of trunk.

*Erythema Exudativum.*

Thos. O., aged 32 (Hosp. No. 17,174), admitted Sept. 1, 1896. On the 9th day the patient had a general erythema which persisted until the 16th day. The temperature was high; frequent tubs. The notes are as follows: On Sept. 5, the 12th day of the disease, after the patient had had 18 tubs, he was noted to have a very intense erythema over the trunk. It was at first thought to be a persistence of the slight erythema after the bath. On Sept. 7 I noted that the patient had again an intense erythema. He had the last tub ten hours before. On Sept. 9 at the morning visit I noted that the last tub was a little after midnight. There was a diffuse erythema over trunk, arms and face, not on the legs. It was a very dusky erythema; no petechiae. It disappeared in a few days.

Patrick B., aged 21 (Hosp. No. 16,736), admitted July 21, 1896. On the 29th day the patient had had 19 baths; temperature had ranged from 102° to 104.5°. On this day Dr. Thayer's note was as follows: "This morning on the backs of the hands are a number of deep red blotches with slight tenderness of the joints on pressure. Upon the skin of the arms are a number of smaller, slightly raised papules and other large blotches about each elbow. They are not so much raised, and look rather hæmorrhagic. Some of the smaller areas are raised. On the thighs and legs are a number of slightly elevated patches, some of a deep red color and a little indurated. Some of the larger ones have a slight bluish tint." Within a couple of days the patches on the hands had almost disappeared. They persisted on the face. On the 32d day, July 30, there were some of them still present. On the left shin there were several slightly raised indurated spots, into which hæmorrhage had taken place. Throughout August at intervals there were fresh crops of papular erythema on the arms and forehead. The case had been very protracted, and he had become greatly emaciated. When I returned

in September I noted, on the 7th, that there were still a few patches of erythema on legs and feet. Even as late as the 23d of September I noted that erythema still persisted, and the face was somewhat swollen. On the night of the 21st of September he had splitting headache with nausea and vomiting. The face became very flushed, and throughout the following day his face was red and swollen.

Charles L., aged 19 (Hosp. No. 17,969), admitted Nov. 27, 1896. At end of second week a rosy blush was present on nose and cheeks for two or three days, variable, sometimes almost disappearing. He was taking tubs at the time.

John L., aged 25 (Hosp. No. 17,984), admitted Nov. 30, 1896. On the 9th day a blotchy erythema over face and trunk. On the forehead the patches were somewhat like urticaria. It only lasted a day. On the following day he had vomiting; no diarrhoea.

Edith C., aged 10 (Hosp. No. 20,436), admitted Aug. 26, 1897. Sponges; moderate attack. On the 31st day of illness an attack of erythema multiforme on face, shoulders and buttocks. Coagulation time two to three minutes. Dr. Camac's note on the condition was as follows: "Over eyelids, forehead and on either cheek are irregular high colored blotches. Here and there within the erythematous areas are whitish islands, which stand out in marked contrast to the surrounding purple red spots. That on the right cheek is not so deep in color. The whitish areas are not raised, and are unaffected portions. There are fading spots of erythema on the arms. Over the buttocks there are marked areas which are more raised. The distribution of the lesions is somewhat symmetrical, over both eyelids, cheeks, shoulders and buttocks." Within three days the rash had disappeared.

#### *Erythema Nodosum.*

In connection with erythema in typhoid fever I may mention a case under observation at the present date. Widal reaction marked; temperature not high. On the 15th day there was a most characteristic rash of erythema nodosum on the legs, six or eight spots on each, raised, and of the most typical appearance. In addition there were a few scattered areas of localized exudative erythema on the arms. The lesions disappeared in a few days.

## URTICARIA.

In the first series a case was noted with an abundant crop of urticaria. In this series there was one case, H. L., aged 27 (Hosp. No. 20,238), had on the 16th an outbreak of urticaria.

## BOILS.

Otto B., aged 19 (Hosp. No. 13,500), had boils on the back at the end of the third week. Mild case, only 9 tubs.

C. H., aged 25 (Hosp. No. 14,586), admitted Nov. 25, 1895. Boils on buttocks, six or eight, up to 3 or 4 cm. in diameter. Cultures showed staphylococcus albus.

Geo. F., aged 18 (Hosp. No. 16,888), admitted Aug. 5, 1896. Very severe attack; death on the 28th day of disease; 45 tubs. On the 16th day numerous boils on the back.

Mary G., aged 15 (Hosp. No. 16,967), admitted Aug. 11, 1896. At intervals from the 17th to the 35th day patient had boils. 35 tubs.

Wm. R., aged 19 (Hosp. No. 17,029), admitted Aug. 18, 1896. In the third and fourth weeks he had successive crops of small boils.

Chas. H., aged 47 (Hosp. No. 17,319), admitted Sept. 17, 1896, on the 63d day of illness had a crop of boils.

Martin B., aged 26 (Hosp. No. 17,417), admitted Sept. 28, 1896. Boils on the 30th day. Patient had 39 tubs.

Amos H., aged 21 (Hosp. No. 17,608), admitted Oct. 16, 1896. On the 18th day of illness several boils on thighs. On the 42d day boil in perineum. Staphylococcus albus in cultures.

Kate N., aged 17 (Hosp. No. 18,117), admitted Dec. 14, 1896. On the 30th day of illness abscess on right buttock; 36th day abscess in left gluteal region; 45th day one on scalp; and one on pubes.

Clarence S., aged 14 (Hosp. No. 20,301), admitted Aug. 14, 1897. Protracted attack; 85 tubs. On the 37th day of illness a large number of pustules on the back. On the 40th day abscess on the buttocks.

Ellen K., aged 6 (Hosp. No. 21,744), admitted Jan. 15, 1898. Thirty-eight tubs. On the 42d day of illness an abscess of labia majora, and on the 50th day an abscess under the chin. Staphylococcus in cultures.

Jos. Y., aged 33 (Hosp. No. 23,376), admitted July 7, 1898. On the 30th day of illness boils on back and buttocks. Staphylococcus in cultures. Thirty-four tubs.

Michael G., aged 32 (Hosp. No. 20,499), admitted Sept. 3, 1897. Boil on the thigh. Skin abscess in right scapula.

Ella T., aged 50 (Hosp. No. 20,666), admitted Sept. 21, 1897. Moderately severe attack; 53 tubs. On the 49th day of illness abscess on left buttock.

Maggie M., aged 25 (Hosp. No. 21,349), admitted Nov. 28, 1897. Two very painful inflammatory swellings at the right auditory meatus.

Thomas B., aged 19 (Hosp. No. 23,643), admitted Aug. 2, 1898. Protracted case; relapse. Abscess in left axilla on 35th day.

Geo. G., aged 12 (Hosp. No. 23,697), admitted Aug. 8, 1898. On the 33d day of a severe attack a boil on the right leg.

Herbert F. H., aged 7 (Hosp. No. 23,698), admitted Aug. 8, 1898. Between the 41st and 52d days numerous small abscesses. Those in axillæ and loins opened; staphylococci in cultures. The patient had been successfully operated upon for perforation.

Geo. H., aged 8 (Hosp. No. 23,953), admitted Sept. 2, 1898. 59 tubs. On the 19th day numerous small boils on chest and arms.

Kate H., aged 23 (Hosp. No. 24,064), admitted Sept. 13, 1898. On the 44th day a boil in the left axilla.

Henry W., aged 27 (Hosp. No. 24,081), admitted Sept. 14, 1898. On the 39th day an abscess in the right gluteal region; an ounce of pus. Staphylococcus aureus.

Jacob D. H., aged 20 (Hosp. No. 24,135), admitted Sept. 20, 1898. On the 26th day boils on the head, face, axilla and later the buttocks.

Chas. O. W., aged 28 (Hosp. No. 23,961), admitted Sept. 3, 1898. On the 22d day boils on arms.

## PEMPHIGUS.

Lewis R., aged 39 (Hosp. No. 20,507), admitted Sept. 4, 1897. On admission on the backs of both hands there were two large patches covered by flat scabs. On Sept. 10, six days after admission, on the back of the right hand there appeared a bulla about 1.5 cm. in diameter, raised, slightly painful, which contained a collection of bloody serum. The patient thinks this similar to the other spots which had appeared at an earlier stage. On the 11th another pemphigus-like bleb appeared over the right metacarpal bone of the little finger. The contents became yellowish and thick.

## PAPULAR RASH.

Mattie K., aged 20 (Hosp. No. 15,908), admitted April 24, 1896. On the 43d day of illness a papular rash developed on arms and legs, which lasted a few days.

## ECTHYMA.

Willie H., aged 6 (Hosp. No. 14,217), admitted Oct. 16, 1895. On the 9th day an ecthymatous rash appeared on the feet and hands. It disappeared under iodide of potassium. The boy's upper central incisors were notched; he possibly had syphilis.

## MILIARY RASH.

K. H., aged 17 (Hosp. No. 16,951), admitted Aug. 10, 1896. On the 21st day the patient had a profuse erythematous rash on thorax and abdomen, and there were small miliary vesicles.

## SWEATING.

Mina F. N., aged 33 (Hosp. No. 17,239), admitted Sept. 9, 1896. Marked sweating at night during the first week.

Amelia T., aged 19 (Hosp. No. 16,707), admitted July 17, 1896. From the 16th to the 21st days of disease she had profuse sweats. Temperature range was up to 105°. Recovery.

Jos. B., aged 28 (Hosp. No. 21,192), admitted Nov. 11, 1897. On the 12th day of illness patient had profuse continuous sweating.

## SLOUGHING OF THE SKIN.

Lena K. (Hosp. No. 17,277), admitted Sept. 12, 1896. Severe case with high fever. On the 46th day there was sloughing of the skin over the heels and one or two spots on the back.

## Nervous System.

### NEURITIS.

We have already considered in Studies I a series of cases of neuritis, and more fully in Studies II the whole subject of neuritis occurring during and after typhoid fever. The following additional case occurred in the third series.

*Severe attack of typhoid fever; in the fifth week, pain in right arm and gradual loss of power in arm and hand; in sixth week, loss of power in both legs without pain; gradual recovery.*

A. B., aged 26 (Hosp. No. 13,738), one of the associate professors in a New England college, was admitted August 30, 1895.

There is nothing of any special moment in his family history.

Early in August he paid a visit to the Eastern Shore, at which time he was quite well. On the 16th he began to complain of headache and pains in the limbs. On the 24th he noticed for the first time fever in the evenings. His appetite, however, was good until about four days before admission. He has had no bleeding from the nose. He has been thoroughly purged with calomel. For a week he has had a good deal of tenderness in the abdomen.

On admission, the features of typhoid fever were quite well marked. There were rose-spots and enlargement of the spleen. For the first week the temperature ranged from 100° to 105°.

On repeated examinations of the urine during the first month he had slight traces of albumin and an occasional small hyaline cast.

About the 21st of September the patient began to complain of pain in the right arm. It was difficult to get from him the exact location. He winced when the shoulder was touched, or the arm, or the elbow. Movement of the arm was very painful, and pressure on the elbow or shoulder, or on the arm caused him much pain. There was no swelling of the joints. He complained, too, that the fingers were numb and stiff. During the next two or three days this condition became more aggravated. The temperature ranged from 98° to 102°.

On the 24th of September he complained that he could not move his legs well, and that they were stiff, but he could move his feet and toes readily. On this day, however, there was distinct wrist drop on the right side. He could neither extend the fingers nor the wrist. It was impossible to fix accurately the point of most

pain about the arm. He winced when the humerus was grasped, but there was no special tenderness over the ulnar nerve or along the brachial cords. The extensor surface of the right arm seemed a little swollen in comparison with the left. For the next few days he did not complain so much, but there was almost complete loss of power in the right arm.

On the 30th the pain was very much less. He could neither lift the right arm from the shoulder joint, nor flex or extend it at the elbow. There was complete wrist drop, and he could only just move the fingers. The legs could not be drawn up, nor could he move the toes of either foot. The muscles were flabby and greatly wasted from the fever, but they were not tender.

There was slight improvement in the paralyzed limbs. He could move the hand and forearm, and the wrist could be slightly extended. The grasp, however, was scarcely perceptible. There was still deep-seated tenderness in the muscles.

On October 7, he could not lift either leg from the bed; the feet were in the typical position of bilateral foot drop. There was no tenderness in the muscles or along the nerves; no paresthesia; the sensation was normal.

October 10 the note was: "He cannot extend the fingers. He can flex the arm at the elbow, but it falls over at once. The left hand and arm are not and have not been affected. He can draw up the legs slightly at the hips. There is still complete foot drop."

With systematic friction to the arm and legs the power returned within a few weeks.

#### CONVULSIONS.

In Studies II, at page 469, I described a case of thrombosis of the branches of the middle cerebral artery on the 9th day of the disease, associated with severe convulsions. The following additional cases of convulsions have been seen.

Wm. T., aged 40 (Hosp. No. 15,015), admitted Jan. 17, 1896. On the 13th day of illness, during his 8th tub, the patient had a convulsive seizure with opisthotonos. The pulse became feeble, pupils contracted. He was taken out at once, had marked opisthotonos, and was unconscious for ten minutes.

Wm. W. K., aged 27 (Hosp. No. 14,453), admitted Nov. 11, 1895. Very severe attack; death from perforation on the 13th day.

On the 8th day the patient had a general convulsive attack, which lasted on and off for fifteen minutes, not followed by any paralysis. There was much muttering delirium subsequently.

Maggie M., aged 16 (Hosp. No. 21,695), admitted Jan. 6, 1898, on the 28th day of illness (?) Attack of great severity; temperature high; 125 tubs. She had been delirious, and had had a good deal of tremulousness. At 6.30 on the morning of Jan. 29 the patient had a convulsion, lasting about a minute, twitching of the face, shaking of the head, and general movements of the muscles. The temperature at midnight had been 104.5°. When I saw her at the visit on the same morning there was marked rigidity of the muscles on both sides. She had been very heavy and lethargic all night, but was aroused somewhat from the stupor. At 3.30 in the afternoon she had a second convulsion. The eyes were turned outwards and to the left; the head was violently shaken. Fifteen minutes later she had a third, which lasted about a minute. There was frothing at the mouth, shaking of the trunk and limbs, and involuntary passage of urine. When seen a short time after this convulsion the head was turned to the left; there was much spasm apparently of the neck muscles. The eyes, too, were turned strongly to the left. At 4.15 she had a fourth convulsion. At 10.45 in the evening, when the temperature was very high, she was tubbed, and she had a fifth convulsion in the bath, not lasting so long; no paralysis followed these convulsions. She lay in an apathetic condition, with a very dull expression, and occasionally cried out. For several days there was marked rigidity of the limbs and the knee jerks were increased. On Feb. 5 and 6 she was very much better, and though the rigidity was still present, it was not quite so marked. On the 7th it had almost disappeared. She had bad bed-sores and the pulse was very feeble. On Feb. 8th the patient was removed to her home, where she died about Feb. 17.

Dec. 13, 1899. I saw this evening, with Dr. Bolgiano, Pauline H., aged 11, with convulsions following typhoid fever. Primary attack of typhoid lasted 24 days, to Oct. 8. On the 15th she was up and about, and the nurse stopped taking the temperature. On November 15 it was noticed that she again had fever; temperature 101°. She had been restless for four days before. The temperature kept up for four days, until the 19th. Then for four days

she was free from fever. Then fever until Dec. 2, thirteen days. On Dec. 8, when she had been without fever for eight days, she had, at twelve o'clock, midnight, a severe convulsion on the left side, which lasted for three or four hours. She was unconscious, but when she recovered she seemed quite herself, perhaps a little confused for a time.

On the 13th at 6 A. M. a second convulsion occurred, also on the left side. The eyes were turned strongly to the left and fixed. The left hand moved a little, but the convulsion was chiefly tonic. It lasted until 11.30. When I saw her at 6.30 P. M. she was blind and had been so all day. She looked bright and there was no paralysis. She asked constantly for her mother, and she did not know whether it was day or night, and asked to have the light so that she might see who I was. The pupils were widely dilated. Ten days ago between seven and nine at night the mother thinks that she was a little blind, and after the first convulsion she seems to have had some difficulty in seeing.

Dec. 14, 1899. I saw this patient again at 2.30 to-day. She had been restless through the night, and had to have a little morphia. There was no paralysis. She was very difficult to examine. She wanted to go to sleep and moaned a great deal. I got a glimpse of both retinæ, and the vessels seemed normal, and I caught the edge of one disc quite plainly; it was not swollen. She gradually improved and two months later when I saw her she was perfectly well.

#### HYSTERIA.

Jos. K., aged 36 (Hosp. No. 14,444), admitted Nov. 9, 1895. On the 44th day of a severe attack he complained of excessive pain over the sacrum and loins. He ground his teeth, was in tears, was very hysterical, jumped and trembled when touched. (Typhoid spine, probably hysterical.) Even on the day of his discharge, when he was quite well in other respects, he complained of pain in the lower part of the back, stood stiffly and was unable to bend the back at all.

Michael G., aged 32 (Hosp. No. 20,499), admitted Sept. 3, 1897, on the 7th day of illness. On the 10th day a well marked hysterical fit. On the 12th a hysterical fit in the tub.

*Special Features, Symptoms and Complications.* 481

Chas. O. W., aged 28 (Hosp. No. 23,961), admitted Sept. 3, 1898. Severe attack. On the 45th day, during convalescence, a well marked hysterical attack. During the fever the patient had had very active delirium.

*Rhythmical Movements of Lower Jaw, Probably Hysterical.*

Eva G., aged 17 (Hosp. No. 20,907), admitted Oct. 12, 1897. Very intense infection with marked nervous symptoms, much rigidity of arms and legs and great delirium. On the 31st day of illness she had rhythmical movements of the lower jaw. Patient recovered.

*Catalepsy.*

Mrs. B., aged 40 (Hosp. No. 20,373), admitted Aug. 20, 1897, on the 8th day. On the same day patient had marked catalepsy; arms and legs would remain in any position in which they were placed. She was very hysterical and emotional; both conditions were much benefited by the tubs.

ONSET WITH MENINGEAL SYMPTOMS.

Jos. T., aged 21 (Hosp. No. 24,932), admitted Dec. 8, 1898, on the 5th day of illness; temperature 102.8°, much pain in the head, arching of the neck, head could not be bent forward; meningitis suspected. Lumbar puncture on the 6th day, negative. Kernig's sign not present. On the 9th day lumbar puncture again, negative. The stiffness persisted for nearly ten days, gradually disappeared. Patient recovered.

PERSISTENT AND AGGRAVATED HEADACHE.

Case 12,881, J. B., aged 23, was admitted May 25, 1895. He had loss of appetite and slight headache three weeks previous to admission. Then for a week he had very severe headache, so that he was forced to stop work. The following week he had to remain in the house most of the time. He began to feel feverish in the evening and had a great deal of nausea. For several days past he has vomited almost everything he has taken. No nosebleed. The headache has been continuous. On admission his temperature was 101.5°. He looked heavy and dull. Tongue covered with a thick yellowish fur. Lips dry. Teeth and gums covered with

sordes; breath very foul. There were several suspicious rose-spots on the skin of the abdomen. He had no diarrhoea, no distention of the abdomen. The headache was not very severe for the first two days in hospital; then on the 27th and 28th it became very intense. The ice-cap did not seem to relieve it. He had antifebrin and small doses of morphia. On the 29th and 30th the headache seemed a little better. On the 31st the pain was very severe in the back of the head and down the back of the neck. The headache persisted for the next few days, and on the 2d of June he was leeches.

In the following cases, also, the headache was severe and persistent:

Robert K., aged 28 (Hosp. No. 17,530), admitted Oct. 8, 1896.

Jos. Y., aged 33 (Hosp. No. 23,376), admitted July 7, 1898.

Henry H., aged 29 (Hosp. No. 24,745), admitted Nov. 18, 1898.

### Special Senses.

#### OTITIS MEDIA.

Conrad H., aged 25 (Hosp. No. 14,586), admitted Nov. 25, 1895. On the 13th day of illness there was a thick purulent discharge from the right ear; no pain. On the 26th day much pain, leeches applied. On the 27th day again profuse discharge. Irrigations of boric acid. On the 40th day almost well. Cultures showed streptococcus.

Charles L., aged 19 (Hosp. No. 17,969), admitted Nov. 27, 1896. On the 18th day of illness, without pain, there was a sero-purulent discharge from the right ear, which lasted two days.

Minnie L., aged 21 (Hosp. No. 20,618), admitted Sept. 15, 1897. Severe attack; 96 tubs. On the 32d day of illness otitis media, profuse purulent discharge from the ear.

Eva G., aged 17 (Hosp. No. 20,907), admitted Oct. 12, 1897. Very severe attack with marked nervous symptoms; 59 tubs. On the 31st day of illness an otitis media developed; slight discharge; no pain.

Ellen K., aged 6 (Hosp. No. 21,744), admitted Jan. 15, 1898. On the 42d day of illness she had an otitis media.

Kate H., aged 23 (Hosp. No. 24,064), admitted Sept. 13, 1898. 59 tubs. On the 32d day otitis media; slight discharge; stopped on the 34th day.

#### DEAFNESS.

Mattie K., aged 20 (Hosp. No. 15,908), admitted April 24, 1896. Moderately severe attack; no otitis media; fever of 21 days' duration; 14 tubs. During convalescence there was deafness of unknown cause.

Jacob D. H., aged 20 (Hosp. No. 24,135), admitted Sept. 20, 1898. Severe case, with much delirium. Marked deafness during the course.

Michael K., aged 32 (Hosp. No. 24,298), admitted Oct. 5, 1898. Severe case. Deafness only noticed for a few days.

Fannie H., aged 9 (Hosp. No. 23,799), admitted Aug. 16, 1898. On admission patient was apparently quite deaf.

#### CONJUNCTIVITIS.

Henry H., aged 29 (Hosp. No. 24,745), admitted Nov. 18, 1898. On Nov. 21, the 6th day of a well marked attack, in which the fever had been high, the patient had well marked conjunctivitis in both eyes. He had a good deal of headache, and on the following day much soreness and pain in the eyes. The condition rapidly improved.

### Locomotor System.

#### ARTHRITIS.

Bessie W., aged 26 (Hosp. No. 24,675), admitted Nov. 9, 1898. Arthritis at onset of relapse. (See relapse cases.)

Bessie M., aged 20 (Hosp. No. 17,101), admitted Aug. 24, 1896. Mild attack. On Sept. 10, at the beginning of a relapse, patient complained of stiffness and pain in the left elbow joint. There seemed to be no swelling. On Sept. 11, when the temperature had been 101°, in the evening the elbow joint looked a little swollen, no redness, but a little swelling on the inner side of the right tibia just above the malleolus. On the 14th it was noted that the pain and swelling of the left elbow were gone and the joint freely movable.

Harry L., aged 22 (Hosp. No. 22,837), admitted May 11, 1898. Severe attack of typhoid fever. He had during the height of the fever and at its decline very great pain in the bones of the knees and legs, and a very severe pain in the region of the left hip, and in the left sacro-iliac region. There was no swelling, no pain along the sciatic nerve. Subsequently both knees became swollen, and there was fluid in the right. At this time his temperature was 101°. The right knee was aspirated, and a yellow, sticky fluid removed. After persisting for about ten days the pains and arthritis gradually disappeared.

#### PAINFUL LEGS.

Mary C., aged 30 (Hosp. No. 13,524), on October 6, when well advanced in convalescence complained of much pain in the calves of the legs, particularly on pressure.

Katie W., aged 30 (Hosp. No. 17,367), admitted Sept. 22, 1896. Very protracted case with relapse. On the 79th day of illness, after the temperature had been normal for more than two weeks, she complained of much soreness in the legs; no swelling.

Martin B., aged 26 (Hosp. No. 17,417), admitted Sept. 28, 1896. Very protracted case with high fever and delirium. On the 56th day of illness there was a rise in temperature to 102.8°. Pain in the feet and calves, which were tender and slightly œdematous. The fever persisted only thirty-six hours. The next day the pain was better, it persisted, however, for a week. The veins were not palpable.

J. B., aged 26, male (Hosp. No. 20,134), admitted July 29, 1897. After a very protracted illness, during convalescence, marked soreness in calves of legs; no swelling.

Minnie S., aged 29 (Hosp. No. 20,227), admitted Aug. 7, 1897. On Sept. 20, after the temperature had been normal for a couple of weeks, the patient complained of great pain in the left leg in the popliteal space and along the inner side of the calf. It was extremely tender to the touch, and large veins could be felt in the popliteal space. No swelling of the leg. The patient had had varicose veins. On the 24th of September the leg was still very painful; no swelling; no tumor. She got well with a flannel bandage.

John E., aged 18 (Hosp. No. 14,191), admitted Oct. 14, 1895, in the second week of illness. Very severe and protracted case; 63 days of fever; 83 baths. On the 52d day the patient had a chill of fifteen minutes' duration; temperature rose to 104.5°. The calf of the leg was a little swollen and there was tenderness along the internal saphenous and femoral veins, most distinct in Scarpa's triangle. A few days subsequently there was pain on pressure along the course of the femur, and motion of the leg caused pain. It was difficult to say whether it was tenderness in the muscles or the bones. The leucocytes were 10,500. By the 57th day the pain had all gone.

#### TENDER SPINE.

Annie K., aged 20 (Hosp. No. 21,492), admitted Dec. 14, 1897. Severe and protracted attack with very marked nervous symptoms. On the 67th day there was great tenderness over the spine, with pain on deep pressure on the lumbar vertebræ. No change in the gait.

#### CRAMPS IN MUSCLES.

Annie A., aged 17 (Hosp. No. 17,619), admitted Oct. 17, 1896. On the 13th day of illness much troubled with cramps in muscles of calves of legs.

#### CHOREIFORM MOVEMENTS.

John E., aged 37 (Hosp. No. 21,152), admitted Nov. 8, 1897. Severe attack. From the 10th to the 13th day the patient, though quite conscious, mind clear, and temperature not very high, had the most marked movements of the muscles of the face, arm and hands, almost choreiform in character. At times the whole body would shake. By the 13th day the tremor had almost disappeared.

#### BONE LESIONS.

##### *Periostitis of Right Humerus and of Ribs during Relapse.*

C. E. D., aged 32 (Hosp. No. 12,915), admitted May 30, 1895. Severe attack with protracted relapse. About the middle of the relapse, between the 60th and 63d days of the disease, the patient complained of much pain in the right arm, which was at first difficult to localize. Subsequently it became limited to the lower

third of the humerus, and here there was on deep pressure excessive tenderness. There was no soreness when the skin or muscle was pinched, but pressure on the bone caused great pain. Counter-irritation was applied, and the condition gradually improved. About a week later the patient began to complain of pain at the sternal ends of the 4th and 5th left ribs, and here a distinct prominence appeared. It was very tender, but did not fluctuate. The tenderness and swelling persisted, and on the day previous to his discharge the following note was made: "There is now a tumor involving apparently the cartilages of the 4th and 5th ribs; it is somewhat tender, does not fluctuate, and is from 3 to 4 cm. in diameter."

*Periostitis of Left Clavicle.*

Leo C., aged 20 (Hosp. No. 23,968), admitted Sept. 3, 1898. On the 29th day, during convalescence from an attack of moderate severity, patient had periostitis of the left clavicle; pain and swelling, which gradually subsided without suppuration.

**MYOSITIS.**

T. A., aged 42 (Hosp. No. 12,404), admitted April 2, 1895. Typical attack of moderate severity; bathed. During convalescence the patient had extreme tenderness of the calf muscles, no special swelling, but a tenderness of the muscles themselves, which was in all probability myositis.

**Abscesses.**

**RECTAL ABSCESS.**

Charles H., aged 22 (Hosp. No. 13,769), admitted Sept. 3, 1895. Severe attack with relapse. On the 37th day of illness he had a rectal abscess with great pain, which discharged on the 40th day.

**ALVEOLAR ABSCESS.**

Mrs. W. B., aged 40 (Hosp. No. 20,373), admitted Aug. 20, 1897. On the 13th day of illness the patient had an alveolar abscess, which had to be opened.

## ON THE STUDY OF TUBERCULOSIS.\*

By WILLIAM OSLER, M.D.,

of Baltimore, Md.

THE history of the acceptance of any great truth in medicine is an interesting study. A slow, gradual recognition seems essential to permanency and stability. As Locke well said, "Truth scarce ever yet carried it by vote anywhere at its first appearance." Even in this electric age the practical application of new knowledge is singularly tardy. Antiseptic surgery took twenty years to win its victory, and for about the same period we physicians have been participants in another long warfare, the successful outcome of which may be said to be now in sight. The twentieth anniversary of the discovery of the germ of tuberculosis by Robert Koch is near at hand—a discovery which, in far-reaching results, will prove to have had few equals in human history. Since 1881 the laboratory phase of the question, with its experiments and researches, has so far been the most complete; the clinical side has been enriched with two facts of supreme importance; first, the earlier and more positive diagnosis of the disease; and, second, a fuller knowledge of the means for its cure; and we have now entered upon an economic stage, and the tuberculosis leagues and congresses, laws and enactments, show how alive we have become to the importance of the disease in national and civic life.

I. *General Relations of Tuberculosis.*—If we compare the mortality bills of any large city today with those of fifty years ago, the most striking change is in a reduction of the deaths from fever, and in the absence of the names of certain diseases which were formerly amongst the most fatal of their kind. Public hygiene has done a great work in ridding us of several of the great scourges,

\* Introductory Remarks at the organization of a Society for the Study of Tuberculosis, Johns Hopkins Hospital, October 30, 1900.

and in lessening the danger from such epidemics as cholera and yellow fever. Of the 10,152 persons who died last year in this city, 3,765 were victims of the infectious diseases. Measles, scarlet fever, diphtheria, whooping-cough, influenza and dysentery together accounted for 801. Three diseases head the list, each one as fatal as all the others combined; tuberculosis of the lungs 974, pneumonia 778, and cholera infantum 703. If we add the deaths due to tuberculosis of other organs, we are well within the mark in saying that one-tenth of the deaths in this city are due to this disease. It is estimated that above a million of persons are suffering with consumption alone in this country, of whom at least 150,000 die annually. The white plague, as Holmes called it, is the great scourge of the race, killing more than 5,000,000 yearly. Let me read you an abstract from De Quincy, which, while expressing an old, erroneous idea, gives in his strong and characteristic language the terrible, the appalling nature of this annual slaughter. "Are you aware, reader, what it is that constitutes the scourge (physically speaking) of Great Britain and Ireland? All readers, who direct any part of their attention to medical subjects, must know that it is pulmonary consumption. If you walk through a forest at certain seasons, you will see what is called a *blaze* of white paint upon a certain *élite* of the trees marked out by the forester as ripe for the axe. Such a blaze, if the shadowy world could reveal its futurities, would be seen everywhere distributing its secret badges of cognizance amongst our youthful men and women. Of those that, in the expression of Pericles, constitute the vernal section of our population, what a multitudinous crowd would be seen to wear upon their foreheads the same sad ghastly blaze, or some equivalent symbol of dedication to an early grave. How appalling in its amount is this annual slaughter amongst those that should by birthright be specially the children of hope, and levied impartially from *every* rank of society! Is the income-tax or the poor-rate, faithful as each is to its regulating tide-tables, paid by *any* class with as much punctuality as this premature *florilegium*, this gathering and rendering up of blighted blossoms by *all* classes? Then comes the startling question

—that pierces the breaking hearts of so many thousand afflicted relatives—Is there no remedy? Is there no palliation of the evil?" Let us be thankful that we can answer today—There is!

II. *Some Special Features of Tuberculosis as a Subject of Study.*—In a comprehensive view of the diseases which we are called upon to study, three only are of wide and universal interest—tuberculosis, cancer, and syphilis. In almost every particular tuberculosis out-tops the others. It is a disease of extensive distribution among animals, in which the veterinarian is interested equally with us. The general surgeon must know it thoroughly, and it occupies his thoughts almost as much as cancer, and his hands more than syphilis. The specialist must be familiar with its manifestations. Though not a disease upon which the specialist thrives, the laryngologist, the neurologist, the gynecologist, and the dermatologist see cases almost daily. Syphilis has a more enduring grasp, and, not content to follow man from the cradle to the grave, nips the fruit in the bud, and more often brands and maims than kills. Tuberculosis and cancer respect the embryo, and are not factors in intrauterine pathology. In many ways syphilis is the most benign of the three. There is a silver lining on the luetic cloud, which we never see in cancer, and not often enough in tuberculosis. And yet tuberculosis, which is a more serious disease than the others combined, offers a greater hope of a reduction in its ravages. We know the cause, the conditions under which the germs thrive and the modes of infection, and the public is at last awake to the importance of the subject, as shown by the remarkable manifestation of national and civic interest during the past few years. We have reached agreement on two points; first, the right of the State to insist that a tuberculous patient shall not be a source of danger to others, (and to this end there must be some supervision, to the extent at least of notification of the cases); and, secondly, the duty of the State, of civic authorities, or of private benefaction to provide suitable accommodation for the poor consumptives. The danger is not from the few well-to-do patients, in whose environments there may be less risk of infection than elsewhere. A person would probably run less risk of

“catching” consumption in the Adirondacks’ sanatorium than living in the tenement districts of New York, or in the Jewish quarter of this city.

III. *The Physician as a Student of Tuberculosis.*—The brunt of the battle in the warfare against tuberculosis falls on the medical profession. We must not only be alive to our duties, but thoroughly prepared to carry them out. If a man looks back on the best work of his life he will find it to be that for which perhaps he has had the least acknowledgment from the public or his colleagues in either cash or credit; and so it must ever be with the work of the units of our army, and particularly in their crusade against tuberculosis. Within the past ten years there has been an extraordinary change in the attitude of the average doctor to the question of consumption; he is more expert in the early recognition of the disease; he appreciates the conditions under which cure may be expected, and he is more ready to take every advantage of the opportunities offered by the health boards and their laboratories; but I must confess he still very often lacks the enthusiasm which is necessary to make a strong fighter. I know how hard it is in general practice, particularly among the poor, to carry out instructions which we rattle off so glibly or write down with so much self-satisfaction, but physicians cannot escape from their responsibility in this matter. To them the public must turn for help, since they alone can insist that the tuberculous patients shall live a hygienic life, and when all fully realize their duties we may look for a marked reduction in the incidence of the disease. The really serious peril is the prevalence of the disease among the poorer classes, who live in the smaller houses and tenements, who for the most part have no physicians to advise and instruct them, and who seek aid at the hospitals and dispensaries. Two years ago I was much impressed with the number of such cases applying at our out-patient department of the Johns Hopkins Hospital, and some kind friends placed at my disposal a sum of money which was to be used to promote the study of tuberculosis, and to diffuse among the poor a proper knowledge of how to guard against the dangers of the disease. A plan of systematic visiting of each applicant was organ-

ized, and Miss Dutcher will speak of her experience during the past year. It was felt that if a well-informed and sympathetic person paid a visit to the house, saw the conditions under which the patient lived, directions could be given with much more likelihood that they would be carried out. Valuable information could also be obtained as to the mode of life and surroundings of these people.

This Society has been organized to promote the study of tuberculosis among the physicians and surgeons of the Hospital, the senior students of the Medical School, and any physicians who may wish to attend our meetings. Believing in the inspiration of great names, we have called it after the name of the greatest student of the disease. An historical review of the great epochs, a minor item relating to the symptomatology of the disease, a critical summary of the conditions relating to tuberculosis in the country at large and in this city, together with a presentation from each of the departments of the work upon tuberculosis in the Hospital during the first decade, will constitute our program for the session.

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THE  
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(WEEKLY)

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## ON PERFORATION AND PERFORATIVE PERITONITIS IN TYPHOID FEVER.\*

BY WILLIAM OSLER, M.D.,  
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CULLEN's remark that the chief function of a physician was to obviate the tendency to death, sounds trite and commonplace in dealing with a condition such as perforation of the bowel in typhoid fever, which is not a tendency to, but, to all intents and purposes, death itself. Until within a comparatively few years, in the presence of this disastrous event, we folded our hands and murmured that all was over. The astonishing results obtained in acute peritonitis from other causes made thoughtful men ask themselves whether something could not be done in the perforative peritonitis of typhoid fever. To two physicians we owe the ardent advocacy of operation—to Leyden in Germany, and to J. C. Wilson in this country. Many of you who listen to me can recall the skepticism so freely expressed, by no one more strongly than by myself, as to the practicability of the procedure; but the surgeons, particularly of this country, took up the question with zeal and energy, and the collected statistics of Keen and of Finney show a most gratifying percentage of recoveries.

I am sorry that we cannot, as a profession, congratulate ourselves upon a reduction in the incidence of typhoid fever in this country. Its widespread prevalence is Nature's judgment upon the transgression of the plain, everyday precepts which we have been preaching in deaf ears for two generations. We can congratulate ourselves, however, upon a striking reduction in the mortality from the disease, for which better nursing and better methods of treatment are responsible. We save 5, 6, or even 7% more patients

\* Read at the Philadelphia County Medical Society, January 9, 1901.

than we did 20 years ago. We may take  $7\frac{1}{2}\%$  as the minimum typhoid death-rate for general hospitals, a figure which should include all cases admitted with the diagnosis of typhoid fever, but from which the doubtful cases of febricula, the estivoautumnal malaria, and cases admitted with the late sequelae of the disease are carefully excluded. It is interesting to note the special class of fatal cases which has been influenced by the modern nonmedicinal methods of treatment. It is not the complications, as hemorrhage, pneumonia, perforation, etc., but it is the largest group in which the patients die of the toxemia. Among 100 fatal cases, 50 die of the progressive asthenia, 30 of perforation, and 20 of other complications. Of 63 deaths in the first 10 years of the work at the Johns Hopkins Hospital, nearly  $\frac{1}{3}$  were due to perforation. There has been no material change in the percentage of cases with perforation, as given in Fitz's collection of statistics. Among the fatal cases the relative proportion due to perforation has become higher, owing, as I have said, to the striking reduction in the deaths in the toxemic group.

It is a wonder that perforation does not occur more frequently when we consider the extent and character of the necrotic processes. As the lower 18 inches of the ileum are chiefly involved, the perforation is usually within this distance of the valve. The higher in the bowel, the more likely is the perforation to be in a small ulcer without much infiltration or necrosis of the walls. The position of the terminal loops of the ileum make the first symptoms of perforation hypogastric, and may give to the case a pelvic or an appendicular aspect. A majority of the cases occur early in the third week; the earlier the perforation the greater will be the difficulties in dealing with the bowel. The earlier the perforation, and the closer to the valve, so much the greater risk of a widespread necrosis of the mucosa and a condition of the gut most unfavorable for any surgical procedure.

In studying the clinical features of these cases one is profoundly impressed, first, with their uncertainty and variability, and, secondly, with the necessity (in view of recent surgical events) of a revision in our methods of dealing with these cases on the medical side. The

accident may be divided into two stages: First, the perforation itself; and, secondly, the consecutive peritonitis. The all-important question is to recognize the perforation, and, if possible, to operate within the first 12 hours, before there is widespread general peritonitis. Let me illustrate the uncertainty by sketches of three recent cases:

CASE I (No 32,411)—Edgar G., aged 24, admitted October 11, 1900, having been ill for more than a month. He looked ill, had only moderate fever, but on the second day after admission he began to complain of abdominal pain, and there was a little fulness. The leukocytes were 7,000. On the 15th the abdomen was again slightly distended, the respiratory movements were well seen, there was no pain, no tension. The hepatic flatness reached to the costal margin. For the next three days the slight distention of the abdomen persisted. There was no diarrhea. At 9 A.M. on the 19th he complained of abdominal pain, which was severe enough to make him cry out. The abdomen was somewhat distended, the respiratory movements were well marked, the muscles were held very tense, the liver-dulness was obliterated in the middle line. The leukocytes at 9.15 were 4,000 per cem. He had been taken out of the bath a little before 9 o'clock, and was still blue and cyanotic. At 11 A.M., when seen by Dr. Futcher, he felt more comfortable. He had had one exacerbation of abdominal pain since 10 A.M. The respiratory movements were well seen, though slightly limited below the level of the umbilicus. The muscles were slightly rigid, but there was no actual muscle spasm. There were tenderness and pain on pressure in the lower abdomen, most on the right side. Pressure brought on sudden paroxysms of pain. Rectal examination showed no bulging of peritoneum posterior to bladder. The leukocytes were counted every hour between 11.15 and 4.15, and they did not rise above 5,200. At 2.30 the abdomen was considerably distended, the tenderness in the hypogastric region was marked, but he complained of less pain. At 2 P.M. he had a profuse perspiration. The pulse was of good volume and good tension, 92 to the minute. The abdominal muscles were a little more rigid. At 4.30 the patient was seen by Drs Futcher, McCrae and Mitchell in consultation. The pulse was still of good volume, but had increased slightly, and he had hicoughed once or twice. There had been no nausea and no vomiting. There was still marked tenderness in the lower abdominal region. Pressure caused the patient to wince. The muscle rigidity was slightly greater over the right rectus. During the day the point of greatest tenderness had varied. There was no actual muscle-spasm. There was slight shifting dulness in the flanks. The liver flatness was

not obliterated. There was no increase in respiration, but the respiratory movements were more limited below the level of the umbilicus. The following symptoms suggested the possibility of perforation: The sudden onset of pain at 9 A.M., the persistence of the pain through the day, its association with marked tenderness on deep pressure, the moderate muscle rigidity, the gradually increasing distention during the day, the suggestive movable dulness in the flanks. The following important symptoms so often present were absent: No drop in temperature, no special increase in the rapidity of the pulse, no symptoms of collapse, no nausea or vomiting, no obliteration of the hepatic dulness, absence of muscle-spasm, absence of any marked diminution of the abdominal respiratory movements, absence of any leukocytosis. It was decided to give the patient the benefit of the doubt.

I saw him at 5.30 P.M. His general condition was excellent, there was moderate distention of the abdomen, the respiratory movements were present, but were relatively much more above the navel, the tension of the abdominal walls was of moderate grade, both iliac fossae were soft and elastic, no spot more painful than another; slight general tenderness. Four finger's breadth of liver-flatness were present just outside the parasternal line. There was no collapse. He was being prepared for operation, and a little excited, and the pulse was 112.

To speak frankly, in this case I had much more confidence in the judgment of my two assistants, Drs. Fitcher and McCrae, than in the symptoms presented by the patient. The sudden onset of pain, the subsequent occurrence of pain in paroxysms, the tenderness, the slight increasing distention of the abdomen were the sole features which warranted an exploration.

Dr. Mitchell operated at 6 P.M., exactly 9 hours after the onset of the pain. The general peritoneum was reddened, but there was no lymph, and it was not until the coils towards the pelvis were lifted up that a perforation was seen, through which feces were oozing. He did very well until the evening of the 21st, when his temperature began to rise, reaching 105° on the 22d, when he died, more apparently from the effects of the fever than from the peritonitis. The abdominal symptoms improved after the operation, and at the autopsy the wound on the bowel was healing per primam.

CASE II (No. 32,765).—The patient had been admitted on November 10, 1900, from West Virginia, about the beginning of the second week of a very severe attack. On November 15, the fourteenth day, he had a hemorrhage from the bowels at 9.30 P.M. At 10.30 he complained of very severe pain in the abdomen, with which he groaned out loudly. At 10.45 the abdomen was flat, almost scaphoid, the respira-

tory movements were slight, there was no tenderness, no rigidity, no muscle spasm; the leukocytes were 7,500. Throughout the 16th his temperature rose, reaching nearly to 106°. He had some hiccough through the night and in the morning; no vomiting. He was pale and tremulous. The right half of the umbilical region and the right iliac fossa were slightly tender on deep pressure, and the muscles were a little more rigid than last night. There was no definite muscle-spasm. A very important point, on which we did not put enough stress, was the fact that the hepatic flatness, which reached to the costal margin at 11 P.M., at 11 A.M. was 8½ cm. above the costal margin. There was no obliteration in the midaxillary line. The leukocytes rose through the day, and at 12.15 P.M. were 17,500. I saw the patient at 6 P.M., and, considering that he had had a severe hemorrhage, I thought his condition fairly good. The temperature was a little above 104°; the pulse was of fair volume, about 120; the tongue was dry, the abdomen was not distended, the respiratory movements were present, there was slight tenderness on deep pressure. In the nipple line the area of liver-dulness was obliterated. Throughout the evening the patient grew worse, the abdomen became distended, respiratory movements were absent, the abdominal walls became rigid, and there was general muscle-spasm, and the patient complained of a good deal of abdominal pain. He had frequent hiccough, and the pulse rose to 140. At 10.15 P.M. he had a profuse hemorrhage, and though his condition was desperate, it was decided to operate, which was done by Dr. Finney. Gas was escaping from the peritoneal cavity, and there was a bloody exudate with fecal matter in the pelvis. About 12 cm. from the cecum there was a large gangrenous ulcer, which presented two perforations. In the neighborhood of the perforations the walls of the gut were so swollen and infiltrated that a suture would not hold, and before anything could be done the patient died on the table.

In this case, no doubt the perforation occurred on the night of the 15th, but we attributed his symptoms to the hemorrhage, which occurred at the same time. There was an absence of any definite abdominal changes until nearly 24 hours later. A third point of interest, which should have made us suspect perforation earlier, was the fact that at 11 A.M. on the 16th, without abdominal distention, the liver-dulness reached a point 8½ cm. above the costal border.

CASE III (No. 32,925) is still more interesting from the standpoint of the study of the symptoms of onset of perforation. This was a child, aged 8 years, admitted on Novem-

ber 22, on the fifth day of the disease. She had a severe attack, the temperature rising to between 104° and 105°. An interesting feature was that the day after admission she began to complain of pain in the right half of the abdomen, and continued to complain until the 28th. The abdomen was a little full. After November 30, the pain was very much diminished. On the morning of December 5, Dr. McCrae made a note that her general condition was good, the abdomen was somewhat full, everywhere soft, nowhere tender. The leukocytes were 5,500. At 7.15 p.m. she cried out with abdominal pain in the right iliac fossa. The pulse was small, dicrotic, and rapid. The abdomen was a little more distended. She was given turpentine stupes, and after each one she would get quieter and fall asleep. At 11 p.m. there was marked general rigidity of the abdominal muscles, no definite local tenderness. The respiratory movements were fairly free, though perhaps a little limited below the navel. The liver flatness extended to a point 3 cm. above the costal margin in the nipple line. At 11.40 p.m. the leukocytes, which had been 11,500 at 7.30, were 7,500. At 1 a.m. the abdominal pain persisted, and at times the patient cried out with its intensity. The pulse was 150; she had not vomited; the abdominal distention had not increased. The tenderness was marked, and the slightest pressure caused her to cry out. The respiratory movements were less marked than 2 hours before. There was marked rigidity, and definite muscle-spasm. The liver dulness was completely obliterated in the nipple line. There was slight movable dulness in both flanks, but the value of this sign was diminished by the fact that the patient had diarrhoea. The leukocytes at 1 a.m. were 7,700 per ccm.

Dr. Fitcher made a diagnosis of perforation, and urged operation, which was done at 2.30 a.m. Gas escaped when the peritoneum was opened, with cloudy, yellow, bile-stained fluid, of which there was a good deal in the right iliac fossa, and in the pelvis. The coils of the small intestine were not much distended, were pinkish in color, somewhat injected. The perforation was 10 cm distant from the cecum, clean, punched out in the middle of a not very prominent ulcer. Golden yellow, bile-stained fluid was escaping through it. The perforation was closed with a pursestring suture, reinforced with 3 mattress sutures of fine silk. The patient stood the operation well, and has made an uneventful recovery.

This patient had had a good deal of pain in the abdomen almost from admission, so that she had been carefully watched, but the character of the pain which came on December 5, was different. It was more severe, it had exacerbations of great severity, which

caused the patient to cry out at intervals. The movable dulness in this case was shown at operation to be undoubtedly due to the free fluid in the peritoneal cavity. As nearly as could be judged the perforation took place at 6 P.M., and the operation was begun at 2.30 A.M.

You will agree with me, I think, after hearing the narration of these 3 cases, that the time-honored picture of perforation, with the Hippocratic facies, the feeble running pulse, the profuse sweat, the distended motionless abdomen must be erased, as not a picture of perforation, but of peritonitis, or, better still, a rough draft of death. What we need more than anything at present is a fuller knowledge of the symptoms of *perforation*, particularly of its onset, apart from those of the consecutive peritonitis. I do not think we are likely to do much with what Dr. Cushing has called the preperforative stage. I do not think we can hope frequently to recognize a case so early, but it should be a special duty of hospital physicians hereafter to study with more than usual care the earliest possible symptoms in perforation cases. I have been looking over the records of the 30 cases of perforation in typhoid fever which have occurred to January 1, 1901, in my wards since the opening of Johns Hopkins Hospital, and in doing so I was reminded of the dying prayer of the celebrated Archbishop Ussher, that the Lord would forgive him his sins of commission. In the matter of hospital histories and notes even the best men are apt, in the hurry and press of work, to leave unrecorded many important points for which the arm-chair clinician in revising the history seeks in vain. What is essential in every serious case is the watchful care of a man who will be quick to grasp changes in the patient's condition, and who in such cases is in hourly collusion with his surgical colleague. In large general hospitals with many cases of typhoid fever, suspected cases should be visited at short intervals by a skilled resident physician, and not left to the tender mercies of an inexperienced interne. To leave the diagnosis of perforation to the attending physician is, in too many cases, to sacrifice the life of the patient. In 3 at least of our successful cases it was the prompt action of Dr. Futcher and Dr.

McCrae, and the prompt cooperation of the resident surgeon, that decided the patient's chances.

Perforation occurs as a rule in the more severe cases, and during the height of the disease. The rare cases during convalescence need scarcely be considered. Cases with diarrhea and with tympanites are more liable to this accident. Of our 30 cases 20 had diarrhea, 16 at the time of perforation, 4 had constipation at the time, and in 10 the bowels were regular. In 1 it is not mentioned. There is an interesting group (6 cases) of perforation with hemorrhage. When we remember that a large proportion of all cases of typhoid fever if left alone have no abdominal symptoms—neither diarrhea, pain nor tympanites—it is not difficult for the attendant to keep his mind constantly on the alert for the danger signals.

I have drawn up a schedule of specific instructions to be followed in cases of typhoid fever in which perforation is suspected.

I. Instructions should be specific and definite to the night superintendent and head-nurses, to notify the house-physician of any complaint of abdominal pain by the patient, of hiccough or vomiting, of a special rise of pulse or respiration, of sweating, or of signs of collapse.

II. House-physicians should note the character of the *pain*. As to (a) *Onset*, whether only an aggravation of slight abdominal pain, such as is common, both with constipation and with diarrhea, or whether it was a sudden, intense pain which caused the patient to call out, and which, though relieved by stupes and ordinary measures, soon recurred in paroxysms and grew worse.

(b) *The locality*, whether diffuse or localized in the hypogastric or right iliac regions; radiation, as to penis. It is to be borne in mind that abdominal pain of a severe character may be associated with an acute pleurisy, with distended bladder, with cholecystitis, and with a packed rectum, or may follow an enema.

III. *State of the abdomen*.—The condition to be noted in writing at once as to the following particulars:

(a) Whether flat, scaphoid or distended. Whether, if distended, it is uniform or chiefly hypogastric.

(b) Respiratory movements, whether present, if uniform and seen both below and above the navel.

(c) Palpation, as to tension and pain, locality and extent, and degree of pressure necessary to elicit; muscle rigidity and spasm, whether present or not, and in which special locality, and noting particularly its absence or presence in the hypogastric region and the right iliac fossa.

(d) Percussion—character of note in front of abdomen and in flanks. Liver-flatness, extent, in middle, nipple, and in mid axillary lines. Note specifically every third hour. Remember, too, that obliteration may occur in a flat as well as in a distended abdomen. Auscultatory percussion may be helpful.

(e) Auscultation—obliteration of signs of peristalsis; presence of friction.

(f) Examination of rectum, whether tenderness; fullness between rectum and bladder.

(g) Stools—character, frequency, presence of blood or sloughs.

#### IV. *General condition of patient:*

(a) Facies, whether change in expression; risus, slight or marked; pallor; sweating, etc.

(b) Pulse, change in rhythm, rate and force.

(c) Temperature, whether a drop or not, whether after a tub or not.

(d) Respiration, sudden increase, not infrequent, whether shallow, or sighing.

(e) Sweating, if subject to during attack; if onset with the pain; whether local or diffuse.

(f) Vomiting, whether with onset of pain or not; character of vomiting.

(g) Hiccough.

V. *Blood-count.*—Leukocytosis, stationary or rising. May be marked and early. In a majority of cases well followed there is a rise. The constant leukopenia in typhoid fever has to be taken into account. Also a count of the red blood-corpuscles and hemoglobin, as a decided drop might suggest hemorrhage.

It is in the hands of the profession to reduce still further the mortality of typhoid fever. The death-rate of the disease under the most disadvantageous circumstances may be gathered from the shocking experience in the South African campaign, in which, to September,

there had been more than 25,000 cases of typhoid fever, with more than 3,000 deaths, 20%. In the Spanish-American campaign there were 20,738 cases of typhoid fever, with a mortality of only 1,580—7.61%. The remarkable prevalence of the disease is illustrated better, perhaps, by the fact that 86.24% of the total deaths during the war were due to this cause.

Under the favorable circumstances with which we are surrounded in this country, and the ease with which patients can be nursed and cared for, the death-rate should reach the lowest possible point. For this blessed consummation one most important preliminary is necessary. Our senior students should receive a practical, first-hand, day by day acquaintance with typhoid fever. Heaven knows there are cases enough and to spare in every city in the Union to provide instruction of this sort. But is it given? I do not mean lectures on typhoid fever, or recitations on typhoid fever. I mean seeing typhoid-fever patients day by day, practically having charge of them, and watching their progress from week to week. This can be done, and this should be done in the case of an all-important disease of this character. The worst indictment ever brought against the medical schools of this country is contained in the recently issued report by Reed, Vaughan, and Shakespeare on the prevalence of typhoid fever during the Spanish-American War. Shades of W. W. Gerhard and of Austin Flint! The young doctors, to whom were entrusted scores of valuable lives, had practically not got beyond the nosology of Rush. Of the total number of 20,000 cases of typhoid fever, only about 50% were diagnosed by the regimental or hospital surgeons. Some of the statistics are perfectly appalling. Thus in 80 out of 85 cases sent from the Fifth Maryland Regiment to civil hospitals in Baltimore, the diagnosis was changed from malaria to typhoid fever. Of 98 cases sent from the Eighth New York Regiment to New York Hospitals all were recognized as typhoid. A majority of them had been entered under other diagnoses. The authors of the report do not improve matters by the lame apology that the army surgeons probably did better than the average physician of the country in his private practice.

There are many lessons which we all have to learn about typhoid fever, but the one I wish to enforce on this occasion is the necessity of watching carefully in the severe cases for the very first features of perforation, in order that the patient may be given the benefit of operation at the earliest possible moment. In general hospitals it may be feasible in the future to save one-half, at least, of the perforation cases. In the severer cases, as in the second one which I have related, the condition of the bowel is hopeless. In another group, illustrated in the first one, the patients recover from the operation, but die of the effects of the disease itself. But one of the most gratifying circumstances connected with the disease has been the demonstration by the surgeons that there is a third group in which complete and perfect recovery may follow. To January 1 of this year 11 cases of perforation have been operated upon from my wards by Dr. Halsted's associates and assistants, Drs. Finney, Cushing and Mitchell, 5 of which have recovered, a percentage of 45.4. Five additional cases have been operated upon by them with 1 recovery, a total of 16 with 6 recoveries, a percentage of 37.5.

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JAMES HENDRIE LLOYD, A.M., M.D., Editor.

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## BOOKS AND MEN.

Remarks made at the Opening of the New Building of the Boston  
Medical Library, January 12th, 1901,

BY WILLIAM OSLER, M. D.,  
*Professor of Medicine, Johns Hopkins University.*

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Those of us from other cities who bring congratulations this evening can hardly escape the tinglings of envy when we see this noble treasure house; but in my own case the bitter waters of jealousy which rise in my soul are at once diverted by two strong sensations. In the first place I have a feeling of lively gratitude towards this library. In 1876 as a youngster interested in certain clinical subjects to which I could find no reference in our library at McGill, I came to Boston, and I here found what I wanted, and I found moreover a cordial welcome and many friends. It was a small matter I had in hand but I wished to make it as complete as possible, and I have always felt that this library helped me to a good start. It has been such a pleasure in recurring visits to the library to find Dr. Brigham in charge, with the same kindly interest in visitors that he showed a quarter of a century ago. But the feeling which absorbs all others is one of deep satisfaction that our friend, Dr. Chadwick, has at last seen fulfilled the desire of his eyes. To few is given the tenacity of will which enables a man to pursue a cherished purpose through a quarter of a century—"Ohne Hast, aber ohne Rast" ('tis his favorite quotation); to fewer still is the fruition granted. Too often the reaper is not the sower. Too often the fate of those who labor at some object for the public good

is to see their work pass into other hands, and to have others get the credit for enterprises which they have initiated and made possible. It has not been so with our friend, and it intensifies a thousandfold the pleasure of this occasion to feel the fitness, in every way, of the felicitations which have been offered to him.

It is hard for me to speak of the value of libraries in terms which would not seem exaggerated. Books have been my delight these thirty years, and from them I have received incalculable benefits. To study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all. Only a maker of books can appreciate the labors of others at their true value. Those of us who have brought forth fat volumes should offer hecatombs at these shrines of Minerva Medica. What exsuccous, attenuated offspring they would have been but for the pabulum furnished through the placental circulation of a library. How often can it be said of us with truth, "*Das beste was er ist verdankt er Andern!*"

For the teacher and the worker a great library such as this is indispensable. They must know the world's best work and know it at once. They mint and make current coin the ore so widely scattered in journals, transactions and monographs. The splendid collections which now exist in five or six of our cities and the unique opportunities of the Surgeon-General's Library have done much to give to American medicine a thoroughly eclectic character.

But when one considers the unending making of books, who does not sigh for the happy days of that thrice happy Sir William Browne\* whose pocket library sufficed for his life's needs; drawing from a Greek testament his divinity, from the

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\* In one of the Annual Orations at the Royal College of Physicians he said: "Behold an instance of human ambition! not to be satisfied but by the conquest, as it were, of three worlds, lucre in the country, honour in the college, pleasure in the medicinal springs."

aphorisms of Hippocrates his medicine, and from an Elzevir Horace his good sense and vivacity. There should be in connection with every library a corps of instructors in the art of reading, who would, as a labour of love, teach the young idea how to read. An old writer says that there are four sorts of readers: "Sponges which attract all without distinguishing; Howre-glasses which receive and powre out as fast; Bagges which only retain the dregges of the spices and let the wine escape, and Sives which retaine the best onely." A man wastes a great many years before he reaches the 'sive' stage.

For the general practitioner a well-used library is one of the few correctives of the premature senility which is so apt to overtake him. Self-centred, self-taught, he leads a solitary life, and unless his every-day experience is controlled by careful reading or by the attrition of a medical society it soon ceases to be of the slightest value and becomes a mere accretion of isolated facts, without correlation. It is astonishing with how little reading a doctor can practice medicine, but it is not astonishing how badly he may do it. Not three months ago a physician living within an hour's ride of the Surgeon-General's Library brought his little girl, aged twelve, to me. The diagnosis of infantile myxedema required only a half glance. In placid contentment he had been practising twenty years in "Sleepy Hollow" and not even when his own flesh and blood was touched did he rouse from an apathy deep as Rip Van Winkle's sleep. In reply to questions: No, he had never seen anything in the journals about the thyroid gland; he had seen no pictures of cretinism or myxedema; in fact his mind was a blank on the whole subject. He had not been a reader, he said, but he was a practical man with very little time. I could not help thinking of John Bunyan's remarks on the elements of success in the practice of medicine. "Physicians," he says, "get neither name nor fame by the pricking of wheals or the picking out thistles, or by laying of plaisters to the scratch of a pin; every old woman can do this. But if they would have a name and a fame, if they will have

it quickly, they must do some great and desperate cures. Let them fetch one to life that was dead, let them recover one to his wits that was mad, let them make one that was born blind to see, or let them give ripe wits to a fool—these are notable cures, and he that can do thus, if he doth thus first, he shall have the name and fame he deserves; he may lie abed till noon." Had my doctor friend been a reader he might have done a great and notable cure and even have given ripe wits to a fool! It is in utilizing the fresh knowledge of the journals that the young physician may attain quickly to the name and fame he desires.

There is a third class of men in the profession to whom books are dearer than to teachers or practitioners—a small, a silent band, but in reality the leaven of the whole lump. The profane call them bibliomaniacs, and in truth they are at times irresponsible and do not always know the difference between *meum* and *tuum*. In the presence of Dr. Billings or of Dr. Chadwick I dare not further characterize them. Loving books partly for their contents, partly for the sake of the authors, they not alone keep alive the sentiment of historical continuity in the profession, but they are the men who make possible such gatherings as the one we are enjoying this evening. We need more men of their class, particularly in this country, where every one carries in his pocket the tape-measure of utility. Along two lines their work is valuable. By the historical method alone can many problems in medicine be approached profitably. For example, the student who dates his knowledge of tuberculosis from Koch may have a very correct, but he has a very incomplete, appreciation of the subject. Within a quarter of a century our libraries will have certain alcoves devoted to the historical consideration of the great diseases, which will give to the student that mental perspective which is so valuable an equipment in life. The past is a good nurse, as Lowell remarks, particularly for the weanlings of the fold.

“’Tis man’s worst deed  
To let the things that have been run to waste  
And in the unmeaning Present sink the Past.”

But in a more excellent way these *laudatores temporis acti* render a royal service. For each one of us today, as in Plato’s time, there is a higher as well as a lower education. The very marrow and fatness of books may not suffice to save a man from becoming a poor, mean-spirited devil, without a spark of fine professional feeling, and without a thought above the sordid issues of the day. The men I speak of keep alive in us an interest in the great men of the past and not alone in their works, which they cherish, but in their lives, which they emulate. They would remind us continually that in the records of no other profession is there to be found so large a number of men who have combined intellectual pre-eminence with nobility of character. This higher education so much needed today is not given in the school, is not to be bought in the market place, but it has to be wrought out in each one of us for himself; it is the silent influence of character on character and in no way more potently than in the contemplation of the lives of the great and good of the past, in no way more than in “the touch divine of noble natures gone.”

I should like to see in each library a select company of the Immortals set apart for special adoration. Each country might have its representatives in a sort of alcove of Fame, in which the great medical classics were gathered. Not necessarily books, more often the epoch-making contributions to be found in ephemeral journals. It is too early, perhaps, to make a selection of American medical classics, but it might be worth while to gather suffrages on the contributions which should go upon the Roll of Honor. I did a few years ago make out a list of those I thought the most worthy to 1850, and it has a certain interest for us this evening. The native modesty of the Boston physician is well known, but in certain circles there has always been associated with it a curious psychical

phenomenon, a conviction of the utter worthlessness of the *status præsens* in New England, as compared with conditions existing elsewhere. There is a variety today of the Back Bay Brahmin who delights in cherishing the belief that medically things are everywhere better than in Boston, and who is always ready to predict "an Asiatic removal of candlesticks," to borrow a phrase from Cotton Mather. Strange indeed would it have been had not such a plastic profession as ours felt the influences which moulded New England into the intellectual centre of the New World. In reality, nowhere in the country has the profession been adorned more plentifully with men of culture and of character—not voluminous writers or exploiters of the products of other men's brains—and they manage to get a full share on the Roll of Fame which I have suggested. To 1850, I have counted some twenty contributions of the first rank, contributions which for one reason or another deserve to be called American medical classics. New England takes ten. But in medicine the men she has given to the other parts of the country have been better than books. Men like Nathan R. Smith, Austin Flint, Willard Parker, Alonzo Clark, Elisha Bartlett, John C. Dalton, and others carried away from their New England homes a love of truth, a love of learning and above all a proper estimate of the personal character of the physician.

Dr. Johnson shrewdly remarked that ambition was usually proportionate to capacity, which is as true of a profession as it is of a man. What we have seen tonight reflects credit not less on your ambition than on your capacity. A library after all is a great catalyser, accelerating the nutrition and rate of progress in a profession, and I am sure you will find yourselves the better for the sacrifice you have made in securing this home for your books, this workshop for your members.

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**THE MEDICAL ASPECTS OF CARCINOMA OF THE  
BREAST, WITH A NOTE ON THE SPONTANEOUS  
DISAPPEARANCE OF SECONDARY GROWTHS.**

BY

WILLIAM OSLER, M.D.,

of Baltimore, Md.

Professor of Medicine, Johns Hopkins University.

The consulting physician sees mammary cancer at two stages of its progress. Dreading the surgeon, and hoping against hope, a number of women prefer to come to him at the first detection of a tumor. But these form a small fraction of the cases. A large majority are the unhappy victims of the internal metastases after operation. For some years I have been interested in this class of cases, and have collected material bearing upon the question of these late, more strictly medical, manifestations of the disease.

Recurrence may occur in the bones and other parts at an indefinite period after the detection or removal of the primary growth. In a case which I saw with Dr. Agnew, fully 18 years had elapsed since the discovery of the breast tumor. S. W. Gross<sup>1</sup> reported an instance in a patient who had had atrophic scirrhus of the breast for 17½ years. Shields quotes a case of Dickinson's, in which secondary paraplegia occurred in a woman who had had an atrophic scirrhus of the breast for 14 years.

On the other hand generalization may occur with extraordinary rapidity. Case XIII in Nunn's Monograph on Cancer was a young woman, aged 27, seen in April with cancer of the left breast, which she had noticed for several months. In June she had ptosis of the left eyelid, and subsequently had paraplegia. He quotes a still more

<sup>1</sup>Transactions of the Pathological Society, Phila., 1880.

acute case. "The patient, under the care of Mr. Pearce Gould, was aged 29; had borne 4 children; after suckling the last one about 8 months symptoms of mischief commenced in the left breast and the axillary glands participated. The patient died within 4 weeks of her admission into the hospital, having a temperature of 101.8, and somewhat higher toward the end. The post-mortem showed infiltration of the left breast and a similar condition of the right breast, effusion into the left pleural cavity, the lumbar vertebrae were invaded, both suprarenals were cancerous."

The cases may be arranged into those with *cerebro-spinal, thoracic and abdominal* manifestations.

#### I.—CEREBROSPINAL MANIFESTATIONS.

The tendency of secondary carcinoma to involve the bones, especially those of the spine, makes the complications of this group very frequent. Of 858 cases of cancer of the breast collected by Hahn (Freiburg Dissertation, 1887), 35 had metastases in the bones, 21 of these in the vertebral column, 11 in the extremities, 1 in the skull. Taking the post-mortem statistics collected by the same writer, of 554 cases, 82 had metastases in the bones.

Borner (Berlin Dissertation, 1886, Ueber Metastasen nach Mammacarcinom in der Wirbelsaule) has dealt very fully with the question of recurrence in the spine. He quotes the interesting remark of Billroth, that cancer of the vertebral column is seen particularly in patients with the atrophic form of scirrhus, which is sometimes so trifling that patients come first under the care of the physician. He gives the statistics of the Vienna Pathological Institute, in which in 366 cases of carcinoma of the breast in 72,000 necropsies, 9 had metastases in the vertebral column.

(a) *Cerebral*. The bones of the skull are not often affected. Broca reports a case with generalized cancer of these parts secondary to scirrhus of the breast. There was facial paralysis.

Secondary cancer of the brain is rare, but a few cases

are referred to in the literature.<sup>2</sup> The only instance which has come under my notice is the following:

CASE 1.—*Symptoms of brain tumor; old sclerotic scirrhus of the breast.*

November 12, 1886, I saw with Dr. Agnew, Mrs. X., aged about 75, who had had for several months headache of great severity, and occasional attacks of vomiting. She was a small woman, moderately emaciated, but looked fairly well in the face. Within a week or 10 days she had become drowsy, and her condition was evidently alarming. There was no paralysis. She had a double optic neuritis, which, with the intense character of the headache, the vomiting and the drowsiness, were suggestive of brain tumor. Dr. Agnew then mentioned that 18 years before she had consulted him for a scirrhus of the left breast. He had not advised operation, and it had gradually become shrunken. On examination there was an old, puckered, cicatricial scirrhus, with an extreme grade of retraction of the nipple. The patient gradually became more drowsy and died in coma.

(b) *Spinal.* In many ways this is perhaps the most important of all the groups. Anyone who has had to do with the postmortem room in a large general hospital has seen many instances of secondary involvement of the bones of the spine with compression of the nerve-roots, or compression of the cord itself. Cruveilhier describes and illustrates the condition, and to him we owe the name *paraplegia dolorosa*. Charcot in 1866 described a painful paraplegia in certain cases of cancer, and he has given a very clear account of the condition in one of his lectures.<sup>3</sup> The main characteristics are pains of great intensity, usually about the sides and down the legs, or, if the secondary masses are situated higher, they may be in the arms. There are areas or zones of anesthesia, sometimes the so-called *anesthesia dolorosa*; or shingles may break out. One feature of the pain, too, is very characteristic; the patient may get into a comfortable position and remain

<sup>2</sup>Walsham, Cases of carcinoma with secondary growths in the brain, *Lancet*, 1880, ii. Wilson, Case of scirrhus of the brain secondary to that of the breast, *Lancet*, 1882, i, 464. Gery, Tumor of the brain, etc., after 2 operations on the breast, *Bull Soc. anat. de Par.*, 1892, xvii.

<sup>3</sup>Oeuvres Complètes, Tome II, p. 116.

so for an hour or more ; then the slightest movement of the spine gives exquisite torment. The crises of pain which these poor victims suffer are simply atrocious. There may be the most extreme feature of pressure on the nerve roots without any paraplegia. In some instances, indeed, the nerves may be involved by enlarged glands in the pelvis. When pressure on the cord begins in addition to the disturbances of sensation and the pain, there are often painful spasms of the muscles, in which the legs are drawn up, sometimes very forcibly. Ultimately there may be complete paraplegia with involvement of the bladder and rectum. A very remarkable fact is that in certain of these cases the spinal symptoms may disappear, and a patient from a desperate condition of paraplegia dolorosa may recover sufficiently to be able to walk about, as in Cases V and VI.

Charcot insists that in any case of painful paraplegia, particularly in a woman, one should look carefully for atrophic, indolent scirrhus of the breast, and gives a case of cervicobrachial neuralgia almost identical with Case IV of my series.

Mr. T. W. Nunn, in his monograph on Cancer (1899) states that the access of the spinal mischief is very insidious ; that the pains may begin in the region of the neck and extend to the branches of the brachial plexus ; one or more fingers being specially neuralgic. He says they are quite dissimilar to the neuralgia arising from implication of the intercostohumeral nerves in the scar. In many cases the patients complain of rheumatic pains in different parts, or the pains may be regarded as neuralgia, or even the symptoms may be thought to be due to hysteria. I have seen a number of cases within the past eight years, the more notable of which I here give in abstract.

CASE II.—I saw at the Hot Springs with Dr. Chapin, Mrs. Z., aged about 53 (?), who had had a scirrhus of the breast removed some months previously. For several months she had had sharp pains in the legs, with increasing disability. At the time of my visit she had agonizing pains in the lower abdomen and down the legs. No secondary masses could be felt. Grad-

ually the picture became that of an extreme paraplegia dolorosa. I did not see her again, but heard of her death some months later.

CASE III.—The next case I saw was with Dr. Ellis, at Elkton, Md. The patient had had a breast cancer removed a year or so before, and I was asked to see her for a condition of agonizing pain in the side and down the legs. I rarely have seen any one who appeared to suffer more excruciating pain than this poor woman. She had gradual loss of power in the legs, evidently with pressure signs, as they were drawn up frequently, and the severe shooting pains down the backs of the legs and around the flanks. She died paraplegic some months later.

This is the usual type of the disease and the cases are only too common. The other cases in this group present more unusual features.

CASE IV.—*Cervical nerve-root pains; cancer of breast.*

On October 28, 1895, I saw with Dr. Pole, Mrs. C., aged about 52 or 53, who had been complaining for 5 or 6 months of severe pains in the region of the neck. They began about June, and were thought at first to be neuralgic and rheumatic, and she went to the Hot Springs. They had never ceased, though they got better at times. She had lost a good deal in weight. The pains were almost entirely confined to the neck. They shot sometimes up the jaws and up behind the ears, but not down the arms. She had no weakness of the arms, no weakness of the legs.

The patient looked well, and was fairly well nourished, though she had lost considerably in weight. There was nothing specially noticeable about her as she rested quietly in bed; in which position she had no pain. So soon as she attempted to move the head forward, as in taking anything to eat or drink, she felt the pain at once in the back of her neck. She had the greatest difficulty in getting out of bed. She had to turn on her side, get up with the help of her arms and knees, and held the neck very stiffly. She stood up and walked about quite well, but in sitting in a chair she had much more pain in the neck than in the recumbent posture. She could move the head from side to side without much pain, though not to the full extent. She could push the head backward to a slight extent, but to bend the head forward gave her at once a great deal of pain. The head and neck were carried quite stiffly. The examination of the neck behind was negative, with the exception of pain on deep pressure upon the fourth spine. The bodies of the vertebrae examined from the pharynx were quite smooth.

It was impossible to get her to contract actively either sternocleidomastoid. There were no sensory changes; no spots of

hyperesthesia. The pains did not extend down the arms. The grasp of the hands was good; no impairment of the motor power in the legs. She walked well and readily. The knee jerks were decidedly increased. She complained occasionally of pains in the side; they were not regular girdle pains.

I confess I have been a good deal puzzled by this case. She gave a very clear, matter-of-fact statement; the examination of the neck was almost negative, yet the whole appearance of the patient and the attitude, particularly the way she got out of bed and back into bed, was strongly suggestive of something more than cervicobrachial neuralgia. When she returned to bed I proceeded to examine the side, and took the opportunity to feel the breasts when I found the left one enlarged, firm, nodular, and evidently the seat of scirrhus. The nipple was not retracted; the skin over it was smooth, and the whole gland seemed to be affected. This at once threw a totally different light upon the case, and though she had no foci of evident metastases, yet the loss of weight, the existence of the tumor in the breast, and the nerve root symptoms seemed sufficient to make it quite clear that she was the subject of secondary growth in the vertebrae of the neck.

During the next month the patient gradually failed; the pains above described continued; she had a great deal of difficulty and pain in swallowing; she died December 2.

Charcot reports an almost identical case of a woman who had suffered for some months with a cervicobrachial neuralgia, which had resisted all treatment. He says, "Struck by the special characters presented by the pain, and calling to mind some of the facts which I had seen at the Salpêtrière, I asked if there was not a lesion of the breast. The reply was negative, but I insisted on examining for myself, when I found, to the great astonishment of the patient, that one of the breasts was retracted, with an atrophic scirrhus."

CASE V — *Tumor in right breast noticed January, 1897; operation November, 1897, scirrhus; good health for a year; in September, 1898, pains in the back and down the*

*legs; recurrence in the right eye; gradual increase of the pains in the legs; orthopnea; emaciation; recurrence in the left breast; tumor mass on sternum; effusion in right pleura. After remaining for months in a desperate condition, gradual improvement; disappearance of tumor on sternum; improvement in vision of the right eye; throughout 1900 persistence of pains to slight extent, but general improvement.*

Miss X., aged 31, consulted me October 6, 1897 for a lump and pain in the right breast, which had been first noticed in January. She had had a fall from her bicycle in November, and to it the trouble was attributed. In a few weeks she entered the Johns Hopkins Hospital, where Dr. Halsted did a most extensive radical operation. The glands in the axilla were much involved; to one of them the axillary vein was adherent, and part of it had to be excised. The case is No. 7,043 in the surgical histories of the hospital. The histological diagnosis was scirrhous. The patient improved, and returned to her home in a few weeks.

On September 24, 1898 she returned complaining of difficulty of vision in the right eye and pains in the back and down the legs. She looked well, but I was naturally apprehensive about the condition, and, as she and her mother were on their way to Philadelphia to visit the father, who was under the care of Dr. deSchweinitz, I asked them to let Dr. deSchweinitz examine the eyes carefully. The following day he reported to me that there was a tumor in the right eye. He had not been told about the operation, and of course when informed he recognized the condition at once as a secondary carcinoma. There was no local recurrence in the scar.

*Winter of 1898-99.* I saw the patient again on November 31. She had shooting pains about the sides, cough, and pains in the legs. There was no pain in the right eye, the vision in which had become progressively worse. About Christmas she became confined to her bed, and the pains were so severe that she had to take morphia. She passed the winter in great distress, the condition becoming steadily aggravated. I saw her twice, and in May her condition seemed really desperate. She had become very thin; there were constant orthopnea, and paroxysms of very severe pain at night, so that the morphia had to be increased to 2 grains at a dose. The emaciation was extreme. The pains were chiefly down the legs and around the sides. There was no local recurrence, but a lump had appeared in the left breast. There was tenderness about the fourth and fifth dorsal spines. About the junction of the manubrium with the

gladiolus there was a distinct tumor, which was very tender, and which looked like a new growth in the bone. There was an extensive pleural effusion on the right side.

I left for England shortly afterwards, and, of course, did not expect to find her alive on my return. She gradually improved through the summer, the dyspnea lessened, the pains became less intense, and toward October she began to get up and move about.

*Winter of 1899-00.* She had on the whole a gaining winter. The pains were less intense, and the morphia was reduced to about a grain 3 times a day. She improved in color, gained in weight, and was able to walk about the house and about the grounds. A remarkable change had taken place in her back. There was a distinct prominence about the fourth and fifth dorsal spines, the back was stiff, and she had a marked stoop. The kneejerks were a little exaggerated. The pains down the legs, which were formerly so excruciating, had almost entirely disappeared. The tumor on the sternum had disappeared. There were no local recurrences. The tumor in the left breast had not increased in size. The most remarkable thing was the progressive improvement in the vision of the right eye, which had been almost entirely lost. She could now recognize faces and even see large type.

During October of 1900 I saw this patient twice. She had improved in every way. She was able to do very much more. She drove a mile and a half to the station to meet me, and drove me to the station on my return. She was still very thin, but her appetite is fairly good, her color is good, she walks stiffly, but gets about with much more comfort than formerly.

I saw her again on December 9, 1900. She had had a little more pain, particularly in the right leg, the sight had not been so good, and on the whole she had been failing somewhat, though she was still able to be up and about, and her appetite was fairly good. There was no local recurrence, and there was no increase in the tumor in the left breast.

*CASE VI.—Tumor of breast in 1896; operation by Dr. Tiffany February, 1898, scirrhus; good health until August, 1899, when she had nerve-root pains, and an attack of shingles; severe pains all winter; in March, 1900, complete paraplegia, with semiconscious condition, and the patient lay at death's door for days. Gradual improvement; disappearance of the paraplegia; slight recurrence in the scar; complete recovery of power in the legs; no disturbance of sensation; in fairly good health at the end of 1900.*

In 1896 Miss Y., aged about 30, whose sister I had seen a year before with cancer of the breast, consulted me for a lump in the left breast. I urged her to have it operated upon at once. I saw nothing more of the case for more than two years, when she called upon me with her nephew, who had anorexia nervosa. She had been operated upon by Dr. Tiffany on February 19, 1898.

I did not see her again until October 10, 1900, when she came to town to consult me about the possibility of getting rid of the morphia habit. She gave the following remarkable history.

She did well after the operation until August, 1899, when she began to have pains in the chest and back, more particularly in the right shoulder blade, where the pain was very acute and intense. She had excruciating pains around both sides, most intense at night, and agonizing attacks of pain down both arms, particularly the right. In November she had a severe attack of shingles over the left chest and shoulder. She had a winter of great suffering and the pains increased up and down the back. In March she became completely paraplegic, with retention of urine. Her physician, Dr. Lockwood, has kindly given me the following statement about this paralysis. "March 23, 1900, she complained of difficulty in walking and using the lower limbs, and she became completely paralyzed as to motion and sensation from about the middorsal region down a few days thereafter (I think March 25th). The abdomen became greatly distended, with apparent complete paralysis of the bowel. On April 6 respiration dropped suddenly to 8 or 10, the pulse was barely perceptible, and the patient was semi-conscious. She remained in what seemed a most critical condition for some days. Nausea and vomiting were persistent from the onset of the paraplegic attack, and up to the time of my last visit (May 6) she was able to take or retain very little food."

She was desperately ill, and neither Dr. Lockwood nor Dr. Tiffany expected her ever to recover. She had a great deal of pain up and down the spine, and for several days she was unconscious. She was moved to the country in June. In July she began to get better, and since then she has steadily improved. The paraplegia has gradually disappeared, and though she is very stiff, she is able to get about with a cane, and has been walking very much better.

When I saw her she looked very thin, color fairly good. She walked stiffly, and with a slight stoop. She has a good deal of stiffness at first when she begins to walk, but she gets more limber as she goes on. She has had to continue the morphia, and she takes now about 3 grains a day. There is a slight local recurrence, which Dr. Tiffany did not think advisable to remove. The spine is bowed, but it can be twisted perfectly

well in all directions. The right shoulder blade is natural. There are no glands enlarged above the clavicles. There are two small recurrences at the margin of the scar. She has recovered power in the legs perfectly; no disturbance of motion or sensation. The kneejerks are greatly increased. Babinski's reflex is not present.

CASE VII.—*Neuralgic pains in the arms, legs and sides; gradual loss in weight; paraplegia dolorosa; scirrhous of the right breast.*

On November 16, 1894, Father S., aged 46, of Watertown, Mass., was admitted to Ward C, of the Johns Hopkins Hospital. He had been in Florida, and there had become so ill that his physician had been sent for. On their way back he had become much worse, and when they reached Baltimore they decided to stop over for a few days to consult me.

About the middle of July he began to have severe pain in the right shoulder blade and subsequently this affected the right arm and hand. About 8 weeks ago he noticed that there was some loss of power and atrophy in the right hand. At times he has had pain in the left arm and about the elbow. A week ago for the first time he noticed numbness in the legs and abdomen. Three days ago he began to have difficulty in walking, but until today he could walk with a little assistance.

He was a large framed, well built man. After he had removed his night shirt I stood at the foot of the bed to get a general survey, and my attention was at once attracted to his right breast, which stood out prominently. He had not noticed it himself, nor had any of his physicians. He had had no pain, and nothing to call attention especially to it. On examination he had a firm, hard tumor, evidently a scirrhous. There was no secondary enlargement of the glands, and there was nothing to be detected in his spine. The kneejerks were increased. The pains were very characteristic of pressure on the cord—those of a paraplegia dolorosa. Finding the breast tumor, there was no question then as to the nature of the spinal cord trouble. I did not hear of the subsequent history of the patient.

The special interest in the case lies in the fact that no complaint had been made of the tumor in the right breast, and I am quite sure it would not have been discovered had he not been stripped for a thorough preliminary inspection.

CASE VIII.—*Carcinoma of left breast; complete remoral; 6 weeks later stiffness of the back and girdle*

*pains; for the next 3 months progressive increase in the pains; onset of paraplegia dolorosa; secondary masses in the ribs and in the spine; death; autopsy.*

W. L. C. B., aged 47 (Surg. No. J. H. H., 8117), I saw repeatedly in Ward E, when he was under the care of my colleague, Dr. Halsted. He had a tumor of the right breast, the size of a walnut in 1897, which grew rapidly, and became sore, and the glands in the axilla became involved. When seen September 15, 1898, he was a healthy looking man, with a disc-like, hard growth in the left breast and enlarged axilla.

On September 21st, Halsted's complete operation was done. The skin graft took well, and the patient was discharged October 2. On October 18 he returned complaining of pain in the epigastrium and along the costal margin on each side. The pain came on in paroxysms, and was often severe enough to keep him awake. There was no nausea or vomiting. He remained in hospital until October 23, when he went out, feeling better, although still suffering with the pain. On November 3 he returned complaining of great stiffness of the back, and pain in the epigastrium, and very severe girdle pains in the course of the ninth and tenth ribs. The rigidity of the back had been present for 2 weeks, and was steadily increasing. On examination there was no curvature, and the spine was held very rigid.

He was seen again on February 6, 1899, complaining a great deal of paroxysms of intense pain, in which he would have to double up, and of trouble with the bladder. He had recently begun to have stiffness of the left leg, and sensations in the soles of the feet as if walking on cotton-wool. The sixth and seventh dorsal spines were prominent, and there was swelling about them, and there was a small, painful mass the size of a lemon at the level of the eighth spine. Both legs gradually became weak, and ultimately completely paralyzed. He died February 22. The autopsy showed secondary nodules in the sternum and ribs. On the floor of the spinal canal, opposite the seventh dorsal body, was a saddle shaped mass, 2 cm. by 1 1/2 cm. projecting into the canal, and causing a well marked compression of the cord at this level. From the fifth and eleventh vertebrae there were also small nodules projecting into the canal, but not far enough to exert any pressure on the cord. It is interesting to note the small size of the mass which caused the pressure.

Shields makes the significant remark that some of these cases are only too apt to be mistaken for hysteria.

In the following instance the symptoms were supposed, for a time at least, to be due to functional disturbance.

October 1, 1900. I saw to-day with Dr. Atkinson, Mrs. Y., aged 37. Dr. Halsted had removed the left breast for carcinoma about 2 years ago. She had done very well until about April, when she began having attacks of pain in the back and side. With these she had a great many nervous symptoms, so much so that she was sent to Dr. Sinkler, in Philadelphia, for a rest treatment. There she gained 10 pounds in weight, but the pains did not subside. Since her return from Philadelphia she has been getting gradually worse, and has had to have morphia, and is scarcely able to stir without great pain. The patient was thin, looked badly, not specially cachectic. She was highly nervous. It was very difficult for her to turn in bed. The pain was chiefly on the left side and down the left leg in the region of the sciatic. There was no local recurrence, but just above the outer margin of the scar there was a slight induration, which possibly was a gland, and just above the left clavicle there was a distinct induration. She moved her head with difficulty, and it was very painful above the left clavicle, but it was very hard to say how much of this was genuine pain. She certainly, however, could not move the head freely from side to side.

I saw her again November 26, 1900, with Dr. Atkinson. She has grown weaker, still has the severe pains, and speaks of committing suicide and wishing to die. She moves the head a little more freely than she did, but she has not been able to get up on her feet, and it was impossible in her condition to make an examination of her back. She complains of difficulty in swallowing, of a lump in her throat.

March 9. This patient has now well marked paraplegia dolorosa and the organic nature of the whole trouble is manifest.

## II.—THORACIC MANIFESTATIONS.

Naturally, from the proximity to the original disease and the intimate connections between the lymphatics of the chest wall and those of the pleura and mediastinum, secondary disease is very common within the thorax. There are 3 groups of cases; the pleural, the glandular and the pulmonary.

(a) *Pleural*. With pains in the chest and sometimes with signs of an acute pleurisy there is a gradual effusion, and the case may be seen first with all the signs of a large exudate. The effusion may be the result of a

cancerous pleurisy, or it may come from pressure of enlarged mediastinal glands on the azygos and other veins.

CASE IX.—*A small nodular scirrhous in left breast; enlargement of the cervical and axillary lymph glands on the same side; effusion in left pleura; condition mistaken for tuberculosis.*

In the spring of 1891, just as we were interested in the use of Koch's tuberculin, the late Dr. Christopher Johnston sent into the hospital a woman, aged about 29. The supraclavicular and the axillary lymph glands on the left side were enlarged, forming quite prominent bunches. They had been noticed about 3 months before, and had gradually increased. She was very well nourished, and had a very good color. She received the tuberculin injections, and the reaction on each occasion was active. About 10 days after admission signs of pleurisy were noted on the left side, and she gradually had quite an extensive effusion. She grew worse, and was taken to her home, where she died some few months later. Dr. Councilman performed the autopsy, and found a small nodular cancer the size of a walnut in the left breast, with cancerous involvement of the left pleura, and of the axillary and subclavicular lymph glands.

CASE X.—Mrs. B., aged 56, seen January 8, 1893, with Dr. James Carey Thomas. She had had a cancer of the breast removed 2 years before. She had had pain in the chest, gradual increase in shortness of breath, slight local recurrence in neighborhood of the scar, and at the time of examination the left side of the chest was full of fluid. She was tapped repeatedly with great relief, but she died ultimately from gradual exhaustion.

In Case V, under the cerebrospinal manifestations, the effusion was very possibly due to pressure, and not to direct involvement of the pleura, as the fluid was gradually absorbed, and she has got so very much better.

There are many instances of hydrothorax referred to in the literature.

(b) *Glandular.* By far the most distressing secondary features of breast cancer are seen in the cases in which the bronchial and mediastinal glands are involved, and in which the patient dies from gradual suffocation. Some years ago I was impressed with the terrible character of this possibility by the death of 2 friends, a mother and daughter, within a few years of each

other, with secondary disease of the bronchial glands. Case V, mentioned under the cerebrospinal manifestations, illustrates how even a mediastinal growth which has begun to penetrate the bone can undergo involution. There may be no external signs of tumor, but the features are most characteristic of intrathoracic tumor; pain, paroxysmal cough, gradually increasing dyspnea, signs of pressure, usually upon the veins, causing great lividity, and sometimes hydrothorax. The features are very much indeed like those produced by pressure of an aneurysm. The literature as given in the Index Catalogue (both series) contains reference to many cases of this variety. The following distressing instance I saw a few months ago.

CASE XI.—Mrs. A., seen June 1, 1900. The patient had had the breast removed about a year and a half or 2 years previously. She was in a most pitiable condition. She had had cough for many weeks, and progressively increasing dyspnea and orthopnea. She was sitting up in bed, livid, respirations very labored. There had been slight local recurrence. The superficial glands were not enlarged. It was impossible to make a very satisfactory examination, as she was in such distress, and evidently was desperately ill. The pulse was extremely feeble, and she suffered at times a great deal of paroxysmal pain. She sank very rapidly through the night, and died at 8 a. m. on the day after I saw her.

(c) *Pulmonary.* Secondary scirrhous of the lungs is not very common, except the presence of scattered nodules, which I have seen not infrequently postmortem. Encephaloid is, I think, more frequent. I remember seeing a postmortem in which the lungs were stuffed with secondary masses following an encephaloid of the breast, and I see in the Index Catalogue a reference to a case reported by Delbarre of encephaloid of the breast with generalization in the lungs<sup>1</sup>.

### III.—ABDOMINAL MANIFESTATIONS.

The cases may be divided into 2 groups, the peritoneal and the hepatic. Throughout the literature there are many references to cases of secondary growths in the omentum and peritoneum, with nodular masses in the

mesenteric glands, with or without ascites. In the following case the masses appeared to be in the omentum and peritoneum.

CASE XII.—*Cancer of the left breast; tumor in the abdomen probably omental and peritoneal.*

Mrs. R. L., aged 59, was transferred from the surgical side on October 26, 1900. She was admitted with cancer of the left breast, but as tumor masses were found in the abdomen, it was decided not to operate. She had been a very healthy woman, of active habits. Her weight was 137 pounds. She noticed the growth in the breast in August, and very shortly afterwards she began to have pain in the upper left half of the abdomen. With this there was belching of gas and some nausea, and twice she had vomited. She had lost much strength, and slightly in weight. Since admission the pain in the abdomen had been the special symptom.

The patient was fairly well nourished; complexion sallow. The conjunctivas had a slightly yellow tint. There was a firm, hard, scirrhous mass in the left breast. The abdomen on admission looked a little full, symmetrical. On palpation there were nodular masses—one in the upper umbilical region, and a second just to the right of the navel. On inflation the lower stomach level was about an inch below the navel. The question was whether these masses were in the stomach or on the omentum and peritoneum. The test meal, given twice, showed once no free hydrochloric acid, and once a slight trace. There was no lactic acid. The Oppler-Boas bacillus was not present. The patient constantly complained of the gastric pain. The abdomen increased in girth. There was flatness in the flanks, evidently some effusion of fluid. The tumor masses in the abdomen were very evident. In all probability they were connected with the omentum and peritoneum rather than with the stomach.

Cancer of the liver secondary to disease of the breast is very common. I have seen a great many cases in the postmortem room. The following are illustrative cases:

CASE XIII.—*Tumor of the right breast for some years; rapid growth within the past year; gradual distension of the abdomen; tapping, blood-stained ascitic fluid; enlarged, nodular liver.*

Mrs. D., aged 64, was admitted to Ward G, February 14, 1900, with swelling of the abdomen and an enlargement of the right breast. She had been a very healthy and strong woman until 4 months ago, when she had vomiting, and the abdomen began

to swell, since which time she has been confined to bed. The abrupt onset is an interesting feature of the case. There has been a tumor of the right breast for some years, she does not remember how long. At first it was as large as the end of her finger. It has grown within the past year with a great deal of rapidity.

She was an elderly woman; some emaciation; slight respiratory distress. There was nothing of special moment in the examination of the chest except that there was a little flatness on the right side, probably due to exudate. In the right breast there was a tumor the size of a large pear. The mass was freely movable, not tender. There was no retraction of the nipple. The tumor was lobulated, measured 17 cm. vertically and 11 cm. transversely. The glands in the axilla were not enlarged. There was a little irregularity in the heart's action, nothing noticeable.

The abdomen was distended, prominent in the umbilical region, and bulged in the flanks. The walls were infiltrated and pitted on pressure. The fluctuation wave was distinct. Circumference of abdomen, 125 cm. There was edema of the legs. She had no leucocytosis; hemoglobin was 83 %; red blood corpuscles just under 5,000,000.

On the 19th the abdomen was tapped, and 5½ litres of a dark yellow turbid fluid removed. After tapping, the edge of the liver was just palpable 1 cm. above the umbilicus, 7 cm. below costal margin in the parasternal line. Two distinct notches could be made out, and there was a distinct nodule above the edge of the right lobe. The surface, too, was slightly irregular. The spleen was not palpable.

The sediment in the ascitic fluid was blood stained; microscopically, red blood corpuscles and fine fat globules. There were no mitotic figures seen in any of the cells.

The patient went home March 16. There was no special change in the condition. On the surgical side it was thought that the breast tumor was probably an intracanalicular myxoma.

CASE XIV.—*Removal of right breast for carcinoma in May, 1896; local recurrence in May, 1897; through the summer and autumn pains in the joints and sciatica; swelling of abdomen in March, 1898; loss in weight; April, 1898, ascites; drainage; large nodular liver; at autopsy secondary carcinoma of the liver.*

Miss O., aged 40, admitted April 12, 1898. In May, 1898, the right breast was removed by Dr. Hartley for carcinoma. In

May, 1897, a small lump appeared at the edge of the axilla, which was removed by the doctor. Shortly before this she had an attack of influenza, and in May an attack of sciatica in the right leg, which was very severe. Later in the summer she had sciatica in the left leg. She had pains in several of the joints, but no redness or swelling. She failed gradually, and in September and October she was a complete invalid. At the New York Hospital, under the care of Dr. Peabody, she improved, and gained in weight. On November 30 she went to Atlantic City, and she again had pains in the joints, and sciatica and high fever. She gradually recovered, and was able to get up and about. About the middle of March, 1898, she noticed that her clothing was very tight, and she found that her abdomen was swollen, and this of late has been increasing. She has had nausea and vomiting, particularly in the morning. She has also had some swelling of the feet. She has lost in weight in 3 months from 125 to 163 pounds.

On admission she was very weak and exhausted, and had an anxious, careworn expression. She was most comfortable when propped up in bed, though there was no great dyspnea, and she had no cyanosis. On the right side of the chest there was the scar of an operation wound, extending to the axilla. There was a hard nodule at its center the size of a chestnut. The abdomen was distended, symmetrical; fluctuation was easily felt. The edge of the liver could be felt on "dipping." There was marked tenderness over the region of the spleen.

On April 18 Dr. Cushing opened the peritoneum, and drained off 1000 cc. of a chylous fluid, which, after centrifugalizing, showed a number of cells 2 or 3 times the size of leucocytes, some of them very granular, others with a row of granules about the nucleus. A most careful search was made for mitotic figures, but none were found.

She was much relieved by the operation for 24 hours. Then she gradually sank and died on the evening of the third day.

The autopsy showed an enlarged liver, with numerous masses of cancer. There were no peritoneal growths.

#### NOTE ON THE SPONTANEOUS DISAPPEARANCE OF SECONDARY GROWTHS.

The phenomena presented by Cases V and VI are among the most remarkable which we witness in the practice of medicine, and illustrate the uncertainty of prognosis, and the truth of the statement that no condition, however desperate, is quite hopeless. The references in the Index Catalogue show that there are a good many similar instances in the literature. Two of the most re-

markable I may quote. One of the most extraordinary is that reported by Mr. Pearce Gould<sup>2</sup>. A woman had noticed a tumor in 1888. Dr. Collins removed a scirrhous in 1890. The tumor was examined microscopically. In 1892 the glands in the axilla were removed. In 1894 there was recurrence in the scar, and a third operation. In the same year recurrent nodules about the scar, and she had dyspnea. In 1895, when aged 43, she was admitted to the cancer ward of the Middlesex Hospital. She then had enlarged glands above the clavicle, dyspnea, paroxysmal cough and hemoptysis. There was a large tumor in the left femur, supposed to be secondary cancer. She gradually improved, her dyspnea subsided, and the tumor in the femur reduced in size, and she slowly recovered, and Dr. Nunn, who also mentions the case, states that she was shown at the Clinical Society in the spring of 1899.

Vulpian<sup>3</sup> gives the case of a woman, aged 32, admitted November 3, 1883. Eighteen months before she had noticed a tumor of the breast, which had increased in size, and had ulcerated. The other breast had become involved. She was admitted in a state of advanced cachexia. The axillary and clavicular glands were involved; there were nodules of secondary cancer in the abdominal walls, and she had an exudate in one pleura. She gradually improved, the secondary masses disappeared, the tumors in the breasts became atrophic, and she left the hospital apparently well on February 23. He quotes a somewhat similar case of Gluck's, in Berlin.

The spontaneous involution which we see occasionally in the primary growth in the breast, affords an explanation of the disappearance of the symptoms in some of the cases with secondary metastases. Without any obvious reason a tumor of the breast, which may have been growing rapidly, ceases to increase in size, slowly and gradually a diminution takes place, the nipple becomes retracted, and in the course of a year or two there is a small, hard, puckered mass, about which, as in Case I, the patient may forget, and even the attending

physician may overlook. The metastases in the bones of the spine may undergo precisely similar shrinkage, with complete disappearance of the pressure symptoms, as in Case VI.

The diagnosis of these cases is, as a rule, easy enough when once it is recognized that paraplegia dolorosa and nerve root pains are exceedingly common sequences of cancer of the breast. I have already referred to the statement made by Shields and others that in the early stages the cases may be mistaken for hysteria or neurasthenia, more particularly as there may be no evidence whatever of secondary growths. The autopsy referred to on Case VIII illustrates how severe may be the symptoms, and how extensive the paralysis, with comparatively small growths.

The treatment is most unsatisfactory. Morphia alone gives relief, and it often has to be used in increasing doses. Many patients, however, are fairly comfortable with 3 or 4 quarter or half grain doses in the 24 hours. It is one of the conditions in which the physician has to bow to the inevitable, and in which to relieve the pain is his plain duty.

BIBLIOGRAPHY.

<sup>1</sup>Bull. Soc. anat. de Paris, xiii.  
<sup>2</sup>Clinical Society's Transactions, Vol. 30, p. 205.  
<sup>3</sup>Gaz. des Hopitaux, 1885, No. 60.

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ON THE ADVANTAGES  
OF A  
TRACE OF ALBUMIN AND A FEW  
TUBE CASTS IN THE URINE OF CERTAIN  
MEN ABOVE FIFTY YEARS OF AGE.

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Year by year I see an increasing number of cases which justify the somewhat paradoxical heading of this brief paper. I do not wish to minimize the importance of the information to be obtained by an examination of the urine, but we must ever bear in mind the adage—true to-day as well as in the times of the old "Pisse-Prophets;" *urina est meretrix, vel mendax*—the urine is a harlot or a liar.

What I wish to emphasize is the importance of basing a judgment less on the urine than on the general condition of the patient. The cases to which I refer are well known to every examiner for life insurance. The successful business or professional man, who lives intensely and strives hard to get wealth or reputation, or both, and who takes plenty of good food three times a day, with two or three

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glasses of spirits, and smokes six or ten cigars, works in blissful ignorance that his bodily mechanism is constructed on much the same principles as a steam engine. In the one, as in the other, fuel, combustion, transformation of energy, and the accumulation of waste materials tell the story of the day's work. The engineer as a rule understands his machine better, and accommodates the amount of coal burnt to the size of the engine and to the amount of work required. He does not "stoke" *No. 15*, a small yard engine employed to shunt empty cars, as he would *No. 580*, the superb machine drawing a limited express. Another important difference is the automatic action of the human engine in getting rid of its ashes and clinkers. The waste-pipes bear the strain of the extra work when the amount of fuel consumed and energy liberated is out of all proportion to the work demanded. *No. 15* "stoked" as if it were *No. 580*, drawing the lightning limited, would go to pieces very rapidly. So it is with our business friend, Mr. Silas Lapham. Careless stoking with high pressure for twenty-five years and bad treatment of his machine mean early degenerations, and his waste-pipes—kidneys—are often the first to show signs of ill usage. Such a man receives a very rude shock when in a polite note the head office of the New York Mutual or Equitable Company declines the extra fifty thousand dollars which he had wished to place upon his life, as the medical examiner reports "a slight trace of albumin and a few tube casts" in the urine. After a period of great distress and worry Mr. Lapham begins to take heart, and on the advice of his family physician remodels his mode

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of life. He restricts his appetite, takes a light lunch and a moderate dinner, gives up whiskey and champagne, resigns from six or eight boards, and at fifty starts to live a rational life. Prospectively nothing could have been more advantageous than the discovery in the urine of a trace of albumin and a few tube casts.

Let me give a few illustrations. Throughout the winter of 1880-'81 I repeatedly examined for Dr. R. P. Howard the urine of a very distinguished man in public life in Canada, in whose urine albumin and tube casts had been accidentally discovered, on the occasion of his applying for additional life insurance. At this date the patient was a man of nearly sixty, who had lived a very active life, and who had been very careless in his habits of eating and drinking. I remember well the great anxiety of the patient himself and the distress that was felt at the possibility that the career of so useful a man would be cut short. In the summer of 1881 I went to England on the same steamer with him, and in London I discussed his condition with Sir Andrew Clarke, who took a very sombre view of the case. After a year or more of rest, the patient gradually got over his fright and began to resume work, of which he has in the past twenty years done perhaps quite as much as he did in the previous twenty years. He is still alive—an octogenarian of exceptional vigor.

Many of the most notable cases are those in which the patients have been rejected for life insurance. In the cathedral at Antwerp this summer I was touched on the shoulder and a voice in my ear whispered, "Not dead yet!" On turning I saw a gentle-

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man who came to me on the 30th of January, 1891, at the age of fifty-three, in a condition of great trepidation, having been rejected a few days before for Bright's disease. He had been a hard worker and a high liver, and had a marked gouty history. In the ten years I have seen him once or twice professionally, and he has tried on several occasions to get additional insurance, but the urine, he tells me, though sometimes free from albumin, has, on centrifugalizing, a few tube casts. He is to-day a vigorous man of sixty-three.

Another interesting patient belonging to the same group of "the rejected of the life insurance companies," was a prominent politician, aged sixty, whom I saw on April 23, 1893, also much distressed in mind after the discovery of albumin and tube casts in the urine. He had been a very hard worker and a pretty steady drinker to his forty-fifth year, but since that date he has been very temperate. The patient had regarded himself as a very healthy man, and was much shocked to find his application for additional insurance refused. I have seen him at intervals, and while he has retired from active work, he is to-day a very healthy man of sixty-eight.

What I wish to call special attention to is the fact that in men in the fifth and sixth decades albuminuria is by no means infrequent and not always serious. It is probably the expression of presenile changes in the kidneys, the result of arterial degeneration, and is often a renal inadequacy, to use Clarke's term, not of vital importance. Neither the presence of albumin nor the number and variety of the casts

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have the same value in estimating the character of the disease and the prognosis as other factors.

The points on which one should lay special stress as indicative of serious disease are:

1. Persistent low specific gravity of the urine, 1.008 to 1.012.
2. The state of the heart and arteries. Marked sclerosis of the peripheral arteries, with the apex beat of the heart an inch or two outside the nipple line, and a ringing, highly accentuated aortic second sound.
3. The presence of albuminuric retinitis.

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It is not always easy to reach a decision, as there are cases in which the detection of a trace of albumin and a few tube casts first calls attention to the existence of serious organic disease. Two conditions have to be carefully differentiated. First, a primary arteriosclerosis, manifest sometimes as early as the fourth decade, and quite common in this country in men who live at very high tension, and who eat and drink a great deal. It is surprising how often this state is overlooked by the general practitioner. The renal changes are secondary, and are expressed by a transitory albuminuria, a not very low specific gravity of the urine, which is not in very large amount. The kidneys post mortem are often of full size, red and beefy in color, with a patchy, cortical sclerosis.

Secondly, the granular, contracted kidneys. Here the aetiological factors are all-important. The cases, which are less common than the arteriosclerotic variety, are met with in young persons consecutive to scarlet fever and other infectious disorders, in

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middle-aged individuals who have had gout, in workers in lead; while in others, in whom no definite factors can be determined, it would seem as if the kidneys had become prematurely aged and hard and fibroid. The cardiovascular changes are very much the same as in the arteriosclerotic group, uræmic symptoms are much more frequent, persistent headache is a notable feature, and retinal changes are very much more common.

Very few of us are made as was the Deacon's masterpiece, the wonderful One Hoss Shay, and lurking somewhere there is a weakest spot, very often in our modern mode of life the kidneys, which, to use the language of the Autocrat's fine poem, may begin to show "a general flavor of mild decay" in the fourth or fifth decade. In very many cases the albumin and the few hyaline casts are simply the expression of this "mild decay" in the kidneys, and not of a condition serious enough to be called Bright's disease. A very important factor, I am sure, is the excessive amount of food eaten. I am much impressed by Aphorism 13 of George Cheyne's *Essay on Regimen*, so well known to our grandfathers; it is worth quoting, as containing the one important element, I think, in the treatment of the condition of which I am speaking: "Every *wise* man, after *fifty*, ought to begin to lessen at least the *quantity* of his *aliment*; and if he would continue free of great and dangerous distempers, and preserve his *senses* and *faculties* clear to the *last*, he ought every seven years to go on abating gradually and sensibly, and at last *descend* out of life as he *ascended* into it, even into the child's diet."

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In conclusion, let me not be misunderstood. A trace of albumin and a few tube casts are danger signals, the red lights which may mean an open draw-bridge or a wrecked road ahead; but they may be simply warnings to the engineer to "go slow," that the pace is too rapid for the state of the track, and it is to the latter significance of the "red lights" that I wish to call attention.

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[FROM THE JOHNS HOPKINS HOSPITAL BULLETIN, VOL. XII, NO. 128,  
NOVEMBER, 1901.]

CONGENITAL ABSENCE OF THE ABDOMINAL MUS-  
CLES, WITH DISTENDED AND HYPERTRO-  
PHIED URINARY BLADDER.

BY WILLIAM OSLER, M. D.,

*Professor of Medicine, Johns Hopkins University.*

In the summer of 1897 a case of remarkable distension of [331]  
the abdomen was admitted to the wards, with greatly dis-  
tended bladder, and on my return in September, Dr. Fletcher,  
knowing that I would be interested in it, sent for the child.  
The accompanying figures, I and II, from photographs, show  
a very remarkable and unusual pattern of "abdominal tumid-  
ity," differing in an interesting way from the picture of the  
dilated colon in children, and resembling rather that of the  
ascitic abdomen.

The examination showed that the child had practically  
no abdominal muscles.

On looking up the literature I can find reports of only two  
similar cases. In the Clinical Society's Transactions (Vol.  
28, 1895), R. W. Parker describes the condition of a newly  
born infant, weighing five and a half pounds, with a very  
large, flaccid abdomen, through which the outlines of the in-  
testinal coils could be clearly seen, and the outlines of the  
abdominal organs easily felt. The abdominal wall was as  
thin as parchment. Along the middle line, where the rectus  
muscles should be found, there was little more resistance  
than over the lateral regions. The oblique and transversalis  
muscles were apparently quite undeveloped. The umbilicus  
was not depressed, it was in normal position, but resembled a  
surface scar. The child died not long after birth. There  
was no trace of any muscle representing the transversalis ab-  
dominis. There was a thin layer of muscular fibres passing

[331] from the cartilages of the ribs to the level of the eighth costal cartilage, where there was the first linea transversa. The body of the muscle was well marked on the right, but on the

[332]



FIG. 1.

[331] left it was but faintly seen. Further down there was the merest trace of muscular fibres, representing the rectus on either side. The most remarkable associated condition in this case

was the enormous hypertrophy of the bladder, which was [331] situated wholly within the abdominal cavity. There was no obstruction anywhere in the urethra or prepuce. The open-

[332]



FIG. 2.

ings of the ureters into the bladder were quite free. The [331] ureters and pelvis of the kidneys were greatly dilated and hypertrophied.

[331] In 1896, Dr. Leonard Guthrie reported to the Pathological Society of London (Transactions, Vol. 47), the history of a male infant, aged nine weeks, pigeon-breasted, very bony and emaciated, with a greatly distended abdomen. Extending between the pubes and the white, linear cicatrix corresponding to the umbilical scar there was a smooth, elastic tumor, corresponding to a distended gall-bladder. The abdominal walls were excessively thin and loose, and seemed to show the coils of the distended intestines on either side, but post-mortem these coils which looked like the intestines [332] proved to be the enormously dilated and convoluted ureters. The liver, spleen and kidneys could be easily palpated. The child wasted rapidly and died when about ten weeks old. Of the recti only the two upper segments as far as the second linea transversa showed muscular fibres. Below this level no trace of muscle could be discerned. The costal origins of the obliqui and transversales showed muscular structures for about two fingers' breadth below the ribs. The muscles of the back, of the thorax and of the extremities were well developed. Here again the most remarkable features related to the urinary organs. The bladder reached as high as the scar of the navel, and the walls were a quarter of an inch in thickness. The ureters were dilated to the size of the small intestines of an adult, and were remarkably tortuous. After death they exactly resembled, and at first were taken to be, portions of distended small intestine, as they were thought to be when seen through the weakened abdominal walls during life. The orifices of the ureters into the bladder admitted a blow-pipe. There was no obstruction in the ureters; there was no stricture of the urethra, and no phimosis. The kidneys were not enlarged, but the pelves were dilated. The position of the testes was not stated.

An important point in Dr. Guthrie's case was that there was no trace of a urachus, and the bladder was closely adherent to the inner surface of the umbilical scar, so much so that it could not be removed without the scar and the adjoining portions of the abdominal skin.

The history of my case is as follows:

Claudius K., aged 6, admitted July 13, 1897, complaining

of stomach trouble, and difficulty in passing the urine. The chest has been deformed, the mother says, since birth. [332]

The family history is good. One other child; well and strong; parents are healthy.

*Personal History.*—The child was well until the second summer, when he had severe stomach trouble. There have been recurrences of these attacks each year. From the account some of them have been gastric attacks, with nausea and vomiting, but others, and apparently the chief troubles, have been with the urine. The spells last four or five weeks, and they have been getting more frequent. In the intervals he is pretty well and strong, and has a large appetite.

His present attack began about a week ago, and he complained of pains in the abdomen and much burning sensation in passing water. He has become very weak; has not had any vomiting. He has had some headache.

The patient was a poorly nourished child, looking anæmic. He complained of much pain, chiefly in the hypogastric and lower umbilical regions. On inspection the condition to be described was noted by Dr. Fletcher, but in particular there was a remarkable fulness in the hypogastric and lower umbilical regions, which were occupied by an ovoid mass corresponding to a dilated bladder. The urine which was obtained by catheter was free from albumin, contained a good many leucocytes. The child had a temperature ranging from 99° to 102°. He passed the urine very frequently, an average of from 60 to 70 cc. In the twenty-four hours ending 5.30 on July 13th he passed urine 20 times, a total amount of 1090 cc.; on the 14th he passed urine 18 times, a total amount of 835 cc.; on the 15th he passed urine 15 times, a total of 1060 cc. [333]

The condition was so unusual that on my return in September the case was sent for, and on the 8th I dictated the following note:

In the erect posture the attitude is very remarkable. It is not quite symmetrical, being fuller on the right side than on the left. The navel looks stretched and distended. It is linear, forming a furrow about an inch in length, and below it are furrows in the skin—crow's feet. Above there is seen

[333] distinctly on either side the attachment of the recti to the sternum and costal margin. The skin over the abdomen is thin; the veins are a little prominent. When he bends back slight movements of the abdominal muscles beneath the skin are seen.

*Recumbent.*—Belly flattens out in front, extends at the flanks. Coils of intestines can be seen in peristalsis. Extreme relaxation of abdominal walls; no resistance; fingers can be passed everywhere to the spine. Three fingers can be passed under costal margin over liver nearly 6 cm. The edge of the liver can be felt in its whole extent, and the fingers can be thrust almost as far under it. The bladder could be felt as a firm ovoid body, reaching almost to the navel.

Spleen can be felt on deep pressure. Both kidneys can be felt.

He cannot raise himself off the bed without turning over. As he makes the attempt the abdomen is thrust forward and slight contraction is seen of the expanded abdominal muscles and recti.

The deformity of the thorax is very remarkable. Harrison's grooves are unusually marked, corresponding to the 6th costal cartilage. The lower portion of sternum is thrust forward, forming almost a right angle with the xiphoid cartilage. As shown in the photograph it is remarkably prominent, and is fully 3 cm. above the level of the skin in the intercostal furrows.

There is a condition of cryptorchidismus. The testes are not to be felt in the groins.

*Remarks.*—These cases illustrate a very remarkable form of congenital defect. The deficiency in the abdominal muscles, and the high position of the bladder are associated conditions due to arrest of development. We could not say definitely in my case whether the bladder was adherent to the umbilical scar. Dr. Guthrie regarded the hypertrophy of the bladder and the dilatation of the ureters as secondary, due to the fact that in his case, being firmly connected with the umbilical scar, it was unable to contract downward and to empty itself completely. In its effort to do so it became hyper-

trophied and dilated, and the accumulation of urine caused [333] backward pressure and dilatation of ureters.

In reply to a question, Dr. Bardeen, one of Prof. Mall's associates in the Anatomical Laboratory of the Johns Hopkins University, who has been specially engaged in a study upon the development of the muscles, writes as follows: "Two possibilities suggest themselves to me in the case:

"1. It is possible that the lack of resistance normally met with in the abdominal wall by the bladder at the time the kidneys begin to secrete urine may cause the bladder to expand rather than to empty secretions into the amniotic cavity through the urethra.

"2. Under normal conditions the growth of the abdominal musculature into the *membrana reuniens*, the early covering of the abdominal cavity, is preceded by the formation of a vascular plexus supplied from above by the internal mammary, from below by the epigastric artery. It is possible that an abnormal arrangement of the blood vessels in the embryo prevented the formation of this plexus, and impeded the growth of the abdominal musculature, and that at the same time circulating disturbances gave rise to the abnormal conditions found in the bladder and ureters."

ON A FAMILY FORM OF RECURRING EPISTAXIS, ASSOCIATED WITH MULTIPLE TELANGIECTASES OF THE SKIN AND MUCOUS MEMBRANES.

BY WILLIAM OSLER, M. D.,  
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The association here described is rare, as, after a careful search through the literature, I can find but one reference to a similar case. [333]

An hereditary form of epistaxis has been well described by Babbington.<sup>1</sup>

The association of epistaxis with angiomas of the nasal septum has long been known; but for the associated condition of multiple telangiectases of other mucous membranes and of the skin, I have been able to find only the following report by Rendu.<sup>2</sup> A man, aged 52, whose father had had repeated attacks of melena, and whose mother and brother had been subject to epistaxis, was admitted in a condition of profound anæmia, having had for three weeks a daily recurrence of epistaxis. He had had his first attacks of bleeding from the nose at the age of twelve, and had been subject to them ever since, particularly in the spring. He had never had any other hæmorrhages. On the skin of the nose, of the cheeks and of the upper lip there were numerous small red spots due to dilatation of superficial vessels of the skin. Similar small telangiectases were seen on the internal surfaces of the lips, the cheeks, the tongue, and on the soft palate. The punctiform angiomas were not seen on the mucous membrane of the nose. [334]

<sup>1</sup> Lancet, 1865, II, p. 362.

<sup>2</sup> Gaz. des Hôpitaux, 1896, p. 1322.

[333]

[334] In the three cases here described, two belonged to a family in which epistaxis had occurred in seven members. Both of my patients had had bleeding at the nose from childhood, and both presented numerous punctiform angiomas on the skin of the face and of the mucous membrane of the nose, lips, cheeks and tongue.

The third patient had suffered in an unusual degree from recurring epistaxis, and the telangiectases were most abundant over the body, and very numerous also on the mucous membranes.

The condition has nothing to do with hæmophilia, with which the cases had been confounded.

CASE I.—*Attacks of Epistaxis from boyhood; seven members of the family subject to it. Telangiectases on skin of face and on mucous membranes of nose and mouth.*

George B., aged 57, a seaman by occupation, admitted to the Johns Hopkins Hospital May 31, 1897, with anæmia and swelling of the feet.

*Family History.*—The father died at 69, of stone in the bladder. From boyhood at intervals he had had bleeding from the nose, never, so far as his son knows, from any other situation, nor does his son think that he bled specially from cuts. The bleeding was very frequent, generally, the son says, every day. So far as he remembers he never was in any danger from it.

The mother, who is living and well, aged 81, has never had epistaxis. He does not know of any members of his father's or mother's families who were bleeders.

*Brothers.*—Two died suddenly, one aged 47, the other aged 57. Neither had ever bled from the nose. He does not know the cause of death. The history of a third brother, who has had epistaxis from boyhood, will be given subsequently.

*Sisters.*—One died at 59, of Bright's disease. She was a large, stout woman, and had been subject to epistaxis from childhood. A second sister, the mother of fourteen children, died several years ago in childbirth. He does not know whether it was from hæmorrhage. She had bled from child-

hood both from the mouth and nose. He does not know [334] whether she had any "spots" on her nose or lips.

In the third generation, this patient has one child, aged 13, who has bled occasionally from the nose. He has never heard that any of his nephews or nieces have bled, but a grandniece, granddaughter of the patient's elder sister, has had epistaxis frequently.

*Personal history.*—He had been a sailor for forty-three years. He had been a moderate drinker. He had had syphilis thirty years ago. With reference to the epistaxis, he does not remember to have had it before his tenth year. The attacks were not very severe, but recurred almost every day. He was able to go to school, and later to his work. Twenty years ago, when he was thirty-seven, the condition became much more serious, and for nearly three years he was unable to do any work on account of the weakness and anæmia induced by the bleeding. He seems to have had a great deal of prostration, and says that for nearly five months he could not use his left arm. He has never bled from cuts, and never from the gums. While in the Navy, in 1862, he bled profusely from one of the angiomas on the lower lip, also from a very small one on the skin of the septum. He has frequently been very anæmic, and has had swelling of the feet and shortness of breath. He has had hæmorrhoids for thirty years, and fourteen months ago had them removed at the Marine Hospital. He has bled indifferently from right or left nostril. Latterly the bleeding has become much more aggravated, and he has become very anæmic.

*Present condition.*—The patient was a large framed, well nourished man, very intelligent. He was short of breath, the face looked a little swollen, suffused and anæmic; the feet and legs were swollen. The blood examination gave 2,980,000 red blood corpuscles, leucocytes 8000, hæmoglobin between 15 and 20 per cent. The nostrils were very capacious, and there was a clot of blood projecting from the left orifice. He had bled up to time of admission. The coagulation time as taken by Wright's tubes ranged from five and a half to seven minutes.

The general surface of the skin was pale, a little yellow.

[334] No hæmorrhages were seen except on the right elbow where was a rounded area of subcutaneous extravasation about  $1\frac{1}{2}$  cm. in diameter. The face presented a very unusual appearance, owing to the large number of dilated venules and capillary and venous telangiectases. They were most abundant on the ears, the skin of which presented a remarkable appearance, partly from the dilatation of the venules, which could readily be seen, and partly from the bright red capillary telangiectases. There were some dilated venules on the nose and cheeks, and the lips present a number of angiomata, particularly on the mucous surface, and just at the junction of it with the skin. There were one or two small ones about the skin of the nostrils, and subsequent examination showed numerous angiomata on the mucosa of the septum, particularly on the cartilaginous portion.

The mucous membrane of the mouth looked normal, but the tongue, on the tip and along the edge for a little distance, showed a number of telangiectases.

There was no albumin in the urine; the specific gravity was 1010, no casts. His legs were swollen to the middle of the calves. There were dilated venules on the outer aspect [335] of the legs. The edge of the spleen could just be felt. The liver was not enlarged. The apex beat of the heart was felt just under the right nipple. There was a soft systolic murmur at the apex, and a louder one along the left sternal border. The bleeding stopped shortly after admission.

On May 25, he had a slight attack of epistaxis, which lasted for thirty minutes. The general condition had much improved. The œdema had disappeared from the extremities, and he had gained rapidly. The blood condition improved, and on the 25th the red corpuscles were 3,224,000.

This patient has reported at intervals at the Dispensary through 1898, 1899 and 1900. He has had bleeding from the nose at intervals, lasting for a few hours at a time. When last seen he looked very well, though a little anæmic. There has been no special change in the cutaneous telangiectases.

CASE II.—*Epistaxis from childhood; Telangiectases of skin* [335]  
*and mucous membranes, bleeding from some of the spots.*  
*Cancer of the stomach, death, autopsy.*

William B., aged 55, admitted Jan. 20, 1899, complaining of stomach trouble.

*Family History* given with Case I.

*Personal History*.—He began to bleed from the nose very early in life; he does not remember exactly the date. It has been a source of constant trouble, and has on several occasions caused extreme anæmia and weakness. He usually bleeds without any provocation. He has never bled freely from cuts, but on several occasions spots on the face have bled after shaving, and he has bled from the red spots on the lips. Of late years he has bled less frequently than when he was a younger man. He has been a sailor, and has led a very irregular life; has used tobacco freely, and has been at times a very heavy drinker.

He came into the hospital complaining of nausea, vomiting and pain in the abdomen, which he had had for some months.

*Present Condition*.—The patient looked pale and sallow, and there were numerous small varicose veins on the skin and mucous membrane of the lips, and on the side of the nose, a few on the cheeks and on the ears. On the tongue there were a number of small red spots, evidently of the same nature. The same spider-like angiomas could be seen on the mucous membrane of the septum of the nose. They were not so numerous nor so striking a feature as in his brother's case, though those upon the mucous membrane of the lips were large enough to at once attract attention. The patient had a large tumor mass in the abdomen, evidently a new growth of the stomach.

Blood examination the day after admission: r. b. c. 4,488,000; leucocytes 7490; hamoglobin 71 per cent. The blood coagulation time on Jan. 20th was eleven minutes; on the 22d, it was eleven minutes; on the 25th it was eleven minutes; on the 26th it was nine and a half minutes. He had repeated bleedings, and then on January 31st the coagulation time

[335] was four minutes. After he had been taking calcium chloride, fifteen grains three times a day for three days.

He bled freely from the nose two days after entering the hospital, and was given 250 cc. of a one per cent gelatin solution hypodermically. The blood coagulation time was reduced to one and a half minutes.

On January 30th he had two bleedings from the nose, and again on the 31st. On Feb. 6th he vomited coffee-ground material. On Feb. 9th he had another bleeding from the nose. On Feb. 10th the blood coagulation time was one minute. On Feb. 18th he had a right hemiplegia. He grew progressively weaker, and died on Feb. 24th.

The anatomical diagnosis was: cancer of the stomach, mesentery, omentum, liver, retroperitoneal glands, lungs and brain. Angiomata in mucous membrane of the nose and of the stomach. In the stomach there were a dozen round foci, each 3 to 4 mm. in size, which at first looked like ecchymoses but were dilated venules and capillaries.

Sections of the septum of the nose made for me by Dr. Austin, showed many large dilated veins just beneath the epithelium.

*CASE III.—Recurring Epistaxis from the 10th year—Multiple Telangiectases of skin and mucous membranes of nose and mouth.*

M. W. C., Inez, Martin Co., Ky., aged 49, was admitted to the Johns Hopkins Hospital, August 28, 1896, complaining of epistaxis, which had recurred at short intervals from his boyhood.

His mother died of consumption; she had had inflammatory rheumatism. His father died of Bright's disease. He has three brothers and one sister living; one sister died of consumption. So far as he knows there are no 'bleeders' in his family, and none of the members have had serious attacks of epistaxis.

With the exception of epistaxis, the patient has been a healthy man. He had typhoid fever when twenty years of age. He has never had rheumatism. He had gonorrhœa at eighteen. He has never had syphilis. He has used alcohol

in moderation. He was a very active boy and took a great [335] deal of exercise. When ten years old he began to have epistaxis, which often followed the trick of walking upon his hands. He would bleed quite profusely for part of a day, or for some hours every day or two for ten days or more, until he got quite weak and anæmic. The attacks were sometimes of much greater severity than at others. For some years he did not pass a week without bleeding from the nose. It usually began as an oozing, and then would end in a very free hæmorrhage, lasting from a few minutes to half an hour. Between his eighteenth and twenty-fifth years he was very much better, and it was thought that perhaps the tendency had been checked. It did not stop entirely, but he was very much better. Then it recurred, and during all these years he does not think he has passed a week without some bleeding from the nostrils, from either one indifferently.

He has been an active business man, and the bleeding has [336] interfered very much with his work, as he would get pale and very weak. He has often had to have the nostrils plugged, and at times after severe bleeding he would get very pale, and as he said, "the blood would be so watery that my feet would swell." He never has had any hæmorrhages into the skin, but he has had at intervals bleeding from the 'spots' on the gums and lips, he thinks perhaps as often as twenty-five times. When a lad (he cannot fix the exact date), he noticed reddish spots on his face and about his hands; they have persisted and have increased in number during the past seven or eight years. He has never had any other hæmorrhages than those mentioned.

*Present condition.*—The patient was a very well nourished, robust looking man, pale (as he had recently had a very severe hæmorrhage), with all the outward evidences of anæmia. The blood count was: red corpuscles, 3,460,000; hæmoglobin 38 per cent. There was marked poikilocytosis; the leucocytes were normal in number. The differential count gave lymphocytes 10 per cent, large transitional forms 9 per cent, polynuclear 80 per cent, eosinophiles 1 per cent. The lymphatic glands were not enlarged. There were hæ-

[336] mic murmurs at the base of the heart, and a soft systolic at the apex. Neither spleen nor liver was enlarged. The coagulation time, as taken by Wright's tubes, was two minutes and a half.

*The telangiectases.*—These were most numerous on the face, which was much disfigured by them. On the right cheek there were twenty-five, some of which projected slightly beyond the skin as purplish spots from 1 to 4 mm. in diameter; the largest presented a stellate arrangement of veins. On the left cheek there were about twenty, several with quite large veins passing to the centre. While most of them were quite superficial, there were others subcutaneous and bluish in tint. On the lower lip the edge at the skin was closely set with them, and on the mucous membrane of the left side there was an angioma the size of a split pea. On the upper lip there were many small ones, and in the very centre, just at the raphé, there was a large, deeply seated, blue one. Scattered over the forehead were eight or ten, most of them purplish red, one or two near the margin of the scalp deep seated and blue. Here and there on the scalp a few could be seen. On the upper surface of the tongue there were five or six, and several on the under surface, all of them small and very bright red in color. There were none on the pharynx, but there were a number on the inner surfaces of the cheeks and on the gums, which were not swollen. The skin of the ears presented numerous pin point telangiectases, giving to it a very peculiar appearance; the spots were about the size of the central point of a flea bite.

Scattered over the back, chest and abdomen were two or three dozen bright red angiomas, none of them more than 2 or 3 mm. in diameter. Several of them project, and one or two are almost pedunculated. The arms and legs are practically free. On the hands, however, there are a good many angiomas, nearly all small and pin point. They are scattered over the fingers and palms, particularly about the pads of the fingers.

Dr. Warfield made several careful examinations of the nose, and reported that on both sides of the septum there

were numerous scattered angiomata, very similar in appearance to the smaller ones on the cheeks, and tortuous veins could be seen radiating from their centres. With the exception of these spots the mucous membrane of the nose and throat looked normal. [336]

The patient remained in hospital until September 18th. In the first ten days there were six bleedings from the nose. On September 9th Dr. Warfield thoroughly cauterized the angiomata on the septum. The operation was followed by quite profuse hæmorrhage, which was readily stopped. On the 10th the hæmorrhage recurred and he lost 580 cc. of blood before it was checked by plugging. Half an hour later he had a second hæmorrhage in which 820 cc. were lost. Within twenty-four hours he bled 1400 cc. He was not very much prostrated, but looked a little pale. This was the largest bleeding he had had while in the hospital, but he said he had not infrequently had much more profuse hæmorrhage. Between the 10th and the 18th, the day of his discharge, he had no bleeding.

*Subsequent history.*—Patient heard from June 5th, 1897. He stated that he had been better than for any time for the past ten years, but he still has occasional bleeding for a day or two pretty freely. He thinks that the cauterization has saved his life. He has been so much better since it was done. After bleeding for a few days he takes the iron and arsenic.

Oct. 11, 1897, I had a note from this patient to the effect that he had had very severe bleedings during the past three weeks.

Jan. 5, 1898. He has been bleeding very badly for the past five weeks, and is in a very weak, critical condition.

Dec. 16, 1898, he writes, "I am still troubled with the hæmorrhages, but am able to attend business. I have procured in the last three months a gum arrangement, which I insert and inflate with air, and keep it in for fifteen or twenty-five minutes, and it stops the bleeding entirely. It is a great improvement on the old plan of plugging with cotton or anything else. I can use it at once myself, and it

[336] causes no pain. Since I have had it I am holding my blood, and I think now I will get stronger."

He sent a diagram of a very ingenious arrangement. He took a rubber finger-stall about three inches long, into which was tied a small bit of rubber-tubing, with a stop-cock at one end. He inserted the finger-stall, relaxed, then put the tubing in his mouth, inflated it, and turned the stop-cock.

Nov. 16, 1899. Patient heard from to-day. He says that with the instrument above described he has succeeded in "holding his blood." Still bleeds a little, but not so frequently as he used to do. He has been able to attend to business.

#### REMARKS.

[337] Angiomata are very peculiar and remarkable structures, in which I have been interested for many years. Apart from the big nevi and angiomata with surgical relations there are:

1. The pin-point, punctiform, capillary angioma, of which few skins lack examples. They may be numerous, but they are rarely disfiguring. They appear and disappear. For ten years I had one the size of a pin's head on a finger.

2. The solid, nodular nevus, ranging from 1 to 4 or 5 mm. in diameter, forming a definite little tumor, either sessile or pedunculated, and very common on the back.

3. The spider angioma, formed by (a) three or four dilated veins, which converge to and join a central vessel; or (b) which unite at a central bright red nodule projecting a little beyond the skin. They are very common, and doctors are often consulted about their presence on the face.

As examples may be found on the skin of nearly everybody, these three varieties may be regarded as almost normal structures.

When the punctiform or spider angiomata increase greatly in numbers they are very disfiguring. In Case III the skin of the face was peppered with them, and at a distance the patient looked disfigured with a bright, fresh acne rash. In Case I they had also proved a source of danger, as he had bled from them repeatedly. An individual spider angioma

may increase in size, or, as in the cases I have here related, [337] they may become very numerous.

Angiomata have a curious relationship with affections of the liver. In cirrhosis, in cancer, in chronic jaundice from gallstones spider angiomata may appear on the face and other parts. They may be of the ordinary stellate variety, like the stars of Verheyen on the surface of the kidney, or the entire area of the star may become diffusely vascularized, so that there is a circular or ovoid territory of skin looking pink or purple, owing to the small dilated venules. A dozen or more of these may appear on the trunk, or even large ones may disappear. And lastly, in a few cases of disease of the liver I have seen large, mat-like telangiectases or angioma involving an inch or two of skin, and looking like a very light birth-mark, but which had appeared during the illness. The skin was not uniformly occupied with the blood vessels, but they were abundant enough on the deeper layers apparently to give a deep change in color and to form very striking objects. The dilated venules on the nose, and the chaplet of dilated veins along the attachment of the diaphragm are not infrequently accompaniments of the spider angiomata in cases of disease of the liver.

I have recently seen the spider angiomata appear in the face in a case of catarrhal jaundice.