

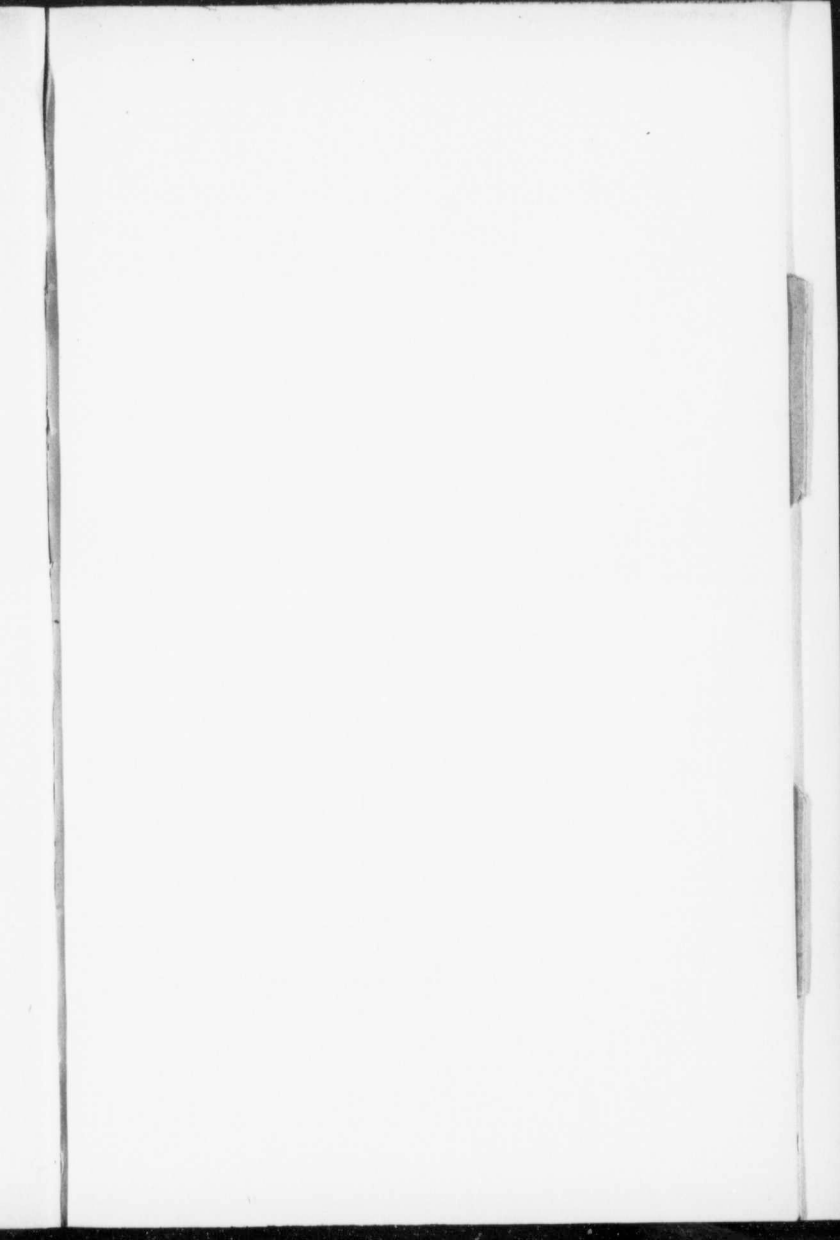
COLLECTED REPRINTS

FIFTH SERIES

(JANUARY 1, 1902—JANUARY 1, 1907)

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## TITLES OF PAPERS

(Continued from Series IV).

- CCXXX. On the Diagnosis of Bilateral Cystic Kidney.  
*American Medicine*, March 22, 1902.
- CCXXXI. On Amoebic Abscess of the Liver.  
*Medical News*, April 12, 1902.
- CCXXXII. Amoebic Dysentery.  
*Therapeutic Gazette*, April, 1902.
- CCXXXIII. Note on the Occurrence of Ascites in Solid Abdominal Tumours.  
*Philadelphia Medical Journal*, May 24, 1902.
- CCXXXIV. Alfred Stillé.  
*University of Pennsylvania Medical Bulletin*,  
June, 1902.
- CCXXXV. Notes on Aneurism.  
*Journal of American Medical Association*,  
June 7, 1902.
- CCXXXVI. On Heredity in Bilateral Cystic Kidney.  
*American Medical*, June 7, 1902.
- CCXXXVII. Some Aspects of American Medical Bibliography.  
*Bulletin of Association of American Librarians*,  
July—October, 1902.
- CCXXXVIII. Chauvinism in Medicine.  
*Philadelphia Medical Journal*, September, 1902.
- CCXXXIX. Anaemia Splenica (second paper).  
*American Journal of Medical Sciences*,  
November, 1902.
- CCXL. William Beaumont.  
*Journal of American Medical Association*,  
November 15, 1902
- CCXLI. On the Need of a Radical Reform in our Methods  
of Teaching Senior Students.  
*Medical News*, January 10, 1903.
- CCXLII. Aneurism of the Descending Thoracic Aorta.  
*International Clinics*, January, 1903.

- CCXLIII. On the Educational Value of the Medical Society.  
*Boston Medical and Surgical Journal*,  
March 12, 1903.
- CCXLIV. Chronic Purpuric Erythema.  
*Journal of Cutaneous Diseases*, July, 1903.
- CCXLV. Obliteration of Superior Vena Cava.  
*Johns Hopkins Hospital Bulletin*, July, 1903.
- CCXLVI. Stokes-Adams Disease. *Lancet*, August 22, 1903.
- CCXLVII. Chronic Cyanosis, with Polycythaemia.  
*American Journal of Medical Science*, August, 1903.
- CCXLVIII. The Master Word in Medicine.  
*British Medical Journal*, November 7, 1903.
- CCXLIX. Typhoid Fever and Tuberculosis.  
*American Medicine*, December 26, 1903.
- CCL. The Home in its Relation to the Tuberculosis  
Problem. *Medical News*, December 12, 1903.
- CCLI. Visceral Manifestations of the Erythema Group.  
*American Journal of Medical Science*, January, 1904.
- CCLII. The 'Phthisiologia' of Richard Morton.  
*Medical Library and Historical Journal*, January, 1904.
- CCLIII. Ochronosis. *The Lancet*, January 2, 1904.
- CCLIV. On the Surgical Importance of the Visceral Crises  
in the Erythema Group of Skin Diseases.  
*American Journal of Medical Science*, May, 1904.
- CCLV. Unity, Peace, and Concord. Farewell Address, 1905.
- CCLVI. The Student Life. 1905.
- CCLVII. Aneurism of the Abdominal Aorta.  
*The Lancet*, October 14, 1905.
- CCLVIII. Convulsions in Typhoid Fever.  
*The Practitioner*, January, 1906.
- CCLIX. Medical Aspects of Carcinoma of the Breast (second  
paper).  
*British Medical Journal*, January 6, 1906.
- CCLX. Angina Pectoris as an Early Symptom in Aneurism  
of the Aorta.  
*The Medical Chronicle*, May, 1906.
- CCLXI. Religio Medici. *The Library*, January, 1906.
- CCLXII. The Growth of Truth. *Lancet*, October, 1906.
- CCLXIII. Fraecastorius. *Charuka Club Proceedings*, Volume II.

*Acute tuberculous pneumonia.  
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CCXXX  
230

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### ON THE DIAGNOSIS OF BILATERAL CYSTIC KIDNEY.

BY

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of Baltimore, Md.

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The condition of bilateral cystic kidney is more often recognized at autopsy or discovered by the surgeon than diagnosed during life by the physician. In Montreal and Philadelphia I had dissected four cases of the kind in children or in adults, and it always seemed to me that the cases presented clinical features distinctive enough to enable one to make the diagnosis during life. Yet this, I believe, is very seldom done. Of the two cases which have been in my wards in the Johns Hopkins Hospital, in one the diagnosis was easily made.

CASE I.—A. W. N., male, aged 59, admitted October 3, 1886, with dyspnea. He had been a hard worker, with no history of any special excesses. He had been ill on and off for 10 years, chiefly with dyspnea and recurring attacks of shortness of breath. These had increased of late very rapidly, so that he had become incapacitated for work.

On admission he was orthopneic and cyanosed, with a rapid, feeble pulse. The heart was dilated and the impulse feeble and diffuse. On auscultation there was a gallop rhythm, but no murmur. There was marked sclerosis of the superficial vessels, and the case was thought to be one of general arteriosclerosis with secondary hypertrophy and dilation of the heart. The abdomen was enlarged and tense. The liver was greatly enlarged, reaching nearly to the navel. The spleen could not be felt. There was no note whether or not the kidneys were palpable. The abdomen was so distended and the liver was so large that it is quite possible they might not have been felt. The urine had a specific gravity of 1,016, a slight trace of albumin, and numerous granular casts; no blood. He had no history of hematuria.

For a week he remained in very much the same condition, with a marked gallop rhythm and shortness of breath, and signs of beginning effusion in the chest and abdomen. On the thirteenth he died suddenly.

*Autopsy, No. 461.*—There were found marked hypertrophy and dilation of the heart, general arteriosclerosis and emphysema. The kidneys were greatly enlarged, measuring 21 by 11 cm. They were universally cystic, the cysts ranging in size from a pea to an egg, containing clear yellow, and in some places turbid, material. There was no dilation in either pelvis, and the ureters were normal.

CASE II.—Florence S., aged 28 (Med. No. 9,479), admitted

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January 21. Her parents were dead. She had one sister and two brothers, living and well. She had one sister, aged 30, who had had, so the doctor said, hemorrhages from the kidney. There was no history of tuberculosis in the family.

She had never had any serious illness. Nine years before she had chills and fever for a couple of weeks. She had always enjoyed good health. For three or four years she had been troubled with headaches, chiefly frontal. Once she had bleeding from the nose. She had had no shortness of breath. As a child and young girl, she took part in games without any trouble. Appetite and digestion had been very good. The abdomen had never been swollen. She did not have to rise at night to micturate; no increase in frequency during the day. Her menstruation had been regular. She had always had a somewhat sallow complexion.

*Present Illness.*—About a year ago patient noticed that for nearly a week the urine was of a blood-red color. There was no pain, no fever, no chills. She did not go to bed, and did not stop work. She had no further trouble until Monday, December 6, when at 10 p. m. she had a severe attack of pain in the right side, which was very sharp, and lasted until 3 o'clock the next day. She did not have a chill, and does not think she was feverish. The doctor thought she was passing a gallstone. The day previous to this attack she noticed that the urine was bloody; and it remained so for nearly two weeks. She did not notice that there were any clots in the urine. She remained in bed for nearly three weeks on account of the prostration and weakness following the loss of blood. The pain in the left side persisted at intervals, coming on in paroxysms. She thinks she was yellow for some days at this time. On December 6, she noticed for the first time that there was some distention of the abdomen, and she thinks that for some time she had felt the waistband to be tight. Since the attack there had been increasing frequency in micturition during the day, sometimes every hour and a half. She did not think that she passed more urine at one time than at another. She had not had headaches for nearly a month before the attack. When the pain was very severe she had vomiting with it. The week after she got out of bed, she noticed that her feet were a little swollen, and that the eyelids were puffy. The bowels had been regular.

*Condition on Admission.*—She was a healthy looking, well nourished woman, skin rather sallow, mucous membranes a little pale, no edema. The pupils were equal. The pulse was 76, of good volume, tension plus. The radials and temporals were sclerotic. The thorax was well formed, expansion good; the lower left axillary region appeared fuller than the right.

There was slight general pulsation over precordia. In fifth interspace the impulse could be felt in the anterior axillary line. The point of maximum impulse was in the fourth interspace, 9 cm. from the midsternal line. The relative cardiac dullness began at the upper margin of the third rib, did not pass to right of midsternal line, and at the fourth rib extended 8½ cm. from the midsternal line. There was a soft systolic murmur at the apex. The second sound was sharply accentuated. The diastolic shock was well felt.

*Abdomen.*—The skin of the lower part of the thorax and abdomen generally was decidedly more pigmented than the other parts of the body. There was fulness in both flanks, more in the right than in the left. The respiratory movements were slightly diminished; no peristalsis. The right flank was

occupied by a large tumor which could be grasped between the hands, and which descended slightly with deep inspiration. It was a little irregular on the surface, not at all sensitive. In the left flank a second tumor could be made out, feeling rather larger and fuller than the one in the right. It reached a point 3½ cm. to the left of the middle line, and below to about 3 cm. above the crest of the ilium. It was irregular, and presented numerous nodular bodies on the surface. It felt much more superficial than the tumor on the right side. It descended very slightly with inspiration. The percussion note over both tumors had a dull tympany. Both tumors became much more prominent and could be much more readily felt when the patient assumed the knee-chest position. The spleen was not palpable. The liver flatness began on the middle of the sixth rib in the parasternal line, and extended to the costal border. The gallbladder could not be felt.

*Blood.*—Red blood-corpuscles, 2,400,000; hemoglobin, 40%; leukocytes 6,000.

*Urine.*—On admission 900 cc., straw-colored, specific gravity 1,007, distinctly acid, slight trace of albumin; the catheterized specimen after centrifugalization showed a few red blood-corpuscles, no casts. Urea, 7.2 grams. A daily analysis was made of the urine during her stay in hospital. The specific gravity was persistently low. In the 19 examinations of the urine made during her stay, in only one did the specific gravity reach 1,009, usually it was 1,007 and 1,008. There was always a slight trace of albumin, and as a rule a few red blood-corpuscles. Once, on February 6, a hyaline cast was seen. An exceedingly interesting point was that on February 5, cholesterol crystals were seen in the urine. The amount of urine rarely reached above one liter; on February 2, she passed three liters. The urea ranged from between 5 and 6 grams the lowest, to 19 grams the highest. She had no fever.

A diagnosis of bilateral cystic kidney was made on the basis of the presence of the tumors in the flanks, recurring hematuria, with the cardiovascular and urinary changes of a sclerosis of the kidneys. The patient left the hospital February 11, 1899, feeling very comfortable.

She was readmitted on February 27, 1900, in a condition of urgent dyspnea. From her friends it was learned that she had remained well and had been at work. She had at times passed bloody urine. For four days she had only been able to speak in a whisper, and had great difficulty in getting her breath. She said that it hurt her when she swallowed, and the trouble was altogether in the throat. She had frequently had attacks of vomiting, and on the morning of admission spat up thick blood clots. She had no fever, no chills.

The patient was in great distress, and it was rather difficult to get an answer. When admitted she was breathing 20 to the minute, very labored and loud and noisy. The *alæ nasi* were dilated, and all the accessory muscles of respiration were in action. The heart's impulse was visible and forcible. She had a very bad night and became cyanosed. The thorax was clear. There was nothing to be seen on careful examination. Examination of the throat showed a few small patches of exudate, but there were no diphtheria bacilli in smears, and subsequently none grew on the cultures. At 6 p. m., on February 28, she became so cyanosed, and there was such distress that Dr. Baer performed tracheotomy. The difficulty in respiration was not at all relieved; the respirations were as full and labored,

and there was the same retraction of the lower sternum and interspaces. The tube was perfectly clear, and a large volume of air passed in and out, apparently without obstruction. As it was thought that possibly she might have laryngeal diphtheria, antitoxin had previously been given.

She sank gradually and died at 5 a.m. on March 1. The urine examined during this admission showed a specific gravity of 1.013, many red blood-corpuscles, no casts, urea 3 grams to the liter. The examination of the abdomen showed the presence of 2 large tumor masses, and Dr. Fletcher thought that the left had increased in size, and in comparison with the charts previously made it evidently had increased a good deal.

*Autopsy No. 1,498*, performed by Dr. McCallum: Before opening the abdomen a mass was felt on the left side extending to the level of the crest of the ilium, and centrally to within 2 fingers' breadth of the navel. On the right side the mass was not so large, but it could be felt in the right hypochondriac and in the right epigastric region.

The abdomen was opened with a crucial incision. The stomach was vertically placed and the lesser curvature made an acute angle reaching nearly as low as the navel. The edge of the left lobe of the liver reached 8 cm. below the costal margin. The caecum bulged in the right iliac fossa. The transverse colon was below the level of the navel, and had a pear-shaped fold reaching to the pubes. Neither kidney could be seen. On lifting the splenic flexure of the colon an enormous cystic kidney was seen. The cysts were plainly seen through the peritoneum. On the right side the hepatic flexure of the colon turned directly over the kidney and was attached to the duodenum. When the intestines were turned to the right the lower end of the left kidney was seen to extend to within 3 cm. of the promontory of the sacrum. The relations of the duodenum to the kidneys were interesting. On the right the first portion of the duodenum lay directly upon the cystic kidney. The terminal portion of the duodenum was in direct contact with the left kidney for 6 cm.

The left kidney was 22.5 cm. long by 9.5 cm. wide, and reached above to the sixth interspace in the mammary line. The pancreas lay directly over it for most of its length. The spleen was above it, but was not adherent. The organ consisted of a congeries of cysts, some with clear, others with dark-colored contents. It weighed 1,400 grams. The ureter was normal. The upper end was formed of one large cyst nearly 9 cm. in diameter.

The right kidney was 16 by 9.5 cm. and reached upward to the level of the seventh interspace in the nipple line. It weighed only 350 grams. It had the same contents. The mucosa of the pelvis and ureters was normal.

There was marked hypertrophy of the heart and general arteriosclerosis.

These two cases illustrate very well the general features of polycystic kidney, and one of them the facility with which the diagnosis can be made in the presence of a characteristic combination of symptoms. These are: First, the presence of bilateral tumors in the flanks. Polycystic kidney is rarely unilateral. Of the 88 cases collected by James Ritchie (Laboratory Reports,

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Royal College of Physicians, Vol. IV), in all of the cases except two both kidneys were involved. Of the 62 cases tabulated by Lejars only one was unilateral. The tumors are often unequal in size, as in Case II here reported. There is no difficulty in recognizing that the tumors are renal. In Florence S. the tumors could be readily grasped bimanually, and the situation and mobility left no question at all that they were enlarged kidneys. This circumstance alone should at once arouse suspicion, as other forms of bilateral renal tumor are excessively rare.

Secondly, the cardiovascular changes of interstitial nephritis. In Case II these were very pronounced—the sclerosis of the arteries, the dislocation of the apex beat to the left and the accentuation of the aortic second sound.

Thirdly, the condition of the urine, which is that of advanced interstitial nephritis. In Case II it was very characteristic—the low specific gravity, the slight trace of albumin, a few red blood-corpuseles and scanty tubecasts. An exceedingly interesting feature in her case, which I do not see mentioned, was the presence of cholesterol crystals in the urine.

Fourthly, hematuria, which in Case II had recurred in attacks for more than a year. It was present in 19 out of 78 cases (Morris). It may recur in paroxysms, as in Case II, and be associated with much pain.

While the local symptoms, such as pain and tumor, may be well marked, it is the cardiovascular, gastric and pulmonary features of interstitial nephritis which attract attention. That the diagnosis has been made so rarely, in only 5 out of 62 cases, according to Lejars (quoted by Morris) is owing to the fact that the patients are seen (as was Case I) with signs of cardiac insufficiency and dyspnea, and no attention is directed to the kidneys; or they are attacked with sudden coma or uremia. Once the attention of the physician is called to the characteristic combination of symptoms, the diagnosis is very readily made.

In these operative days the question of diagnosis has a very practical aspect. At a medical society I saw a surgeon exhibit a very large cystic kidney, which he had just removed. I asked whether the other kidney had been examined, as the condition was almost always bilateral, and he replied that he had not had his attention called to it. The patient died in a few days with symptoms of uremia. As a rule, in polycystic disease

operation is contraindicated, since removal of one kidney simply takes away one-half of the already reduced kidney tissue available for excretory purposes. Even in unilateral cases it is stated that the remaining kidney may become cystic after a few months. Mr. Henry Morris, in his recent treatise on *Surgical Diseases of the Kidney and Ureter*, states that he has operated on three cases of unilateral disease, and in two of them the patients were alive and well several years after, and he states that "when the opposite kidney has been ascertained, either by inspection or palpation, to be unaffected, we are not justified, in my opinion, in refusing a patient the relief from severe pain or hemorrhage, or from the dangers of infection from suppuration of the cysts, which nephrectomy affords."

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CCXXXI

231

ON AMEBIC ABSCESS OF THE  
LIVER.

BY  
WILLIAM OSLER, M.D.,  
OF BALTIMORE,

FROM  
THE MEDICAL NEWS,  
NEW YORK,  
APRIL 12, 1902.

## ON AMEBIC ABSCESS OF THE LIVER.<sup>1</sup>

BY WILLIAM OSLER, M.D.,

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By far the most frequent form of abscess of the liver met with in this locality is that which is secondary to the amebic dysentery of which it is by far the most frequent and serious complication. The relative frequency may be judged from the fact that of some 93 cases of amebic dysentery which have been admitted to the wards, abscess of the liver occurred in 23 as a complication. Naturally this very high percentage is owing to the fact that only the more serious cases are admitted, and a considerable number of these, of course, come into the hospital for the hepatic symptoms and not for the dysentery.

Within the past three or four months we have had a rather unusual series of five (possibly six) cases, illustrating many interesting points in the clinical history of abscess of the liver. You have had many opportunities of studying these cases, and I purpose this morning to review their histories in order that I may impress upon you the chief features.

*Case I.*—Clinical Summary. No history of dysentery. Illness of four weeks' duration. Pain in the right side. Swelling over the sixth and seventh ribs. No enlargement of the liver. Remarkable persistent cyanosis. Operation. Opening and draining of an abscess of the liver. Recovery.

The patient, Thos. E., aged thirty-two years,

<sup>1</sup> A Clinical Lecture delivered at the Johns Hopkins Hospital, Feb. 15, 1902.

admitted Oct. 18, 1901, had been a healthy man, with a good history. He had not had dysentery. He entered the hospital complaining of pain in the right side below the ribs. His illness had begun four weeks before admission with a chill, followed four days later by pain in the right side, not severe enough to make him take to bed. This pain had gradually increased, and was most intense beneath the lower ribs on the right side; it was especially severe after eating and frequently radiated to the shoulder. Shortly after the onset of his illness he began to notice that he passed mucus in the stools, but there was no blood, and he had only one or two movements in the twenty-four hours. He had several slight night-sweats; no chills, no jaundice. His appetite and digestion were good, and the patient felt well except for the pain and a sense of weakness. One remarkable feature in his case was the diffuse cyanosis, a general blueness of his face and hands which he had noted about two weeks after the onset of his illness. On admission this lividity was very striking. On the right side over the sixth and seventh ribs there was a swelling between the parasternal and midaxillary lines. There was no redness and no heat over it. There was tenderness on light palpation, and on deep palpation it gave a boggy sensation. The right costal margin was a little more prominent than the left, and the right rectus was held a little tense. The liver flatness began at the fifth rib and extended two centimeters below the costal border. The edge could not be felt. The spleen was not palpable. Examination of the other organs was negative. The stools showed no amebæ. The leucocytes were 6,825 per cubic millimeter. An extraordinary feature was the general diffuse cyanosis. He constantly looked as if he had just come out of a cold tub. The

hand forcibly pressed upon the skin of the chest or back left an area of anemia which was very slowly obliterated. His temperature was normal. He was under observation until November 11th, and, with the exception of the swelling over the sixth and seventh ribs and a slight pain, there were no symptoms. The liver was not enlarged and there was no tenderness on deep pressure over the liver, either in the axillary region or at the tip of the tenth rib. The intercostal

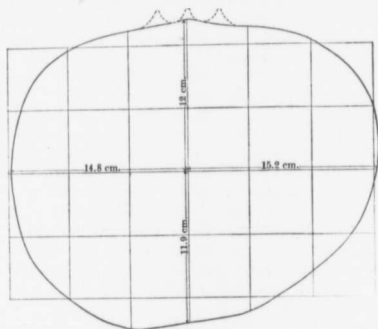


Chart 1. Cyrtometric tracing in Case III., showing the enlargement of the right half of the thorax.

spaces on this side were not obliterated. The swelling persisted, but did not increase. It was particularly to be noted that his temperature was normal; he had no chills; there was no leucocytosis. On the night of November 6th he had a heavy sweat. I discussed the case frequently with Dr. Halsted, and I must say we could not arrive at a positive diagnosis. I inclined to the

view that he had necrosis of the ribs from some cause, and, though the diagnosis of abscess of the liver was suggested, the negative character of the symptoms rather pointed against it. The leucocytosis on the 7th rose to 11,000, and he was transferred to the surgical side.

On the 11th Dr. Halsted operated, and found that there was only an area of infiltrated tissue over the region of the swelling; there was no necrosis of the ribs, but there was a remarkable tag of adhesions passing between the surface of the liver and the chest-wall, corresponding to the area of swelling over the ribs. At operation the surface of the liver looked quite normal, but as it felt a little boggy in places it was aspirated and pus was found. The abscess cavity was then very freely opened and drained. Numerous active amebæ were found in the pus. The patient is now convalescent and will get perfectly well.

*Case II.*—Clinical Summary. Dyspepsia for two years. Loss of weight. For three months pain in the right side at intervals. Attacks of vomiting. Slight jaundice. Progressive weakness. No chills. No leucocytosis. Increase in the size of the liver. Diagnosis of cancer of the liver. Death. Autopsy, abscess of the right lobe of the liver.

Amelia B., aged sixty-four years, admitted November 11th, complaining of pain in the right side. For many years she had had dyspepsia and had been very nervous. For two years she had been losing in weight. Her present illness began thirteen weeks before admission, with a sudden severe pain in the right side, which lasted for two days and then subsided; she has had it at intervals ever since, particularly with nocturnal exacerbations; it is usually in the lower part of the right side and radiates to the front of the



abdomen, never to the shoulder. She has had frequent attacks of vomiting, particularly at night when the pain is worse. The bowels have been constipated, except at the onset of the illness, when she passed a little blood in the stools. She has grown progressively weaker and has lost in weight. During the past few weeks she has

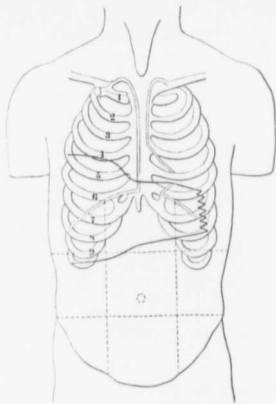


Chart 2. Showing the upward enlargement of right lobe in Case III.

become slightly jaundiced. The abdomen was full and large; there was tenderness below the right costal border; no special tenderness over the gall-bladder, but deep under the costal margin there was a firm hard mass to be felt, which descended with inspiration. The edge of the liver could be felt all along the costal border. She

had no fever and the leucocyte-count was only 10,000. The stools were clay-colored. They were not examined at the time for amebæ, as there was no suspicion of abscess. She remained in the hospital two weeks and improved very much; she was afebrile throughout and was discharged very much better on November 26th.

She returned on December 30th, complaining

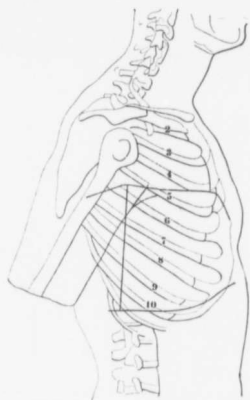


Chart 3. Showing the high limit of liver dulness in Case III.

of a great increase in the pain in the side, particularly on movement. She had a great deal of nausea, vomiting and insomnia. She was sallow, but not jaundiced. The edge of the liver could be felt three finger-breadths below the costal border, and there was irregularity of the

edge. During the month she was under observation she had slight fever, ranging occasionally to 101° F.; usually it was not above 99° F. She had no chills, no diarrhea; the stools were clay-colored; no bloody mucus. There was a trace of bile in the urine. The leucocytes were only 8,800. The liver gradually increased in size. The abdomen was difficult to palpate, as it was full and large, but a nodular mass was made out below the right costal border. The liver flatness began at the fifth interspace, and gradually, as the liver increased, extended almost to the navel. The pain in this case was peculiar. Any movement caused it, and the patient suffered a great deal at night. She gradually grew weaker and died on February 2d.

The autopsy showed a large, solitary abscess of the right lobe of the liver. There was no ulceration in the intestines. At the time of the post-mortem, amebæ were not found in the superficial examination of the pus, but later they were seen in large numbers in a section of the wall of the liver abscess. We had no suspicion whatever in this case of the existence of abscess of the liver. I thought that possibly it was a case of gall-stones with cancer, as the pain came on so suddenly, but, while no definite diagnosis was reached, strong suspicion was entertained that it was cancer of the liver. The organ increased rapidly in size. There were no chills, no sweats and no leucocytosis, and the pain was not greater than one sees sometimes in rapidly-growing carcinoma.

*Case III.*—Clinical Summary. Dysentery five months before admission. Gradual improvement. Recurrence. No chills. Progressive weakness. Amebæ found in the stools. Characteristic signs of abscess of the liver. Litten's sign in the fifth

interspace. Operation refused. Discharge. Rupture of abscess into lung. Death.

Joseph S., aged twenty-nine years, admitted December 9, 1901, complaining of trouble in the abdomen. He had been a healthy man, an Austrian, who had lived in this country for seven years. He had been a sailor and had been on repeated cruises. He had not been out of Maryland for four years. Five months ago he had had a severe attack of dysentery which was very severe for three or four days and had continued ever since. He was treated in Brooklyn, N. Y., for typhomalaria, and subsequently, by another doctor, for spinal disease. He had been getting progressively weaker. His dysentery improved and for some time he was constipated. Two weeks ago he began again to have diarrhea and passed some mucus. He had had no chills.

On admission the patient looked ill and pale. His temperature was normal, but rose to  $101.5^{\circ}$  F. in the evening. The thorax was asymmetrical, bulging on the lower right side, as shown very well in the accompanying cyrtometric tracing (Chart I.). The liver was enlarged and there was a marked fulness in the epigastric and right hypochondriac regions. There was nowhere any tenderness. The liver could be seen descending with inspiration. Charts II. and III. (outlined by Dr. McCrae) show very well the interesting increase in the area of liver flatness. The measurements were 17 cm. in the nipple line,  $16\frac{1}{2}$  cm. in the parasternal line, 16 cm. in the mid-axillary line. The left limit of liver flatness was somewhat doubtful. One point of very great interest was a very definite Litten's diaphragm phenomenon in the fifth interspace. Never do I remember having seen the diaphragm phenomenon so high, and it was almost evident from it alone that the bulging and fulness were not due

to empyema. In the mucus of the soft stools amebæ coli were found.

On the following day the patient was aspirated and a creamy, glutinous pus obtained, chiefly made up of granular debris and a few cells looking not unlike liver cells. No amebæ were found in it. In this case too the leucocytes on the 9th were only 9,000, and on the 10th practically the same, red blood corpuscles 4,500,000, hemoglobin 51. He had not a particularly septic look, nor was he jaundiced. The patient was urged to have an operation, but he refused and went home. There was nothing of special moment in the urine. His temperature ranged from 97.5 to 101.5° F. At his home the abscess ruptured into the lung and he spat up a large quantity of pus. He grew progressively weaker and died about February 5th.

In this case the history of dysentery and the patient's condition on inspection were almost sufficient in themselves to make the diagnosis. The high situation of the diaphragm phenomenon was a most interesting feature.

*Case IV.*—Clinical Summary. Imperfect history. Marked cough. Pain in the right side. No sweats, irregular fever. Leucocytosis. Diagnosis of empyema. Operation. Multiple abscesses of the liver. Drainage of a large one. Death. Autopsy.

Jos. K., aged forty years, admitted December 4, 1901, complaining of pain in the right side and fever. He was a Pole, did not speak English, and the history was difficult to obtain.

His present illness had begun two weeks before admission with a severe pain in the right side, which was exaggerated as the patient drew a deep breath. He had had no definite chills, but did have chilly sensations. He had had marked

cough from the onset and spat up blood once during the first week. He had had no sweats. The bowels had been regular.

On admission the patient looked ill, had a sallow, gray, septic appearance, and was somewhat cyanosed. Respiration was increased. He had a full, emphysematous chest. On the right side there was flatness to the fourth rib with distant breath sounds and diminished vocal fremitus. When sitting up the flatness reached to the lower border of the third rib. Over the dull area there were diminished vocal fremitus and distant breath sounds. The heart impulse could not be localized. The abdomen was full, particularly in the epigastric region. The edge of the liver could be felt 4.5 cm. below the costal border. There was a leucocytosis of 22,800. The temperature range for the first few days was between 100 and 104.5° F. A needle was inserted in the sixth left interspace in the mid-axillary line and pus was obtained. The patient was transferred at once to the surgical side.

The eighth rib was resected and when the pleural cavity was opened it was found normal. The wound in the pleura was then closed, and the following day a large abscess of the liver was evacuated through an incision in the diaphragm. Amebæ in abundance were found in the pus. The patient died on the 9th.

The autopsy showed multiple abscesses of the liver and small ulcers in the colon. The case was a hopeless one for surgery. There were numerous large abscesses, and it would not have been possible to reach them by any surgical procedure.

*Case V.*—Clinical Summary. Five months before admission an attack of dysentery. Subsequently an illness supposed to be typhoid fever with irregular temperature and night sweats.

Sudden attack of coughing in which he spat up large quantities of pus of a reddish-brown color. Signs of a hepato-pulmonary abscess. Amebæ in the pus. Patient recovering.

J. H. B., of Virginia, colored, aged forty-six years, admitted January 23, 1902, complaining of weakness. During last September and October he had an attack which was supposed to be typhoid fever. He had diarrhea for three or four days with mucus and blood in the stools, which were from three to seven in the day. A number of people in his neighborhood had attacks of the same character. On September 18 he had an attack of cramps in the stomach, headache, fever and pain in the right side. After this he was ill for three weeks with what the doctor called typhoid fever. Then he had irregular fever for several weeks with severe night-sweats. On November 9, during the night, he had an attack of coughing of great severity, during which he spat up a large quantity of blood and pus. The attacks of coughing have persisted ever since and every morning he coughs up reddish-brown mucus. He has had no pain since November 9, but has been growing weaker.

On admission he was looking fairly robust; there was a bulging in the right lower thorax, especially behind and in the flanks, and there was a little fulness at the right costal border. There was flatness in the right side beginning at the fourth rib and extending into the axilla and as high behind as the lower half of the scapula. The breath sounds were suppressed. Just beyond the posterior axillary line there was a region in which large gurgling râles were heard when he coughed and there was a friction sound in the right axilla. The edge of the liver was not palpable. There was no blood and no mucus in the stools and nothing was found on passing the rec-

tal tube. He had a leucocytosis of nearly 15,000 and a decided anemia, the red blood corpuscles numbering only a little over 2,500,000.

When I saw this patient a few days after his admission I was at once struck by the character of the sputum, which looked very much like that which we have learned to recognize as almost characteristic of liver abscess discharging through the lung. No amebæ, however, had been found in it. On the 24th, Dr. Warfield inserted a needle deep between the eighth and ninth ribs in the posterior axillary lines and drew off a brownish-red, very grumous-looking pus which contained motile amebæ.

As we had several cases in which the abscess had been discharged through the lung and the patients had made a good recovery, we thought it best to wait a few weeks before operating. He is now very much better. His expectoration has diminished, his cough is not nearly so severe, his temperature is normal, and he is gaining in weight. The right side of the chest has become flattened, there is less expansion and the intercostal spaces are very much narrowed. There is flatness to the fourth rib. There is everywhere feeble breathing over the dull region, and on coughing one can hear medium-sized râles.

I may briefly refer to a case at present in the private ward, which I have been seeing at intervals with Dr. Thayer—a man from Norfolk, who has had recurring attacks of amebic dysentery for the past six or eight months. He came into the hospital in a condition of great emaciation, with very frequent evacuations, and for some weeks we were very doubtful about his recovery. With careful irrigations and dieting he began to improve, and early in February the dysentery seemed to be cured entirely. He improved in color and altogether has done remarkably well.



For between two and three weeks he has had persistent pain in the right side, far back under the edge of the ribs, and the liver has been increasing in size, so that it is now three finger-breadths below the costal margin. He has a little fever every evening, up to 100° F., a slight leucocytosis and every night a sweat, but he is gaining in weight, and during the past week he gained some two or three pounds. The question is whether he, too, has not an abscess of the liver.<sup>1</sup>

Several points are illustrated in these five cases.

*Latency.*—In Case I. the abscess was not large and the features of the case were singularly negative, there being absence of fever, of chills, of sweats and of leucocytosis, until just before the operation. There were, however, two features worthy of special comment, viz., the remarkable diffuse cyanosis, for which I cannot offer any satisfactory explanation, and the localized swelling above the right costal border, which is sometimes seen in abscess of the liver which approaches the surface and is preparing to perforate. At operation, however, this was found to be associated with a group of adhesions between the liver and the costal margin, but there was no necrosis and no sign of the abscesses actually pointing in this situation.

*The Liability to Error in Diagnosis.*—I must say Case II. was what Niemeyer used to call "a mortifying postmortem disclosure." A few days after her admission the patient was seen with a view to the possibility of surgical interference, but the symptoms seemed to point so strongly to malignant disease that we did not think it worth

<sup>1</sup>After the delivery of the lecture this patient's liver increased in size, the bulging in the right flank became more marked, and on March 8th Dr. Finney operated and evacuated an enormous abscess. A point of very great interest in this case is the fact that there was progressive increase in weight and the general condition was good. He had been sitting up and looked well.

while to put her to the trouble of an exploratory operation. As the specimen showed, operation might have done good, as the abscess could have been easily evacuated. Such a case makes one strongly in favor of the exploratory incision for diagnostic purposes.

Case IV. illustrates one of the commonest errors in diagnosis, the mistaking of a large abscess projecting upward into the lung for empyema; nor is the diagnosis always cleared up by the exploratory needle. Large abscesses toward the surface of the right lobe pass high into the pleura in the direction of least resistance and the features may simulate closely those of a right-sided exudate.

Case V. as seen to-day would be readily taken for a case of empyema which had perforated into the lung and was healing, but the character of the attack following dysentery, the sudden expectoration of the anchovy-sauce-like pus and the presence of amebæ were sufficient to settle the diagnosis.

*Leucocytosis in Abscess of the Liver.*—A point of very considerable interest is the question of leucocytosis in amebic abscess of the liver. From the history of these cases and of others, too, some of the statements on this point need revision. In Case I., on admission, the leucocytes were only 6,000 per cubic millimeter and only once rose to 11,000. In Case II. the leucocytes were only between 8,000 and 10,000 per cubic millimeter. In Case III. they were only 9,000 per cubic millimeter. In Case IV. there was a leucocytosis of 22,000, and in Case V. a leucocytosis of 15,000. Three of the cases, as you see, had practically no leucocytosis. The strong statements as to the invariable presence of leucocytosis in abscess of the liver—made even, I am sorry to say, in the

recent fourth edition of a text-book of medicine in which I am interested—require to be modified.

Lastly, amebic abscess of the liver is not always associated with existing ulceration in the intestines, as is shown by the postmortem in Case II. The patient may have had dysentery months before and the ulcers may have healed competely.

OCXXII,  
232

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# Amebic Dysentery.

BY WILLIAM OSLER, M.D.,

Professor of Medicine, Johns Hopkins University.

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*REPRINTED FROM THE THERAPEUTIC GAZETTE, APRIL, 1902.*

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# THE THERAPEUTIC GAZETTE

occupies a unique position in medical literature in that it deals with practical therapeutics and brings to the hand of the practitioner a description of the latest and best methods of treating the various diseases with which he comes in contact. It is a noteworthy fact that these descriptions, when taken from other journals, are sufficiently thorough and complete to prove interesting reading, and to provide sufficient information to permit of the institution of the line of treatment suggested. The original articles, editorials, and correspondence are designed to prove of practical advantage to the active practitioner of medicine and surgery. That the needs of the practitioner are thoroughly met is indicated by the great popularity of the GAZETTE, which has a large circulation in every State and Territory of the Union. The subscription price is \$2.00 a year, which should be sent to

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Box 484, DETROIT, MICH.

*AMEBIC DYSENTERY.\**

BY WILLIAM OSLER, M.D.

As, with the exception of the studies of Kartulis, the most important work on the subject of amebic dysentery has come from the Johns Hopkins Hospital, we have naturally followed the recent investigation on dysentery with great interest. I cannot here go into historical details, but the work in this country dates from March, 1890, when I found amebæ in the liver abscess of a young doctor from Panama. Ever since the question of the relationship of the amebæ to dysentery has been one of constant study. In quick succession a series of cases occurred in my wards, and were made the subject of study by Councilman and Lafleur, whose monograph has done much to make this form of the disease widely known.

I do not propose in this discussion to speak of the pathology of the disease or of the characters of the amebæ. What I wish to make is a brief statement as to the colitis, with which in Baltimore we have found the amebæ associated.

A sporadic affection, it has not occurred in wide-spread epidemics, either throughout the city or State, so far as I

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\*Remarks at a discussion on dysentery at the Philadelphia County Medical Society, Philadelphia, March 26.

know, or in institutions. A very limited number of cases have been admitted to the wards, only ninety-three to date. In a few instances three, four, and five cases have come from the same locality, or three and four members of the same family have been attacked. It has involved chiefly males; only eleven females in our group. It is more common among whites than among the colored; there were only nine colored patients. It is a disease of adults; more than fifty per cent of the cases were in the third and fourth decades.

While the disease may run an acute course and may prove fatal within a few weeks, in a very large proportion of the cases it is chronic, characterized by slight fever and frequent movements, containing mucus, blood, pus, and amebæ. Many cases are from the very outset subacute; a majority of them become chronic, so that the disease drags on for many months or years, with alternating periods of constipation and diarrhea. Very few cases die of the dysentery *per se*; of the ninety-three patients in my wards, only two died of the asthenia induced by the dysentery itself. Two died of perforation.

By far the most important and serious feature of the type of colitis with which the amebæ are associated is the liability to abscess of the liver. Of the ninety-three cases referred to, twenty-three had abscess of the liver. This large percentage is due to the fact that only the more severe cases come to hospital. In Strong's sev-

enty-nine post-mortems on cases of amebic dysentery there were fourteen instances of liver abscess.

While at first, after the work of Shiga and Flexner, there was a feeling that possibly all the forms of dysentery might be due to the bacilli, gradually those who have had the most favorable opportunities for studying the diseases have come to the conclusion that the amebic form of dysentery has well marked and characteristic differences. As Dr. Strong has pointed out in his admirable studies in Manila, where the two forms occur together, the cases can be recognized from each other and readily differentiated. In the first place the amebic variety does not seem to occur in such wide-spread epidemics. Secondly, it rarely has the very acute course, and it kills much more frequently by its complications than by the actual colitis. The chronicity and the liability to recurrence give it a very peculiar stamp. Thirdly, characteristic amebæ are found in the stools or in the liver abscess which may have followed a protracted case. Lastly, and this is a very important point in the differentiation, the serum reaction with Shiga's bacillus is absent in the amebic form. Upon this point we can speak very positively. Since the return of Dr. Flexner from the Philippines there have been some fifteen or sixteen cases of amebic dysentery in my wards, in none of which has the serum reaction, so characteristic of the bacillary form, been present.



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### NOTE ON THE OCCURRENCE OF ASCITES IN SOLID ABDOMINAL TUMORS.

By WILLIAM OSLER, M. D.,  
of Baltimore, Md.

Professor of Medicine, Johns Hopkins University.

The interesting lecture by Dr. Eden in the *Lancet* of February 8th., on the two cases of solid abdominal tumor with ascites, calls attention to a not sufficiently recognized cause of abdominal dropsy. In 1885, I saw with Dr. Walker, of Dundas, Ontario, a woman with recurring ascites, of doubtful origin, for which she had been tapped many times. Fortunately I saw her a day or two after the removal of the fluid, and was able to feel a tumor in the lower part of the abdomen. A week later, Dr. Thomas, of New York, removed a solid ovarian growth, and the patient has been well ever since.

My interest in the subject has been renewed recently by a very remarkable case referred to me by Dr. Koehler and Dr. Fackler, in a woman, aged 53, who had had at intervals for three years attacks of ascites. Within the past four months she had been tapped four times. Ten years ago it was stated that a tumor had been detected in the abdomen. There was a good deal of discussion as to the nature of the case, and she was referred to me for a decision as to the advisability of an operation. There was a solid tumor in the lower abdomen, which could be moved from side to side. I suggested the possibility of dropsy dependent upon a solid ovarian tumor, and asked my colleague, Dr. Kelly, to operate. He found a large fibroma of the right ovary with twisted pedicle and adhesions to the omentum. The tumor was removed, and the patient has recovered.

Dr. Hunner, Professor Kelly's first assistant, has very kindly collected for me the cases bearing upon

this point from the gynecological clinic of the Johns Hopkins Hospital. Among 9400 cases there have been 10 patients with solid ovarian tumors, the ages ranging from 32 to 63. In six of these cases ascites was present on admission. Three of the cases had required repeated tapping. All of the cases recovered after operation.

As Dr. Eden remarks, ascites is the rule with solid tumors of the ovary, and so rare with fibroids of the uterus that its presence almost serves to exclude them. Other forms of tumor may be associated with ascites. In Montreal I saw a case of leukemia with recurring ascites. On the occasion of my first visit the distension was so great that the spleen could not be felt; in fact, the diagnosis was not made until after the patient had been tapped. In a case of a solid tumor of the mesentery there was an ascites of moderate degree.

The association is one to which the attention of the profession has not been called sufficiently. I was so impressed with it in the case upon which Dr. Thomas operated, that I made a reference to solid tumors as a cause of recurring ascites in the first edition of my text-book (1892). The question of operation is a very important one; the solid ovarian tumor is usually benign, and, as mentioned, the cases in Dr. Kelly's clinic have uniformly recovered.

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CCXXXIV,  
234

ALFRED STILLÉ.

BY

WILLIAM OSLER, M.D.

FROM THE

UNIVERSITY OF PENNSYLVANIA MEDICAL BULLETIN,

JUNE, 1902.

## ALFRED STILLÉ.<sup>1</sup>

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

I DOUBT not that every Fellow of this College had a feeling of thankfulness, mingled with a sort of pride, that Alfred Stillé was spared so long to grace and adorn our Society. His venerable presence was itself a sort of benediction; his culture a refining influence, and there was about him "a certain niceness of nature, an honest haughtiness and self-esteem," which well became his position and his years.

The College has had Fellows more distinguished—men who have filled a wider space in our annals and who have been more closely identified with her history—but it would be hard to name a Fellow in the past half-century who was more deeply interested in her welfare, more appreciative of her needs, or one upon whom was a richer anointing of the spirit of the fathers.

I feel it a special privilege to be allowed to act as the mouthpiece of my colleagues in expressing our sense of the value of his work and the lessons of his life. The physician of the last century, whose "floruit" came in the fourth, fifth, and sixth decades, is of all men the most to be envied.

<sup>1</sup> Read at the meeting of the College of Physicians of Philadelphia, April 2, 1902.

Coming out of the wilderness in which we had wandered for two thousand years, he entered the promised land, and under the leadership of Laennec and Louis, of Skoda and of Virchow, he saw the heathen dispossessed and the profession at last enter upon a heritage of scientific medicine.

## I.

Born in 1815, Dr. Stillé began his lifework with the generation which saw the new pathology and the new clinical methods. To this accident of the time of birth were added favoring social and local surroundings. Like Sir Thomas Browne, he could "lift up one hand to heaven that he was born of honest parents, and that modesty, humility, patience, and veracity lay in the same egg and came into the world with him." With Milton, he could feel that his endowments were happily not the worse for 40° of northern latitude. Among his papers are several interesting autobiographical fragments relating to this period. After joining in the "conic section" rebellion at Yale, which led to the retirement of one-half of the class, he seems to have had for a time a leaning toward the law. "During the years of probation," he says, "I tested the strength of my partiality for a medical career by some medical reading, including Bell's *Anatomy* and Bichat's *General Anatomy*, and attending the anatomical instruction at the Jefferson Medical College. In this last I was joined by my friend Mandeville, who was at that time already a student of law. I was induced to pursue these anatomical studies at the Jefferson College by Dr. George McClellan, who was then attending my sister Sarah for a tedious ailment, and also by

the reputation of the professor of anatomy in that institution, Dr. Granville Sharpe Pattison. He was certainly a most eloquent teacher, and he made the dry subject interesting by mixing with pure anatomy a good deal of physiology and surgery, and even a dash of poetry. I shall never forget his lecture upon the skull, in which he recited with admirable feeling the famous lines of Byron beginning, 'Is this a palace where a god might dwell?' Indeed, the charm of Pattison's lectures was his enthusiasm, tempered and guided by cultivation. His voice was flexible and sonorous, though not loud, and his manner intensely earnest, but never violent. While I attended his lectures I also began the study of practical anatomy in the new and admirably constructed dissecting-room of the same college, and pursued it with much enthusiasm in company with Mandeville."

The best of luck awaited him when, in 1835-36, he became house physician at "Blockley," under W. W. Gerhard, a clinical teacher of the very first rank, and fresh from the wards of the great French physician, Louis.

He was much indebted, too, to Pennock, of whom he has left the following appreciative sketch: "Meanwhile, I studied physical exploration and diagnosis with Dr. Pennock, who, besides having been associated with Dr. Gerhard in his fever studies, also devoted himself specially to diseases of the heart. I had assisted him in or been present at some of the experiments on sheep which he performed to demonstrate the mechanism of the heart's action, and now at the hospital I was instructed by him in the clinical diagnosis of heart disease by physical methods. He was a man who united with a rare enthusiasm in the study of the heart's functions and diseases—and, indeed, in whatever



he undertook—a transparent honesty and innocence of character and a generous ardor of benevolence that made him beloved as well as admired. He was in nearly all respects in contrast with his friend Gerhard, who was frequently satirical, devoid of sentiment or imagination, and equally so of strong personal attachments. No doubt Gerhard was the more intellectual man, but Pennock was the nobler of the two. His chief contribution to medical literature, besides his collaboration with Gerhard in the essay on *Typhus*, was an edition of Hope's *Treatise on the Heart*, to which he added much that was valuable, including the experiments performed by Moore and himself. It is remarkable that both of these men were arrested in their professional career not by death, but disease; for about 1850 Gerhard suffered from disease within the cranium, which, although it did not render him a paralytic or an imbecile, extinguished every spark of his ambition and caused a permanent halt in his acquisition of knowledge. He repeated over and over again his old lectures, but added to them nothing new. In 1863 he did, indeed, record his observations of epidemic meningitis; but this was, I think, the only occasion of his revival."

In remarks made at the dinner given on the occasion of his retirement from the Chair of Medicine, Dr. Stillé referred to his two teachers in the following words: "While still a medical student two of my fellow-townsmen returned from abroad glowing with the fire they had caught in Paris, the then acknowledged centre of medical science. Gerhard and Pennock were the apostles of the school of observation, under whose preaching I became a zealous convert. As soon as it was possible I hastened to the enchanted scene of their European labors."

I have written much and talked more on the subject of Louis and his band of American pupils, of whom Stillé was a good representative. The mantle of Laennec fell upon Louis, who seems to have had in singular measure the gift of inspiring enthusiasm in his students and a touching personal devotion. No European teacher has ever appreciated more highly his transatlantic pupils, and not one has ever had a more distinguished band of followers. Oliver Wendell Holmes said that he had learned three things in Paris: "Not to take authority when I can have facts, not to guess when I can know, and not to think a man must take physic because he is sick." It seems to me that this group of young fellows brought back from Paris, first, an appreciation of the value of method and accuracy in the study of the phenomena of disease; secondly, a profound, and at the time a much needed, distrust of drugs; and, thirdly, a Gallic refinement and culture which stamped them, one and all, as unusual men. Let me name the list over as given to me by Stillé himself: "From Boston: James Jackson, Jr., H. I. Bowditch, O. W. Holmes, George C. Shattuck, Jr., John C. Warren (then past middle age), John Mason Warren, and John D. Fisher. From Philadelphia: George W. Norris, William W. Gerhard, Caspar W. Pennock, Thomas Stewardson, Alfred Stillé, Thomas L. Mütter, E. Campbell Stewart, Charles Bell Gibson, John B. Biddle, David H. Tucker. Baltimore: William Power (see biography of Charles Frick, in Gross' *Lives*). Charleston: G. S. Gibbes, Peter C. Gaillard, Pryce Porcher. Virginia: J. L. Cabell, L. S. Joynes, — Randolph. New York: John A. Swett, Abraham Dubois, Alonzo Clark, Charles L. Mitchell, — Punnet, Charles D. Smith, Valentine Mott, Sr. In addition,

Edward Peace, Meredith Clymer, William P. Johnston, W. S. W. Ruschenberger, and John T. Metcalf." There were many others, of course—some before Louis' day, as Samuel G. Morton, who was Laennec's most distinguished American pupil, and some of those mentioned, as Meredith Clymer (*ultimus Romanorum*<sup>1</sup>) and Metcalfe, just gone, who did not come so directly under Louis' influence, but were pupils of Chomel and Andral.

## II.

Method and accuracy were from the first characteristic of Dr. Stillé's work. He played an interesting part in that splendid contribution of American medicine to the differentiation of typhus and typhoid fever. I will let him tell the story in his own words. In a manuscript he says: "The year 1836 is memorable for an epidemic of typhus (t. petechialis) which prevailed in the district of the city which is the usual seat of epidemics caused or aggravated by crowding, viz., south of Spruce and between Fourth and Tenth streets. A great many of the poor creatures living in that overcrowded region and who were attacked with typhus were brought to the Philadelphia Hospital, where I had charge of one of the wards assigned to them. I had the great good fortune to study these cases under Dr. Gerhard. His permanent reputation rests upon the papers published by him in *Hays' Journal*, in which he fully established the essential differences between this disease and typhoid fever. All the original material he obtained in this country for determining the symptomatology of typhus was gathered by him during

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<sup>1</sup> Died April 20, 1902.

this epidemic; but his first studies of the disease had been made in Great Britain. The contrasted picture of typhoid fever was composed of the features he had become familiar with while studying that disease as a favored pupil of Louis, in Paris, so that he may be said to have been the first to meet the two diseases face to face with a full acquaintance with one of them and a daily increasing knowledge of the other. On a small scale I went through the same experience, for I had grown familiar with typhoid fever while following Gerhard's clinical instructions in the Pennsylvania Hospital the year before, and at every step of my study of typhus in the wards and post-mortem revealed new contrasts between the two diseases, so that I felt surprised that the British physicians should have continued to confound them. I was very diligent in making clinical notes and dissections, spending many hours every day in the presence of the disease. I, however, escaped its contagion, while several others of the resident physicians suffered attacks of it, one of which, I think, ended fatally. I look upon that arduous and even dangerous experience as one of my most valuable clinical lessons." In the draft of a letter dated February, 1862, found among his papers, entitled *Refutation of A. F. Stewart's Claims about Typhus and Typhoid Fevers*, there is the following account: "It is known that the question had already been conclusively solved by Drs. Pennock and Gerhard, of Philadelphia, in 1837, whose essay upon it was published in the February and August numbers for that year of the *American Journal of the Medical Sciences*, republished in the *Dublin Journal of Medical Science*, September, 1837, p. 148, analyzed in the *London Medico-Chirurgical Review* for October, 1837, p. 553, and translated in a

Parisian medical journal, *l'Experience*, in 1838. The writer of the present communication, having had the advantage of observing the typhus epidemic in the Blockley Hospital under the physicians just named, afterward made a special study of typhoid fever in the wards of M. Louis, in Paris, and had opportunities of observing typhus with Vulpes in Naples, Tweedie in London, Alison in Edinburgh, and Graves in Dublin. The results of these observations were contained in a paper, of which Valleix speaks as follows: 'In an unpublished memoir of Dr. Stillé, an interne of Dr. Gerhard during the prevalence of the epidemic in Philadelphia, which was read before the Medical Society of Observation (September 14 and 28, 1838), and which we have before us, the two diseases are compared, symptom by symptom and lesion by lesion; and, apart from the phenomena of fever common to all febrile affections, the opposite of what is observed in the one is sure to be presented in the other' (*Arch. gen.*, February, 1839, p. 213). Among other conclusions reached by Valleix is the following: 'English and American typhus is a different disease from typhoid fever.' A few months later (*Arch. gen.*, October, 1839, p. 25 and p. 129) the same physician published an analysis of thirteen cases of typhus observed in London by Dr. G. C. Shattuck, of Boston, fully confirming the conclusion just stated. A paper founded on the same cases is also contained in the *Philadelphia Medical Examiner* for February, 1840, p. 133. It was after the whole of these publications—viz., in April, 1840—that Dr. Stewart first communicated his observations to the Parisian Medical Society, and they were not published until October of the same year. His apparent want of candor, therefore, in the paragraph above quoted

from his communication to the *Times and Gazette* is, for his own sake, very much to be regretted.' I am fortunately able to show you the manuscript of Dr. Stillé's paper, which, with that of Shattuck, made a strong impression on the French physicians, who still clung to the view that there was but one disease. It is a pity that this admirable paper has never been printed. A casual glance over the headings will give you an idea of the fulness and accuracy with which these able young fellows had worked out the differences between these two great diseases. Gerhard and Pennock, Stillé and Shattuck, appear to have been the first to fully grasp their essential clinical distinctions, and to appreciate their merit one has only to read the British writings on fever at this period. Some years later A. F. Stewart did good work in the same line, and later still Jenner made his important study; but that in the first edition of Bartlett on *Fevers*, 1842, the two diseases should have been considered apart is the best testimony to the rapidity with which the new views were received in this country.

Between two and three years of study in Europe gave Dr. Stillé a fine training for his lifework. Returning to Philadelphia, he began practice, wrote for the journals, taught students, and gradually there came to him reputation and recognition. After lecturing on pathology and the practice of medicine in the Philadelphia Association for Medical Instruction he was elected, in 1854, to the Chair of Practice in the Pennsylvania Medical College. In 1864 he succeeded Dr. Pepper (Primus) in the Chair of Medicine at the University of Pennsylvania. While always a student, he was no hermit, but from the start took a deep interest in the general welfare of the profession. He was the first Secretary of the American Med-

ical Association, and President in 1867. The local societies recognized his work and worth, and he became President of the Pathological and of the County Medical Societies, and in 1885 he took the Chair of our ancient and honorable body. He was from the outset of his career a strong advocate for higher medical education, and from 1846—the date of his first address on the subject—to 1897—the date of his last—he pleaded for better preliminary training and for longer sessions. No one rejoiced more in the new departure of the University in 1876, and he was a consistent advocate of advanced methods of teaching.

Dr. Stillé's medical writings show on every page the influence of his great master. His first important work, *The Elements of General Pathology*, 1848, was based on the modern researches, and every chapter echoed with his favorite motto, *Tota ars medica est in observationibus*. I must quote one sentence from the *Introductory Essay on Medical Truth*: "But we assert that there is a genius, not a speculative, not a poetical, not a mere fantastic faculty, but a practical genius, which is, to say the least, a far more rare endowment than that just mentioned; 'a power which is capable of penetrating into all things *within our reach and knowledge* and of distinguishing their essential differences.' It creates nothing, it does not even invent anything; it only *sees things as they are* and discovers truth in what it sees; for the truth, as we are told by Rousseau, is in things and not in our minds, and the less of ourselves we introduce into our judgments the nearer we shall approach to truth. Such was the genius of Hippocrates, of Sydenham, of Morgagni, of Haller, of Laennec, of Abercrombie, of Hunter, of Bichat, of Sir Astley Cooper; such is that of Andral, of Chomel, of

Louis, of Cruveilhier, of Brodie, of Graves. These men saw relations among the phenomena of disease which were invisible to less gifted men; and having seen them by virtue of their genius they did not stop there and build up a theory upon them, assuming them to be true, but immediately applied themselves to discover *whether they had seen correctly*; they tested their inspirations by observation and experiment, and when they found them unable to bear these tests they rejected them as delusions, as idle dreams not even worth remembering; but when, on the other hand, they found them confirmed, they gave credit, not to the original penetration which had guessed at the truth, but to the series of facts which had established it."

Apart from numerous smaller articles in the journals, there are two important monographs by Dr. Stillé—one on *Cerebro-spinal Meningitis* and the other on *Cholera*. In addition, two minor studies were on *Dysentery*, in the publications of the United States Sanitary Commission, and on *Erysipelas*. The work on cerebro-spinal fever is a model of accurate, systematic study based on a large series of cases seen in the Philadelphia Hospital, and upon an exhaustive analysis of the literature. The work on cholera is of the same kind. To a generation of lesser writers they have served as unailing sources of trustworthy information.

Estimated by bulk, the most important of Dr. Stillé's works are the *Materia Medica and Therapeutics* and the *National Dispensatory*. It was always a mystery to me how a man with his training and type of mind could have undertaken such colossal and, one would have thought, uncongenial tasks. He was not so deeply imbued with skepticism as some of his contemporaries. Of him it could scarcely have been said, as of Jacob Bigelow



by Professor Peabody, that his qualifications to teach therapeutics were on a par with those of a learned Mohammedan to teach Christian exegesis. Dr. Stillé's attitude on the question of therapeutics was very sane. In illustration, let me quote one or two sentences. "Of therapeutics we may say what has been said of the legislative powers of a State. We cannot assign definite and immutable limits to them or lay down inflexible rules for their use. The treatment of every case of sickness must be determined ultimately for and by itself, tentatively by skilled men and as their practical sagacity may determine, while they bear in mind that the virtues of a medicine depend less upon its intrinsic properties and powers than on the sagacity of the physician who administers it, just as the efficiency of fire-arms depends less upon the explosives and the missile they contain than on the judgment and accuracy of aim of the man who discharges them." He had grasped the great truth that the art as an art had its true and only foundation in clinical medicine. In his Valedictory Address, 1884, he said: "I have devoted whatever knowledge and skill I possessed to the simple, if difficult, task of knowing and curing diseases. I have striven, in season and perhaps out of season, to impress upon you that medicine is, first of all, an art, but an art that can only be successfully practised when the physician is able to recognize the individual diseases he must meet with in practice, and distinguish from one another those which are similar in appearance, but unlike in nature." Again: "But every observant practitioner knows that he treats patients rather than diseases. He does not regard the former as the chemist does his crucibles, retorts, and test-glasses, which have no reaction upon their contents, but he knows that every substance taken

into the body acts upon it and is itself acted upon by it, and in innumerable modes and degrees, according to the existing condition of the body and the quantity, combination, and form of administration of the medicine; so that there is some ground for the sarcastic comment that 'the art of medicine consists in introducing a body of which we know little into another of which we know still less.'" And yet again: "It is quite as necessary for the physician to know when to abstain from the use of medicine as it is for him to prescribe when medication is necessary; that he must, as far as possible, see the end of a disease from its beginning; that he must never forget that medical art has a far higher range and aim than the prescription of drugs or even of food and hygienic means; and that when neither of these avails to ward off the fatal ending, it is still no small portion of his art to rid his patient's path of thorns if he cannot make it bloom with roses."

### III.

On the roll of our Fellows will be found the names of at least half a dozen distinguished bibliophiles to whom we are deeply indebted, as they have kept alive in this society the interest of the average Fellow in books, and have made possible a great library. Dr. Stillé was not only a book-lover, but a discriminating and learned student. Our shelves testify not less to his liberality than to his taste for rare and important monographs, while the Stillé Library of the University of Pennsylvania will remain a monument to his love of the literature and history of our profession.

But it was neither as a teacher nor as a writer

that Dr. Alfred Stillé's influence was most deeply felt. In a long career several generations of students and physicians were influenced by an earnest, real man, whose life was true and sincere, whose ideals were lofty, and whose devotion to duty came from pure and unselfish motives. "A life of probity, a high sense of honor, uniform courtesy," as Dr. Da Costa remarked, endeared him to the profession and crowned his declining years with all the things which should accompany old age. Nothing in his life, which was one calling for courage of a high order, became him more than the graceful way in which he grew old. So far as I know, the chapter on the old man in the profession has not yet been written. To-day, as in the sixteenth century, the bitter *mot* of Rabelais is true: "There be more old drunkards than old physicians." Take the list of Fellows of our College, look over the names and dates of graduation of the practitioners of this city, and the men above seventy years of age form, indeed, a small remnant. All the more reason that we should cherish and reverence them. It interested me greatly in Dr. Stillé, and I only knew him after he had passed his seventieth year, to note the keenness of his mind on all questions relating to medicine. He had none of those unpleasant senile vagaries, the chief characteristic of which is an intense passion for opposition to everything that is new. He had that delightful equanimity and serenity of mind which is one of the most blessed accompaniments of old age. He had none of those irritating features of the old doctor, who, having crawled out of the stream about his fortieth year, sits on the bank, croaking of misfortunes to come, and, with less truth than tongue, lamenting the days that have gone and the men of the past. He was not like

the sage of Agrigentum, of whom Matthew Arnold sings :

“ Whose mind was fed on other food, was train'd  
By other rules than are in vogue to-day ;  
Whose habit of thought is fix'd, who will not change  
But, in a world he loves not, must subsist  
In ceaseless opposition.”

From this unhappy attitude of mind he was saved by a serene faith in the future of the profession. Naturally he did not approve of much that is unpleasant in our modern ways. In some of his last letters there is a touch of the old vigor with which he was wont to rap the pretensions of the ignorant or the half-educated. In a letter to me dated February 7, 1900, he writes : “ I never supposed the Louis methods would be accepted by the profession generally. They were too laborious, and they gratified too little the thirst for popular applause and personal exaltation that contaminates so many, even men of merit. Not even their adoption and illustration by a certain number of physicians who drew their inspiration from the Parisian fount has sufficed to prevent their being overwhelmed by the deluge of German speculation on pathology and therapeutics.” And again, in the last letter I had from him, June 27, 1900, referring to Bartlett's sketch of Hippocrates, which he says “ I read and enjoyed, as I do whatever helps to strip Truth of her gauds and present her in her native simplicity. It seems inseparable from all progress in knowledge that it shall not be administered in too concentrated a form, lest it produce repugnance and indigestion. This has been found necessary in religion, and how could philosophy escape it? Our medical principles and doctrines are found insipid by the vulgar unless

they are confectioned to suit the popular palate, with a large seasoning of human invention."

Not the least important service of Dr. Stillé was his persistent emphasis on lofty professional ideals, of which his own life was in reality the best exemplar; for, to use his own words, he was loyal to science and truth, loyal to his art, loyal to the history and traditions of his profession, loyal to the principles and precepts which the peculiar relations of medical men to one another, to the public, and to their patients impose upon them. On the occasion of the dinner given to him in 1884 Dr. Stillé told an interesting incident, which I quote here as his *credo*: "During one of my summer holidays, while abroad, it was my lot—less vulgar than now—to climb the Alps and observe the expedients used by the mountaineers in ascending the icy peaks. I noted the laborious industry with which they cut for themselves footholds on the slippery steep, and so mounted slowly to their destination. This method profoundly impressed me at the time, and I said to myself, 'Surely in such wise must one hew his way to fame and fortune; and whether the point to be attained be the highest peak of all, or only some humbler hill-top by the way, it was clear that whatever else might win, *improbis labor omnia vincit*.' What seemed revealed to me then among the sublime solitudes of nature has been echoed by a thousand voices along the whole pathway of my life. It came to me also, like a voice from the tomb, in the words of an old family motto, *Innocenter, patienter, constanter*, and it was repeated in the history of all the men I have known who secured for themselves a steadfast place in their day and generation. I cannot doubt that in the bosom of everyone who hears my voice there is felt a silent attestation

of its truth. It has been the keynote of my teaching as well as the guide of my actions, and, therefore, how little soever of the good that has been attributed to me by your partial voices may in reality be mine, I owe it all to the lessons of steady industry and undaunted perseverance that I learned from the Alpine mountaineer."

Among his papers is a most interesting and touching letter of advice to his brother Moreton, whose brilliant career was cut short in his thirty-third year. I cannot refrain from quoting the concluding sentences, which express admirably his relations to his students and his general attitude toward the profession he loved: "It would be useless for me at this time to go into a more detailed development of the system of instruction I wish you to follow. It will be gradually unfolded as you advance, and may be modified by circumstances; and in all your intercourse with me I wish you to look upon me merely as an older student than yourself, who, having trod the same path, has a greater knowledge of its difficulties, and pleasures, and dangers; who will be proud to be your guide, and glory in inspiring you with an ardent love of the profession you have chosen. I feel deeply impressed with the belief that your character and talents are such as eminently to qualify you for attaining distinction as a medical philosopher and gaining the respect and affection of those among your fellow-men who may require your professional services. I will not conceal from you that there is much before you to make even a strong resolution waver. You must toil for years to fit you for the guardianship of the health and lives of men; and yet again you must toil, long and diligently, to reap the reward of your labor. But if you have a spark of benevolence in your

heart; if you have that only ambition which is not a vice—to excel others in doing good; if you think that the gratitude and the affection of those you may relieve from sickness is a sufficient recompense for much self-denial and self-sacrifice, then you will not be disappointed. You will be richly repaid for your days of labor and your nights of watching; you will learn to cultivate a spirit of charity toward others, and of justice toward yourself, which will make your station in life respectable and your social and domestic relations hallowed by the light of an unbroken peace.” Hear the conclusion of the whole matter—the lesson of a long and good life. It is contained in a sentence of his Valedictory Address: “*Only two things are essential, to live uprightly and to be wisely industrious.*”

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235

**NOTES ON ANEURISM**

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Baltimore, Md.

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## NOTES ON ANEURISM.

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### SUMMARY.

1. Arteriovenous Aneurism of the Subclavian Vessels.
2. The Humming-top Murmur in Thoracic Aneurism.
3. On the Value of the Fluoroscope in the Diagnosis of Obscure Cases of Thoracic Aneurism.
4. On the Importance of Careful Inspection of the Chest in Thoracic Aneurism.

#### I. ARTERIOVENOUS ANEURISM OF THE SUBCLAVIAN VESSELS.

The elaborate study by Matas, published in the early numbers of *THE JOURNAL* this year, and his analysis of the 15 cases on record, add interest to the following report:

CASE I.—CLINICAL SUMMARY. *Bullet-wound of the right subclavian artery and vein in January, 1900. Formation of arteriovenous aneurism. Operation not advised. Good health March, 1902.*

Edward S., aged 29, of Kentucky, was sent to me by Dr. Alderson on April 9, 1900, with the following history: On the night of Jan. 5, 1900, he was shot, receiving four bullets. One entered the left shoulder and is now imbedded in the upper portion of the spine of the scapula and gives no trouble. One entered about the middle of the back of the left arm and passed inwards and downwards to inside the condyle of the humerus, where it was deflected across the bend of the elbow and down the forearm, making its exit about the upper third, injuring the ulnar nerve. The third bullet entered the left side a little behind the mid-axillary line between the ninth and tenth ribs. It apparently did not penetrate the chest at all. The fourth entered just about the middle of the fold of the left trapezius, passed inwards and downwards in front of

the spine and came out under the right clavicle. The wounds healed rapidly. He had at first some difficulty in swallowing, but he has gradually been getting well. There was at once considerable swelling in the neighborhood of the clavicle, with marked pulsation, a thrill and a bruit.

*Present Condition.*—He looks well. Tongue is clean. Chest is well formed. Immediately above the free margin of the middle of the left trapezius there is a bullet-wound, the point of entrance of the ball which caused the aneurism. The left clavicle stands out a little more prominently than the right. The right clavicle is just visible. The supraclavicular fossa is occupied by a pulsating swelling which causes a marked prominence between the sterno-clavicular margin, extending outward a distance of about 7 cm. It does not lift the sterno-cleido-mastoid muscle, the sternal outline of which is plainly marked. The sternal notch is plainly marked. Above, the swelling extends for fully 7 cm. The pulsation is visible over the whole tumor. From behind it is very noticeable. On palpation there is a marked thrill, continuous, but with systolic intensification, felt and heard over the whole tumor, and felt up the neck fully 7 cm. from the clavicle. It is well felt on deep pressure to the right in the sternal notch, not felt on the clavicle. The tumor forms a distinct pulsating mass about the size of, or a little larger than, an egg, quite painless. No thrill is felt below the clavicle or over the body of the heart or on the sternum. Apex beat in nipple line; no increase in area of cardiac flatness. On auscultation both sounds are loud and clear at apex and over the whole precordia. Everywhere, too, from the apex up, increasing in intensity, is heard a humming-top murmur, with marked systolic intensification. At the sternum it is very loud, and over the aneurism reaches its maximum intensity. An interesting feature is that he feels the pulsation in the left ear, not in the right. The murmur is of extraordinary intensity, heard up and down the neck, heard along the axillary artery to the elbow. The systolic murmur is very intense, and the whole diastole is occupied by a wheezing, wiry Eolean murmur. In the recumbent posture the tumor does not look larger, and the thrill is not so evident. The pulsation in the subclavian below the clavicle on the left side is visible. On the right side it is not visible. There is a marked difference between the pulse in the radial arteries; the right is feeble, only just to be felt. The brachial pulse can be felt. The axillary can be felt, much feebler on the right side than on the left. The carotid on the right side is full and easily felt. There is no thrill in it on palpation. There is no difference in the pulse in the temporal arteries. The bullet was located with the x-rays, and can be felt just below the clavicle.

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There is no question that the bullet in this case has nicked the subclavian artery and vein, causing arteriovenous aneurism. The man's general condition was good, and as he was improving I counseled very strongly non-interference. Subsequently he saw several surgeons, some of whom were anxious to operate, but fortunately he escaped them. Since then he has been doing well, and I heard from his physician, March, 1902, that the tumor is smaller and he is able to do quiet work and has little or no inconvenience.

The question of operation in these cases has been very fully discussed by Matas in his exhaustive study above referred to. Of his collection of 15 cases 4 were operated on, 3 within 12 days of the injury, and one 32 years after, which was the only one fatal. Unfortunately, 6 of the 11 cases passed out of observation within a few weeks or months after the injury, while the lesion was still active. The ultimate result of the other cases shows that the condition may remain quiescent for a long period of years. In a few instances there were serious disturbances of the circulation and innervation of the hand and arm, while in one case (Wattmann's), after a latent period of thirty-one years, the lesion became active and gave rise to fatal complications.

The condition of arteriovenous aneurism has interested me for a number of years, having had under observation at intervals a man whose case I described in the *Annals of Surgery*, 1893. At that time he was twenty-five years of age. When fifteen he had fallen and a lead-pencil in his waistcoat pocket penetrated the axilla, causing an arteriovenous aneurism. He had remained very well, had been very active and strong, had rowed in boat races. I heard of this patient not many months ago. He had served through the South African war, so that his general condition must have remained good. The aneurism has persisted now for more than twenty-three years.

Arteriovenous aneurism is so rare a lesion that even surgeons of large experience are often a little perplexed as to the best course to follow. I am very much impressed with this in the extraordinary differences of opinion given to the young man with the lesion high up in the axillary artery. The conclusions of Matas which are strongly in favor of non-interference may be quoted:

"The statistics which we furnish in this paper—the most complete list of the reported instances of this rare lesion which has thus far appeared—tend to confirm the arguments of the 'let-well-enough-alone' policy, in so far as they demonstrate that in at least 11 of the 15 cases the patient survived the immediate effects of the injury and of the arteriovenous aneurism that followed it for variable and often long periods of time."

## 2. THE HUMMING-TOP MURMUR IN THORACIC ANEURISM.

In September, 1888, there was admitted under Dr. Pepper's care at the University Hospital, Philadelphia, a Chinaman, whose case I had frequent opportunities to study with Dr. Crozier Griffith. The case was reported by Pepper and Griffith in the "Transactions of the Association of American Physicians," Vol. V. The remarkable features were cyanosis, and a murmur of extraordinary character, heard loudest at the aortic cartilage and accompanied with a thrill. As described by the writers, the murmur was "loudest and highest pitched with the cardiac systole; it died away very considerably during the diastole, and lowered its pitch by several tones, to rise again both in volume and pitch with the next systole. It was thus continuous, and had a distinctly venous quality, although unlike a venous hum in that it was distinctly rhythmic." At the autopsy there was found a small aneurism of the ascending aorta which communicated with the superior vena cava by an opening three-fourths of an inch in length. The case made a very definite impression upon me, and I have since learned to recognize the murmur as almost pathognomonic of abnormal communication between the chambers of the heart or between the great vessels at the root of the neck, or of an aneurism at the aorta with the vena cava or pulmonary artery. More definitely, the cases in which I have recognized it have been congenital heart disease with persistence of the ductus arteriosus, cases of imperfection of the ventricular septum, and in the two cases here given:

CASE 2.—CLINICAL SUMMARY. *Young man. Syphilis 3 years before admission. Cough. Shortness of breath. Aneurismal tumor to right of sternum. Loud, continuous murmur with systolic intensification. Postmortem. Communication of a large branch of the right pulmonary artery with the aneurismal sac.*

Joseph M., aged 30, admitted first on July 29, 1901 (Med.

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No. 13,212), complaining of shortness of breath, cough and pain in the chest. An important point in his history was that three years ago he had syphilis. He had been a heavy drinker and a heavy smoker. His illness began in October, 1900, with a cough, which was dry and hard and troubled him very much at night. He had shortness of breath from the beginning. These symptoms increased throughout the winter. He had pain first in February.

On his first admission the signs of aneurism of the thoracic aorta were very well marked—a visible bulging with pulsation to the right of the sternum; no thrill; very exaggerated diastolic shock; flatness over the pulsating area. Dr. Fletcher, who dictated the note, described the heart sounds as clear and a very faint soft systolic murmur along the left sternal border and over the prominent part of the pulsation. There was no diastolic murmur. The patient was given a gelatin injection and kept at rest. On my return in September I saw him, and he then had very much the symptoms described by Dr. Fletcher when first admitted.

Then he returned on December 31. He had been in the country and had become very much worse, having attacks of dyspnea and weak spells. The pulsating tumor was larger. There was a wider extent of flatness. The most remarkable change was on auscultation over the sac. The diastolic shock was extreme and there was a feeble thrill. There was a very loud, continuous murmur occupying the entire cardiac cycle, with a great deal of echoing reverberation and marked systolic intensification.

The sac was evidently so large and so far out that, while I recognized the murmur as the kind heard with abnormal communication, I must say I thought it possible that this remarkable whirring, continuous murmur might be produced in a very large sac.

The patient died Jan. 10, 1902. The anatomic diagnosis was arteriosclerosis, aneurism of the arch of the aorta, compression and atelectasis of right lung. On the posterior wall of the sac, where it had pressed into the lung, one of the main branches of the right pulmonary artery, fully as large as the little finger, opened directly into the sac.

CASE 3.—CLINICAL SUMMARY. *Syphilis two years before observation. Cyanosis. Shortness of breath. Great congestion of the veins of the upper-half of the body and of the arms. Gradual development of compensatory circulation in the mammary and epigastric veins. Over the manubrium and aortic regions a continuous murmur with marked systolic intensification, limited to the area about the aortic cartilage and the middle of the manubrium. Death. No Autopsy.*

Jos. S., aged 39, an iron-molder, applied at the dispensary of the Johns Hopkins Hospital Dec. 7, 1889. He had been ill

since January, complaining of giddiness, cough, shortness of breath, swelling of the feet and a congested and bluish condition of the face, which became aggravated when he attempted to do heavy work. He is a thick-set, well-built, muscular man. He had a chancre two years ago. There is no history of rheumatism or chorea, but in September, 1888, he was in bed three weeks with some obscure pulmonary trouble.

*Physical Examination.* Face is swollen and reddish; lips and ears are cyanotic. Conjunctivæ watery. The tongue is clean, deeply congested and the whole of the pharyngeal mucosa is intensely engorged. Chest is large, antero-posterior in diameter, deep. The skin, covering the entire thorax and of the arms is congested. The venules along the line of the diaphragm and in the lateral region of the chest are dilated. The neck is thick, supra-clavicular spaces distended, sternal notch obliterated. The breathing is quiet, 24 to the minute. The apex beat is indistinct, but a feeble impulse is visible in 5th in nipple line and there is throbbing in the epigastric notch. There is a feeble shock of the first to be felt at the apex, but there is no pulsation at the base on deep pressure. There is no dulness on the manubrium sterni and the superficial area of heart dulness is not increased. On auscultation there is a systolic murmur at apex, propagated to the back. The second sound is ringing. Along the left sternal border the systolic murmur becomes more intense. Over the manubrium there is a loud murmur of very peculiar character, not like an ordinary aortic systolic, short and rough, but a murmur which seems continuous and during the systole greatly intensified. The second sound at the base is clear and ringing. The radial pulses are equal; pupils equal. There is no brassy cough. On examination of the chest a few piping râles with prolonged expiration were noted.

The patient was seen on four occasions during the next month. The cyanosis and shortness of breath had increased. On January 7 I made the following note: Much worse since last seen on the 2d. The face is much swollen and absolutely blue, looking like that of a man who had been strangled. The mucous membrane of the pharynx intensely livid. Eyelids swollen; conjunctivæ deeply engorged. The neck is enlarged; the external jugular is prominent. The upper part of the chest and both arms are swollen but not edematous. The veins of the arms are full. The whole subcutaneous tissue feels thickened and infiltrated. The right side and the right arm are more swollen than the left. In the lower chest zone the venules are greatly enlarged, but no large mammary veins are visible. When stripped the contrast between the upper and the lower parts of the body is remarkable. The engorgement goes as far as the lower abdominal zone. The legs are quite pale.

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The amount of subcutaneous infiltration is such that the superficial veins are not visible. The apex beat is indistinct. There is a systolic shock. The area of cardiac dullness is not increased. In 5th interspace below nipple, there is a loud systolic murmur not obliterating the first sound, at aortic cartilage and on manubrium the same remarkably loud, continuous murmur is heard, with systolic intensification; second sound clear and ringing. The systolic murmur is heard to left and right two inches from the sternum, but the continuous murmur is only heard at the more limited area about the aortic cartilage with a maximum at mid-manubrium.

The radial pulses were equal, 98; respiration quiet. The subjective sensations of the patient are remarkable. He says that he feels comfortable with the exception of the feeling of distension in face, chest and arms. It is extraordinary how slight is the distress in breathing in a man presenting a condition of such extreme cyanosis. He says that one of his chief annoyances is the shock which his appearance gives to his friends. He is not drowsy. His intellectual condition is perfect. He sleeps at night with his head high.

About two weeks subsequent to this visit we heard that the patient had died; but his wife refused an autopsy. She said he got progressively worse and even more cyanotic. He was taken to the city hospital, but whether he died there or at his house she did not say.

This patient presented the characteristic features which Pepper and Griffith describe in an analysis of some 29 cases of communication between an aneurism of the aorta and the superior vena cava, more particularly the extreme cyanosis of the face and upper parts of the body, with evidences of obstruction of the circulation in the tributaries of the superior vena cava. They regard the murmur as characteristic of communication between an artery and a vein, and state that it was first described by Thurman in 1832-33. The characters are:

1. It is continuous, occupying both the systole and diastole.
2. There is a systolic reinforcement, often of great intensity.
3. The venous quality of the murmur, resembling the characteristic venous hum in the jugular and the murmur over the thyroid in Graves' disease.

The quality varies. It may be a buzzing or it may have a remarkable, sonorous, vibratory character, or, again, it may be a churning or purring murmur. Ord describes

it very well as a long continuous humming murmur, never ceasing, but varying in intensity, more sonorous during systole, fainter during diastole. To Thurman the credit appears to be due for the recognition of a murmur of this quality as pathognomonic of arterio-venous aneurism. The question has been very fully discussed by Sir William Gairdner in the Glasgow Hospital Reports, 1899, in the report of an interesting case in which a small aneurism of the ascending portion of the arch communicated with the pulmonary artery.

### 3. ON THE VALUE OF THE FLUOROSCOPE IN THE DIAGNOSIS OF OBSCURE CASES OF THORACIC ANEURISM.

CASE 3.—CLINICAL SUMMARY. *Cough and dyspnea for six months. Much emaciation. Flatness to left of sternum. Diagnosis of mediastinal sarcoma. Examination by fluoroscope showed a characteristic pulsating tumor. Subsequent slight pulsation of the thoracic wall. Wiring of the sac. Hemoptysis. Death.*

On Jan. 15, 1902, I was consulted by Mr. T. R. F., who had been complaining of cough for six months, loss in weight and pains through the chest. I was impressed at once with the expression of great distress and anxiety in the poor fellow's face. He looked worn and exhausted with suffering, and he said that he had not been able to lie down for some weeks, and had had nights of indescribable anguish owing to the orthopnea, pain and sense of smothering. I was impressed at once with the noisy, stridulous, tracheal character of the breathing. He had been a bartender, had taken alcohol freely, and had had venereal sores at different times; the strong probability is that he has had syphilis. He thinks that for a year he has had some cough, but for six months there have been shortness of breath, loss of weight and pain in the chest. About three months ago his voice changed. He has had no spitting of blood. Of late he has had frightful paroxysms of pain and orthopnea, particularly at night. He had consulted a number of physicians in New York and elsewhere, and the diagnosis had been made of mediastinal sarcoma.

*On examination* the chest was well-formed, expansion good and seemed equal on both sides. No abnormal area of pulsation was noticeable; no throbbing in the sternal notch. There was an area of impaired resonance in the first, second and third left interspaces and over the central portion of the manubrium. The point of maximum impulse was in the fifth interspace,  $10\frac{1}{2}$  cm. from the mid-sternal line. The cardiac flatness was not increased. There was a soft systolic murmur at the apex; the second sound was clear and without special



accentuation over the area of dullness. The pulse was of good volume; the left radial was smaller than the right. The breath sounds on the left side were less intense than on the right.

Altogether, at the first examination I was inclined to agree with the diagnosis which had already been made of mediastinal sarcoma. It seemed to me that an aneurism would by this time have shown more definite physical signs. The patient entered the Johns Hopkins Hospital that I might study his case more fully. The following additional points were then made out. First, "with the  $x$ -rays there was a large shadow seen, which extended from the upper end of the sternum to the upper border of the third rib. It did not extend to the right beyond the shadow of the vertebrae, but did to the left to about opposite a point  $2/5$  of the extent of the clavicle from the inner end. It was sharply defined with clear outlines, showed slight pulsation and moved very slightly to the left on deep inspiration. It could be clearly separated from the shadow of the heart. Looked at from behind it looked larger than from in front. It is worthy of note that it seemed denser and with much sharper outlines than in cases of undoubted aneurism previously examined." (Dr. McCrae.) Secondly, on the second day after admission, on getting the patient into a bright light and examining the chest critically, there was seen a distinct slight visible pulsation in the first left interspace and the left clavicle was slightly lifted. Thirdly, there was well-marked paralysis of the left vocal cord. Fourthly, the blood pressure showed the right brachial maximum 118, left brachial maximum 103. These points seemed quite sufficient to settle the diagnosis of aneurism against that of mediastinal sarcoma. It is interesting to note that there was no bruit over the pulsation; no special accentuation of the aortic second sound. The patient's condition was most distressing. The nights were passed in terrible distress and in order to reduce the blood pressure he was bled on several occasions with very great relief. On January 20 his condition seemed perfectly desperate, and as a last resort I asked Dr. Finney to wire the sac. The patient stood the operation remarkably well. The needle was inserted in the second left interspace about 5 cm. from the sternal margin over an area in which there was marked pulsation. "A medium-sized needle was inserted in a direction backward and slightly downward and inward. When the needle had been inserted about 6 cm. a pulsation was transmitted to it. It was then pushed in about 2 cm. further, when fresh blood escaped in spurts. Ten feet and seven inches of No. 27 spring silver wire, wound large, (75 parts copper to 1000 silver, alloy) was then slowly inserted. A current of 10

ma. was then allowed to pass through the wire for one hour." The patient seemed very much benefited by the operation, and seemed for a few days decidedly improved. Then, on the night of the 17th he had a small hemorrhage. On the 18th he had a sudden profuse hemorrhage from the lungs and died in a few moments. The heart beat faintly for thirty seconds after the last respiration.

Postmortem there was found an aneurism of the transverse arch, containing mural thrombi within the sac, and the wire was within the sac. There was compression of the left bronchus, perforation into the trachea, hemorrhage into the right lung.

It is particularly in this group of aneurisms, with symptoms and no physical signs, that the x-ray examination is of such service, but we have not had a case in which it was more clearly demonstrated than in the one here noted.

#### I. ON THE VALUE OF CAREFUL INSPECTION OF THE CHEST IN THE DIAGNOSIS OF THORACIC ANEURISM.

A bare chest, a good light and good eyes are the essentials. Routine in the examination is important. Invariably at the ward visit after the inspection of the front of patient's chest I say to the student, "What next?" and he immediately proceeds to palpation, overlooking the inspection of the back, and which, if not made in the right time, and in a routine manner, may be overlooked altogether.

Many years ago at the Girard Hotel, Philadelphia, I saw a remarkable case which illustrated the value and importance of the point. The patient had a large area of pulsation in the lower front of the chest, extending almost from one nipple to the other, with distinct prominence. There was a double murmur at the base of the heart, and the case had been regarded as one of aortic insufficiency, which condition was present. He had paroxysms of great distress and orthopnea, and there were peculiar features about the case, so that one or two of the leading physicians in Philadelphia had expressed themselves as somewhat puzzled about its nature. Fortunately, after finishing the inspection in front, I turned the patient's back to a good light, and the diagnosis was made at a glance. There was a pulsating aneurismal tumor in the left interscapular region, which had given him no pain whatever, and which had not attracted the attention of his physicians. A remarkable condition

was present in this case, which I had never seen before; namely, a complete absence of the pulse in the iliacs and femorals.

At present in my wards are two cases illustrating this very well; a man (Leonard) has a wide area of impulse in the lower sternum and adjacent interspaces. He has been under observation now for nearly three years, and time and again Dr. Thayer, Dr. Futcher and myself have discussed the possibilities. A positive diagnosis was not reached until a year ago, when a slight pulsation was seen in the left interscapular region, which has increased, and it is now quite evident that there is a large aneurism of the descending thoracic aorta.

The second case, a man aged about 35, has on inspection of the chest a very well-marked pulsation of the manubrium. The diagnosis of aneurism will be made at a glance. He has had a great deal of dyspnea and pain in the chest. On additional examination it is noted as rather remarkable that with so much pulsation on the manubrium there is little or no flatness. There is a well-marked to-and-fro friction. Inspection of the back shows in the left interscapular region slight bulging, with well-marked visible and palpable pulsation.

Sometimes the diagnosis is hidden beneath a tucked-up undershirt. Last year a robust-looking man consulted me about Nauheim: he had been told that he had heart disease, and a physician in Florida had said that his case was a very suitable one for the Schott baths. When stripped, the diagnosis was made at a glance. The head of the clavicle was lifted out of its bed with each systole, and there was a definite pulsating tumor above the sternal notch with a thrill and a loud to-and-fro murmur. In the numerous examinations he had never taken off his shirt, but had tucked it up, and consequently, nobody had ever noticed the aneurism.

Some years ago I got into trouble by too careful inspection and detecting an early throbbing in the third right interspace. A robust, strong man consulted me for cough, shortness of breath and inability to lie down at night. He had the wheezing, goose-cough, as it is called, and there was to be seen most clearly and distinctly, a pulsation to the right of the sternum. With rest, the symptoms improved and the pulsation lessened remarkably. Other physicians (among them one well-

recognized authority on heart disease) assured the family there must have been a mistake, as there were no signs of aneurism. The patient improved and I saw him about for more than two years. I began to think that there had been a mistake, but subsequent events showed that the diagnosis was correct. Spontaneously, particularly after prolonged rest, the pulsation of an aneurism to the right or left of the sternum may completely disappear. I do not refer here to cases of 20 called dynamic pulsation, but to cases in which the subsequent history and autopsy has confirmed the existence of an aneurism.

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June 7, 1902.]

## ON HEREDITY IN BILATERAL CYSTIC KIDNEY.

BY

WILLIAM OSLER, M.D.,

Professor of Medicine, Johns Hopkins University.

Since reporting the two cases in *American Medicine* of March 22, the following case has come under observation, illustrating the unusual feature of heredity in this condition:

B. E. B., aged 39, Chestnuthill, Mass. He was perfectly well until two years ago, when he had influenza severely. He at that time had hematuria, and three years before, while coasting, he tripped and had a fall, and then had hematuria. Before this he had noticed that he had not been in as good health as usual, and had some fulness of the abdomen, more at times than at others, and had felt a hardness in it. He was under the care of Dr. Baldwin, of Chestnuthill, and he at this time began to fear that he had the same malady of which his mother died. In 1882 Dr. Fitz performed a necropsy on his mother and found bilateral cystic kidneys. This statement is confirmed in a letter from Dr. Fitz, who says that the patient was supposed to have scrofulous glands. She died unconscious in the fiftieth year of her age, probably in a state of uremia.

With the exception of occasional attacks of dyspepsia, the patient had been strong and well, had taken plenty of exercise, had no pain in the back, no lameness. He has been playing golf and has felt very well and vigorous. He had been seen by Dr. Folsom and by Dr. Fitz, both of whom decided that he had bilateral cystic kidneys.

*Present Condition.*—The patient looks very well, of good color. There is nothing in his appearance to attract attention. There is a little fulness in the upper abdomen. I dictated the following note at the time of examination: Robust, healthy-looking man; weight about 145, stripped; good color; tongue clean. Pupils are of medium size, react well to light and on accommodation. Superficial arteries are sclerotic. Heart: apex beat in fourth and fifth, in and just inside the nipple a little forcible; rather wide area of pulsation; aortic second palpable; soft systolic at apex; ringing, accentuated aortic second.

*Abdomen.*—Symmetrical; looks a little full in proportion to the chest. The costal border in the nipple line is lifted on both

sides; a little greater fulness below the right costal border. The flanks bulge considerably. Girth of abdomen at navel, 85 cm.; at level of ensiform, 89 cm. From behind slight bulging in both flanks. When he stands up there is a marked prominence of the abdomen, particularly in the flanks. The lower ribs have been spread by the tumors. On palpation both flanks are occupied by large masses. On the left side, the larger, the tumor extends fully three inches below level of navel; not so much to be felt except on deep pressure below the costal border in the nipple line. On bimanual palpation the mass can be lifted up and visibly pressed forward; irregularities can be distinctly felt. The descending colon runs over it, and can be felt as a cord (he himself has noted that it can be moved from side to side). In the right side the mass is not so large. The colon is felt in front of it. There are several distinct nodular prominences; one can feel definite hemispheric irregularities with the greatest ease. Both masses descend with inspiration. The liver is not enlarged; perhaps a little pushed up by the tumor. The thyroid is not enlarged; both lobes are palpable. Both discs are clear.

*Urine.*—Pale, straw yellow; clear; no precipitate, acid, 1.012; faint trace of albumin; no sugar; no diazo. Microscopically (centrifugalized specimen) no casts to be found; few squamous cells.

The bilateral tumors, the cardiovascular changes, the recurring hematuria and the condition of the urine make the diagnosis quite clear. The unusual feature is the fact that his mother died of the same disease. So far as he knew, no other members of the family had been attacked.

With reference to heredity in this condition Morris notes as follows: "Polycystic kidney has been known to follow a natural labor in a mother of five children; it affected only one of her kidneys. There cannot be said to be more than a slight hereditary tendency to polycystic kidney. The three cases in the same family reported by Bar have been just referred to. A case is recorded in which it affected one kidney of a woman two members of whose family died of post-scarlatinal nephritis, and another child, a daughter, had a polycystic kidney." (Vol. i, p. 656.) In a recent paper by Borelius (*Nordiskt Med. Arkiv*, abstracted in the *Journal of the Amer. Med. Assoc.*, 1902, I), three of the four cases which he described belonged to the same family, father, son and nephew.

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# Some Aspects of American Bibliography

BY

WILLIAM OSLER, M.D.

*Professor of Medicine, Johns Hopkins University*

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Address at the Meeting of the Association of Medical Librarians,  
Saratoga, June 10, 1902

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REPRINTED FROM THE BULLETIN OF THE ASSOCIATION, NO. 2

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*Professor of Medicine, Johns Hopkins University*

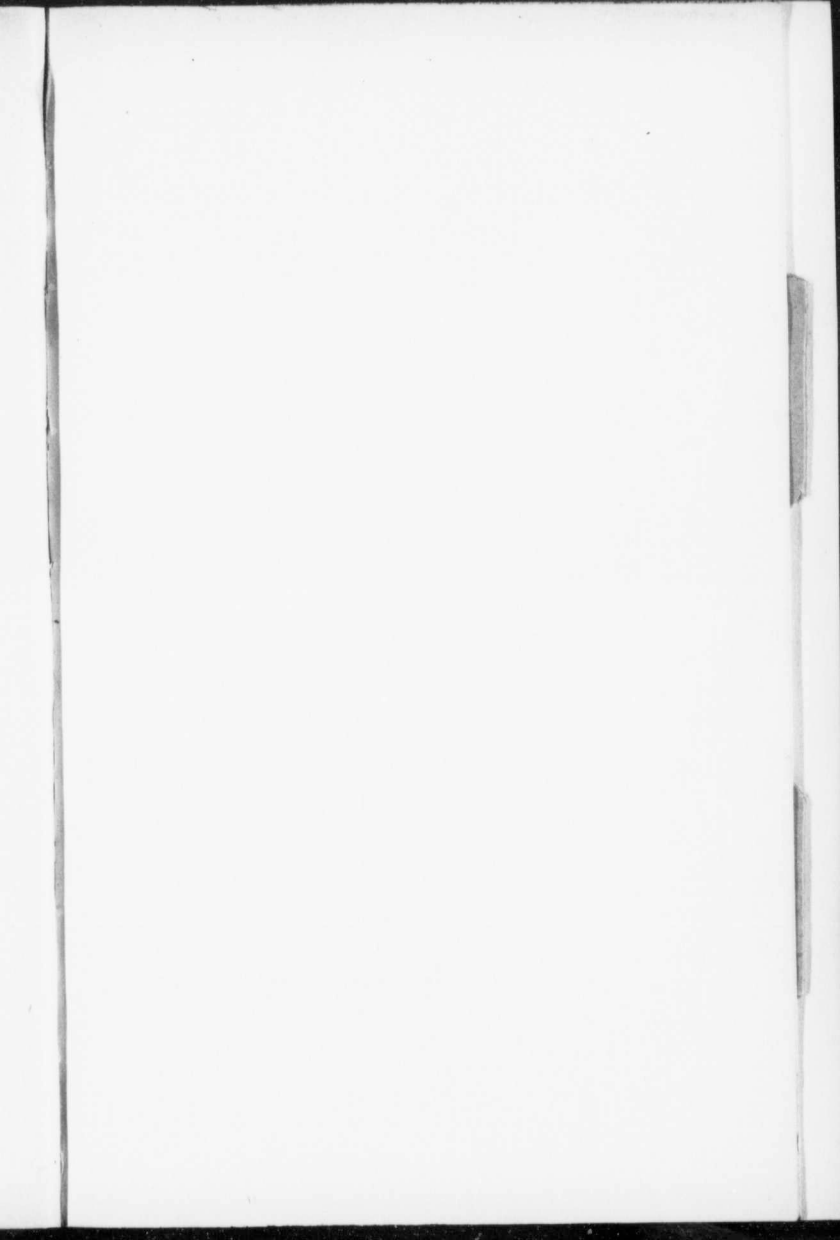
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# Some Aspects of American Bibliography

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## I.

In conferring upon me the presidency of this Association, I felt that you wished to pay a compliment to a man who had been much helped by libraries and who knew their value, and I hoped that it was, perhaps, in recognition of the fact that a practical and busy physician may be at the same time a book lover, even a book worm.

You are familiar, of course, with the objects of this Association, but as there are present with us also those who are not members, this is an occasion in which a little missionary work is timely, and I may briefly refer to some of them. An association of the medical libraries of the country, our membership includes both the great libraries, with 50,000-100,000 volumes, and the small collections just started of a few hundred books. The former gain nothing directly from an affiliation with us—they give more than they get, but the blessing that goes with this attitude is not to be despised, and from their representatives we look for guidance and advice. Please understand that in this address I am not talking to the men in charge of them who are familiar with what I shall say, and who are experts where I am only a dabbler; but I wish to catch the inexperienced, those in charge of the small but growing libraries, upon whom I wish to impress some wider aspects of the work. In the recent history of the profession there is nothing more encouraging than the increase in the number of medical libraries.

The organization of a library means effort, it means union, it means progress. It does good to men who start it, who help with money, with time and with the gifts of books. It does good to the young men, with whom our hopes rest, and a library gradually and insensibly molds the profession of a town to a better and higher status.

We trust that this Association may be a medium through which men interested in the promotion of the welfare of the profession may do much good in a quiet way. We have to thank some twenty physicians who have kindly joined us in this work and whose subscriptions help to pay the expenses of our exchange; but their names on our list do more—it is an encouragement to know that they are with us, and as they get nothing in return (except the BULLETIN) they should know how much we appreciate their fellowship. We have to thank, in particular, many editors who send us their journals for distribution, and the editors of many Transactions. The liberality with which the work of our Exchange has been aided by the large libraries is beyond all praise. Time and again the Library of the Surgeon-General's Office, the Academy of Medicine of New York, the Boston Medical Library Association and the College of Physicians' Library of Philadelphia have filled long lists of wants for smaller libraries. The profession is deeply indebted to Drs. Merrill, Chadwick, and Brigham, to Mr. Brownne and to Mr. C. P. Fisher for their disinterested labors. In some details our machinery could be better adjusted, but we have had to work with very little money, which means slight clerical help where much is needed, but with an increasing membership we can look forward confidently to a much more complete organization and to a wider field of usefulness.

But this Association may have other ambitions and hopes. We desire to foster among our members and in the profession at large a proper love of books. For its own sake and for the sake of what it brings, medical bibliography is worthy of a closer study than it has received heretofore in this country. The subject presents three aspects, the book itself, the book as a literary record, *i. e.*, its contents, and the book in relation to

the author. Strictly speaking, bibliography means the science of everything relating to the book itself, and has nothing to do with its contents. In the words of a recent writer, the bibliographer "has to do with editions and their peculiarities, with places, printers, and dates, with types and illustrations, with sizes and collations, with bindings and owners, with classifications, collections, and catalogues. It is the book as a material object in the world that is his care, not the instruction of which it may be, or may fail to be, the vehicle. Bibliography is the science or the art, or both, of book description."<sup>\*</sup>

But there is a larger sense of the word, and I shall discuss some aspects of American medical bibliography in the threefold relationship to which I have referred.

## II.

The typographical considerations may be passed over with a few words. We have no Aldus or Froben or Stephanus or Elzevir, whose books are sought and prized for themselves, irrespective of their contents. With few exceptions the medical works published here at the end of the eighteenth and the beginning of the nineteenth centuries were poor specimens of the printer's art. Compare a Sydenham first edition of 1682 with Caldwell's Cullen, issued in Philadelphia more than 100 years later, and the comparison is in favor of the former; and yet there is much of bibliographical interest in early American publications. It would make an instructive exhibit to take a series of surgical books issued in this country from "Jones' Manual" in 1776 to "Kelly's Operative Gynecology;" it would illustrate the progress in the art of book making, and while there would be nothing striking or original, such volumes as "Dorsey's Elements of Surgery" (1813), particularly in the matter of illustrations, would show that there were good book makers at that date. At one of the meetings of the American Medical Association a selection of the works issued during the

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<sup>\*</sup> Professor Ferguson, "Some Aspects of Bibliography," Edinburgh, 1900.

117 years of the existence of the house of Lea Brothers would form an instructive exhibition. There are few medical works in this country the genealogy of which require any long search. Other than the "Code of Ethics" of the American Medical Association and the "American Pharmacopeia," both of which, by the way, have histories worth tracking, and the "Dispensary" of Wood and Bache, I know of no works fifty years old which continue to be reprinted. Compared with the text-books, etc., the journals of the early days were more presentable, and the general appearance of such publications as the *Medical Repository*, of New York, the *Medical Museum*, of Philadelphia, and later the *Medical and Physical Journal*, the *North American Medical and Surgical Journal* and the *Medical Recorder*, not only compare favorably with European journals of the period, but one gets an impression of capable and scholarly editorial control and a high grade of original contribution. The *Medical and Physical Journal*, founded in 1820, has a special interest and should be put on the shelves just before the *American Journal of the Medical Sciences*, into which it merged, one of the few great journals of the world, and the one from which one can almost write the progress of American medicine during the past century.

While there is not in American medicine much of pure typographical interest, a compensation is offered in one of the most stupendous bibliographical works ever undertaken. The Index-Catalogue of the Library of the Surgeon-General's Office atones for all shortcomings, as in it is furnished to the world a universal medical bibliography from the earliest times. It will ever remain a monument to the Army Medical Department, to the enterprise, energy and care of Dr. Billings, and to the scholarship of his associate, Dr. Robert Fletcher. Ambitious men before Dr. Billings had dreamt of a comprehensive medical bibliography. Conrad Gesner, the learned Swiss naturalist and physician, had published up to Section 21 his "Bibliographia Universalis" (1545). Section 20, which was to represent the quintessence of the labors of his life and which was to include the medical bibliography, never appeared, owing to his untimely yet happy

death—*felix mors Gesneri*, as Caius says, in the touching tribute to his friend.\* Merklin, von Haller, Haeser, Young, Forbes, Atkinson and others have dipped into the vast subject, but their efforts are Lilliputian beside the Gargantuan undertaking of the Surgeon-General's Office. One work I cannot pass without a regret and a reference—the unfinished medical bibliography of James Atkinson, London, 1834. If not on your shelves, keep your eyes on the London catalogues for it. It only includes the letters A and B, but it is a unique work by a Thelemite, a true disciple of Rabelais. I need not refer in this audience to the use of the Index-Catalogue in library work; it is also of incalculable value to any one interested in books. Let me give an everyday illustration. From the library of my friend, the late Dr. Rush Huidekoper, was sent to me a set of very choice old tomes, among which was a handsome folio of the works of du Laurens, a sixteenth century anatomist and physician. I had never heard of him, but was very much interested in some of his medical dissertations. In a few moments from the Index-Catalogue the whole bibliography of the man was before me, the dates of his birth and death, the source of his biography, and where to look for his portrait. It is impossible to overestimate the boon which this work is to book lovers. One other point—the Index is not used enough by students. Take under the subject of diseases of the heart. Only the other day I referred to a journal article which had a very full bibliography, and I turned to Volume V in the old series, and to the just issued Volume VI of the new series, and there was the literature in full on this subject and in it many articles which the author had overlooked. The entire bibliography might have been omitted with advantage from the paper and simply a reference made to the Index-Catalogue. It would be well in future if writers would bear in mind that on many subjects, particularly those covered by the second series of the Catalogue, the bibliography is very complete, and only supplementary references should be made to the articles which have

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\* Caii Opera, Jebb's edition.



appeared since the volume of the new series dealing with the subject was printed.

### III.

The second aspect of a book relates to its contents, which may have an enduring value or which may be of interest only as illustrating a phase in the progress of knowledge, or the importance may relate to the conditions under which the book appeared.

It is sad to think how useless are a majority of the works on our shelves—the old cyclopedias and dictionaries, the files of defunct journals, the endless editions of text-books as dead as the authors. Only a few epoch-making works survive. Editions of the Hippocratic writings appear from time to time, and in the revival of the study of the history of medicine the writings of such masters as Galen and Aretæus reappear, but the interest is scholastic, and amid the multiplicity of studies how can we ask the student to make himself familiar with the ancients? We can, however, approach the consideration of most subjects from an historical standpoint, and the young doctor who thinks that pathology began with Virchow gets about the same erroneous notion as the student who begins the study of American history with the Declaration of Independence.

Now among the colossal mass of rubbish on the shelves there are precious gems which should be polished and well set and in every library put out on view. But let me first mollify the harshness of the expression just used. The other day, thinking in this way, I took from a shelf of old books the first one I touched. It was Currie's "Historical Account of the Climates and Diseases of the United States of America," published in Philadelphia in 1792. I had possessed it for years, but had never before looked into it. I found the first comprehensive study on climatology and epidemiology made in this country, one which antedates by several years Noah Webster's work on epidemics. With remarkable industry Dr. Currie collected from correspondents in all parts of the country information about the prevalent diseases, and I know of no other work from

which we can get a first-hand sketch from the practitioners themselves of the maladies prevalent in the different States. Then I had to look up his possible relationship with James Currie, of Liverpool, the strong advocate of hydrotherapy, the friend and editor of Burns, who had had, I remembered, interesting affiliations with Virginia. At the outbreak of the Revolutionary War he was employed as a clerk at one of the landings on the James River, and suffered not a little for the Tory cause. His letters, given in his "Life," which are well worth reading, give a valuable picture of the period. The American Currie's book at least was not rubbish in 1792, but who will read it now? And yet it is on our shelves for a purpose. It may not be called for once in five years; it did a good work in its day, and the author lived a life of unselfish devotion to the profession. As a maker of much which in a few years will be *rubbish* of this kind, let me take back the harsh expression.

But I wish to refer particularly to certain treasures in American bibliography which you should all have on your shelves. Of course the great libraries have most of them, and yet not all have all of them, but with a little effort they can be picked up. Take that notable "Discourse upon the Institution of Medical Schools in America," by John Morgan, M.D., 1765. From it dates the organization of medical colleges in this country, but there is much more in this scholarly address. The introduction contains a picture of the state of practice in Philadelphia which is in its way unique, and for the first time in the history of the profession in this country Morgan tried to introduce what he calls the regular mode of practising physic, as apart from the work of the surgeon and apothecary. What interests us, too, here is his plea for the establishment of a medical library. Listen to his appeal: "Perhaps the physicians of Philadelphia, touched with generous sentiments of regard for the rising generation and the manifest advantages accruing to the College thereby, would spare some useful books or contribute somewhat as a foundation on which we might begin." The biographical fragments in the introduction show the remarkable care with which

some of the young colonial physicians sought the best available education. Few to-day, after a protracted apprenticeship, do as did Morgan, spend five years in Europe under the most celebrated masters, but he returned a distinguished Fellow of the Royal Society of London, and a Correspondent of the Royal Academy of Surgery in Paris.

John Jones' "Plain, Practical, Concise, Remarks on the Treatment of Wounds and Fractures, Designed for the Use of Young Military and Naval Surgeons in North America," 1776, was the *vade mecum* of the young surgeons in the Revolutionary War. As the first separate surgical treatise published in this country it has a distinct bibliographical value, and, when possible, you should put the three editions together.

Samuel Bard's study on "Angina Suffocativa" (1771), or diphtheria, as it would be now termed, is an American classic of the first rank. It is difficult to get, but it is worth looking for. Get, too, his work on "Midwifery," 1807, the first published in this country. An enterprising librarian will have all the editions of such a work.

Thomas Bond's "Lecture Introductory to the Study of Clinical Medicine at the Pennsylvania Hospital," 1766, remained in manuscript until printed in Vol. IV of the *North American Medical Journal*, 1827, a copy of which is not difficult to obtain. It is also republished in Morton's "History of the Pennsylvania Hospital," and I republished it in the *University Medical Magazine* in 1897.

The works of Rush should be fully represented even in the smaller libraries. His collected writings passed through five editions and are easy to get. Rush "is the father not only of American medicine, but of American medical literature, the type of a great man, many-sided, far-seeing, full of intellect and genius; abused and vilified, as man hardly ever was before, by his contemporaries, professional and non-professional; misunderstood by his immediate successors, and unappreciated by the present generation, few of whom know anything of his real character." I gladly quote this estimate of Rush by S. D. Gross. Owing to the impression that he was disloyal to Wash-

ington, there has arisen of late a certain feeling of antagonism to his name. The truth is he was a strong hater, and, as was common at that period, a bitter partisan. I wish some one would give us the account from contemporary letters, and from the side of Rush. There is an astonishing amount of bibliographical interest in the writings of Rush, and a good story awaits the leisure hours of some capable young physician. His letters are innumerable and scattered in many libraries. I came across one the other day ("Bulletin of the New York Library," Vol. I, No. 8), dated July 27, 1803, in which, replying to an invitation from Horatio Gates, he says pathetically, "A large and expensive family chain me to the pestle and mortar," and in a postscript he adds that as he now confines his labors to his patients, without trying to combat ignorance and error, he is kindly tolerated by his fellow-citizens.

Many early works of great importance are difficult to find, such as Elisha North on "Spotted Typhus" or cerebrospinal fever, 1811. Noah Webster's "History of Epidemics" has a special value, apart from its interest as the most important medical work written in this country by a layman.

The tracts on vaccination by Waterhouse—the American Jenner—should be sought for carefully. Try to have a copy of Nathan Smith's "A Practical Essay on Typhous Fever" (1824) to hand to any young physician who asks for something good and fresh on typhoid fever. There is a long list of important essays which you should have. I cannot begin to name them all, but such as Jacob Bigelow on "Self-limited Diseases," 1835, which is a tract every senior student should read, mark, learn and inwardly digest. If not obtainable, his "Nature in Disease," 1859, contains it and many other essays of value. James Jackson's "Letters to a Young Physician," 1856, are still worth reading—worth republishing.

The stories of the great epidemics offer material for careful bibliographical research. Mathew Carey's graphic description of the great epidemic of yellow fever in Philadelphia, while not so lifelike and brilliant as De Foe's great story of the plague in London, has the advantage of the tale of an eye-witness and of

a brave man, one of the small band who rose above the panic of those awful days. It is a classic of the first rank. The little book, by the way, had a remarkable sale. The first edition is dated November 13, 1793, the second, November 23, the third, November 30, and the fourth, January 16, 1794. Brockden Brown's "Arthur Mervyn," while it gives in places a vivid description of this epidemic, is, in comparison, disappointing and lame, not worthy to be placed on the same shelf with Carey's remarkable account.

Even the smaller libraries should have the works of this type. They are not hard to get, if sought for in the right way. Early American works on special subjects should be sought for. Such a collection of works on ophthalmology as is in exhibit in the section on this subject at the meeting of the American Medical Association is most instructive, and shows the early publications of this country.

#### IV.

The third aspect of medical bibliography relates to writings which have a value to us from our interest in the author. After all, the true bibliophile cares not so much for the book as for the man whose life and mind are illustrated in it. There are men of noble life and high character, every scrap of whose writings should be precious to us, and such men are not rare. The works are not always of any special value to-day, or even of any intrinsic interest, but they appeal to us through the sympathy and even the affection, stirred in us by the story of the man's life. It is, I know, a not uncommon feeling—a feeling which pervades No. XXXII of Shakespeare's "Sonnets" and is so beautifully expressed in the concluding line, "Theirs for their style I'll read, his for his love." Such an attitude I feel personally toward the literary remains of John Morgan, David Ramsay, Daniel Drake, John D. Godman, James Jackson, Jr., Elisha Bartlett and others.

In our libraries under John Morgan, to whose remarkable essay I have already referred, there should be also his "Vindication," which gives the story of the Army Medical Depart-

ment in the early days of the Revolution. One of the most famous names in American medicine is David Ramsay, perhaps the most distinguished pupil of Benjamin Rush, a man of high character, full of zeal and ambition and devoted to his profession, yet what he has left in general literature far excels in importance his medical writings. The larger libraries should have his famous "History of the American Revolution," 1789, his "Life of Washington" and the "History of South Carolina," 1809. The memory of such a man should be cherished among us, and one way—and the best—is to put a complete set of his writings on our shelves.

Another noble soul of the same stamp was John D. Godman, the tragedy of whose life and early death has a pathos unequaled in the annals of the profession of America. Besides his anatomical works, his "Museum of American Natural History" and "The Rambles of a Naturalist" should be among your treasured Americana.

There is a large literature in this group illustrating the excursions of medical men into pure literature. A complete set of the writings of Oliver Wendell Holmes should be in every medical library. His Boylston prize essays on "Neuralgia," on "Malarial Fever," and on "Direct Explorations" can be had bound in one volume. One of his writings is inestimable, and will be remembered in the profession as long, I believe, as posterity will cherish his "Chambered Nautilus" or the "Last Leaf." If you can find the original pamphlet on the "Contagiousness of Puerperal Fever," a reprint from the *New England Journal of Medicine and Surgery*, 1844, have it bound in crushed levant—'tis worthy of it. The reprint of 1855 is more accessible. Failing either of these, get the journal and cut out and bind the article. Semmelweiss, who gets the credit for introducing asepsis in midwifery, came some years later. Occasionally a well-known medical writer will dabble in pure literature, and will sometimes, as in the case of Dr. Weir Mitchell, attain a success as remarkable as that which he has had in his profession. Put his writings on the shelves—they illustrate his breadth and his strength. A volume of poems

may illustrate some strong man's foible. George B. Wood's epic poem, "First and Last," and the "Eolopæsis" of Jacob Bigelow illustrate the dangers which best physicians who write poetry.

Biography is a department which you will find a very attractive and a most profitable field to cultivate for your readers. The foreign literature includes several comprehensive encyclopedias, but it is not a department very well represented in this country. It is true that an enormous literature exists, chiefly in periodicals, but the sort of biography to which I refer has a threefold distinction. The subject is a worthy one, he is dead, and the writer has the necessary qualifications for the task. We possess three notable works on American medical biography: James Thacher, 1828; Stephen W. Williams, 1845, and Samuel D. Gross, 1861, which remain to-day the chief works of reference to the latter date. Thacher's is a remarkable production and for the period a most ambitious work. It has been a common tap to which writers have gone for information on the history of medicine in this country, and the lives of the prominent physicians to about 1825. It is a rare volume now, but worth its price, and I know of no more fascinating book, or one more difficult to put down. Even the printed list of subscribers—a long one, too—is most interesting. Many of Thacher's best known books come in the third category, and are of value in a medical library only so far as they illustrate the remarkable versatility of the man. His "Practice," the first American one, you will, of course, try to get, and you should also have one of the editions of his "Journal of the Revolutionary War," through which he served with pencil, as well as scalpel, in hand. It is a most graphic account, and of interest to us here since he describes very fully the campaign in this region, which led to the surrender of Burgoyne, the treachery of Arnold, and he was an eye-witness of the tragic end of poor Major André. You will not find it easy to get a complete set of his writings.

There are many single volumes for which you will be on the lookout. Caldwell's "Autobiography" is a storehouse of facts

(and fancies!) relating to the University of Pennsylvania, to Rush and to the early days of the Transylvania University and the Cincinnati schools. Pickled, as it is, in vinegar, the work is sure to survive.

Have carefully rebound James Jackson's Memoir of his son (1835), and put it in the way of the young men among your readers. Few biographies will do them more good.

For the curious pick up the literature on the Chapman-Pattison quarrel, and anything, in fact, relating to that vivacious and pugnacious Scot, Granville Sharpe Pattison.

There are a few full-blown medical biographies of special interest to us: The life and writings of that remarkable philosopher and physician, Wells, of Charleston. The life of John C. Warren (1860) is full of interest, and in the "Essays" of David Hossack you will get the inner history of the profession in New York during the early years of the last century. In many ways Daniel Drake is the most unique figure in the history of American medicine. Get his "Life," by Mansfield, and his "Pioneer Life in Kentucky." He literally made Cincinnati, having "boomed" it in the early days in his celebrated "Picture of Cincinnati," 1815. He founded nearly everything that is old and good in that city. His monumental work on "The Diseases of the Mississippi Valley" is in every library; pick out from the catalogues every scrap of his writings.

I must bring these "splintery," rambling remarks to a close, but I hope that I may have stirred in you an interest in some of the wider aspects of American medical bibliography—I mean aspects other than the daily demand upon you for new books, new editions and new journals.

Keep ever in view, each one in this circle, the important fact that a library should be a storehouse of everything relating to this history of the profession of the locality. Refuse nothing, especially if it is old; letters, manuscripts of all kinds, pictures, everything illustrating the growth, as well as the past condition, should be preserved and tabulated. There is usually, in each community a man who is fond of work of this sort. Encourage him in every possible way. Think of the legacy left by Dr.



Toner, of Washington, rich in materials for the history of the profession during the Revolutionary War! There should be a local pride in collecting the writings and manuscripts of the men who have made a school or a city famous. It is astonishing how much manuscript material is stowed away in old chests and desks. Take, for example, the recent "find" of Dr. Cordell of the letters of the younger Wiesenthal, of Baltimore, describing student life in London about the middle of the eighteenth century. Think of the precious letters of that noble old man, Nathan Smith, full of details about the foundations of the Dartmouth and the Yale Schools of Medicine! Valuable now (too valuable to be in private hands), what will they be 100 or 200 years hence!

What should attract us all is a study of the growth of the American mind in medicine since the starting of the colonies. As in a mirror this story is reflected in the literature of which you are the guardians and collectors—in letters, in manuscripts, in pamphlets, in books and in journals. In the eight generations which have passed, the men who have striven and struggled—men whose lives are best described in the words of St. Paul, in journeyings often, in perils of water, in perils in the city, in perils in the wilderness, in perils in the sea, in weariness and painfulness, in watchings often, in hunger and thirst and in fastings—these men, of some of whom I have told you somewhat, have made us what we are. With the irrevocable past into which they have gone lies our future, since our condition is the resultant of forces which, in these generations, have molded the profession of a new and mighty empire. From the vantage ground of a young century we can trace in the literature how three great streams of influence—English, French and German—have blended into the broad current of American medicine on which we are afloat. Adaptiveness, lucidity and thoroughness may be said to be the characteristics of these Anglican, Gallic and Teutonic influences, and it is no small part of your duty to see that these influences, the combination of which gives to medicine on this continent its distinctively eclectic quality, are maintained and extended.

# Chauvinism in Medicine

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An Address before the Canadian Medical Association,  
Montreal, September 17, 1902

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BY

WILLIAM OSLER, M.D., F.R.S.

*Professor of Medicine, Johns Hopkins University*

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## CHAUVINISM\* IN MEDICINE.

A rare and precious gift is the Art of Detachment, by which a man may so separate himself from a life-long environment as to take a panoramic view of the conditions under which he has lived and moved, and that frees him from Plato's den long enough to see the realities as they really are, the shadows as they appear. Could a physician attain to such an art he would find in the state of his profession a theme calling as well for the exercise of the highest faculties of description and imagination as for the deepest philosophic insight. With wisdom of the den only and of my fellow-prisoners, such a task is beyond my ambition and my powers, but to emphasize duly the subject that I wish to bring home to your hearts I must first refer to certain distinctive features of our profession:

### I. FOUR GREAT FEATURES OF THE GUILD.

*Its noble ancestry.*—Like everything else that is good and durable in this world, modern medicine is a product of the Greek intellect, and had its origin when that wonderful people created positive or rational science, and no small credit is due to the physicians who, as Professor Gomperz remarks (in his brilliant chapter "On the Age of Enlightenment," *Greek Thinkers*, Vol. 1), very early brought to bear the spirit of criticism on the arbitrary and superstitious views of the phenomena of life. If science was ever to acquire "steady and accurate habits instead of losing itself in a maze of phantasies, it must be by quiet methodical research." "It is the undying glory of the school of Cos that it introduced this innovation into the domain of its Art, and thus exercised the most beneficial influence on the whole intellectual life of mankind. Fic-

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\* Definition: A narrow, illiberal spirit in matters national, provincial, collegiate or personal.

tion to the right! Reality to the left! was the battle cry of this school in the war it was the first to wage against the excesses and defects of the nature philosophy" (Gomperz). The critical sense and skeptical attitude of the Hippocratic school laid the foundations of modern medicine on broad lines, and we owe to it: *first*, the emancipation of medicine from the shackles of priestcraft and of caste; *secondly*, the conception of medicine as an art based on accurate observation, and as a science, an integral part of the science of man and of nature; *thirdly*, the high moral ideals, expressed in that most "memorable of human documents" (Gomperz), the Hippocratic oath; and *fourthly*, the conception and realization of medicine as the profession of a cultivated gentleman.\* No other profession can boast of the same unbroken continuity of methods and of ideals. We may indeed be justly proud of our apostolic succession. Schools and systems have flourished and gone, schools which have swayed for generations the thought of our guild, and systems that have died before their founders; the philosophies of one age have become the absurdities of the next, and the foolishness of yesterday has become the wisdom of to-morrow; through long ages which were slowly learning what we are hurrying to forget—amid all the changes and chances of twenty-five centuries, the profession has never lacked men who have lived up to these Greek ideals. They were those of Galen and of Aretæus, of the men of the Alexandrian and Byzantine schools, of the best of the Arabians, of the men of the Renaissance, and they are ours to-day.

A second distinctive feature is the *remarkable solidarity*. Of no other profession is the word universal applicable in the same sense. The celebrated phrase used of the Catholic Church is in truth much more appropriate when applied to medicine. It is not the prevalence of disease or the existence everywhere of special groups of men to treat it that betokens

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\*Nowhere in literature do we have such a charming picture illustrating the position of a cultivated physician in society as that given in Plato's Dialogues of Eryximachus, himself the son of a physician, Acumenus. In that most brilliant age the physician was the companion and friend, and in intellectual intercourse the peer of its choicest spirits.

this solidarity, but it is the identity throughout the civilized world of our ambitions, our methods and our work. To wrest from nature the secrets which have perplexed philosophers in all ages, to track to their sources the causes of disease, to correlate the vast stores of knowledge, that they may be quickly available for the prevention and cure of disease—these are our ambitions. To carefully observe the phenomena of life in all its phases, normal and perverted, to make perfect that most difficult of all arts, the art of observation, to call to aid the science of experimentation, to cultivate the reasoning faculty, so as to be able to know the true from the false—these are our methods. To prevent disease, to relieve suffering and to heal the sick—this is our work. The profession in truth is a sort of guild or brotherhood, any member of which can take up his calling in any part of the world and find brethren whose language and methods and whose aims and ways are identical with his own.

Thirdly, *its progressive character*.—Based on science, medicine has followed and partaken of its fortunes, so that in the great awakening which has made the nineteenth memorable among centuries, the profession received a quickening impulse more powerful than at any period in its history. With the sole exception of the mechanical sciences, no other department of human knowledge has undergone such a profound change—a change so profound that we who have grown up in it have but slight appreciation of its momentous character. And not only in what has been actually accomplished in unravelling the causes of disease, in perfecting methods of prevention and in wholesale relief of suffering, but also in the unloading of old formulæ and in substitution of the scientific spirit of free enquiry for cast-iron dogmas we see a promise of still greater achievement and of a more glorious future.

And lastly, the profession of medicine is distinguished from all others by its *singular beneficence*. It alone does the work of charity in a Jovian and God-like way, dispensing with free hand truly Promethean gifts. There are those who listen to me who have seen three of the most benign endowments

granted to the race since the great Titan stole fire from the heavens. Search the scriptures of human achievement and you cannot parallel in beneficence Anæsthesia, Sanitation, with all that it includes, and Asepsis—a short half-century's contribution towards the practical solution of the problems of human suffering, regarded as eternal and insoluble. We form almost a monopoly or trust in this business. Nobody else comes into active competition with us, certainly not the other learned professions which continue along the old lines. Every few years sees some new conquest, so that we have ceased to wonder. The work of half a dozen men, headed by Laveran, has made waste places of the earth habitable and the wilderness to blossom as the rose. The work of Walter Reed and his associates will probably make yellow fever as scarce in the Spanish Main as is typhus fever with us. There seems to be no limit to the possibilities of scientific medicine, and while philanthropists are turning to it as to the hope of humanity, philosophers see, as in some far-off vision, a science from which may come in the prophetic words of the Son of Sirach, "Peace over all the earth."

Never has the outlook for the profession been brighter. Everywhere the physician is better trained and better equipped than he was twenty-five years ago. Disease is understood more thoroughly, studied more carefully and treated more skillfully. The average sum of human suffering has been reduced in a way to make the angels rejoice. Diseases familiar to our fathers and grandfathers have disappeared, the death rate from others is falling to the vanishing point, and public health measures have lessened the sorrows and brightened the lives of millions. The vagaries and whims, lay and medical, may neither have diminished in number nor lessened in their capacity to distress the faint-hearted who do not appreciate that to the end of time people must imagine vain things, but in the light of the colossal advances of the past fifty years, what are they but flies on the wheels of progress?

So vast, however, and composite has the profession become, that the physiological separation, in which dependent parts



are fitly joined together, tends to become pathological, and while some parts suffer necrosis and degeneration, others, passing the normal limits, become disfiguring and dangerous outgrowths on the body medical. The dangers and evils which threaten harmony among the units, are internal, not external. And yet, in it more than in any other profession, owing to the circumstances of which I have spoken, is complete organic unity possible. Of the many hindrances in the way time would fail me to speak, but there is one aspect of the question to which I would direct your attention in the hope that I may speak a word in season.

Perhaps no sin so easily besets us as a sense of self-satisfied superiority to others. It cannot always be called pride, that master sin, but more often it is an attitude of mind which either leads to bigotry and prejudice or to such a vaunting conceit in the truth of one's own beliefs and positions, that there is no room for tolerance of ways and thoughts which are not as ours are. To avoid some smirch of this vice is beyond human power; we are all dipped in it, some lightly, others deeply grained. Partaking of the nature of uncharitableness, it has not the intensity of envy, hatred and malice, but it shades off in fine degrees from them. It may be a perfectly harmless, even an amusing trait in both nations and individuals, and so well was it depicted in a play, *Soldat Laboureur*, by Scribe, one character in which was an old veteran named Chauvin, whose devotion to Napoleon was so unbounded that the name Chauvinism has become a by-word, expressing a bigoted, intolerant spirit.\* The significance of the word has been widened, and it may be used as a synonym for a certain type of nationalism, for a narrow provincialism or for a petty parochialism. It does not express the blatant loudness of Jingoism, which is of the tongue, while Chauvinism is a condition of the mind, an aspect of character much more subtle and dangerous. The one is more apt to be found in the educated classes, while the other is pandemic in the

\* I was misinformed as to the origin of the word Chauvinism and in the journals the statement is made that it came from the play *La Cocarde Tricolore*. Brewer gives it as I have here stated.

fool multitude—"that numerous piece of monstrosity which, taken asunder, seem men and reasonable creatures of God, but confused together, make but one great beast, and a monstrosity more prodigious than Hydra" (*Religio Medici*). Wherever found, and in whatever form, Chauvinism is a great enemy of progress and of peace and concord among the units. I have not the time, nor if I had, have I the ability to portray this failing in all its varieties; I can but touch upon some of its aspects, national, provincial and parochial.

#### II. NATIONALISM IN MEDICINE.

Nationalism has been the great curse of humanity. In no other shape has the Demon of Ignorance assumed more hideous proportions; to no other obsession do we yield ourselves more readily. For whom do the hosannas ring higher than for the successful butcher of tens of thousands of poor fellows who have been made to pass through the fire to this Moloch of nationalism? A vice of the blood, of the plasm rather, it runs riot in the race, and rages to-day as of yore in spite of the precepts of religion and the practice of democracy. Nor is there any hope of change; the pulpit is dumb, the press fans the flames, literature panders to it and the people love to have it so. Not that all aspects of nationalism are bad. Breathes there a man with soul so dead that it does not glow at the thought of what the men of his blood have done and suffered to make his country what it is? There is room, plenty of room, for proper pride of land and birth. What I inveigh against is a cursed spirit of intolerance, conceived in distrust and bred in ignorance, that makes the mental attitude perennially antagonistic, even bitterly antagonistic to everything foreign, that subordinates everywhere the race to the nation, forgetting the higher claims of human brotherhood.

While medicine is everywhere tinctured with national characteristics, the wider aspects of the profession, to which I have alluded—our common lineage and the community of interests—should always save us from the more vicious aspects of this sin, if it can prevent it altogether. And yet I cannot say, as I wish I could, that we are wholly free from this form of Chau-

vinism. Can we say, as English, French, German or American physicians, that our culture is always cosmopolitan, not national, that our attitude of mind is always as frankly open and friendly to the French as to the English, to the American as to the German, and that we are free at all times and in all places from prejudice, at all times free from a self-satisfied feeling of superiority the one over the other? There has been of late years a closer union of the profession of the different countries through the International Congress and through the international meetings of the special societies; but this is not enough, and the hostile attitude has by no means disappeared. Ignorance is at the root. When a man talks slightly of the position and work of his profession in any country, or when a teacher tells you that he fails to find inspiration in the work of his foreign colleagues, in the words of the Arabian proverb—he is a fool, shun him! Full knowledge, which alone disperses the mists of ignorance, can only be obtained by travel or by a thorough acquaintance with the literature of the different countries. Personal, first-hand intercourse with men of different lands, when the mind is young and plastic, is the best vaccination against the disease. The man who has sat at the feet of Virchow, or has listened to Traube, or Helmholtz, or Cohnheim, can never look with unfriendly eyes at German medicine or German methods. Who ever met with an English or American pupil of Louis or of Charcot, who did not love French medicine, if not for its own sake, for the reverence he bore his great master? Let our young men, particularly those who aspire to teaching positions, go abroad. They can find at home laboratories and hospitals as well equipped as any in the world, but they may find abroad more than they knew they sought—widened sympathies, heightened ideals and something perhaps of a *Welt-cultur* which will remain through life as the best protection against the vice of nationalism.

Next to a personal knowledge of men, a knowledge of the literature of the profession of different countries will do much to counteract intolerance and Chauvinism. The great works

in the department of medicine in which a man is interested, are not so many that he cannot know their contents, though they be in three or four languages. Think of the impetus French medicine gave to the profession in the first half of the last century, of the debt we all owe to German science in the latter half, and of the lesson of the practical application by the English of sanitation and asepsis! It is one of our chief glories and one of the unique features of the profession that, no matter where the work is done in the world, if of any value, it is quickly utilized. Nothing has contributed more to the denationalization of the profession of this continent than, on the one hand, the ready reception of the good men from the old countries who have cast in their lot with us, and, on the other, the influence of our young men who have returned from Europe with sympathies as wide as the profession itself. There is abroad among us a proper spirit of eclecticism, a willingness to take the good wherever found, that augurs well for the future. It helps a man immensely to be a bit of a hero-worshipper, and the stories of the lives of the masters of medicine do much to stimulate our ambition and rouse our sympathies. If the life and work of such men as Bichat and Laennec will not stir the blood of a young man and make him feel proud of France and of Frenchmen, he must be a dull and muddy mettled rascal. In reading the life of Hunter, of Jenner, who thinks of the nationality which is merged and lost in our interest in the man and in his work? In the halcyon days of the Renaissance there was no nationalism in medicine, but a fine catholic spirit made great leaders like Vesalius, Eustachius, Stensen and others at home in every country in Europe. While this is impossible to-day, a great teacher of any country may have a world-wide audience in our journal literature, which has done so much to make medicine cosmopolitan.

### III. PROVINCIALISM IN MEDICINE.

We may congratulate ourselves that the worst aspects of nationalism in medicine are disappearing before the broader culture and the more intimate knowledge brought by ever-

increasing intercourse, yet conditions have favored in English-speaking countries the growth of a very unpleasant sub-variety, which may be called provincialism or sectionalism. In one sense the profession of this continent is singularly homogeneous. A young man may be prepared for his medical course in Louisiana and enter McGill College, or he may enter Dalhousie College, Halifax, from the State of Oregon, and in either case he will not feel strange or among strangers so soon as he has got accustomed to his environment. In collegiate life there is a frequent interchange of teachers and professors between all parts of the country. To better his brains the scholar goes freely where he wishes—to Harvard, McGill, Yale, or Johns Hopkins; there are no restrictions. The various medical societies of the two countries are, without exception, open to the members of the profession at large. The President of the Association of American Physicians this year (Dr. James Stewart), is a resident of this city, which gave also last year, I believe, presidents to two of the special societies. The chief journals are supported by men of all sections. The text-books and manuals are everywhere in common; there is, in fact, a remarkable homogeneity in the English-speaking profession, not only on this continent but throughout the world. Naturally, in widely scattered communities sectionalism—a feeling or conviction that the part is greater than the whole—does exist, but it is diminishing, and one great function of the national associations is to foster a spirit of harmony and brotherhood among the scattered units of these broad lands. But we suffer sadly from a provincialism which has gradually enthralled us, and which sprang originally from an attempt to relieve conditions insupportable in themselves. I have praised the unity of the profession of this continent, in so many respects remarkable, and yet in another respect it is the most heterogeneous ever known. Democracy in full circle touches tyranny, and as Milton remarks, the greatest proclaimers of liberty may become its greatest engrossers (or enslavers). The tyranny of labor unions, of trusts and of an irresponsible press may bear as heavily on the people as imperialism in its worst form.

And, strange irony of fate! the democracy of Provincial and State Boards has imposed in a few years a yoke more grievous than that which afflicts our brethren in Great Britain, which took generations to forge.

The delightful freedom of intercourse of which I spoke, while wide and generous, is limited to intellectual and social life, and on the practical side, not only are genial and courteous facilities lacking, but the bars of a rigid provincialism are put up, fencing each state as with a Chinese wall. In the Dominion of Canada there are eight portals of entry to the profession, in the United States almost as many as there are States, in the United Kingdom nineteen, I believe, but in the latter the license of any one of these bodies entitled a man to registration anywhere in the kingdom. Democracy in full circle has reached on this hemisphere a much worse condition than that in which the conservatism of many generations has entangled the profession of Great Britain. Upon the origin and growth of the Provincial and State Boards I do not propose to touch. The ideal has been reached so far as organization is concerned, when the profession elects its own Parliament, to which is committed the control of all matters relating to the license. The recognition, in some form, of this democratic principle, has been one of the great factors in elevating the standard of medical education, and in a majority of the States of the Union it has secured a minimum period of four years of study, and a State Examination for License to Practice. All this is as it should be. But it is high time that the profession realized the anomaly of eight boards in the Dominion and some scores in the United States. One can condone the iniquity in the latter country more readily than in this, in which the boards have existed for a longer period, and where there has been a greater uniformity in the medical curriculum. After all these years that a young man, a graduate of Toronto and a registered practitioner in Ontario, cannot practice in the Province of Quebec, his own country, without submitting to vexatious penalties of mind and pocket, or that a graduate from Montreal and a registered practitioner of this province cannot go to Manitoba,

his own country again, and take up his life's work without additional payments and penalties, is, I maintain, an outrage; it is provincialism run riot. That this pestiferous condition should exist throughout the various provinces of this Dominion and so many States of the Union, illustrates what I have said of the tyranny of democracy and how great enslavers of liberty its chief proclaimers may be.

That the cure of this vicious state has to be sought in Dominion bills and National examining boards, indicates into what debasing depths of narrow provincialism we have sunk. The solution seems to be so simple, particularly in this country, with its uniformity of methods of teaching and length of curriculum. A generous spirit that will give to local laws a liberal interpretation, that limits its hostility to ignorance and viciousness, that has regard as much or more for the good of the guild as a whole as for the profession of any province—could such a spirit brood over the waters, the raging waves of discord would soon be stilled. With the attitude of mind of the general practitioner in each province rests the solution of the problem. Approach it in a friendly and gracious spirit and the difficulties which seem so hard will melt away. Approach it in a Chauvinistic mood, fully convinced that the superior and unparalleled conditions of your province will be jeopardized by reciprocity or by Federal legislation, and the present antiquated and disgraceful system must await for its removal the awakening of a younger and more intelligent generation.

It would ill become me to pass from this subject—familiar to me from my student days from the interest taken in it by that far-sighted and noble-minded man, Dr. Palmer Howard—it would ill become me, I say, not to pay a tribute of words to Dr. Roddick for the zeal and persistence with which he has labored to promote union in the compound, comminuted fracture of the profession of this Dominion. My feeling on the subject of international, intercolonial and interprovincial registration is this—a man who presents evidence of proper training, who is a registered practitioner in his own country and who brings credentials of good standing at the time of depar-

ture, should be welcomed as a brother, treated as such in any country and registered upon payment of the usual fee. The ungenerous treatment of English physicians in Switzerland, France and Italy, and the chaotic state of internecine warfare existing on this continent, indicates how far a miserable Chauvinism can corrupt the great and gracious ways which should characterize a liberal profession.

Though not germane to the subject, may I be allowed to refer to one other point in connection with the State Boards—a misunderstanding, I believe, of their functions. The profession asks that the man applying for admission to its ranks shall be of good character and fit to practice the science and art of medicine. The latter is easily ascertained if practical men have the place and the equipment for practical examinations. Many of the boards have not kept pace with the times, and the questions set too often show a lack of appreciation of modern methods. This has, perhaps, been unavoidable since, in the appointment of examiners, it has not always been possible to select experts. The truth is, that however well organized and equipped, the State Boards cannot examine properly in the scientific branches, nor is there need to burden the students with additional examinations in anatomy, physiology and chemistry. The Provincial and State Boards have done a great work for medical education on this continent, which they would crown and extend by doing away at once with all theoretical examinations and limiting the tests for the license to a rigid practical examination in medicine, surgery and midwifery, in which all minor subjects could be included.

#### IV. PAROCHIALISM IN MEDICINE.

Of the parochial and more personal aspects of Chauvinism I hesitate to speak; all of us, unwittingly as a rule, illustrate its varieties. The conditions of life which round us and bound us, whether in town or country, in college or institution, give to the most liberal a smack of parochialism, just as surely as we catch the tic of tongue of the land in which we live. The dictum put into the mouth of Ulysses, "I am a part of all that



I have met," expresses the truth of the influence upon us of the social environment, but it is not the whole truth, since the size of the parish, representing the number of points of contact, is of less moment than the mental fibre of the man. Who has not known lives of the greatest freshness and nobility hampered at every turn and bound in chains the most commonplace and sordid, lives which illustrate the liberty and freedom enjoyed by minds innocent and quiet, in spite of stone walls and iron bars. On the other hand, scan the history of progress in the profession, and men the most illiberal and narrow, reeking of the most pernicious type of Chauvinism, have been among the teachers and practitioners in the large cities and great medical centres; so true is it, that the mind is its own place and in itself can make a man independent of his environment.

There are shades and varieties which are by no means offensive. Many excellent features in a man's character may partake of its nature. What, for example, is more proper than the pride which we feel in our teachers, in the university from which we have graduated, in the hospital at which we have been trained? He is a "poor sort" who is free from such feelings, which only manifest a proper loyalty. But it easily degenerates into a base intolerance which looks with disdain on men of other schools and other ways. The pride, too, may be in inverse proportion to the justness of the claims. There is plenty of room for honest and friendly rivalry between schools and hospitals, only a blind Chauvinism puts a man into a hostile and intolerant attitude of mind at the mention of a name. Alumni and friends should remember that indiscriminate praise of institutions or men is apt to rouse the frame of mind illustrated by the ignorant Athenian who, so weary of hearing Aristides always called the Just, very gladly took up the oyster shell for his ostracism, and even asked Aristides himself, whom he did not know, to mark it.

A common type of collegiate Chauvinism is manifest in the narrow spirit too often displayed in filling appointments. The professoriate of the profession, the most mobile column of its great army, should be recruited with the most zealous regard to

fitness, irrespective of local conditions that are apt to influence the selection. Inbreeding is as hurtful to colleges as to cattle. The interchange of men, particularly of young men, is most stimulating, and the complete emancipation of the chairs which has taken place in most of our universities should extend to the medical schools. Nothing, perhaps, has done more to place German medicine in the forefront to-day than a peripatetic professoriate, owing allegiance only to the profession at large, regardless of civic, sometimes, indeed, of national limitations and restrictions. We acknowledge the principle in the case of the scientific chairs, and with increasing frequency act upon it, but an attempt to extend it to other chairs may be the signal for display of rank parochialism.

Another unpleasant manifestation of collegiate Chauvinism is the outcome, perhaps, of the very keen competition which at present exists in scientific circles. Instead of a generous appreciation of the work done in other places, there is a settled hostility and a narrowness of judgment but little in keeping with the true spirit of science. Worse still is the "lock and key" laboratory in which suspicion and distrust reign, and everyone is jealous and fearful lest the other should know of or find out about his work. Thank God! this base and bastard spirit is not much seen, but it is about, and I would earnestly entreat any young man who unwittingly finds himself in a laboratory pervaded with this atmosphere, to get out ere the contagion sinks into his soul.

Chauvinism in the unit, in the general practitioner, is of much more interest and importance. It is amusing to read and hear of the passing of the family physician. There never was a time in our history in which he was so much in evidence, in which he was so prosperous, in which his prospects were so good or his power in the community more potent. The public has even begun to get sentimental over him! He still does the work; the consultants and the specialists do the talking and the writing—and take the fees! By the work, I mean that great mass of routine practice which brings the doctor into every household in the land and makes him, not alone the adviser, but the valued

friend. He is the standard by which we are measured. What he is we are; and the estimate of the profession in the eyes of the public is their estimate of him. A well-trained, sensible doctor is one of the most valuable assets of a community, worth to-day, as in Homer's time, many another man. To make him efficient is our highest ambition as teachers, to save him from evil should be our constant care as a guild. I can only refer here to certain aspects in which he is apt to show a narrow Chauvinism hurtful to himself and to us.

In no single relation of life does the general practitioner show a more illiberal spirit than in the treatment of himself. I do not refer so much to careless habits of living, to lack of routine in work, or to failure to pay due attention to the business side of the profession—sins which so easily beset him—but I would speak of his failure to realize *first*, the need of a life-long progressive personal training, and *secondly*, the danger lest in the stress of practice he sacrifice that most precious of all possessions, his mental independence. Medicine is a most difficult art to acquire. All the college can do is to teach the student principles, based on facts in science, and give him good methods of work. These simply start him in the right direction, they do not make him a good practitioner—that is his own affair. To master the art requires sustained effort, like the bird's flight which depends on the incessant action of the wings but this sustained effort is so hard that many give up the struggle in despair. And yet it is only by persistent intelligent study of disease upon a methodical plan of examination that a man gradually learns to correlate his daily lessons with the facts of his previous experience and with that of his fellows, and so acquires clinical wisdom. Nowadays it is really not a hard matter for a well-trained man to keep abreast of the best work of the day. He need not be very scientific so long as he has a true appreciation of the dependence of his art on science, for, in a way, it is true that a good doctor may have practice and no theory, art and no science. To keep up a familiarity with the use of instruments of precision is an all-important help in his art, and I am profoundly convinced that

as much space should be given to the clinical laboratory as to the dispensary. One great difficulty is that while waiting for the years to bring the inevitable yoke, a young fellow gets stale and loses that practiced familiarity with technique which gives confidence. I wish the older practitioners would remember how important it is to encourage and utilize the young men who settle near them. In every large practice there are a dozen or more cases requiring skilled aid in the diagnosis, and this the general practitioner can have at hand. It is his duty, and failing to do so he acts in a most illiberal and unjust way to himself and to the profession at large. Not only may the older man, if he has soft arteries in his gray cortex, pick up many points from the young fellow, but there is much clinical wisdom afloat in each parish which is now wasted or dies with the old doctor, because he and the young men have never been on friendly terms.

In the fight which we have to wage incessantly against ignorance and quackery among the masses and follies of all sorts among the classes, *diagnosis*, not *drugging*, is our chief weapon of offense. *Lack of systematic personal training in the methods of the recognition of disease leads to the misapplication of remedies, to long courses of treatment when treatment is useless, and so directly to that lack of confidence in our methods which is apt to place us in the eyes of the public on a level with empirics and quacks.*

Few men live lives of more devoted self-sacrifice than the family physician but he may become so completely absorbed in work that leisure is unknown; he has scarce time to eat or to sleep, and, as Dr. Drummond remarks, in one of his poems, "He's the only man, I know me, dont get no holiday." There is danger in this treadmill life lest he lose more than health and time and rest—his intellectual independence. More than most men he feels the tragedy of isolation—that inner isolation so well expressed in Matthew Arnold's line "We mortal millions live *alone*" Even in populous districts the practice of medicine is a lonely road which winds up-hill all the way and a man may easily go astray and never reach the Delectable

mountains unless he early finds those shepherd guides of which Bunyan tells, *Knowledge, Experience, Watchful* and *Sincere*. The circumstances of life mould him into a masterful, self-confident, self-centered man, whose worst faults often partake of his best qualities. The peril is that should he cease to think for himself he becomes a mere automaton, doing a penny-in-the-slot business which places him on a level with the chemist's clerk who can hand out specifics for every ill, from the "pip" to the pox. The salt of life for him is a judicious skepticism, not the coarse, crude form, but the sober sense of honest doubt expressed in the maxim of the sly old Sicilian Epicharmus, "Be sober and distrustful; these are the sinews of the understanding." A great advantage, too, of a skeptical attitude of mind is, as Green the historian remarks, "One is never very surprised or angry to find that one's opponents are in the right." It may keep him from self-deception and from falling into that medical slumber into which so many drop, deep as the theological slumber so lashed by Erasmus, in which a man may write letters, debauch himself, get drunk, and even make money—a slumber so deep at times that no torpedo-touch can waken him.

It may keep the practitioner out of the clutches of the arch enemy of his professional independence—the pernicious literature of our camp-followers, a literature increasing in bulk, in meretricious attractiveness and in impudent audacity. To modern pharmacy we owe much, and to pharmaceutical methods we shall owe much more in the future, but the profession has no more insidious foe than the large borderland pharmaceutical houses. No longer an honored messmate, pharmacy in this form threatens to become a huge parasite, eating the vitals of the body medical. We all know only too well the bastard literature which floods the mail, every page of which illustrates the truth of the axiom, the greater the ignorance the greater the dogmatism. Much of it is advertisements of nostrums foisted on the profession by men who trade on the innocent credulity of the regular physician, quite as much as any quack preys on the gullible public. Even the most respecta-

ble houses are not free from this sin of arrogance and of ignorant dogmatism in their literature. A still more dangerous enemy to the mental virility of the general practitioner, is the "drummer" of the drug house. While many of them are good, sensible fellows, there are others, voluble as Cassio, impudent as Autolycus and senseless as Caliban, who will tell you glibly of the virtues of extract of the coccygeal gland in promoting pineal metabolism, and are ready to express the most emphatic opinions on questions about which the greatest masters of our art are doubtful. No class of men with which we have to deal illustrate more fully that greatest of ignorance—the ignorance which is the conceit that a man knows what he does not know; but the enthrallment of the practitioner by the manufacturing chemist and the revival of a pseudo-scientific poly-pharmacy, are too large questions to be dealt with at the end of an address.

But there is a still greater sacrifice which many of us make, heedlessly and thoughtlessly forgetting that "Man does not live by bread alone. One cannot practice medicine alone and practice it early and late, as so many of us have to do, and hope to escape the malign influences of a routine life. The incessant concentration of thought upon one subject, however interesting, tethers a man's mind in a narrow field. The practitioner needs culture as well as learning. The earliest picture we have in literature of a scientific physician, in our sense of the term, is as a cultured Greek gentleman; and I care not whether the young man labors among the beautiful homes on Sherbrooke Street or in the slums of Caughnawauga, or in some sparsely settled country district, he cannot afford to have learning only. In no profession does culture count for so much as in medicine, and no man needs it more than the general practitioner, working among all sorts and conditions of men, many of whom are influenced quite as much by his general ability, which they can appreciate, as by his learning of what they have no measure. The day has passed for the "practiser of physic" to be like Mr. Robert Levet, Dr. Johnson's friend, "Obscurely wise and coarsely kind." The wider and freer the man's general education the better practi-

tioner is he likely to be, particularly among the higher classes to whom the reassurance and sympathy of a cultivated gentleman of the type of Eryximachus, may mean much more than pills and potions. But what of the men of the type of Mr. Robert Levet, or "Ole Docteur Fiset," whose virtues walk a narrow round, the men who do the hard general practices in the poorer districts of the large cities, in the factory towns and in the widely scattered rough agricultural regions—what, I hear you say has culture to do with him? Everything! It is the bichloride which may prevent the infection and may keep a man sweet and whole amid the most debasing surroundings. Of very little direct value to him in his practice—though the poor have a pretty keen appreciation of a gentleman—it may serve to prevent the degeneration so apt to overtake the overworked practitioner, whose nature is only too prone to be subdued like the dyer's hand to what it works in. If a man does not sell his soul, if he does not part with his birthright of independence for a mess of pottage to the Ishmaelites who harass our borders with their clubs and oppress us with their exactions, if he can only keep *free*, the conditions of practice are nowhere incompatible with St. Paul's noble Christian or Aristotle's true gentleman (Sir Thomas Browne).

Whether a man will treat his professional brethren in a gentlemanly way or in a narrow illiberal spirit is partly a matter of temperament, partly a matter of training. If we had only to deal with one another the difficulties would be slight, but it must be confessed that the practice of medicine among our fellow creatures is often a testy and choleric business. When one has done his best or when a mistake has arisen through lack of special knowledge, but more particularly when, as so often happens, our heart's best sympathies have been engaged, to be misunderstood by the patient and his friends, to have evil motives imputed and to be maligned, is too much for human endurance and justifies a righteous indignation. Women, our greatest friends and our greatest enemies, are the chief sinners, and while one will exhaust the resources of the language in

describing our mistakes and weaknesses, another will laud her pet doctor so indiscriminately that all others come under a sort of oblique condemnation. It is hard to say whether as a whole we do not suffer just as much from the indiscriminate praise. Eut against this evil we are helpless. Far otherwise, when we do not let the heard word die; not to listen is best, though that is not always possible, but silence is always possible, than which we have no better weapon in our armory against evil-speaking, lying and slandering. The bitterness is when the tale is believed and a brother's good name is involved. Then begins the worst form of ill-treatment that the practitioner receives—and at his own hands! He allows the demon of resentment to take possession of his soul, when five minutes frank conversation might have gained a brother. In a small or a large community what more joyful than to see the brethren dwelling together in unity. The bitterness, the rancour, the personal hostility which many of us remember in our younger days has been very largely replaced by a better feeling and while the golden rule is not always, as it should be, our code of ethics, we have certainly become more charitable the one towards the other.

To the senior man in our ranks we look for an example, and in the smaller towns and country districts if he would remember that it is his duty to receive and welcome the young fellow who settles near him, that he should be willing to act as his adviser and refuse to regard him as a rival, he may make a good friend and perhaps gain a brother. In speaking of professional harmony, it is hard to avoid the trite and commonplace, but neglecting the stale old chaps whose ways are set and addressing the young, to whom sympathy and encouragement are so dear, and whose way of life means so much to the profession we love, to them I would give the motto of St. Ambrose. It is told of St. Augustine, after having decided to become a Christian, that when he visited St Ambrose, at dinner with the venerable father and his brethren, one motto above all others on the wall of the refectory caught his eye and heart, "If you cannot speak well of your brother, keep silence!"



With our History, Traditions, Achievements and Hopes, there is little room for Chauvinism in medicine. The open mind, the free spirit of science, the ready acceptance of the best from any and every source, the attitude of rational receptiveness rather than of antagonism to new ideas, the liberal and friendly relationship between different nations and different sections of the same nation, the brotherly feeling which should characterize members of the oldest, most beneficent and universal guild that the race has evolved in its upward progress—these should neutralize the tendencies upon which I have so lightly touched.

I began by speaking of the art of detachment as that rare and precious quality demanded of one who wished to take a philosophical view of the profession as a whole. In another way and in another sense this art may be still more precious. There is possible to each one of us a higher type of intellectual detachment, a sort of separation from the vegetative life of the work-a-day world—always too much with us—which may enable a man to gain a true knowledge of himself and of his relations to his fellows. Once attained, self-deception is impossible, and he may see himself even as he is seen—not always as he would like to be seen—and his own deeds and the deeds of others stand out in their true light. In such an atmosphere pity for himself is so commingled with sympathy and love for others that there is no place left for criticism or for a harsh judgment of his brother. But as Sir Thomas Browne—most liberal of men and most distinguished of general practitioners—so beautifully remarks: “These are Thoughts of things which Thoughts but tenderly touch,” and it may be sufficient to remind this audience, made up of practical men, *that the word of action is stronger than the word of speech.*

CCXXVIX,

239

# ANEMIA SPLENICA.

[SECOND PAPER.]

BY

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## ANEMIA SPLENICA.

[SECOND PAPER.]

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THE question of the existence of a separate malady, anemia splenica is still in what may be called the tentative or inquisitive stage. The proposition which I offer for discussion is, that a special malady does exist, of unknown etiology, characterized by a chronic course, enlargement of the spleen, anemia of a secondary type, a marked tendency to hemorrhage from the stomach, and a liability in the late stages to be associated with jaundice, cirrhosis of the liver, and ascites. The conditions described as primitive splenomegaly and Banti's disease are initial and terminal stages, respectively, of this malady. The history of the question I need not discuss, as it is very fully given in the papers of Sippy<sup>1</sup> and of Wentworth.<sup>2</sup> Nor is it necessary to discuss the possible connection of the malady with Hodgkin's disease or pseudoleukemia, with which a majority of observers rightly consider it has nothing whatever to do. In January, 1900, I reported a series of cases.<sup>3</sup> In the present paper I shall give (1) a few additional cases and the subsequent history of several of those previously reported; (2) an analysis of a series of cases of anemia with enlarged spleen, furnished by members of the Association, and (3) a summary of the clinical features of the disease.

### I.

The subsequent history of some of the cases in my previous paper may first be given :

<sup>1</sup> American Journal of the Medical Sciences, November, 1899.

<sup>2</sup> Boston Medical and Surgical Journal, 1900.

<sup>3</sup> American Journal of the Medical Sciences, 1900, vol. cxix.

CASE X.—A man, aged thirty-nine years, was first seen June 15, 1898, with moderate enlargement of the spleen, moderate corpuscular anemia, low hemoglobin, and marked pigmentation. He did not know for exactly how long he had had the anemia or the enlarged spleen. I heard from him March 27, 1902. He had been in fairly good health, except that in March, 1901, he had three hemorrhages from the stomach, which, he says, nearly killed him. He was unconscious and in a state of torpor for two weeks. Following this, he had ascites, and had to be tapped. At the date of writing he said he had recovered sufficiently to be able to do his work.

CASE XIV.—A man, aged thirty-five years; a very typical instance, with a greatly enlarged spleen, characteristic blood condition, slight pigmentation of the skin, attacks of hematuria, with slight jaundice. He was last seen on April 16, 1900. The spleen was enlarged; he had been jaundiced for two weeks; edge of liver could be felt 6 cm. from the ensiform cartilage; the right lobe only felt on deep inspiration. He has been under Dr. Thayer's care, who reports this spring that he is still anemic, but able to be at work.

CASE XIII.—Mrs. C. was of exceptional interest, as there was a doubt as to whether the case was not one of pernicious anemia, with greatly enlarged spleen. She did well in the hospital, the spleen reduced in size in a remarkable way. She left the hospital November 20, 1899. She remained well during 1900. The spleen was not below the costal border. She was readmitted in April, 1901, in a condition of the most profound and progressive anemia, in which she died on the 26th. The blood had all the features of a pernicious anemia. The spleen weighed only 400 grams, and the pulp was soft and flabby. There was fatty degeneration of the heart. The liver weighed 1500 grams. The bone-marrow was of a deep gray-red color. The blood condition on her first admission (see first paper), the remarkable improvement with rest and arsenic, the complete disappearance of the symptoms, and the enlargement of the spleen, the relapse, with profound and fatal anemia, leave no doubt, I think, that this belongs to a group of cases of pernicious anemia with enlarged spleen, and does not come in the category of chronic cases here considered.

CASE V.—Male, aged thirty-eight years; seen first November 10, 1898. For nearly twelve years he had had recurring hemorrhages. He returned to the hospital in January, 1900. Dr. Cushing removed the spleen. He did well for ten days, and then had a severe, uncontrollable hemorrhage from the stomach, which proved fatal. On postmortem there were found (1) a practically normal condition of the viscera; (2) moderate cirrhosis of the liver, and (3) esophageal varices, from one of which the last bleeding had occurred. The spleen showed a condition of chronic hyperplasia. In this extraordinary case the enlarged spleen had existed for fourteen years, and he had had throughout the period recurrent hemorrhages.

#### NEW CASES.

CASE XVI. *Clinical summary: Enlarged spleen and marked pallor for nine years; four severe attacks of hematemesis; removal of spleen; uncontrollable*

*hemorrhage; death.*<sup>1</sup>—Frederick G., aged thirty years; referred to me by Dr. W. W. Johnston, January 14, 1901. The patient had lived in Washington all his life. When a boy at school he had chills and fever. He has had no attacks within ten years. For years he has been pale. He has, however, been able to attend to his work, and has been active and energetic. He is married. In 1892 it was first noticed that he had an enlargement in the abdomen. This was recognized by Dr. Johnston and others to be the spleen. It had caused him no inconvenience except for an occasional attack of pain in the side. He has had four severe attacks of hemorrhage from the stomach, the first in November, 1896, the second in November, 1897, the third in August, 1900, and the fourth on December 17, 1901, from which he is just recovering. Dark and bloody stools were often noticed after the attacks. They were of great severity. In the one in November, 1897, he had repeated hemorrhages, and very nearly died. He did not recover for nearly five months. Apart from the hemorrhages, his health, on the whole, has been good. The appetite and digestion had been normal and the bowels regular. He has never had a high color, but has had a curious gray pallor, with slight diffuse pigmentation, which has increased of late. His average weight has been 133 pounds. The spleen was enormous, almost filling the left half of the abdomen. The liver was not enlarged.

He was urged by Dr. W. W. Johnston to have the spleen removed, in which opinion I concurred, and he was admitted to the hospital for preparatory treatment. The blood showed red blood corpuscles, 3,300,000; white blood corpuscles, 2400; hemoglobin, 30 per cent.; moderate poikilocytosis; no nucleated redds. Between February 14th and April 14th he gained thirty pounds in weight! The blood improved, rising gradually until on April 5th the red blood corpuscles were 5,200,000 and the hemoglobin 75 per cent. On April 15th Dr. Halsted operated. After ligature of the splenic vessels great difficulty was met with in controlling the hemorrhage from the large veins passing to the stomach—*vasa brevia*—some of which were as large as the little finger. He lost so much blood that death took place a few hours after the operation. There was no autopsy. The liver, seen at the time of the operation, was smooth, and did not look cirrhotic.

CASE XVII. *Clinical summary: History of malarial fever eighteen years ago; tumor of left side of eleven years' duration; in 1898 an attack of severe anemia, with ascites; recovery; in 1900 a second attack, with jaundice, anemia, and ascites; gradual recovery; in 1901 a third attack, with jaundice, ascites, profound anemia; recovery.*—Minnie W., aged forty years, was first seen in 1898, when she was admitted to Ward O on August 3d (Med. No. 8864), with great swelling of the abdomen and anemia. She had been a healthy woman, married, three children—the youngest eighteen years old. She has always lived in Baltimore. In 1890 she had chills and fever through the summer, and they recurred for several years. She has noticed a hard mass in the left

<sup>1</sup> The surgical and pathological aspects of Cases IV., V., and XVI will be considered in a separate paper by Drs. Cushing and Macallum.

side of the abdomen since 1890. On the first admission, August 3d, there was no jaundice. She had a greatly distended abdomen, edema of the ankles, and an extreme anemia. The red blood corpuscles were 2,500,000; hemoglobin, 47 per cent.; white blood corpuscles, 1500. There were no malarial parasites; no pigment in the blood. The dropsy subsided rapidly, and it was then found that the spleen reached 18 cm. from the costal margin. A differential count of 525 leukocytes gave small mononuclears 21, large mononuclears 5, polymorphonuclears 67, eosinophiles 2.6, transitionals 1.9. Two nucleated reds were seen. With iron, good food, and open-air treatment (eight to ten hours daily) she improved rapidly, and on September 30th she left the hospital with the condition of the spleen unchanged, but with the red blood corpuscles at 3,500,000; white blood corpuscles, 2400; hemoglobin, 53 per cent. The edge of the liver could be felt 3.5 cm. below the costal border, "soft and slightly tender."

Second admission August 10, 1900, with jaundice, anemia, and ascites. The jaundice had come on about three weeks previously. She has been pretty well for two years, and had been at work. The abdomen measured 92 cm. She was anemic. Red blood corpuscles, 3,800,000; white blood corpuscles, 2000; hemoglobin, 65 per cent. The ascites quickly disappeared and the jaundice lessened. She had two transient attacks of fever. There were no parasites in the blood, and no pigment. She left the hospital November 10, with red blood corpuscles at 4,600,000; white blood corpuscles, 7000; hemoglobin, 70 per cent. The liver reached 3 cm. below the costal margin in the nipple line, and was very tender.

Third admission September 30, 1901, with jaundice, moderate ascites, and anemia. She had kept pretty well since last note. Two weeks before admission she had nausea and vomiting and a chill. With the exception of the deeper jaundice her condition was a good deal better than at the last admission. The abdomen was large and contained a good deal of fluid. The spleen reached 5 cm. below the navel, and the edge was 18 cm. from the costal border. Red blood corpuscles, 3,800,000; white blood corpuscles, 4200; hemoglobin, 58 per cent. As the fluid reduced the liver could be felt just below the costal border in the nipple line, and I noted on October 4th the "edge can be distinctly felt; it is very hard and feels cirrhotic." The jaundice was marked, and there were dilated venules on the face. She again improved, and on October 26th the red blood corpuscles were 4,700,000; white blood corpuscles, 3000; hemoglobin, 62 per cent. The spleen was unchanged. On October 5th a differential count of 500 leukocytes gave, polymorphonuclears 80.6, small mononuclears 9, large mononuclears 5.8, transitionals 3.4, eosinophiles 1.2.

CASE XVIII. *Clinical summary: Enlarged spleen first noticed fifteen years ago; attacks of abdominal pains; marked pigmentation; slight enlargement of the liver; jaundice and secondary anemia; slight fever; marked improvement.*—A. L. W., aged thirty-three years; admitted December 27, 1901 (Med. No. 13,848), with jaundice and slight fever. Inflammatory rheumatism fifteen years ago; ulcers on the right leg afterward. Sixteen or seventeen years ago

had chills and fever. He went to Mexico, and while there was jaundiced and sickly for eight or nine months. He returned from Mexico fifteen years ago, and the doctors told him he had an enlarged spleen, which has persisted ever since. He has had gonorrhoea, but has not had syphilis. He has been a moderate drinker. He does not think the spleen has increased much in size since it was first noticed. He has been pale for years; he has had occasional attacks of pain, and often a sense of discomfort after eating. For some time he has been losing in weight and feeling badly. His normal weight is 145 pounds; on admission it was 127 pounds. He has lately had cough, with fever and sweats.

On admission Dr. McCrae made the following note:

"His color is striking; he is exceedingly sallow. There are numerous areas of pigmentation over the face and forehead; there is definite jaundice. The patient is sweating profusely; tongue slightly coated; gums and mucous membranes rather pale.

"*Thorax.* Well formed, rather rounded. Expansion good; seems equal. Percussion note clear throughout; everywhere hyperresonant. Breath sounds seem clear throughout.

"*Heart.* There is rather a diffuse impulse. Point of maximum impulse, fifth left interspace, 155 cm. from mid-sternal line. Cardiac dullness begins at third right, opposite fourth interspace; extends 3 cm. to right and 11 cm. to left of mid-sternal line. Impulse well felt; no thrill. At apex the first sound completely replaced by soft murmur, carried to axilla. In fourth interspace there is a suggestion of a sound. On passing upward the systolic bruit increases in intensity, reaching a maximum in aortic and pulmonary areas. It can be heard on both sides out to about the nipple line; is loudly heard over the vessels of the neck. In the third left interspace close to the sternum the systolic murmur has a very rough quality. The second sound everywhere is soft. No definite diastolic murmur is made out. In aortic area has a murmurish quality. Pulse 24 to quarter, of fair tension, regular, of suggestive collapsing quality; there is a quick rise. Pulse is not that of aortic stenosis.

"*Abdomen.* Slightly full; no special visible prominence; no rose spots; walls fairly soft. Spleen very readily palpable; extends 12 cm. from the left costal margin, and comes to within 4 cm. of the navel and 5 cm. of the left anterior superior spine. It is hard, slightly tender, and slightly movable. Liver apparently also enlarged; in median line the edge being 5 cm. above the navel, and in the right nipple line 4 cm. below the costal margin. In the right nipple line dullness begins at the fifth right and extends 12 cm.; in the mid-axillary line dullness begins at the fifth interspace. The patient's body not specially pigmented, though dark; no special pigmentation about the nipples.

"Hemoglobin, 53 per cent.; red blood corpuscles, 3,026,000; white blood corpuscles, 6875. Differential count; Jenner stain. Red cells show marked poverty in hemoglobin, marked variation in size, there being many microcytes, no macrocytes, some poikilocytosis. In counting 536 cells no nucle-

ated reds seen. Count in general shows relative increase in mononuclear elements; polymorphonuclears, 55.96; large mononuclears, 29.85; small mononuclears, 11.19; transitionals, 2.23; eosinophiles, 0.37; mastzellen, 0.37."

For five days his temperature ranged between 100° and 101°, and he had a soft friction murmur in the left axilla. He had a small quantity of sputum, which was repeatedly examined for tubercle bacilli, with negative results. He gradually improved, the jaundice lessened, but there seemed to be an increase in the general pigmentation of the skin. By February 1st the patient was very much better. On the 2d, red blood corpuscles, 3,600,000; hemoglobin, 65 per cent.

He was discharged February 7th, still looking rather pigmented, but free from fever, and having gained six pounds in weight. The urine contained bile at first, but was otherwise normal. The spleen was unchanged.

## II. INCIDENCE OF ENLARGED SPLEEN WITH ANEMIA.

While the combination seems to be not infrequent, yet cases reported in the literature as splenic anemia are rare. Rolleston, in his recent paper,<sup>1</sup> states that he has been able to collect only thirty-seven cases. In February last I sent a circular letter to members of the Association asking for information on the subject, and for notes of unpublished cases. I am indebted to twenty-four physicians for notes of forty-five cases, which I have grouped as best I could. It was not always possible to classify the cases properly, as in some no information was given as to the duration of the disease.

### 1. *Acute Anemia, under One Year's Duration, with Enlarged Spleen*, 12 cases.<sup>2</sup>

In none of the cases was there a history of malaria, the duration of the illness ranged from eleven weeks to twelve months. The size of the spleen was not always stated. In the cases of A. O. J. Kelly and J. C. Wilson it was only two fingers' breadth below the costal border; but in the cases of Cary, Edwards, Blackader, and Rotch the organ was greatly enlarged. In eight of the cases the red blood corpuscles were below 2½ millions per cubic millimeter. In the cases of Musser and Blackader the count sank below one million per cubic millimeter. The hemoglobin was relatively low in six cases, of normal proportion in two, plus in two, and not given in two cases.

The leucocytes were under 6000 per centimeters in eight cases; in three of these, below 2500. In two they were about normal, and in

<sup>1</sup> Clinical Journal, 1902.

<sup>2</sup> Abstracts will be found in the appendix.



only two above normal, in one 7000 per cubic millimeter, and in one 20,000 per cubic millimeter.

In some of these cases the history, course, and blood condition suggest progressive pernicious anemia. Case XIII., reported in my first paper, had, as I then remarked, many of the features of this disease. She returned (as noted in the early part of this article), and died with all the features of a pernicious anemia, plus great enlargement of the spleen. This group is of unusual interest, and brings up the question of the frequency of enlarged spleen in pernicious anemia. Hunter<sup>1</sup> says "in a certain number of instances the spleen has been found enlarged, this condition being even recognizable during life." He mentions a number of cases reported by different observers; the largest mentioned "was in a case reported by Wilks (500 grams). In four cases of his own, the spleen weights were 19 ounces, 11 ounces, 10 ounces, and 13 ounces." In a great majority of the cases the spleen is either described as normal or no mention is made of the condition at all. Cabot<sup>2</sup> notes enlargement in 13 of 110 cases; Billings<sup>3</sup> in 5 of 20 cases. Among 40 cases from my wards, reported by McCrae<sup>4</sup> "the spleen was felt in only 6 cases, and in none of them was the enlargement at all marked, it being noted that 'the spleen was just felt.'"

2. *Chronic Anemia, with Enlarged Spleen*, 26 cases.

Eighteen of these were in males. The duration of the disease is most interesting; eleven years, 1 case; nine, 1; eight, 1; seven, 3; six, 2; five, 1; three, 2; four, 1; two, 3; between one and two years, 3; in 1 doubtful, "many years." In 9 of the cases the disease had lasted for more than five years; in 7 the duration was unknown. Hematemesis occurred in 9 cases, jaundice in 4 cases, ascites in 5, and in 7 cases the liver was enlarged. Several of the cases had been regarded as Banti's disease, or the terminal stage of anemia splenica.

In only 7 of the cases were the red blood corpuscles below 2,500,-000 per cubic millimeter. In 22 cases the hemoglobin percentage was relatively low, in 3 it was normal, and in 1 it was not given. In 13 cases the leukocytes were below 5000 per cubic millimeter. In a

<sup>1</sup> Pernicious Anemia (monograph), 1901.

<sup>2</sup> American Journal of the Medical Sciences, 1900, p. 1.

<sup>4</sup> Journal of the American Medical Association, 1902, 1.

<sup>3</sup> Ibid.

case of Vickery's they were only 650 to 700 per cubic millimeter, and in Peabody's case they were only 800 per cubic millimeter, and the highest of several counts in this case was 1400. In 3 cases they were above 7000 per cubic millimeter, and in 9 cases they ranged from 5000 to 7000 per cubic millimeter.

3. *Simple Splenomegaly*, 2 cases.

Two cases were returned as simple or primitive splenomegaly. In Dr. Herrick's case the normal red count and the relatively low hemoglobin, with a history of ill-defined symptoms for five years, suggest the early period of splenic anemia. In Drs. Blackader and Martin's case the enlarged spleen was found after an accident in which the man was knocked breathless. He vomited dark material. The spleen has gradually increased in size. There is practically no anemia.

There were three cases difficult to classify, and in two cases other diseases were presented—cirrhosis of the liver and sarcoma of the spleen. (See Appendix.)

### III. ANEMIA SPLENICA CHRONICA.

DEFINITION. *A chronic affection, probably an intoxication of unknown origin, characterized by a progressive enlargement of the spleen which cannot be correlated with any known cause, as malaria, leukemia, syphilis, cirrhosis of the liver, etc. (primary splenomegaly); anemia of a secondary or chlorotic type (leukopenia), a marked tendency to hemorrhage, particularly from the stomach; and in many cases a terminal stage, with cirrhosis of the liver, jaundice, and ascites (Banti's disease).* It seems probable that the conditions separately described in the literature as primitive splenomegaly, splenic anemia, splenomegalic cirrhosis of the liver, or Banti's disease are stages of one and the same malady. Let me first give a brief analysis of the cases which have been under my care which conform to the above definition. I have cut out Cases I. and II. of my first series, as they were seen long ago (1879), though both patients had enlarged spleen and hematemesis; but I am uncertain about the duration and etiology. Case XIII. I have also discarded as probably progressive pernicious anemia with greatly enlarged spleen. This leaves a group of fifteen cases, seen within the past ten years; all have been carefully studied, and the full report of the blood condition will be found

in the *Edinburgh Medical Journal*, May, 1899, and in the *American Journal of the Medical Sciences*, January, 1900, and in the present paper.

## ABSTRACT OF FIFTEEN CASES.

CASE III.—Male, aged thirty-five years; duration twelve years. Enormous spleen; recurring attacks of hematemesis and melena; pigmentation of the skin; death after an attack; no cirrhosis of the liver. Blood count lost.

CASE IV.—Male, aged thirty-three years; duration ten years. Recurring attacks of hematemesis and melena; enormous spleen; pigmentation of the skin; removal of the spleen; liver not cirrhotic; recovery. Red blood corpuscles, 3,000,000; hemoglobin, 25 per cent.; leukocytes, 2800.

CASE V.—Male, aged forty years; duration thirteen years. Recurring attacks of hematemesis; occasional melena; enormous spleen; grayish-brown pigmentation of the skin; slight ascites; removal of the spleen; liver moderately cirrhotic; death from rupture of esophageal varix. Red blood corpuscles, 4,000,000; hemoglobin, 30 per cent.; leukocytes, 6500.

CASE VI.—Male, aged twenty years; duration eleven years. Onset with hematemesis; pigmentation of the skin; spleen very large. Red blood corpuscles, 2,187,000; leukocytes, 12,497.

CASE VII.—Male, aged forty years; duration two years. Enormous spleen; recurring cutaneous hemorrhages; remarkable pigmentation of the skin. Red blood corpuscles, 4,816,000; hemoglobin, 55 per cent.; leukocytes, 5000.

CASE VIII.—Female, aged fifty-six years; duration three years. Spleen very large; no hemorrhages; no pigmentation. Red blood corpuscles, 3,600,000; hemoglobin, 60 per cent.; leukocytes, 3000.

CASE IX.—Male, aged fifty-eight years; duration six years. Spleen very large; recurring ascites; no hemorrhage; no pigmentation; enormous ascites; no cirrhosis of liver; death. Red blood corpuscles, 4,788,000; hemoglobin, 60 per cent.; leukocytes, 5200.

CASE X.—Male, aged thirty-nine years; duration doubtful—more than three years; hematemesis, melanoderma, and leukoderma; spleen greatly enlarged. Red blood corpuscles, 4,128,000; hemoglobin, 45 per cent.; leukocytes, 2800.

CASE XI.—Male, aged fifty-seven years; duration two years. Spleen greatly enlarged; no hemorrhages. Red blood corpuscles, 2,500,000; hemoglobin, 37 per cent.; leukocytes, 3000.

CASE XII.—Male, aged forty years; duration (now) four years. Greatly enlarged spleen; recurring hematemesis; ascites; recovery. Red blood corpuscles, 4,208,000; hemoglobin, 45 per cent.; leukocytes, 4000.

CASE XIV.—Male, aged thirty-five years; duration (now) four years. Hemorrhage from kidneys; no malaria; greatly enlarged spleen; marked pigmentation of the skin. Red blood corpuscles, 3,856,000; hemoglobin, 55 per cent.; leukocytes, 4500.

CASE XV.—Male, aged forty-three years; duration eight years. Very large spleen; recurring hematemesis. Red blood corpuscles, 4,270,000; hemoglobin, 45 per cent.; leukocytes, 2500.

CASE XVI.—Male, aged thirty years; duration ten years. Recurring hematemesis; grayish-brown pigmentation of the skin; removal of spleen; no cirrhosis of liver; death. Red blood corpuscles, 3,300,000; hemoglobin, 30 per cent.; leukocytes, 2400.

CASE XVII.—Female, aged forty years; duration ten years. Recurring attacks of acute anemia, with jaundice and ascites; enormous spleen; no hemorrhages. Red blood corpuscles, 3,500,000; hemoglobin, 53 per cent.; leukocytes, 2400.

CASE XVIII.—Male, aged thirty-three years. Duration of enlarged spleen fifteen years; organ greatly enlarged and liver enlarged; slight jaundice; marked pigmentation of the skin; no hemorrhages. Red blood corpuscles, 3,326,000; hemoglobin, 53 per cent.; leukocytes, 6875.

As in the cases collected by Rolleston, the *sex* in my series shows a great prevalence among males—thirteen to two. All of the cases were in adults, chiefly in young adults; in one only (Case VI.) had the disease begun in childhood.

There is nothing in the *etiology* of the cases to throw any light on the causation. The question of *malaria* naturally arises, considering the locality in which I practise. There was a history of malaria in five cases. In three of these (aged 40, 56, and 30 years) the infection was in childhood. In only two (Cases XVII. and XVIII.) had the infection occurred in adult life—one twelve years before onset of illness, the other eighteen years before. The locality has nothing to do with the number of cases observed; only five cases came from Maryland, four of which were from the city of Baltimore. The others came from New York, Pennsylvania, Illinois, Massachusetts, West Virginia, Virginia, North Carolina, South Carolina, Canada, and Jamaica.

*Heredity* has played no part in my cases, but Brill<sup>1</sup> has reported three cases in one family. One girl died, aged nine years, with enlargement of the spleen. The description of the other two cases leaves no doubt, I think, that they belong to the disease under discussion. Case III., with the peculiar pigmentation, the tendency to hemorrhages, and the type of anemia present, corresponds exactly with chronic splenic anemia. Bovaird<sup>2</sup> has described a similar condition in

<sup>1</sup> American Journal of the Medical Sciences, April, 1901.

<sup>2</sup> *Ibid.*, October, 1900.

two sisters; a sister of Collier's<sup>1</sup> patient died with enlarged spleen, while C. Wilson<sup>2</sup> has reported a family in which in three generations six members had enlarged spleen. It is quite possible that all of these cases belong in the category of chronic splenic anemia.

SYMPTOMATOLOGY. 1. *The Remarkable Duration of the Disease.* Among disorders of the blood or blood-making organs anemia splenica is characterized by an extraordinary chronicity. In some of the cases in my series the disease had lasted more than twelve years. Rolleston reports a case of twelve years' duration, beginning in the eleventh year, the condition remaining throughout very much the same, except that during the last three years of life there was recurring hematemesis. Senator<sup>3</sup> and others have noted this peculiarity. An extraordinary illustration I saw last winter in New York with Dr. Walter James, who will report the case in full. The patient had had an enlarged spleen, with anemia of varying intensity, for at least twenty-five years. He died at last in a profound anemia, with ascites. Gaucher's case of splenic enlargement existed for twenty-five years. In my series of fifteen cases, in seven the duration of the disease was more than ten years, and in eleven, more than four years.

In ten of the twenty-six cases of chronic splenic enlargement, with anemia, under the care of my colleagues in the Association, the disease had lasted more than five years. It is strange how slight may be the inconvenience, even with a spleen extending below the navel. A majority of my patients were active business men, and, as in Cases III. and XVI., the chief trouble was the recurring hematemesis and the protracted up-hill convalescence after the attacks.

2. *The Splenomegaly.* There are many conditions in which the spleen may be enlarged for months or years, sometimes without any apparent injury to health. I have had a group of cases of moderate enlargement of the spleen in women, without obvious cause and without marked anemia, in which the discomfort of the movable organ was the chief complaint. Two of these cases have remained well for years, having had the organ "packed" into position. Among the dark-skinned emigrants from southern and eastern Europe and from Armenia moderate enlargement of the spleen is not uncommon

<sup>1</sup> Pathological Society Transactions, vol. xlv.

<sup>2</sup> Clinical Society Transactions, vol. xxiii.

<sup>3</sup> Deutsches Archiv f. klin. Med., 1901.

—a point noted by Cabot in the discussion of this paper. It may be a manifestation of latent paludism.

In the very large group of cases of splenomegaly, with secondary anemia :

(a) The cause is usually apparent—malaria, tuberculosis, rickets, or syphilis—particularly in children, in whom any state of malnutrition, if protracted, may be associated with enlargement of the spleen.

(b) The anemia and splenomegaly usually yield to appropriate treatment ; at all events there is not the remarkable chronicity.

(c) The spleen in this group rarely reaches the colossal size seen in chronic splenic anemia.

(d) The sequences so characteristic of splenic anemia are not seen.

(e) While the blood shows the features of a secondary anemia, there is rarely the exaggerated chlorotic type, and leukocytosis is more common than leukopenia.

There are many gaps in our knowledge, and it is difficult to assign to individual cases their proper places. It may not always be possible to speak definitely. For example, in the case of James P., aged four years, sent by Dr. Rotch (No. 12, acute cases), with a large spleen and a marked anemia, with leukopenia of two months' duration, where shall we classify it ? or a case, sent by Cabot, of a child aged seven months, duration of illness not stated, with red blood corpuscles, 3,200,000 ; hemoglobin, 25 per cent. ; leukocytes, 36,800, and nucleated red blood corpuscles 6190 per cubic millimeter. The anemia is more or less acute, the splenomegaly moderate, and the blood condition may be very variable. On the other hand, many of the cases in children conform to the definition above given of chronic splenic anemia. Another case of Rotch's (No. 18 in chronic series) : at the age of three years the spleen and liver were large, the anemia was marked ; nine years later the spleen was enormous, the liver still enlarged, the anemia pronounced, and the skin was pigmented.

The special feature of the enlarged spleen in chronic splenic anemia is the size, which is unequalled in any other disease except, perhaps, leukemia. The abdomen may be enormously distended, and the organ may not only occupy the left side, but may curve upon itself and pass across to the right iliac fossa and the right flank. The notches may be directed upward, as in one of Collier's cases which I saw with him at the Radcliffe Infirmary, Oxford, in which the

border of the spleen and the notches were between the navel and the ensiform cartilage. The average weight in twelve cases collected by Rolleston was sixty-one ounces. In Bovaird's case the organ weighed twelve and one-half pounds. The mechanical discomfort may be considerable, though as a rule there is very little pain unless perisplenitis be present, in which case a friction may be felt or heard. In Rolleston's case a *bruit de diable* was heard over the organ.

Many of the cases reported in the literature as primary or primitive splenomegaly come under the definition of the disease as given above. In the chronicity (eleven and fifteen years and thirteen years) and in the general features the cases of Brill and of Bovaird conform to chronic splenic anemia.

3. *Hematemesis* is a remarkable feature of the disease. Eight of my patients had attacks of vomiting of blood. In Cases I. and II. (which I have discarded from my series as seen in 1879 and deficient in certain details) the hemorrhages were most profuse. I have never seen such enormous losses of blood as in Case II. In the nineteen cases communicated by members of the Association, hematemesis occurred in seven. In a large proportion of the cases the hemorrhage is due to conditions associated with the enlarged spleen, not to accompanying cirrhosis of the liver. In Cases IV. and XVI. of my series the spleen was removed, and at the operation the liver was seen to be normal. In Case III. it was not cirrhotic postmortem. It is easy to understand this splenic origin, as 40 per cent. of the blood from the stomach passes by the vasa brevia to the splenic veins. (Mall and Krauss.) Watson gave a mechanical explanation (which I have quoted in my first paper) of the bleeding. The source of the blood may be (*a*) a general diapedesis from the gastric mucosa. This is doubted by some writers, but on several occasions I have not been able to find, after a most careful search, either minute erosions of the mucosa or ruptured veins in the esophagus, and there seems to be no other explanation; (*b*) small erosions of the gastric mucosa; (*c*) rupture of a varicose vein of the esophageal plexus, which was the cause of death in Case V. after removal of the spleen. The recurring profuse bleedings may very often be from this source, considering the intimate relation between the veins of the fundus of the stomach supplying the vasa brevia and those of the cardiac orifice and the esophagus; (*d*) Rolleston suggests that the large wandering spleen

may pull on the gastrosplenic omentum and give rise to torsion of the veins, or cause a kink in the splenic vein, and so induce intense venous engorgement of the stomach.

With the exception of the chronic hemorrhagic form of the peptic ulcer there is no known condition in which hematemesis may occur for so many years. In Preble's<sup>1</sup> study of gastrointestinal hemorrhages in cirrhosis of the liver, in five of the thirty-five cases in which esophageal varices were found the hemorrhages had occurred at intervals varying from a few months to five years.

Hemorrhage from other sources is less frequent. Epistaxis may recur at intervals; retinal hemorrhages, bleeding gums, menorrhagia, and hematuria have been recorded. Purpuric attacks, as in Case VII. of my series, may occur.

4. *Anemia.* Even in well-defined cases the anemia may be slight. As in locomotor ataxia there may be no ataxia, so in anemia splenica there may be no corpuscular anemia—a point which may be urged against the use of these names. Take, for example, Case XVI., here reported. Prior to the operation there was no anemia of corpuscles, which were 5,200,000 per cubic millimeter, but he was still pallid and had only 75 per cent. of hemoglobin, and there was not the slightest change in the spleen; yet he presented a most typical picture, and anyone who had seen Cases III., IV., and V. could have recognized at a glance that the case belonged, with them, to a separate clinical group, quite as definite as leukemia or Addison's disease. Very few of the patients will be found to have a normal amount of hemoglobin; they are constantly "off color."

There is nothing peculiar or distinctive in the anemia, which is of the secondary or chlorotic type.

(a) *The corpuscular anemia* is of a moderate grade. Of the fifteen cases of my series the average was 3,425,000 per cubic millimeter. The lowest blood count was 2,187,000; the highest count was 5,200,000, in the patient just referred to.

(b) *The low hemoglobin* is an interesting feature and rather more striking than in other secondary anemias. It is certainly rare, except in chlorosis, to find a patient with obvious anemia and a blood count (corpuscles) normal or even, as in Case XVI., above normal. The average of thirteen hemoglobin counts was 47 per cent.

<sup>1</sup> American Journal of the Medical Sciences, January, 1901.



(c) *Leukocytes*. Immediately after a profuse hemorrhage, or in a terminal affair, there may be a leukocytosis, but, as a rule, there is a leukopenia. Of 14 cases the average leukocyte count was 4520 per cubic millimeter. If we leave out Case VI., admitted shortly after a severe bleeding, with a leukocytosis of 12,500, the average of 13 cases—in one of the series (III.) the blood count was mislaid—was 3850 per cubic millimeter.

In the extreme anemia which may come on at the close there may be marked poikilocytosis, with nucleated red corpuscles, etc. There has been nothing characteristic in the differential count of the leukocytes.

5. *Pigmentation of the skin* is a common event in the very chronic forms, having been present in eight of my cases. A majority of these presented the usual bronzing of the skin, diffuse in character, and resembling that seen in Addison's disease, though rarely so intense. In some it was a curious steel-gray staining of the skin, of a very peculiar character, suggesting rather argyria than the usual form of melanoderma. In some cases it was patchy and associated with areas of leukoderma.

Pigmentation of the skin seems to be a common feature in the long-standing cases, and has been commented upon by Brill, Bovaird, Frederick Taylor, and others. It is of special interest in connection with the melanoderma of hemochromatosis (bronzed diabetes) and of Hanot's cirrhosis. In Case XIV. of the series a portion of the skin did not show the ochre-brown pigment such as is present in hemochromatosis. It is to be borne in mind that arsenic is used largely in these cases, and it is quite possible that to it in part may have been due the dark color of the skin. In no case were there keratoses.

6. *Hepatic Features*. The mutual relations of diseases of the spleen and liver are well illustrated in splenic anemia. While a majority of the cases present no symptoms of disturbed action of the liver, and in a few the occurrence of ascites, even when the liver is normal, suggests cirrhosis, there is a third group in which the hepatic features so predominate that cirrhosis of the liver is at once suspected. Hematemesis is a splenic, not an hepatic, feature of the disease. Cases IV. and XVI., in which the hemorrhages had occurred for many years, presented at the time of operation a normal liver. Case IV. was alive and well (having had no recurrence of the hemorrhage) nearly three years subsequently. While hemorrhage from the stomach may be a

very early, indeed the very first, symptom of cirrhosis of the liver, it is most unusual to have recurrences over long periods, as in the cases recorded in this series. Even in the more chronic type of cirrhosis—Hanot's variety—hematemesis is not so special a feature as in splenic anemia. In the later stages of the disease the cirrhosis of the liver, if present, as in Case V., may aggravate the conditions favoring hemorrhage. In my series hepatic features have not been very marked.

*Ascites* occurred in four cases. In Case V. it was slight and associated with edema of the ankles. The patient had had shortly before readmission a series of bleedings. At the operation, and ten days subsequently at autopsy, slight cirrhosis of the liver was found. In Case XVII. ascites was present at the time of the admissions, August 3, 1898, August 10, 1900, and September, 1901. In each instance it disappeared with the general improvement. In the second and third admissions there was jaundice. The liver was slightly enlarged and felt cirrhotic. In Case XII. there was no dropsy when I saw him, but six weeks before six quarts were drawn off. Dr. Vickery writes that he had been tapped again. The liver was not enlarged. In Case IX. there was ascites in 1895, again in 1897, and a third time in his final illness, in the spring of 1898. The liver could be felt a little below the costal border, but at the postmortem there was no cirrhosis.

In the series of cases of anemia, with enlargement of the spleen, sent by my colleagues, ascites was present in the cases of McPhedran, Edes, Atkinson, Sears, and Cabot; in two of the cases in association with jaundice.

*Jaundice* was present in only two cases in my series and in four in the association series.

*State of the Liver.* In eight cases the liver was of normal size. In Cases IV. and XVI. the organ was seen to be smooth and natural looking at the time of operation. In Cases III. and IX. it was normal postmortem. In six cases it was slightly enlarged; in no case was the organ large and hard, as in forms of hypertrophic cirrhosis. In one case it was reduced in size; in only one (Case V.) was cirrhosis of moderate grade found postmortem. In seven of the cases in the association series the liver was enlarged.

RELATION OF THE CIRRHOSIS OF THE LIVER TO THE ENLARGED SPLEEN. Splenomegaly and cirrhosis of the liver are associated in the following conditions:

1. *Atrophic Cirrhosis of the Liver.* So constant is moderate enlargement of the spleen that in doubtful cases it is an important help in diagnosis. The organ is not often very large, rarely reaching to the navel. That it is due to the chronic passive congestion is shown by the remarkable reduction in size which may follow an attack of hematemesis. There is a moderate hyperplasia and often a perisplenitis. Parkes Weber suggests that the enlarged spleen may be due in part to a toxemia.

2. *Syphilis of the Liver.* Both liver and spleen may be involved in amyloid degeneration, but the cases in question are gummata of the liver with consecutive contraction. The spleen may reach a very large size. A remarkable congenital case, in a girl twenty-one years of age, occurred some years ago in my wards,<sup>1</sup> in which, in addition to the big spleen and syphilitic liver, there was a high degree of leukocytosis. In my previous paper on splenic anemia I have reported two other cases, and have called attention to the liability of error. In one of the histories sent by Dr. Musser the patient, aged forty-five years, had had syphilis of the brain. In 1898 and 1899 he had jaundice, with great enlargement of the spleen and liver, hemorrhages from the stomach and bowels, and moderate anemia. In Coupland's case<sup>2</sup> an enlarged spleen was removed, and two years later the patient died with hematemesis and ascites; the liver was found to be syphilitic. When we recognize more fully the great frequency of syphilis of the liver<sup>3</sup> and learn the extraordinary diversity of its clinical features we shall find, I think, a very interesting group of cases characterized by irregularly contracted liver, big spleen, and anemia.

In both the alcoholic and syphilitic cirrhosis the liver, as a rule, is small, and *the splenomegaly follows and depends, in great part at least, on the condition of the liver.*

3. *Hemochromatosis.* This remarkable and most obscure affection is characterized by a chronic course, a gradual deposition of an iron-containing pigment in the organs and in the skin (leading to pigmentation), a progressive enlargement of the spleen, hypertrophic cirrhosis of the liver, sclerosis of the pancreas, and, finally, diabetes—the

<sup>1</sup> Johns Hopkins Hospital Bulletin, vol. ii.

<sup>2</sup> British Medical Journal, 1896, vol. i.

<sup>3</sup> See recent papers by Elnhorn, Medical Record, 1901, and Stockton, Journal of the American Medical Association, 1902, vol. ii.

bronzed diabetes of the French. Anschutz<sup>1</sup> and Opie<sup>2</sup> regard the affection as a chronic toxemia leading to hemolysis, with gradual deposition of blood pigment in the organs (leading to sclerosis) and in the skin. There may be a marked tendency to hemorrhage (purpura). In the cases I have seen the spleen has not been enormously large,<sup>3</sup> and the condition is one in which *the splenomegaly and the cirrhosis of the liver go hand-in-hand*, both apparently due to the same cause.

Anemia, so far as I can learn, has not been a special feature of the cases. It is of interest to note that in the case which was reported by H. A. Hare as Banti's disease, and which had been under the care of Musser and J. C. Wilson (Case I., *Chronic Cases*, in Appendix) the patient, who had been ill for seven years, had a very large spleen, moderately enlarged liver, anemia, and diabetes. No mention is made of pigmentation of the skin.

4. *Other Forms of Cirrhosis.* Apart from the alcoholic and syphilitic varieties, there is a large group of cases in which the disease occurs chiefly in the young, usually the hypertrophic form, and in association with great enlargement of the spleen.

(a) *Hanot's cirrhosis*, the best known of these varieties, is a very chronic enlargement of the liver occurring in young persons, sometimes as a family form, not associated with the abuse of alcohol or with malarial or syphilitic infection. The spleen is enlarged, but not of very great size in proportion to the liver. There is a chronic jaundice of varying intensity, a marked tendency to hemorrhage, but not specially to hematemesis, and very often a terminal *icterus gravis*. Rarer features are bronzing of the skin, a marked leucocytosis, and fever. Ascites does not occur (?). The relation in time of the hepatic enlargement, and the predominance of the biliary symptoms from the outset are characteristic features. The lesions are those of a biliary cirrhosis.

(b) There is a *simple cirrhosis* of the liver in children, without great enlargement of the liver, moderate splenomegaly, and a clinical picture almost identical with that of the disease in adults. Ascites is a prominent feature. Some of the cases have been of alcoholic origin, but in a majority I think the starting point has been in the changes which have followed one of the fevers of childhood. The

<sup>1</sup> Deutsches Archiv für klin. Med., 1899, Band lxiil.

<sup>2</sup> Opie, Journal of Experimental Medicine, vol. v.

<sup>3</sup> British Medical Journal, 1899, vol. ii.

condition is certainly very different from Hanot's cirrhosis, and very different, too, from the third type, (*c*) *splenomegalic cirrhosis*, the form which specially concerns us here on account of its relations with splenic anemia, and which must be discussed as a separate section.

5. *Splenomegalic Cirrhosis of the Liver*. After lasting for some time, splenic anemia may be followed by cirrhosis of the liver. It was the merit of Banti to call attention to this sequence. The splenomegaly may exist for a long period of years without leading to cirrhosis of the liver, as illustrated in Cases III. and IV. of my series. In Case V., after a period of between thirteen and fourteen years, the organ was only moderately cirrhotic. The enlargement, in adults at least, is not very great, and the splenic features dominate the case throughout, and the ascites and hematemeses, as I have insisted, do not necessarily indicate that the liver is involved.

Can we bring into this category the remarkable group of cases in children, particularly the family form of splenomegaly, which corresponds in so many features with chronic splenic anemia? Take, for example, the case reported by Frederick Taylor.<sup>1</sup> The lad, aged thirteen years, had had for six years an enlarged spleen, with jaundice and enlarged liver. There were anemia, melanoderma, hemorrhages, and clubbed fingers. Postmortem the spleen weighed eighty-seven and a half ounces, and the liver, only forty ounces in weight, was rough and nodular. The case is reported as one of splenomegalic cirrhosis. Bovaird's case, already referred to, was one of two sisters affected. At the age of sixteen years, thirteen years after the onset, there was marked anemia, no jaundice, enormous spleen, moderate enlargement of the liver, and melanoderma. The spleen weighed twelve and a half pounds; the liver, sixty-eight ounces, was cirrhotic. In Rotch's case (No. 18 in Appendix) the lad, aged twelve years, had had a big spleen for nine years. When three years old the spleen and liver were enlarged, and there was anemia. Nine years later the spleen was enormous, reaching to the pelvis; there was pigmentation of the skin and extreme anemia, without leukocytosis. In the cases of Edes (No. 8) and Vickery (No. 12), also of long duration in children with enormous spleens—ascites in the one case and hematemeses in the other—the liver was not enlarged.

Some of these are undoubtedly cases of splenic anemia in child-

<sup>1</sup> Guy's Hospital Reports, vol. liv.

hood. The truth is, we need a very careful study of this group of cases before we can speak of them with any certainty. The cases are singularly chronic, and pass from one physician to another. The relation in time of the hepatic and splenic lesions, the forms of hypertrophic cirrhosis of the liver in children, the relation of the family variety to the others, the state of the liver in the cases of primary splenomegaly, the condition of the blood, the relation of the cases to hemochromatosis and to Hanot's cirrhosis—these are some of the questions awaiting solution. I have purposely refrained from using the terms introduced of late years by our French colleagues, whose studies in cirrhosis of the liver have been so important. The long-sounding names simply express the plain fact that the cirrhosis of the liver may precede (as in portal cirrhosis), accompany (as in hemochromatosis), or follow (as in splenic anemia) the splenomegaly. For the last group the term splenomegalic cirrhosis is allowable; but, as Dr. Frederick Taylor says, it is devoutly to be hoped that "we may be delivered from the cumbrous and unwieldy nomenclature which has been suggested for temporary use by our foreign *confrères*."

**PATHOLOGY.** The morbid anatomy throws very little light on the origin of this remarkable disease. Two conditions have been described in the spleen: 1. A fibrosis and hyperplasia, with atrophy of the pulp and a hyaline degeneration of the Malpighian bodies;<sup>1</sup> and with this description Dr. W. G. McCallum tells me our cases (IV., V., and XVI.) correspond, with certain minor differences. 2. On the other hand, a very remarkable change has been found in certain cases of splenomegaly; cases which, as I have said, agree in every clinical particular with the definition of the disease above given. The normal texture is largely replaced by fibrous tissue and large endothelial cells with clear protoplasm containing two or more nuclei, and among them giant cells. The condition is beautifully shown in the illustration in Bovaird's article. No wonder that Gaucher described it as primary endothelioma, although the spleen had been enlarged twenty-five years. The same structure has been described by Picou and Ramond, Collier, Harris and Herzog, and Rolleston. "It has been suggested by Bovaird that the proliferated endothelial cells eventually form fibrous tissue, and, though Harris and Herzog do not support this, the microscopic appearances certainly are compat-

<sup>1</sup> Banti, Ziegler's Beiträge, Band xxiv.

ible with this view. It is perhaps more probable that the fibrous hyperplasia goes on at the same time as the endothelial proliferation, and is due to the same cause, viz.: a chronic intoxication. The fibrous tissue of the organ contains pigment granules of hemosiderin and hematoïdin. . . . In some recorded cases fibrosis and atrophy of the pulp and Malpighian bodies have been the only changes described. It is perhaps possible that in such cases the change has progressed, as it may do, in lymphadenoma to fibrosis and disappearance of the endothelial proliferation" (Rolleston). A point to be emphasized in favor of the view that these two changes of endothelial proliferation and fibrous hyperplasia are part of the same process is the identity of the clinical course in cases in which one or other of the changes has predominated. In Bovaird's patient the splenomegaly had lasted thirteen years; there was marked pigmentation, a secondary anemia, and moderate sclerosis of the liver. In Rolleston's case the enlarged spleen had existed twelve years, and, as already stated, in Gaucher's patient twenty-five years.

The true nature of the disease is unknown. It is probably a chronic toxic rather than an infective process, but of the character and the source of the poison we are ignorant. Naturally, with the prevalence of theories of auto-intoxication, the origin has been sought in the intestinal tract—among the *fermenta imaginaria*, of which Glisson speaks in the section *de Flatu* of his celebrated *Tractatus de Ventriculo et Intestinis*. Harris and Herzog suggest that a chronic hemolysis is caused by an enzyme manufactured by the endothelial cells of the spleen, but this does not explain the cause of the splenic changes. That the spleen is a most important factor in the disease is shown by the cure which has followed its removal, as though the organ were the seat of the manufacture of some poison; but all this is theory.

NOMENCLATURE. "What's in a name?" may well be asked of the disorder under discussion, to which an unusual number of labels have been attached. The all-important matter is to define as accurately as possible the condition named, according to the good rule laid down by Socrates: "Now, I have no objection to your giving names any significance you please if you will only tell me what you mean by them."<sup>1</sup> If our knowledge does not permit to give a name

<sup>1</sup> Plato's Charmides (Jowett's Plato, vol. I. p. 21).

according with the etiology of the disease, the rule should be to pick the one which seems least objectionable, taking priority and usage into account. To me splenic anemia seems a less objectionable term than *splenic pseudoleukemia*, *splenic lymphadenoma*, *splenic cachexia*, *primitive splenomegaly*, or *Banti's disease*. So far as we know, the primary involvement is of the spleen, though the anemia and the enlargement of the organ may both depend on a common, unknown factor. The name certainly expresses the two most constant features of the affection, though the anemia is not necessarily present throughout. A serious objection is that the term has been used in a generic sense, as under anemia splenica several diseases have doubtless been described; but the condition here described has features so remarkable and definite that to restrict the term to it seems advisable, with the qualifying addition of the word *chronic*. The protracted course of the disease is one of its most extraordinary peculiarities, and serves to separate this group from the acute anemias with enlargement of the spleen. Usage, too, should count, and it is something that the name should have been introduced by a great clinical physician, Griesinger, and has been adopted by such men as Strümpell, Senator, Coupland, Rolleston and others.

The name *primary or primitive splenomegaly* has the advantage of neutrality or indifference in not suggesting any theory of origin, and there is no objection to its use in designating cases—such as those reported by Herrick, Martin, and others—in which the enlarged spleen constitutes the only manifestation. *Banti's disease* is simply chronic splenic anemia plus features of cirrhosis of the liver, which represent a terminal stage in the disease. Banti's merit consists in calling attention to this important aspect; but, after all, these secondary changes in the liver are somewhat rare, and, as my records show, the hemorrhages, ascites, and even the jaundice may be present without existing cirrhosis.

TREATMENT. Since my first paper there has been a notable contribution made to the treatment of splenic anemia in the study, by Harris and Herzog,<sup>1</sup> of the results of splenectomy. Of nineteen cases, in fourteen recovery followed; in one the result was not given. In three of my patients, as already stated, the spleen was removed. In Case IV. (operated on by Dr. Cushing) the man, when heard from

<sup>1</sup> Annals of Surgery, July, 1901.



last, three years after the operation, remained well. This man had had at intervals of a year, for ten years, attacks of hematemesis. In Case V. (operated on by Dr. Cushing), in which the hemorrhages had recurred for more than fourteen years, death occurred on the tenth day from rupture of an esophageal varix. In Case XVI. (operated on by Professor Halsted) the patient died of uncontrollable hemorrhage from the large veins passing between the stomach and the spleen. Recurring hematemesis, the most serious event in the disease, and, as I have insisted, usually of splenic origin, is the most important indication for operation.

CONCLUSION. A growing clinical experience should give a sort of miniature picture of the general clinical experience of the profession. Few of us see all the aspects of any disease; few of us recognize all the aspects of the diseases we see; but all of us can try to correlate our own observations with the facts presented by our colleagues, and this is what I have attempted in these papers on splenic anemia. The conclusion to which I have been led by the study of a remarkable group of cases is that—

*From among the conditions with which anemia and enlarged spleen are associated, a well-defined disease may be separated conforming to the definition above given, and which may be called chronic splenic anemia.*

#### APPENDIX.<sup>1</sup>

##### I. Acute Cases.

1. Musser (Philadelphia).—Hugh E., aged thirty years; duration fifteen weeks. Diarrhea chief symptom; liver and spleen enlarged. Red blood corpuscles, 890,000; hemoglobin, 20 per cent.; no nucleated red corpuscles; leukocytes average of seven counts, 2400; lowest, 1200 per cubic millimeter.

2. Kelly, A. O. J. (Philadelphia).—W. E. K., female, aged twenty-two years; duration twelve months. Spleen only two fingers' breadth below the costal border. Lowest blood count, 3,070,000 per cubic millimeter; hemoglobin, lowest, 33 per cent.; leukocytes, 6300; nucleated red corpuscles abundant. Death.

3. Wilson, J. C. (Philadelphia).—John V., aged twenty-five years; duration under one year. Spleen three fingers' breadth below the costal border. Red blood corpuscles, 1,650,000 to 4,580,000; hemoglobin, 18 to 65 per cent.; leukocytes, almost always under 4000 per cubic millimeter; no nucleated reds. Yellowish-green tint of skin; marked improvement at date of report.

<sup>1</sup> I am much indebted to my colleagues for the trouble they have taken in sending these reports.

4. Cary (Buffalo).—S., male, aged fifty-nine years; duration eight months. Etiology obscure. Red blood corpuscles, lowest, 1,776,000; hemoglobin, 41 per cent.; leukocytes, 3075; nucleated red corpuscles present. Death. Spleen weighed 1270 grams; liver weighed 2280 grams. No jaundice.

5. Fitz (Boston).—T. B., male, aged twenty-seven years; duration one year. Armenian. Frequent epistaxis; spleen enlarged; liver normal. Red blood corpuscles, 3,652,000 per cubic millimeter; hemoglobin, 65 per cent.; leukocytes, 5800.

6. Fitz (Boston).—T. D., male, aged twenty years; duration one year. Typhoid fever twice; spleen and liver enlarged; jaundice; epistaxis. Red blood corpuscles, 2,500,000; hemoglobin, 40 to 45 per cent.; leukocytes, 20,000.

7. McPhedran (Toronto).—W. W., male, aged thirty-five years; duration several months. Red blood corpuscles, 3,500,000; hemoglobin (?); leukocytes, 7000. Liver slightly enlarged; jaundice well marked; did well on arsenic; relapsed; lost sight of.

8. Edwards, A. R. (Chicago).—Male, aged sixty-five years; duration eleven weeks. Red blood corpuscles, 2,500,000; hemoglobin, 40 per cent.; leukocytes, 5400; nucleated red corpuscles present. Spleen reached half-way to navel; skin lemon tint; repeated (ten or twelve) hemorrhages from the stomach; liver not enlarged; death; no autopsy.

9. Blackader (Montreal).—F. S., male, aged forty-two years; duration six weeks before admission. Malaria fifteen years previously; spleen reached to navel. Red blood corpuscles, 1,106,000; eight days later, 843,336; leukocytes scanty. Liver enlarged; temperature, 100° to 103° F.; diarrhea.

10. Martin, C. F. (Montreal).—Male, aged thirty-nine years; duration of illness five months. After complaining for a time of shortness of breath he had slight hematemesis, and once a large dark (probably bloody) stool. On admission, November 15, 1900, profound anemia; spleen much enlarged, reaching nearly to the navel. Red blood corpuscles, 2,060,000; hemoglobin, 25 per cent.; leukocytes, 2000. Died end of December.

11. Sears (Boston).—A. I., female, aged forty-nine years; duration six months (?). Malaria fifteen years ago; liver enlarged; ascites present. Red blood corpuscles, 3,008,000 to 4,240,000; hemoglobin, 30 to 35 per cent.; leukocytes, 2600 to 3800.

12. Rotch (Boston).—James P., aged four months; duration of illness two months. Spleen reached to middle line and nearly to crest of the ilium; liver 3 cubic millimeters below the costal border. Red blood corpuscles, 2,408,000; hemoglobin, 25 to 30 per cent.; leukocytes, 2800; no nucleated red corpuscles.

## II. Chronic Cases.

1. Musser (Philadelphia).—J. P., aged twenty-eight years; duration seven years. Spleen very large; liver  $\frac{1}{2}$  cubic millimeter below costal margin; diabetes chronic; hemoptysis; epistaxis. Red blood corpuscles, 1,990,000; hemoglobin, lowest, 30 per cent.; leukocytes, 2040 to 6400 per cubic millimeter;

nucleated red corpuscles. Death, acute pneumonia; light yellow tint of skin through the illness. Case reported as Banti's disease by H. A. Hare; case also under J. C. Wilson. Postmortem: hyperplasia in liver; pancreatic sclerosis.

2. Kelly, A. O. J. (Philadelphia).—J. M., male, aged thirty-six years; duration three years. Spleen a hand's breadth below the costal border; liver slightly enlarged; hematemesis a marked feature of the case. Red blood corpuscles, lowest, 2,110,000; hemoglobin, 47 per cent.; leukocytes, 4200. Still under observation.

3. Fitz (Boston).—K. T., male, Armenian, aged twenty-two years; duration of illness three years. Malaria (?); spleen enlarged; liver normal. Red blood corpuscles, 3,920,000; hemoglobin, 55 per cent.; leukocytes, 2900.

4. Fitz (Boston).—Annie H., Armenian, aged thirty years; duration of illness five years. Malaria (?). Red blood corpuscles, 3,693,000; hemoglobin, 53 per cent.; leukocytes, 7800. Liver and spleen enlarged.

5. McPhedran (Toronto).—Female, aged thirty-one years; duration two years. Red blood corpuscles, 4,000,000; hemoglobin, 73 per cent.; leukocytes, 6500. Spleen much enlarged; liver slightly enlarged; moderate jaundice; laparotomy; slight ascites; improvement; death two months later from diphtheria. Diagnosed as Banti's disease.

6. Hun (Albany).—Female, aged thirty years; duration eleven years. Always pale; many attacks of jaundice. Red blood corpuscles, 2,152,000; hemoglobin, 38 per cent.; leukocytes, 14,000. Moderate enlargement of liver. In 1899, pleurisy, with effusion; tubercle bacilli in sputum; spleen enormously enlarged.

7. Cutler (Boston).—Male, aged sixty-five years; good habits; duration six years. Began with vomiting large amount of blood; fainted. Three years later, second attack; four years later, third attack; in July, 1901, fourth attack; in October, fifth attack; in each only a single attack. No nausea or dyspepsia in intervals. Gained weight and strength rapidly. Liver not enlarged; no jaundice; spleen enlarged 8 cubic millimeters below the costal border. At time of observation, March 7, 1902, six months after last attack, still pale, but general condition good. Red blood corpuscles, 5,216,000; hemoglobin, 60 per cent.; leukocytes, 6200. Spleen much enlarged.

8. Edes (Boston).—P. H., male, aged nine years; severe; duration four years. In July, 1900, enlarged spleen and ascites. Red blood corpuscles, 3,769,000; leukocytes, 5700. Laparotomy. Ascites returned and then disappeared; copious hematemesis once; no jaundice; liver not enlarged. April, 1902, boy has remained pale; spleen at level of navel. Severe typhoid fever four years before onset of ascites and enlargement of spleen.

9. Peabody (New York).—Camillo E., aged thirty-six years; duration six years. Chills in Italy three months ago; sore on penis two months ago; hematemesis six years ago; six attacks in all—very severe; spleen greatly enlarged. Red blood corpuscles from 1,820,000, on December 24th, to 3,856,000, on February 16th; hemoglobin, 27 to 56 per cent.; leukocytes, 800 to 1400; no nucleated red corpuscles. Liver dulness diminished; no ascites.

10. Herrick (Chicago).—T. S., male, aged twenty-five years; duration more than two years. Typhoid fever three years ago. February 3, 1900, hematemesis, severe; fainted; three subsequent attacks—last severe, in February, 1902. Has grown paler, and has a subicteroid tint. Liver not enlarged; spleen much enlarged, reaching below navel April, 1902. Red blood corpuscles, 2,950,000; hemoglobin, 35 per cent.; leukocytes, 2600; no nucleated red corpuscles.

11. Dock (Ann Arbor).—Male, aged forty-one years; duration sixteen months. No hemorrhages; no jaundice; liver slightly enlarged. Red blood corpuscles, 4,480,000; hemoglobin, 75 per cent.; leukocytes, 5857; a few nucleated red corpuscles.

12. Vickery (Boston).—Fanny S., aged seven years; duration of illness eight years. In 1894 profuse hemorrhage from the stomach; liver not enlarged; spleen much enlarged. Red blood corpuscles, 2,560,000; hemoglobin, 20 per cent.; leukocytes, 650 to 700; no nucleated red corpuscles. In 1899 intense hemorrhage from the stomach; death.

13. Stockton (Buffalo).—W. B., male, aged fifty-two years; duration more than two years. Spleen reached to the navel; liver enlarged; no hemorrhages. Red blood corpuscles, 4,650,000; hemoglobin, 68 per cent.; leukocytes, 13,000. (Case of Dr. Woehner's.)

14. Stockton (Buffalo).—M. S., male, aged fifty years; duration one year. Spleen very large; liver enlarged. Red blood corpuscles, 2,685,000; hemoglobin, 45 per cent.; leukocytes, 4000. No jaundice or ascites; marked pigmentation of the skin.

15. Stockton (Buffalo).—Male, aged sixty years; duration eighteen months. Spleen greatly enlarged; liver enlarged; marked sallow pigmentation. Red blood corpuscles, 2,900,000; hemoglobin, 55 per cent.; leukocytes, 3900.

16. Atkinson, A. D. (Baltimore).—Male (colored), aged forty-eight years; duration seven years +. No malaria. In 1892, attack of jaundice, with swelling of the abdomen; in 1894, melena; in 1897, a second attack. Enlarged spleen discovered in 1898; ascites. Red blood corpuscles, 4,000,000; hemoglobin, 54 per cent.; leukocytes, 1500. In August, 1899, vomited large amount of blood; liver not enlarged. Autopsy: spleen weighed 2400 grams—chronic hyperplasia; Malpighian bodies not made out; liver was not enlarged and showed no well-defined increase in the connective tissue.

17. Sears, D. (Boston).—Frank D., aged twenty-seven years; duration seven years. Doubtful history of malaria; no hemorrhages; liver enlarged; no jaundice; ascites present. Red blood corpuscles, 1,808,000 to 2,240,000; hemoglobin, 25 to 30 per cent.; leukocytes, 1850 to 3400; myelocytes, 3.5 per cent.

18. Rotch (Boston).—A. S., male, aged twelve years; duration nine years. When conditions had lasted three years: red blood corpuscles, 2,412,000; hemoglobin, 18 per cent.; leukocytes, 36,000; no nucleated red corpuscles. Liver enlarged; spleen extended below the navel. After condition had lasted nine years: red blood corpuscles, 1,733,000; hemoglobin, 30 per cent.; leukocytes, 6000. Liver still enlarged; skin and conjunctivæ stained, but no bile in urine; spleen extended into the pelvis.

19. Stewart, D. D. (Philadelphia).—Mrs. A., aged thirty years; duration doubtful, probably some years. Has had peculiar yellow hue since childhood. Spleen greatly enlarged; no enlargement of liver; no jaundice. Red blood corpuscles, 2,684,000; hemoglobin, 58 per cent.; leukocytes, 6700. Has had epistaxis.

20. Cabot, R. C. (Boston).—N., female, aged thirteen years; duration (?). Ascites; hematemesis, caused death; melena; liver not enlarged. Red blood corpuscles, 4,280,000; hemoglobin, 42 per cent.; leukocytes, 1300 to 2100.

21. Cabot, R. C. (Boston).—D., female, aged twenty-three years; duration ten years. Liver not enlarged; hematemesis at intervals for ten years; died of hemorrhage. Red blood corpuscles, 1,656,000 to 4,240,000; hemoglobin, 18 to 60 per cent.; leukocytes, 1300 to 2300.

22. Cabot, R. C. (Boston).—A., male, aged twenty-four years; duration (?). Jaundice; liver enlarged; no hemorrhages. Red blood corpuscles, 4,620,000; hemoglobin, 48 per cent.; leukocytes, 6400.

23. Cabot, R. C. (Boston).—N., male, aged thirty-two years; duration (?). Red blood corpuscles, 4,684,000; hemoglobin, 55 per cent.; leukocytes, 9000; 18 normoblasts per cubic millimeter.

24. Cabot, R. C. (Boston).—W., female, aged fifty-three years; duration (?). Red blood corpuscles, 4,790,000; hemoglobin, 65 per cent.; leukocytes, 4800.

25. Cabot, R. C. (Boston).—I. H., male, aged thirty-five years; Armenian; duration (?). Red blood corpuscles, 3,484,000; hemoglobin, 45 per cent.; leukocytes, 4500.

26. Cabot, R. C. (Boston).—T., male, aged twenty-seven years; duration unknown. Red blood corpuscles, 3,652,000; hemoglobin, 65 per cent.; leukocytes, 5800.

### III. *Simple Splenomegaly.*

Herrick (Chicago).—Felix G., aged twenty-five years; duration many months, probably two to five years. Spleen greatly enlarged; liver normal. Red blood corpuscles, 5,120,000; hemoglobin, 80 per cent.; leukocytes, 5000. Has not been well for five years.

Blackader and C. F. Martin (Montreal).—Male, aged twenty-one years. At eighteen had an attack of jaundice; nothing abnormal in abdomen. In January, 1901, by an accident, in which he was struck in the abdomen, he was knocked breathless; on recovery vomited a dark material. Afterward the spleen was found to be enlarged, and it has gradually increased in size to date, and now crosses the middle line. Red blood corpuscles, 4,710,000; hemoglobin, 90 per cent.; leukocytes, 5000.

### IV. *Other Diseases.*

Cary (Buffalo).—V. B., aged forty years. Hemorrhages, melena, and epistaxis. Red blood corpuscles, 4,600,000; hemoglobin, 6 per cent.; leukocytes, 3120. Spleen enlarged. Doubtful, during life, of splenic anemia. Postmortem: cirrhosis of liver. Spleen weighed 730 grams; liver, 1860 grams.

Ewing (New York).—F., aged thirty-two years; duration four years. Spleen very large, 1470 grams. Red blood corpuscles, 2,908,000; hemoglobin, 45 per cent.; leukocytes, 3300. Liver enlarged; ascites. Postmortem: large round-celled sarcoma of spleen (epithélome primitive); gummata of spleen; diffuse cirrhosis of liver. (Case to be published by Dr. C. W. Field.)

In Cary's case the picture during life suggested splenic anemia, but the postmortem showed alcoholic cirrhosis, with enlarged spleen. In Ewing's case there was round-celled sarcoma of the spleen, with gummata, and also diffuse cirrhosis of the liver. It is interesting to note the similarity of the blood condition to that in cirrhotic splenic anemia. It is quite possible that when the full report is published this case will prove to be similar to those of Bovaird and others.

#### V. Cases Difficult to Classify.

I. Musser.—J. H., aged forty-five years; duration four years. Syphilis. In latter part of 1898 and 1899 jaundice, with enlargement of spleen and liver; hemorrhages of stomach and bowel. Lowest blood count, 3,200,000 per cubic millimeter; hemoglobin, lowest, 65 per cent.; no leukocytosis. He had cerebral syphilis.

II. Greene.—Mrs. L. H., aged twenty-one years; duration four years—followed typhoid fever. Spleen five inches below the costal margin; liver not enlarged; tuberculous history; has had cough and expectoration; flatness at both apices. Red blood corpuscles, 2,500,000; hemoglobin, 45 per cent.; leukocytes, 10,000.

III. Sears.—J. W., female, aged forty-six years; duration twelve years (?). Biliary colic for twelve years; no malaria; no syphilis; liver much enlarged; spleen extends to ilium; no hemorrhages; jaundice present; no ascites. Red blood corpuscles, 3,496,000 to 4,308,000; hemoglobin, 60 per cent.; leukocytes, 1400 to 5800.

In I. the possibility of syphilis of the liver has to be considered; in II. the complication of tuberculosis makes one doubtful; while in III. the long duration of attacks of colic make it possible that the whole trouble is pressure on the liver, though it is rare to see, in cirrhosis from any cause, a spleen that reaches to the ilium.

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240

**WILLIAM BEAUMONT**

**A Pioneer American Physiologist**



**William Osler, M.D.**  
**Baltimore**

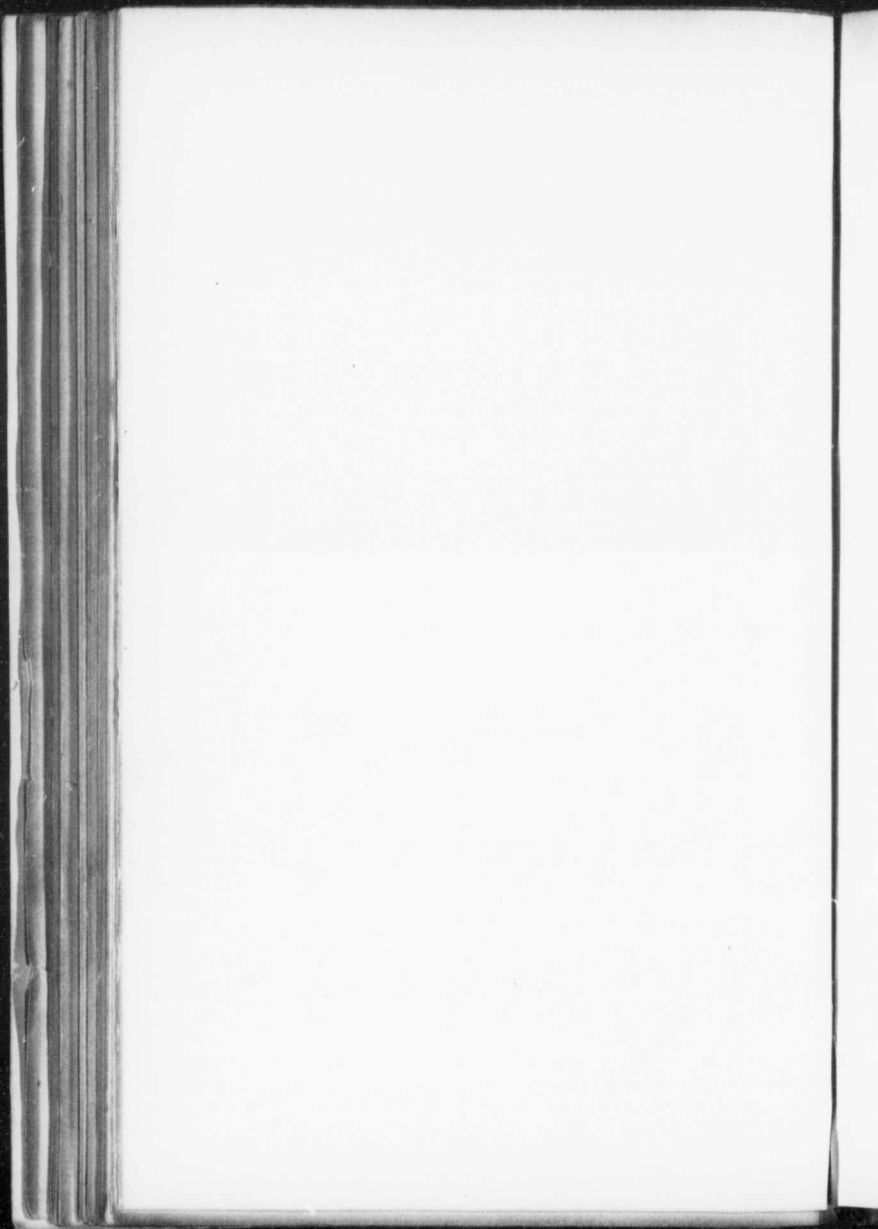
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WILLIAM BEAUMONT  
A PIONEER AMERICAN PHYSIOLOGIST

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William Osler, M. D.  
Baltimore





## WILLIAM BEAUMONT.

A PIONEER AMERICAN PHYSIOLOGIST.\*

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WILLIAM OSLER, M.D.

PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY.  
BALTIMORE.

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Come with me for a few moments on a lovely June day in 1822, to what were then far-off northern wilds, to the Island of Michilimacinae, where the waters of Lake Michigan and Lake Huron unite and where stands Fort Mackinac, rich in the memories of Indian and voyageur, one of the four important posts on the upper lakes in the days when the rose and the fleur-de-lys strove for the mastery of the western world. Here the noble Marquette labored for his Lord, and here beneath the chapel of St. Ignace they laid his bones to rest. Here the intrepid LaSalle, the brave Tonty and the resolute Du Luht had halted in their wild wanderings. Its palisades and block-houses had echoed the war-whoops of Ojibwas and Ottawas, of Hurons and Iroquois, and the old fort had been the scene of bloody massacres and hard-fought fights, but at the conclusion of the War of 1812, after two centuries of struggle, peace settled at last on the island. The fort was occupied by United States troops, who kept the Indians in check and did general police duty on the frontier, and the place had become a rendezvous for Indians and voyageurs in the employ of the American Fur Company. On this bright spring morning the village presented an animated scene. The annual return tide to the trading

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\* An Address before the St. Louis Medical Society, Oct. 4, 1902.

post was in full course, and the beach was thronged with canoes and batteaux laden with the pelts of the winter's hunt. Voyageurs and Indians, men, women and children, with here and there a few soldiers, made up a motley crowd. Suddenly from the company's store there is a loud report of a gun, and amid the confusion and excitement the rumor spreads of an accident, and there is a hurrying of messengers to the barracks for a doctor. In a few minutes (Beaumont says twenty-five or thirty, an eye-witness says three) an alert-looking man in the uniform of a U. S. Army surgeon made his way through the crowd and was at the side of a young French Canadian who had been wounded by the discharge of a gun, and with a composure bred of an exceptional experience of such injuries, prepared to make the examination. Though youthful in appearance, Surgeon Beaumont had seen much service, and at the capture of York and at the investment of Plattsburgh he had shown a coolness and bravery under fire which had won high praise from his superior officers. The man and the opportunity had met—the outcome is my story of this evening.

#### I. THE OPPORTUNITY—ALEXIS ST. MARTIN.

On the morning of June 6 a young French Canadian, Alexis St. Martin, was standing in the company's store, "where one of the party was holding a shotgun (not a musket), which was accidentally discharged, the whole charge entering St. Martin's body. The muzzle was not over three feet from him—I think not more than two. The wadding entered, as well as pieces of his clothing; his shirt took fire; he fell, as we supposed, dead."

"Doctor Beaumont, the surgeon of the fort, was immediately sent for and reached the wounded man in a very short time, probably three minutes. We had just gotten him on a cot and were taking off some of his clothing. After the doctor had extracted part of the shot, together with pieces of clothing, and dressed his wound carefully, Robert Stuart and others assisting, he left him, remarking: "The man can not live thirty-six hours; I will

come and see him by and by.' In two or three hours he visited him again, expressing surprise at finding him doing better than he had anticipated. The next day, after getting out more shot and clothing and cutting off ragged edges of the wound, he informed Mr. Stuart, in my presence, that he thought he would recover."\*

The description of the wound has been so often quoted as reported in Beaumont's work that I give here the interesting summary which I find in a "Memorial" presented to the Senate and House of Representatives by Beaumont. "The wound was received just under the left breast, and supposed, at the time, to have been mortal. A large portion of the side was blown off, the ribs fractured and openings made into the cavities of the chest and abdomen, through which protruded portions of the lungs and stomach, much lacerated and burnt, exhibiting altogether an appalling and hopeless case. The diaphragm was lacerated and a perforation made directly into the cavity of the stomach, through which food was escaping at the time your memorialist was called to his relief. His life was at first wholly despaired of, but he very unexpectedly survived the immediate effects of the wound, and necessarily continued a long time under the constant professional care and treatment of your memorialist, and, by the blessing of God, finally recovered his health and strength.

"At the end of about ten months the wound was partially healed, but he was still an object altogether miserable and helpless. In this situation he was declared 'a common pauper' by the civil authorities of the county, and it was resolved by them that they were not able, nor required, to provide for or support, and finally declined taking care of him, and, in pursuance of what they probably believed to be their public duty, authorized by

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\* Statement of G. G. Hubbard, an officer of the company, who was present when St. Martin was shot, quoted by Dr. J. R. Bally, of Mackinac Island, in his address on the occasion of the Beaumont Memorial Exercises, Mackinac Island, July 10, 1900. *The Physician and Surgeon*, December, 1900.

the laws of the territory, were about to transport him, in this condition, to the place of his nativity in lower Canada, a distance of more than fifteen hundred miles.

"Believing the life of St. Martin must inevitably be sacrificed if such attempt to remove him should be carried into execution at that time, your memorialist, after earnest, repeated, but unavailing, remonstrances against such a course of proceedings, resolved, as the only way to rescue St. Martin from impending misery and death, to arrest the process or transportation and prevent the consequent suffering, by taking him into his own private family, where all the care and attention were bestowed that his condition required.

"St. Martin was, at this time, as before intimated, altogether helpless and suffering under the debilitating effects of his wounds—naked and destitute of everything. In this situation your memorialist received, kept, nursed, medically and surgically treated and sustained him, at much inconvenience and expense, for nearly two years, dressing his wounds daily, and for considerable part of the time twice a day, nursed him, fed him, clothed him, lodged him and furnished him with such necessaries and comforts as his condition and suffering required.

"At the end of these two years he had become able to walk and help himself a little, though unable to provide for his own necessities. In this situation your memorialist retained St. Martin in his family for the special purpose of making physiological experiments."

In the month of May, 1825, Beaumont began the experiments. In June he was ordered to Fort Niagara, where, taking the man with him, he continued the experiments until August. He then took him to Burlington and to Plattsburgh. From the latter place St. Martin returned to Canada, without obtaining Dr. Beaumont's consent. He remained in Canada four years, worked as a voyageur, married and had two children. In 1829 Beaumont succeeded in getting track of St. Martin, and the American Fur Company engaged him

and transported him to Fort Crawford on the upper Mississippi. The side and wound were in the same condition as in 1825. Experiments were continued uninterruptedly until March, 1831, when circumstances made it expedient that he should return with his family to lower Canada. The "circumstances," as we gather from letters, were the discontent and homesickness of his wife. As illustrating the mode of travel, Beaumont states that St. Martin took his family in an open canoe "via the Mississippi, passing by St. Louis, ascended the Ohio river, then crossed the state of Ohio to the lakes, and descended the Erie and Ontario and the river St. Lawrence to Montreal, where they arrived in June." Dr. Beaumont often lays stress on the physical vigor of St. Martin as showing how completely he had recovered from the wound. In November, 1832, he again engaged himself to submit to another series of experiments in Plattsburgh and Washington. The last recorded experiment is in November, 1833.

Among the Beaumont papers, for an examination of which I am much indebted to his daughter, Mrs. Kein (Appendix A), there is a large mass of correspondence relating to St. Martin, extending from 1827, two years after he had left the doctor's employ, to October, 1852. Alexis was in Dr Beaumont's employ in the periods already specified. In 1833 he was enrolled in the United States Army at Washington as Sergeant Alexis St. Martin, of a detachment of orderlies stationed at the War Department. He was then 28 years of age, and was five feet five inches in height.

Among the papers there are two articles of agreement, both signed by the contracting parties, one dated Oct. 19, 1833, and the other November 7 of the same year. In the former he bound himself for a term of one year to "serve, abide and continue with the said William Beaumont, wherever he shall go or travel or reside in any part of the world his covenant servant and diligently and faithfully, etc., . . . that he, the said

Alexis, will at all times during said term when thereto directed or required by said William, submit to assist and promote by all means in his power such philosophical or medical experiments as the said William shall direct or cause to be made on or in the stomach of him, the said Alexis, either through and by means of the aperture or opening thereto in the side of him, the said Alexis, or otherwise, and will obey, suffer and comply with all reasonable and proper orders of or experiments of the said William in relation thereto and in relation to the exhibiting and showing of his said stomach and the powers and properties thereto and of the appurtenances and the powers, properties and situation and state of the contents thereof." The agreement was that he should be paid his board and lodging and \$150 for the year. In the other agreement it is for two years and the remuneration \$400. He was paid a certain amount of the money down.

There are some letters from Alexis himself, all written for him and signed with his mark. In June, 1834, he writes that his wife was not willing to let him go and thinks that he can do a great deal better to stay at home. From this time on Alexis was never again in Dr. Beaumont's employ.

There is a most interesting and protracted correspondence in the years 1836, 1837, 1838, 1839, 1840, 1842, 1846, 1851 and 1852, all relating to attempts to induce Alexis to come to St. Louis. For the greater part of this time he was in Berthier, in the district of Montreal, and the correspondence was chiefly conducted with a Mr. William Morrison, who had been in the northwest fur trade and who took the greatest interest in Alexis and tried to induce him to go to St. Louis. (See Appendix B.)

In 1846 Beaumont sent his son Israel for Alexis, and in a letter dated Aug. 9, 1846, his son writes from Troy: "I have just returned from Montreal, but without Alexis. Upon arriving at Berthier I found that he

owned and lived on a farm about fifteen miles southwest of the village." Nothing would induce him to go.

The correspondence with Mr. Morrison in 1851 and 1852 is most voluminous, and Dr. Beaumont offered Alexis \$500 for the year, with comfortable support for his family. He agreed at one time to go, but it was too late in the winter and he could not get away.

The last letter of the series is dated Oct. 15, 1852, and is from Dr. Beaumont to Alexis, whom he addresses as *Mon Ami*. Two sentences in this are worth quoting: "Without reference to past efforts and disappointments—or expectation of ever obtaining your services again for the purpose of experiments, etc., upon the proposals and conditions heretofore made and suggested, I now proffer to you in faith and sincerity, new, and I hope satisfactory, terms and conditions to ensure your prompt and faithful compliance with my most fervent desire to have you again with me—not only for my own individual gratification, and the benefits of medical science, but also for your own and family's present good and future welfare." He concludes with, "I can say no more, Alexis—you know what I *have* done for you many years since—what I have been *trying*, and am still anxious and wishing to do with and for you—what efforts, anxieties, anticipations and disappointments I have suffered from your non-fulfilment of my expectations. Don't disappoint me more nor forfeit the bounties and blessings reserved for you."

So much interest was excited by the report of the experiments that it was suggested to Beaumont that he should take Alexis to Europe and submit him there to a more extended series of observations by skilled physiologists. Writing June 10, 1833, he says: "I shall engage him for five or six years if he will agree, of which I expect there is no doubt. He has always been pleased with the idea of going to France. I feel much gratified at the expression of Mr. Livingston's desire that we should visit Paris, and shall duly consider the interest



he takes in the subject and make the best arrangements I can to meet his views and yours." Mr. Livingston, the American minister, wrote from Paris March 18, 1834, saying that he had submitted the work to Orfila and the Academy of Sciences, which had appointed a committee to determine if additional experiments were necessary and whether it was advisable to send to America for Alexis. Nothing, I believe, ever came of this, nor, so far as I can find, did Alexis visit Paris. Other attempts were made to secure him for purposes of study. In 1840 a student of Dr. Beaumont's, George Johnson, then at the University of Pennsylvania, wrote saying that Dr. Jackson had told him of efforts made to get Alexis to London, and Dr. Gibson informed him that the Medical Society of London had raised £300 or £400 to induce St. Martin to come, and that he, Dr. Gibson, had been trying to find St. Martin for his London friends. There are letters in the same year from Dr. R. D. Thomson of London to Professor Silliman urging him to arrange that Dr. Beaumont and Alexis should visit London. In 1856 St. Martin was under the observation of Dr. Francis Gurney Smith, in Philadelphia, who reported a brief series of experiments, so far as I know the only other report made on him.\*

St. Martin had to stand a good deal of chaffing about the hole in his side. His comrades called him "the man with a lid on his stomach." In his memorial address Mr. C. S. Osborn of Sault Ste. Marie states that Miss Catherwood tells a story of Etienne St. Martin fighting with Charlie Charette because Charlie ridiculed his brother. Etienne stabbed him severely and swore that he would kill the whole brigade if they did not stop deriding his brother's stomach.

At one time St. Martin traveled about exhibiting the wound to physicians, medical students and before medical societies. In a copy of Beaumont's work, formerly

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\* Medical Examiner, 1856, and Experiments on Digestion, Phila., 1856.

belonging to Austin Flint, Jr., and now in the possession of a physician of St. Louis, there is a photograph of Alexis sent to Dr. Flint. There are statements made that he went to Europe, but of such a visit I can find no record.

My interest in St. Martin was of quite the general character of a teacher of physiology, who every session referred to his remarkable wound and showed Beaumont's book with the illustration. In the spring of 1880, while still a resident of Montreal, I saw a notice in the newspapers of his death at St. Thomas. I immediately wrote to a physician and to the parish priest, urging them to secure me the privilege of an autopsy and offering to pay a fair sum for the stomach, which I agreed to place in the Army Medical Museum in Washington, but without avail. Subsequently, through the kindness of the Hon. Mr. Justice Baby, I obtained the following details of St. Martin's later life, and the picture here given, which was taken the year before his death so as to show the wound, which I here show you. Judge Baby writes to his friend, Prof. D. C. MacCallum of Montreal, as follows: "I have much pleasure to-day in placing in your hands such information about St. Martin as Revd. Mr. Chicoine, Curé of St. Thomas, has just handed over to me. Alexis Bidigan, *dit* St. Martin, died at St. Thomas de Joliette on the 24th of June, 1880, and was buried in the cemetery of the parish on the 28th of the same month. The last sacraments of the Catholic church were ministered to him by the Revd. Curé Chicoine, who also attended at his burial service. The body was then in such an advanced stage of decomposition that it could not be admitted into the church, but had to be left outside during the funeral service. The family resisted all requests—most pressing as they were—on the part of the members of the medical profession for an autopsy, and also kept the body at home much longer than usual and during a hot spell of weather, so as to allow decomposition to set in

and baffle, as they thought, the doctors of the surrounding country and others. They had also the grave dug eight feet below the surface of the ground in order to prevent any attempt at a resurrection. When he died St. Martin was 83 years of age, and left a widow, whose maiden name was Marie Joly. She survived him by nearly seven years, dying at St. Thomas on the 20th of April, 1887, at the very old age of 90 years. They left four children still alive—Alexis, Charles, Henriette and Marie.

“Now I may add the following details for myself. When I came to know St. Martin it must have been a few years before his death. A law suit brought him to my office here in Joliette. I was seized with his interests; he came to my office a good many times, during which visits he spoke to me at great length of his former life, how his wound had been caused, his peregrinations through Europe and the United States, etc. He showed me his wound. He complained bitterly of some doctors who had awfully misused him, and had kind words for others. He had made considerable money during his tours, but had expended and thrown it all away in a frolicsome way, especially in the old country. When I came across him he was rather poor, living on a small, scanty farm in St. Thomas, and very much addicted to drink, almost a drunkard one might say. He was a tall, lean man, with a very dark complexion, and appeared to me then of a morose disposition.”

## II. THE BOOK.

In the four periods in which Alexis had been under the care and study of Beaumont a large series of observations had been recorded, amounting in all to 238. A preliminary account of the case and of the first group of observations appeared in the *Philadelphia Medical Recorder* in January, 1825. During the stay in Washington in 1832 the great importance of the observations had become impressed on the Surgeon-General, Dr. Lovell, who seems to have acted in a most generous and

kindly spirit. Beaumont tried to induce him to undertake the arrangement of the observations, but Lovell insisted that he should do the work himself. In the spring of 1833 Alexis was taken to New York and there shown to the prominent members of the profession, and careful drawings and colored sketches were made of the wound by Mr. King. A prospectus of the work was issued and was distributed by the Surgeon-General, who speaks in a letter of sending them to Dr. Franklin Bache and to Dr. Stewart of Philadelphia, and in a letter from Dr. Bache to Dr. Beaumont acknowledging the receipt of a bottle of gastric juice, Bache states that he has placed the prospectus in Mr. Judah Dobson's store and has asked for subscribers. Beaumont did not find New York a very congenial place. He complained of the difficulty of doing the work owing to the vexatious social intercourse. He applied for permission to go to Plattsburgh, in order to complete the book. After having made inquiries in New York and Philadelphia about terms of publication he decided, as the work had to be issued at his own expense, that it could be as well and much more cheaply printed at Plattsburgh, where he would also have the advice and help of his cousin, Dr. Samuel Beaumont. In a letter to the Surgeon-General, dated June 10, 1833, he acknowledges the permission to go to Plattsburgh, and says: "I shall make my arrangements to leave here for Pl. in about a week to *rush* the execution of the Book as fast as possible. I am now having the drawings taken by Mr. King engraved here."

The summer was occupied in making a fresh series of experiments and getting the work in type. On December 3 he writes the Surgeon-General that the book will be ready for distribution in a few days and that 1,000 copies will be printed.

The work is an octavo volume of 280 pages, entitled "Experiments and Observations on the Gastric Juice and the Physiology of Digestion," by William Beau-

mont, M.D., Surgeon in the United States Army. Plattsburgh. Printed by F. P. Allen, 1833. While it is well and carefully printed, the paper and type are not of the best, and one can not but regret that Beaumont did not take the advice of Dr. Franklin Bache, who urged him strongly not to have the work printed at Plattsburgh, but in Philadelphia, where it could be done in very much better style. The dedication of the work to Joseph Lovell, M.D., Surgeon-General of the United States Army, acknowledges in somewhat laudatory terms the debt which Beaumont felt he owed to his chief, who very gratefully acknowledges the compliment and the kindly feeling, but characterizes the dedication as "somewhat apocryphal."

The work is divided into two main portions; first, the preliminary observations on the general physiology of digestion in seven sections: Section I, Of Aliment; Section II, Of Hunger and Thirst; Section III, of Satisfaction and Satiety; Section IV, Of Mastication, Insalivation and Deglutition; Section V, Of Digestion by the Gastric Juice; Section VI, Of the Appearance of the Villous Coat, and of the Motions of the Stomach; Section VII, Of Chylification and Uses of the Bile and Pancreatic Juice. The greater part of the book is occupied by the larger section of the detailed account of the four series of experiments and observations. The work concludes with a series of 51 inferences from the foregoing experiments and observations.

The subsequent history of the book itself is of interest, and may be dealt with here. In 1834 copies of the Plattsburgh edition, printed by F. P. Allen, were issued by Lilly, Wait & Co., of Boston.

In the Beaumont correspondence there are many letters from a Dr. McCall, in Utica, N. Y., who was an intimate friend of a Mr. Wm. Combe, a brother of the well-known physiologist and popular writer, Dr. Andrew Combe of Edinburgh. Doubtless it was through this connection that in 1838 Dr. Combe issued an edi-

tion in Scotland, with numerous notes and comments. (Appendix C.)

The second edition was issued from Burlington, Vt., in 1847, with the same title page, but after Second Edition there are the words, Corrected by Samuel Beaumont, M.D., who was Dr. William Beaumont's cousin. In the preface to this edition the statement is made that the first edition, though a large one of 3,000 copies, had been exhausted. This does not agree with the statement made in a letter of Dec. 3, 1833, to the Surgeon-General, stating that the edition was to be 1,000 copies. Of course more may have been printed before the type was distributed. While it is stated to be a new and improved edition, so far as I can gather it is a verbatim reprint, with no additional observations, but with a good many minor corrections. In an appendix (D) I give an interesting letter from Dr. Samuel Beaumont with reference to the issue of this edition.

A German edition was issued in 1834 with the following title: "Neue Versuche und Beobachtungen ueber den Magensaft und die Physiologie der Verdauung, auf eine hochst merkwuerdige Weise waehrend einer Reihe von 7 Jahren, an einen und demselben Subject angestellt." Beaumont's earlier paper, already referred to, was abstracted in the *Magazin der auslaendischen Litteratur der gesammten Heilkunde*, Hamburg, 1826, and also in the *Archives generales de Medecine*, Paris, 1828. I can not find that there was a French edition of the work.

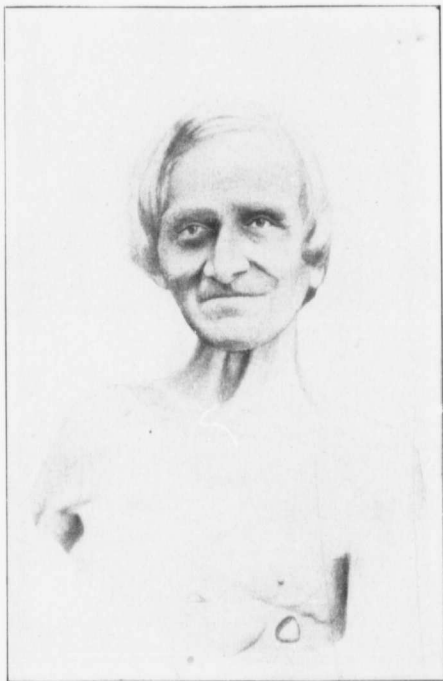
The "Experiments and Observations" attracted universal attention, both at home and abroad. The journals of the period contained very full accounts of the work, and within a few years the valuable additions to our knowledge filtered into the text-books of physiology, which to-day in certain descriptions of the gastric juice and of the phenomena of digestion even the very language of the work is copied.

## III. THE VALUE OF BEAUMONT'S OBSERVATIONS.

There had been other instances of artificial gastric fistula in man which had been made the subject of experimental study, but the case of St. Martin stands out from all others on account of the ability and care with which the experiments were conducted. As Dr. Combe says, the value of these experiments consists partly in the admirable opportunities for observation which Beaumont enjoyed, and partly in the candid and truth-seeking spirit in which all his inquiries seem to have been conducted. "It would be difficult to point out any observer who excels him in devotion to truth and freedom from the trammels of theory or prejudice. He tells plainly what he saw and leaves every one to draw his own inferences, or where he lays down conclusions he does so with a degree of modesty and fairness of which few perhaps in his circumstances would have been capable."

To appreciate the value of Beaumont's studies it is necessary to refer for a few moments to our knowledge of the physiology of digestion in the year 1832, the date of the publication. Take, for example, "The Work on Human Physiology" (published in the very year of the appearance of Beaumont's book), by Dunglison, a man of wide learning and thoroughly informed in the literature of the subject. The five or six old theories of stomach digestion, concoction, putrefaction, trituration, fermentation and maceration, are all discussed, and Wm. Hunter's pithy remark is quoted, "some physiologists will have it, that the stomach is a mill, others, that it is a fermenting vat, others, again, that it is a stew-pan; but, in my view of the matter, it is neither a mill, a fermenting vat nor a stew-pan; but a stomach, gentlemen, a stomach."

The theory of chemical solution is accepted. This had been placed on a sound basis by the experiments of Reaumur, Spallanzani and Stevens, while the studies of Tiedemann and Gmelin and of Prout had done much



ALEXIS ST. MARTIN, AGED 81.





WILLIAM BEAUMONT.

to solve the problems of the chemistry of the juice. But very much uncertainty existed as to the phenomena occurring during digestion in the stomach, the precise mode of action of the juice, the nature of the juice itself and its action outside the body. On all these points the observations of Beaumont brought clearness and light where there had been previously the greatest obscurity.

The following may be regarded as the most important of the results of Beaumont's observations: First, the accuracy and completeness of description of the gastric juice itself. You will all recognize the following quotation, which has entered into the text-books and passes current to-day. "Pure gastric juice, when taken directly out of the stomach of a healthy adult, unmixed with any other fluid, save a portion of the mucus of the stomach with which it is most commonly and perhaps always combined, is a clear, transparent fluid; inodorous; a little saltish, and very perceptibly acid. Its taste, when applied to the tongue, is similar to this mucilaginous water slightly acidulated with muriatic acid. It is readily diffusible in water, wine or spirits; slightly effervesces with alkalies; and is an effectual solvent of the *materia alimentaria*. It possesses the property of coagulating albumen, in an eminent degree; is powerfully antiseptic, checking the putrefaction of meat; and effectually restorative of healthy action, when applied to old, foetid sores and foul, ulcerating surfaces."

Secondly, the confirmation of the observation of Prout that the important acid of the gastric juice was the muriatic or hydrochloric. An analysis of St. Martin's gastric juice were made by Dunglison, at that time a professor in the University of Virginia, and by Benjamin Silliman of Yale, both of whom determined the presence of free hydrochloric acid. A specimen was sent to the distinguished Swedish chemist, Berzelius, whose report did not arrive in time to be included in

the work. In a letter dated July 19, 1834, he writes to Professor Silliman that he had not been able to make a satisfactory analysis of the juice. The letter is published in *Silliman's Journal*, Vol. 27, July, 1835.

Thirdly, the recognition of the fact that the essential elements of the gastric juice and the mucus were separate secretions.

Fourthly, the establishment by direct observation of the profound influence on the secretion of the gastric juice and on digestion of mental disturbances.

Fifthly, a more accurate and fuller comparative study of the digestion in the stomach with digestion outside the body, confirming in a most elaborate series of experiments the older observations of Spallanzani and Stevens.

Sixthly, the refutation of many erroneous opinions relating to gastric digestion and the establishment of a number of minor points of great importance, such as, for instance, the rapid disappearance of water from the stomach through the pylorus, a point brought out by recent experiments, but insisted on and amply proven by Beaumont.

Seventhly, the first comprehensive and thorough study of the motions of the stomach, observations on which, indeed, are based the most of our present knowledge.

And lastly, a study of the digestibility of different articles of diet in the stomach, which remains to-day one of the most important contributions ever made to practical dietetics.

The greater rapidity with which solid food is digested, the injurious effects on the stomach of tea and coffee, when taken in excess, the pernicious influence of alcoholic drinks on the digestion, are constantly referred to. An all-important practical point insisted on by Beaumont needs emphatic reiteration to this generation: "The system requires much less than is generally supplied to it. The stomach disposes of a definite

quantity. If more be taken than the actual wants of the economy require, the residue remains in the stomach and becomes a source of irritation and produces a consequent aberration of function, or passes into the lower bowel in an undigested state, and extends to them its deleterious influence. Dyspepsia is oftener the effect of over-eating and over-drinking than of any other cause."

One is much impressed, too, in going over the experiments, to note with what modesty Beaumont refers to his own work. He speaks of himself as a humble "enquirer after truth and a simple experimenter." "Honest objection, no doubt, are entertained against the doctrine of digestion by the gastric juice. That they are so entertained by these gentlemen I have no doubt. And I cheerfully concede to them the merit of great ingenuity, talents and learning, in raising objections to the commonly received hypothesis, as well as ability in maintaining their peculiar opinions. But we ought not to allow ourselves to be seduced by the ingenuity of argument or the blandishments of style. Truth, like beauty, when 'unadorned is adorned the most'; and in prosecuting these experiments and inquiries, I believe I have been guided by its light. Facts are more persuasive than arguments, however ingeniously made, and by their eloquence I hope I have been able to plead for the support and maintenance of those doctrines which have had for their advocates such men as Sydenham, Hunter, Spallanzani, Richerand, Abernethy, Broussais, Philip, Paris, Bostock, the Heidelberg and Paris professors, Duglison, and a host of other luminaries in the science of physiology."

In reality Beaumont anticipated some of the most recent studies in the physiology of digestion. Doubtless many of you have heard of Professor Pawlow's, of St. Petersburg, new work on the subject. It has been translated into German; and I see that an English edition is advertised. He has studied the gastric juice in an iso-

lated pouch, ingeniously made at the fundus of the stomach of the dog, from which the juice could be obtained in a pure state. One of his results is the very first announced by Beaumont and confirmed by scores of observations on St. Martin, viz., that, as he says, "the gastric juice never appears to be accumulated in the cavity of the stomach while fasting." Pawlow has shown very clearly that there is a relation between the amount of food taken and the quantity of gastric juice secreted. Beaumont came to the same conclusion: "when aliment is received the juice is given in exact proportion to its requirements for solution." A third point on which Pawlow lays stress is the curve of secretion of the gastric juice, the manner in which it is poured out during digestion. The greatest secretion, he has shown, takes place in the earlier hours. On this point hear Beaumont: "It (the gastric juice) then begins to exude from the proper vessels and increases in proportion to the quantity of aliment naturally required and received." And again: "When a due and moderate supply of food has been received it is probable that the whole quantity of gastric juice for its complete solution is secreted and mixed with it in a short time." A fourth point, worked out beautifully by Pawlow, is the adaptation of the juice to the nature of the food, on which I do not see any reference by Beaumont, but there are no experiments more full than those in which he deals with the influence of exercise, weather and the emotions on the quantity of the juice secreted.

#### IV. MAN AND DOCTOR.

Sketches of Dr. Beaumont's life have appeared from time to time. There is a worthy memoir by Dr. T. Reyburn in the *St. Louis Medical and Surgical Journal*, 1854, and Dr. A. J. Steele, at the first annual commencement of the Beaumont Medical College, 1887, told well and graphically the story of his life. A few years ago Dr. Frank J. Lutz, of this city, sketched his life

for the memorial meeting of the Michigan State Medical Society on the occasion of the dedication of a Beaumont monument.

Among the papers kindly sent to me by his daughter, Mrs. Keim, are many autobiographical materials, particularly relating to his early studies and to his work as a surgeon in the War of 1812. There is an excellent paper in the handwriting, it is said, of his son, giving a summary of the earlier period of his life. So far as I know this has not been published, and I give it in full:

Dr. William Beaumont was born in the town of Lebanon, Conn., on the 21st day of November, A. D. 1785. His father was a thriving farmer and an active politician of the proud old Jeffersonian school, whose highest boast was his firm support and strict adherence to the honest principles he advocated. William was his third son, who, in the winter of 1806-7, in the 22d year of his age, prompted by a spirit of independence and adventure, left the paternal roof to seek a fortune and a name. His outfit consisted of a horse and cutter, a barrel of cider, and one hundred dollars of hard-earned money. With this he started, laying his course northwardly, without any particular destination, Honor his rule of action, Truth his only landmark, and trust placed implicitly in Heaven. Traversing the western part of Massachusetts and Vermont in the spring of 1807 he arrived at the little village of Champlain, N. Y., on the Canada frontier—an utter stranger, friendless and alone. But honesty of purpose and true energy invariably work good results. He soon gained the people's confidence and was entrusted with their village school, which he conducted about three years, devoting his leisure hours to the study of medical works from the library of Dr. Seth Pomeroy, his first patron. He then went over to St. Albans, Vt., where he entered the office of Dr. Benjamin Chandler and commenced a regular course of medical reading, which he followed for two years, gaining the utmost confidence and esteem of his kind preceptor and friends. About this time the War of 1812 commenced, and he applied for an appointment in the U. S. Army, successfully. He was appointed assistant-surgeon to the Sixth Infantry, and joined his regiment at Plattsburgh, N. Y., on the 13th of September, 1812. On the 19th of March, 1813, he marched from Plattsburgh with the First Brigade, for Sackett's Harbor, where they arrived on the 27th inst. Here he remained in camp till the 22d of April, when he embarked with the troops on Lake Ontario. His journal will best tell this portion of his history:

"April 22, 1813.—Embarked with Captain Humphreys, Wal-

worth and Muhlenburg, and companies on board the Schooner 'Julia.' The rest of the brigade, and the Second, with Forsyth's Rifle Regiment and the Eighth Artillery, on board a ship, brig and schooner—remain in the harbor till next morning.

"23d.—11 o'clock a. m.—Weighs anchor and put out under the impression we were going to Kingston. Got out 15 or 20 miles—encountered a storm—wind ahead and the fleet returned to harbor.

"24th.—6 o'clock a. m.—Put out with a fair wind—mild and pleasant—the fleet sailing in fine order.

"26th.—Wind pretty strong—increasing—waves run high, tossing our vessels roughly. At half past four pass the mouth of Niagara river. This circumstance baffles imagination as to where we are going—first impressed with the idea of Kingston—then to Niagara—but now our destination must be 'Little York.' At sunset came in view of York Town and the Fort, where we lay off some 3 or 4 leagues for the night.

"27th.—Sailed into harbor and came to anchor a little below the British Garrison. Filled the boats and effected a landing, though not without difficulty and the loss of some men. The British marched their troops down the beach to cut us off as landing, and, though they had every advantage, they could not effect their design. A hot engagement ensued, in which the enemy lost nearly a third of their men and were soon compelled to quit the field, leaving their dead and wounded strewn in every direction. They retired to the Garrison, but from the loss sustained in the engagement, the unlaunted courage of our men, and the brisk firing from our fleet, with the 12 and 32 pounders, they were soon obliged to evacuate it and retreat with all possible speed.—Driven to this alternative they devised the inhuman project of blowing up their magazine, containing 300 pounds of powder, the explosion of which had well-nigh destroyed our army. Over 300 were wounded and about 60 killed on the spot, by stones of all dimensions falling, like a shower of hail, in the midst of our ranks. A most distressing scene ensues in the hospital. Nothing is heard but the agonizing groans and supplications of the wounded and the dying. The surgeons wade in blood cutting off arms and legs and trepaning heads, while the poor sufferers cry, 'O, my God! Doctor, relieve me from this misery! I can not live!' 'Twas enough to touch the veriest heart of steel and move the most relentless savage. Imagine the shocking scene, where fellow-beings lie mashed and mangled—legs and arms broken and sundered—heads and bodies bruised and mutilated to disfigurement! My deepest sympathies were roused—I cut and slashed for 36 hours without food or sleep.

"29th.—Dressed upwards of 50 patients—from simple contusions to the worst of compound fractures—more than half the latter. Performed two cases of amputation and one of trepanning. At 12 p. m. retired to rest my fatigued body and mind."

One month after the taking of York he witnessed the storming of Fort George. The troops were transported from York to "Four-Mile Creek" (in the vicinity of Ft. George), where they encamped from the 10th of May to the 27th, when they advanced to the attack. His journal runs thus:

"May 27 (1813).—Embarked at break of day—Col. Scott with 800 men, for the advanced guard, supported by the First Brigade, commanded by General Boyd, moved in concert with the shipping to the enemy's shore and landed under their battery and in front of their fire with surprising success, not losing more than 30 men in the engagement, though the enemy's whole force was placed in the most advantageous situation possible. We routed them from their chosen spot—drove them from the country and took possession of the town and garrison."

On the 11th of September, 1814, he was at the Battle of Plattsburgh, still serving as assistant-surgeon, though doing all the duty of a full surgeon. At the close of the war, in 1815, when the Army was cut down, he was retained in service, but resigned soon after, deeming himself unjustly treated by the government in having others, younger and less experienced, promoted over him.

In 1816 he settled in Plattsburgh and remained there four years in successful practice. In the meantime his army friends had persuaded him to join the service again, and, having applied, he was reappointed, in 1820, and ordered to Ft. Mackinac as post surgeon. At the end of the first year he obtained leave of absence, returned to Plattsburgh and married one of the most amiable and interesting ladies of that place. (She still survives her honored husband, and in her green old age is loved devotedly by all who know her.) He returned to Mackinac the same year, and in 1822 came in possession of Alexis St. Martin, the subject of his "Experiments on the Gastric Juice." By the accidental discharge of his gun, while hunting, St. Martin had dangerously wounded himself in the abdomen and came under the treatment of Dr. Beaumont, who healed the wound (in itself a triumph of skill almost unequalled) and in 1825 commenced a series of experiments, the results of which have a world-wide publication. These experiments were continued, with various interruptions, for eight years, during which time he was ordered from post to post—now at Niagara, N. Y., anon as Green Bay, Mich., and finally at Fort Crawford, on the Mississippi. In 1834 he was ordered to St. Louis, where he remained in service till 1839, when he resigned. He then commenced service with the citizens of St. Louis, and from that time till the period of his last illness, enjoyed an extensive and distinguished practice, interrupted only by the base attacks of a few disgraceful and malicious knaves (self-deemed members of the medical profession) who sought to destroy a reputation which they could not share.



They gained nothing except some little unenviable notoriety and they have skulked away like famished wolves, to die in their hiding places.

The dates of Beaumont's commissions in the army are as follows: Surgeon's Mate, Sixth Regiment of Infantry, Dec. 2, 1812; Cavalry, March 27, 1819; Post Surgeon, Dec. 4, 1819; Surgeon First Regiment and Surgeon, Nov. 6, 1826.

From the biographical sketches of Reyburn, Steele and Lutz, and from the personal reminiscences of his friends, Drs. J. B. Johnson, S. Pollak and Wm. McPheeters, who fortunately remains with you, full of years and honors, we gather a clearly-defined picture of the latter years of his life. It is that of a faithful, honest, hard-working practitioner, doing his duty to his patients, and working with zeal and ability for the best interests of the profession. The strong common sense which he exhibited in his experimental work made him a good physician and a trusty adviser in cases of surgery. Among his letters there are some interesting pictures of his life, particularly in his letters to his cousin, Dr. Samuel Beaumont. Writing to him April 4, 1846, he says:

I have a laborious, lucrative and increasing practice, more than I can possibly attend to, though I have an assistant, Dr. Johnson, a young man who was a pupil of mine from 1835 to 1840. He then went to Philadelphia a year or two to attend lectures, and graduated, and returned here again in 1842, and has been very busy ever since and is so now, but notwithstanding I decline more practice daily than half the doctors in the city get in a week. You thought when you were here before that there was too much competition for you ever to think of succeeding in business here—there is ten times as much now and the better I succeed and prosper for it. You must come with a different feeling from your former—with a determination to follow in my wake and stem the current that I will break for you. I am now in the grand climacteric of life, three-score years and over, with equal or more zeal and ability to do good and contribute to professional service than at forty-five, and I now look forward with pleasing anticipation of success and greater usefulness—have ample competence for ourselves and children, and no doleful or dreaded aspect of the future—to be sure I have to wrestle with some adverse circumstances of

life, and more particularly to defend myself against the envious, mean and professional jealousies and the consequent prejudices of some men, but I triumph over them all and go ahead in defiance of them.\*

His professional work increased enormously with the rapid growth of the city, but he felt, even in his old age, that delicious exhilaration which it is your pleasure and privilege to enjoy here in the west in a degree rarely experienced by your eastern confrères. Here is a cheery paragraph from a letter dated Oct. 20, 1852: "Domestic affairs are easy, peaceable and pleasant. Health of community good—no severe epidemic diseases prevalent—weather remarkably pleasant—business of all kinds increasing—product of the earth abundant—money plenty—railroads progressing with almost telegraphic speed—I expect to come to Plattsburgh next summer all the way by rail."

But work was becoming more burdensome to a man nearing threescore years and ten, and he expresses it in another letter when he says: "There is an immense professional practice in this city. I get tired of it, and have been trying hard to withdraw from it altogether, but the more I try the tighter I seem to be held to it by the people. I am actually persecuted, worried and almost worn out with valetudinarian importunities and hypochondriacal groans, repinings and lamentations—Amen."

He continued at work until March, 1853, when he had an accident—a fall while descending some steps. A few weeks later a carbuncle appeared on the neck, and proved fatal April 25. One who knew him well wrote the following estimate (quoted by Dr. F. J. Lutz in his sketch of Beaumont):

"He was gifted with strong natural powers, which working upon an extensive experience in life, resulted in a species of natural sagacity, which, as I suppose,

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\* He had evidently hopes that when his cousin and son arrived with Alexis they would arrange and plan for another series of experiments and in another year or two make another book, better than the old one.

was something peculiar in him, and not to be attained by any course of study. His temperament was ardent, but never got the better of his instructed and disciplined judgment, and whenever or however employed, he ever adopted the most judicious means for attaining ends that were always honorable. In the sick room, he was a model of patience and kindness, his intuitive perceptions, guiding a pure benevolence, never failed to inspire confidence, and thus he belonged to that class of physicians whose very presence affords Nature a sensible relief."

You do well, citizens of St. Louis and members of our profession, to cherish the memory of William Beaumont. Alive you honored and rewarded him, and there is no reproach against you of neglected merit and talents unrecognized. The profession of the northern part of the state of Michigan has honored itself in erecting a monument to his memory near the scene of his disinterested labors in the cause of humanity and science. His name is linked with one of your educational institutions, and joined with that of a distinguished laborer in another field of practice. But he has a far higher honor than any you can give him here—the honor that can only come when the man and the opportunity meet—and match. Beaumont is the pioneer physiologist of this country, the first to make an important and enduring contribution to this science. His work remains a model of patient, persevering investigation, experiment and research, and the highest praise we can give him is to say that he lived up to and fulfilled the ideals with which he set out and which he expressed when he said: "Truth, like beauty, when 'unadorned, is adorned the most,' and, in prosecuting these experiments and enquiries, I believe I have been guided by its light."

#### APPENDIX A.

The Beaumont papers in the possession of his daughter, Mrs. Keim of St. Louis, consist of (1) interesting certificates from his preceptors, Dr. Pomeroy and Dr. Chandler, the license from the Third Medical Society of Vermont, the commissions in the

U. S. Army, several certificates of honorary membership in societies, and the parchment of the M.D. degree conferred upon him, *honoris causa*, by the Columbian University of Washington, 1833; (2) a journal containing his experiences in the War of 1812, from which I give an extract, a journal of his trip to Fort Mackinac, a journal containing the reports of many cases, among them that of St. Martin (in addition there is a protocol of the case in loose folio sheets), a journal of the experiments, and a commonplace book of receipts and jottings; (3) an extensive correspondence relating to St. Martin and the book, and many rough drafts of sections of the book; (4) a large mass of personal correspondence, much of it of interest as relating to conditions of practice in St. Louis.

The picture reproduced here in his army uniform is from a miniature; the picture which has been previously reproduced is of an older man from a daguerreotype. It is satisfactory to know that the ultimate destination of this most valuable collection of papers is the Surgeon-General's Library of the United States Army, of which Dr. Beaumont was so distinguished an ornament.

#### APPENDIX B.

On Oct. 20, 1853, he writes to his cousin, Dr. Samuel Beaumont, on the subject of "that old, fistulous Alexis," as he calls him. "Alexis' answer to yours is the very fac-simile or stereotype of all his Jesuitical letters to me for the last fifteen years. His object seems only to be to get a heavy bonus and undue advance from me and then disappoint and deceive me, or to palm and impose himself and whole family upon me for support for life.

"I have evaded his designs so far; but I verily fear that the strong and increasing impulse of conscious conviction of the great benefits and important usefulness of further and more accurate physiological investigation of the subject will compel me to still further efforts and sacrifices to obtain him. Physiological authors and most able writers on dietetics and gastric functions generally demand it of me in trumpet tones.

"I must have him at all hazards, and obtain the necessary assistance to my individual and private efforts or transfer him to some competent scientific institution for thorough investigation and report—I must retrieve my past ignorance, imbecility and professional remissness of a quarter of a century, or more, by double diligence, intense study and untiring application of soul and body to the subject before I die—

Should posthumous Time retain my name,  
Let historic truths declare my fame.

"Simultaneous with this I write to Mr. Morrison and Alexis my last and final letters—perhaps, proposing to *him*, as bribe to his cupidity, to give him \$500 to come to me *without his* family, for one year—\$300 of them for his salary, and \$200

for the support and contentment of his family to remain in Canada in the meantime—with the privilege of bringing them on here another year, upon my former proposition of \$300 a year, at his own expense and responsibility and support them himself after they get here out of his \$300 salary—I think he will take the bait and come on this fall, and when I get him alone again into my keeping and engagement, I will take good care to control him as I please.”

## APPENDIX C.

Letter from Dr. Andrew Combe, May 1, 1838:

“My Dear Sir—May I beg your acceptance of the accompanying volumes as a small expression of my respect for your character and scientific labors. I need not detain you by repeating in this note the high estimation in which I hold you. The volumes herewith sent will, I trust, convince you of the fact, and that it will not be my fault if you do not receive the credit justly due to your valuable and disinterested services. I remain, My Dear Sir,

Very respectfully yours,

“ANDW. COMBE.”

## APPENDIX D.

Letter from Dr. Samuel Beaumont, March 16, 1846:

“Your letter of the 1st of February arrived here in the course of mail, and I have attended to the business which you authorized me to do. I am afraid, however, that you will be disappointed, and perhaps dissatisfied with the arrangement. Mr. Goodrich came here some five or six days after I received your letter, and made his proposal, which was to give you every tenth copy for the privilege of publishing an edition. The number he proposed to publish was fifteen hundred, which would give you 150 copies. I did not like to close the bargain on this condition, and he was not disposed to give any more. This was in the evening. I told him to give me time till the next morning, and I would make up my mind. In the morning, after consultation, I concluded to offer him the copyright for the unexpired time (only one year) for two hundred copies. After some demurring, we closed the bargain. I then thought and I still think it was not enough; but it was all I could get. In making up my mind the following considerations presented themselves: First, that the copyright would expire in one year, and he would then have the right to print it without consulting the author; second, that it would be somewhat mortifying to the author not to have his work republished, even if no great pecuniary benefit was to be obtained by such a republication; and it appeared to me to be quite certain that a new edition would not be soon printed, if I let this opportunity slip; third, I have been long anxious, as I presume you have been, to see the work gotten up in a better dress than it originally had, and in a way which will give it a general credit

and more notoriety among all classes of the reading public than it has heretofore possessed—in fact, make it a standard work; fourth, it has given us a chance to give it a thorough correction, a thing which was very desirable. The work, you recollect, was got up in a great hurry, and a great many errors escaped our notice. You may also recollect that the Philadelphia reviewer spoke of the inaccuracies in the work. And he had reason enough for it. In looking over the work critically with a view of correction, I have been perfectly astonished at the errors that occur on almost every page. And although we understood perfectly what we meant to say, the reader would find it somewhat difficult to decipher our meaning. In the first 140 pages I made nearly 300 corrections. These are practically merely verbal alterations or change of phrases or sentences so as to make them more accurate or perspicuous. I have in no case so changed the text as to give it a different meaning. I flatter myself that it will now be more worthy the public patronage; and if for no other, this chance for correction I consider alone almost a sufficient remuneration for the brief limits of the copyright. I have also written a preface for the second edition, making quotations from American and European authorities in praise of the merits of the work. From delicacy I have written this as from the publisher. I think it is pretty well done. The work will probably be published in the course of about a month, and those designed for you will be delivered to me, when I shall send them to you. He guarantees not to sell in the state of Missouri, or the states south and west of that state. But that, of course, is all gammon. The book will be thrown into market, and he can not control the direction in which it will go.”

ccxli,

241

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ON THE NEED OF A RADICAL  
REFORM IN OUR METHODS  
OF TEACHING SENIOR STU-  
DENTS.

BY  
WILLIAM OSLER, M.D.,  
OF BALTIMORE, MD.

FROM  
THE MEDICAL NEWS,  
NEW YORK,  
JANUARY 10, 1903.

ON THE NEED OF A RADICAL REFORM IN OUR  
METHODS OF TEACHING SENIOR  
STUDENTS.

BY WILLIAM OSLER, M.D.,  
OF BALTIMORE, MD.,

PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY.

MOTTO.—"The Hospital is the only proper college in  
which to rear a true disciple of Æsculapius."

—ABERNETHY.

My text is taken from the report of the Examining Board to the Surgeon-General of the Army, which received wide publicity last spring. *Of 87 candidates, graduates from medical schools, only 18 were accepted.* On further analysis of these figures it is found that 21 were physically disqualified and 48 withdrew or were rejected. Taking the figures for the years 1901 and 1902, kindly furnished by Surgeon-General O'Reilly, of 333 candidates, 101 were physically disqualified, 165 withdrew or were rejected (96 rejected), and only 67 were accepted. The percentage of rejections during the two examinations of this year is somewhat higher than that of the two previous examinations.

From the standpoint of practical medicine and surgery, the examiners for the Army and Navy constitute the only independent boards of judges of the quality of our work as teachers. The examination is largely practical, and I am told that the failure is chiefly in this part of the test. The figures justify, I think, the somewhat sweeping title which I have chosen for my paper. The examinations of the State Boards are still theoretical

<sup>1</sup> This quotation is from an interesting lecture by John W. Francis (an old pupil of Abernethy), at Bellevue Hospital, 1858.



and the results cannot be taken as a safe indication of the character of our work.

### I.

The last quarter of the last century saw many remarkable changes and reformations, among which in far-reaching general importance not one is to be compared with the reform, or rather revolution, in the teaching of the science and art of medicine. Whether the conscience of the professors at last awoke, felt the pricking of remorse, or whether the change, as is most likely, was only part of that larger movement toward larger events in the midst of which we are to-day, need not be here discussed. The improvement has been in three directions: in demanding of the student a better general education; in lengthening the period of professional study; and in the substitution of laboratories for lecture rooms, in the replacement of theoretical by practical teaching. The problem before us as teachers may be very briefly stated: to give to our students an education of such a character that they can become sensible practitioners—the destiny of seven-eighths of them. Toward this end are all our endowments, our multiplying laboratories, our complicated curricula, our palatial buildings. In the four years' course a division is very properly made between the preparatory or scientific branches and the practical; the one taught in the school or college, the other in the hospital. Not that there is any essential difference; there may be as much science taught in a course of surgery as in a course of embryology. The special growth of the medical school in the past 25 years has been in the direction of the practical teaching of science. Everywhere the lectures have been supplemented or replaced by prolonged practical courses, and instead of a single laboratory devoted to anatomy,

there are now laboratories of physiology, of physiological chemistry, of pathology, of pharmacology, and of hygiene. Apart from the more attractive mode of presentation and the more useful character of the knowledge obtained in this way, the student learns to use the instruments of precision, gets a mental training of incalculable value, and perhaps catches some measure of the scientific spirit. The main point is that he has no longer a lecture-room, theoretical knowledge, but a first hand practical acquaintance with the things themselves. He not only has dissected the sympathetic system, but he has set up a kymograph and can take a blood pressure observation, he has personally studied the action of digitalis, of chloroform and of ether, he has made his own culture media and he has "plated" organisms. The young fellow who is sent on to us in his third year is nowadays a fairly well-trained man and in a position to begin his life's work in those larger laboratories, private and public, which nature fills with her mistakes and experiments.

How can we make the work of the student in the third and fourth year as practical as it is in his first and second? I assume that it is not; my text allows it. I take it for granted we all feel that it should be. The answer is, take him from the lecture-room, take him from the amphitheatre,—put him in the out-patient department—put him in the wards. It is not the systematic lecture, not the amphitheatre clinic, not even the ward class—all of which have their value—in which the reformation is needed, but in the whole relationship of the senior student to the hospital. In the laboratories during the first two years, he is thoroughly at home, domiciled with his place in each one at which he can go and work quietly under a tutor's direction and guidance. To parallel this condition in the third and fourth

years certain reforms are necessary. First, in the conception of how the art of medicine and surgery can be taught. My firm conviction is that we should start the senior student at once on his road of life. Ask any physician of 20 years' standing how he has become proficient in his art, and he will reply, by constant contact with disease; and he will add that the medicine he learned in the school was totally different from the medicine he learned at the bedside. The graduate of a quarter of a century ago went out with little practical knowledge, which increased only as his practice increased. In what may be called the natural method of teaching the student begins with the patient, continues with the patient, and ends his studies with the patient, using books and lectures as tools, as means to an end. The student starts, in fact, as a practitioner, as an observer of disordered machines, with the structure and orderly functions of which he is perfectly familiar. Teach him how to observe, give him plenty of facts to observe and the lessons will come out of the facts themselves. For the junior student in medicine and surgery it is a safe rule to have no teaching without a patient for a text, and the best teaching is that taught by the patient himself. The whole art of medicine is in observation, as the old motto goes, but to educate the eye to see, the ear to hear and the finger to feel takes time, and to make a beginning, to start a man on the right path, is all that we can do. We expect too much of the student and we try to teach him too much. Give him good methods and a proper point of view, and all other things will be added, as his experience grows.

The second, and what is the most important reform, is in the hospital itself. In the interests of the medical student, of the profession and of the public at large we must ask from the hospital au-

thorities much greater facilities than are at present enjoyed, at least by the students of a majority of the medical schools. The work of the third and fourth year should be taken out of the medical school entirely and transferred to the hospital, which, as Abernethy remarks in the motto (at the head of this article), which I have chosen is the proper college for the medical student, in his last years at least. An extraordinary difficulty here presents itself. While there are institutions in which the students have all the privileges to be desired, there are others in which they are admitted by side entrances to the amphitheatre of the hospital, while from too many the students are barred as hurtful to the best interests of the patients. The work of an institution in which there is no teaching is rarely first class. There is not that keen interest, nor the thorough study of the cases, nor amid the exigencies of the busy life is the hospital physician able to escape clinical slovenliness unless he teaches and in turn is taught by assistants and students. It is, I think, safe to say that in a hospital with students in the wards the patients are more carefully looked after, their diseases are more fully studied and fewer mistakes made. The larger question, of the extended usefulness of the hospital in promoting the diffusion of medical and surgical knowledge, I cannot here consider.

The objection often raised that patients do not like to have students in the wards is entirely fanciful. In my experience it is just the reverse. On this point I can claim to speak with some authority, having served as a hospital physician for more than 25 years, and having taught chiefly in the wards. With the exercise of ordinary discretion and if one is actuated by kindly feelings toward the patients, there is rarely any difficulty. In the present state of medicine it is very difficult

to carry on the work of a first-class hospital without the help of students. We ask far too much of the resident physicians, whose number has not increased in proportion to the enormous increase in the amount of work thrust upon them, and much of the routine work can be perfectly well done by senior students.

## II.

How, practically, can this be carried into effect? Let us take the third year students first. A class of 100 students may be divided into 10 sections, each of which may be called a clinical unit, which should be in charge of one instructor. Let us follow the course of such a unit through the day. On Mondays, Wednesdays and Fridays at 9 A.M. elementary instruction in physical diagnosis. From 10 to 12 A.M. practical instruction in the out-patient department. This may consist in part in seeing the cases in a routine way in receiving instruction how to take histories, and in becoming familiar with the ordinary aspect of disease as seen in a medical out-clinic. At 12 o'clock a senior teacher could meet four, or even five, of the units, dealing more systematically with special cases. The entire morning, or, where it is customary to have the hospital practice in the afternoon, a large part of the afternoon, two or three hours at least, should be spent in the out-patient department. No short six weeks' course, but each clinical unit throughout the session should as a routine see out-patient practice under skilled direction. Very soon these students are able to take histories, have learned how to examine the cases, and the out-patient records gradually become of some value. Of course all of this means abundance of clinical material, proper space in the out-patient department for teaching, sufficient apparatus and young

men who are able and willing to undertake the work.

On the alternate days, Tuesdays, Thursdays and Saturdays, the clinical unit (which we are following) is in the surgical out-patient department, seeing minor surgery, learning how to bandage, to give ether and helping in all the interesting work of a surgical dispensary. Groups of three or four units should be in charge of a demonstrator of morbid anatomy, who would take them to postmortems, the individual men doing the work, and one day in the week all the units could attend the morbid anatomy demonstration of the professor of pathology. I take it for granted that the student has got so far that he has finished his pathological histology in his second year, which is the case in the more advanced schools.

Other hours of the day for the third year could be devoted to the teaching of obstetrics, materia medica, therapeutics, hygiene and clinical microscopy. At the end of the session in a well conducted school the third-year student is really a very well-informed fellow. He knows the difference between Pott's disease and Pott's fracture; he can readily feel an enlarged spleen, and he knows the difference between Charcot's crystals and Charcot's joint.\*

In the fourth year I would still maintain the clinical unit of 10 men, whose work would be transferred from the out-patient department to the wards. Each man should be allowed to serve for at least half of the session in the medical wards and half in the surgical wards. He should be assigned four or five beds. He has had experience enough in his third year to enable him to

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\*The question of the methods of teaching of Physical Diagnosis has been dealt with recently by my associate, Professor W. S. Thayer.—Boston Medical and Surgical Journal, 1902, II.

take the history of the new cases, which would need, of course, supervision or correction by the senior house officer or attending physician. Under the supervision of the house physician he does all of the work connected with his own patients; analysis of the urine, etc., and takes the daily record as dictated by the attending physician. One or two of the clinical units are taken round the wards three or four times in the week by one of the teachers for a couple of hours, the cases commented upon, the students asked questions and the groups made familiar with the progress of the cases. In this way the student gets a familiarity with disease, a practical knowledge of clinical methods and a practical knowledge of how to treat disease. With equal advantage the same plan can be followed in the surgical wards and in the obstetrical and gynecological departments.

An old method, it is the only method by which medicine and surgery can be taught properly, as it is the identical manner in which the physician is himself taught when he gets into practice. The radical reform needed is in the introduction of the system of clinical clerks and surgical dressers, who should be just as much a part of the machinery of the wards as the nurses or the house physicians.

There is no scarcity of material; contrariwise. Think of the plethora of patients in this city, the large majority of whom are never seen, not to say touched, by a medical student! Think of the hundreds of typhoid fever patients, the daily course of whose disease is never watched or studied by our pupils! of the hundreds of cases of pneumonia which will enter the hospitals during the next three months, how few will be seen daily, hourly, in the wards by the fourth year men! And yet this is what they are in the medi-

cal school for, just as much as, more indeed, than they are in it to learn the physiology of the liver or the anatomy of the hip-joint.

But, you may ask, how does such a plan work in practice? From a long experience I can answer admirably! It has been adopted in the Johns Hopkins Medical School, of which the hospital, by the terms of the founder's will, is an essential part. There is nothing special in our material, our wards are not any better than those in other first-class hospitals but a distinctive feature is that greater provision is made for teaching of students and perhaps for the study of disease. Let me tell you in a few words just how the work is conducted. The third year students are taught medicine:

*First*, in a systematic course of physical diagnosis conducted by Drs. Thayer and Fletcher, the Associate Professors of Medicine, in the rooms adjacent to the out-patient department. In the second half of the year, after receiving instruction in history-taking, the students take notes and examine out-patients.

*Secondly*, three days in the week at the conclusion of the out-patient hours, the entire class meets the teacher in an adjacent room, and the students are taught how to examine and study patients. It is remarkable how many interesting cases can be shown in the course of a year in this way. Each student who takes a case is expected to report upon and "keep track" of it, and is questioned with reference to its progress. The opportunity is taken to teach the student how to look up questions in the literature by setting subjects upon which to report in connection with the cases they have seen. A class of 50 can be dealt with very conveniently in this manner.

*Thirdly*, the clinical microscopy class. The clinical laboratory is part of the hospital equip-



ment. It is in charge of a senior assistant, who is one of the resident officers of the hospital. There is room in it for about one hundred students on two floors, each man having his own work-table and locker and a place in which he can have his own specimens and work at odd hours. The course is a systematic one, given throughout the session, from two hours to two hours and a half twice a week, and consists of routine instruction in the methods of examining the blood and secretions, the gastric contents, urine, etc. This can be made a most invaluable course, enabling the student to continue the microscopic work which he has had in his first and second years, and he familiarizes himself with the use of a valuable instrument, which becomes in this way a clinical tool and not a mere toy. The clinical laboratory in the medical school should be connected with the hospital, of which it is an essential part. Nowadays the microscopical, bacteriological and chemical work of the wards demands skilled labor, and the house physicians, as well as the students need the help and supervision of experts in clinical chemistry and bacteriology, who should form part of the resident staff of the institution.

*Fourthly*, the general medical clinic. One day in the week, in the amphitheater, a clinic is held for the third and fourth year students and the more interesting cases in the wards are brought before them. As far as possible we present the diseases of the seasons, and in the autumn special attention is given to malarial and typhoid fever, and later in the winter to pneumonia. Committees are appointed to report on every case of pneumonia and the complications of typhoid fever. There are no systematic lectures, but in the physical diagnosis classes there are set recitations, and in what I call the observation class in the dispensary held three times a week, general statements

are often made concerning the diseases under consideration.

*Fourth Year Ward Work.*—The class is divided into three groups (one in medicine one in surgery and one in obstetrics and gynecology) which serve as clinical clerks and surgical dressers. In medicine each student has five beds. He takes the notes of the new cases as they come in, does the urine and blood work and helps the house physician in the general care of the patients. From nine to eleven the visit is made with the clinical clerks, and systematic instruction is given. The interesting cases are seen and new cases are studied and the students questioned with reference to the symptoms and nature of the disease and the course of treatment. What I wish to emphasize is that this method of teaching is not a ward-class in which a group of students is taken into the ward and a case or two demonstrated; it is *ward-work*, the students themselves taking their share in the work of the hospital, just as much as the attending physician, the interne or the nurse. Moreover, it is not an occasional thing. His work in medicine for the three months is his major subject, and the clinical clerks have from nine to twelve for their ward-work, and an hour in the afternoon in which some special questions are dealt with by the senior assistant or by the house physicians.

*The Recitation Class.*—As there are no regular lectures, to be certain that all of the subjects in medicine are brought before the students in a systematic manner, a recitation class is held once a week upon subjects set beforehand.

*The Weekly Clinic* in the amphitheatre, in which the clinical clerks take leading parts, as they report upon their cases and read the notes of their cases brought before the class for consideration. Certain important aspects of medicine are

constantly kept before this class. Week after week the condition of the typhoid fever cases is discussed, the more interesting cases shown, the complications systematically placed upon the board. A pneumonia committee deals with all the clinical features of this common disease, and a list of the cases is kept on the blackboard, and during a session the students have reports upon 50 or 60 cases, a large majority of which are seen in the clinic by all of them, while the clinical clerks have in the wards an opportunity of studying them daily.

The general impression among the students and the junior teachers is that the system has worked well. There are faults, perhaps more than we see, but I am sure they are not in the system. Many of the students are doubtless not well informed theoretically on some subjects, as personally I have always been opposed to that base and most pernicious system of educating them with a view to examinations, but even the dullest learn how to examine patients, and get familiar with the changing aspects of the important acute diseases. The pupil handles a sufficient number of cases to get a certain measure of technical skill, and there is ever kept before him the idea that he is not in the hospital to learn everything that is known but to learn how to study disease and how to treat it, or rather, as I prefer to teach, how to treat patients.

### III.

A third change is in a reorganization of the medical school. This has been accomplished in the first two years by an extraordinary increase in the laboratory work, which has necessitated an increase in the teaching force, and indeed an entirely new conception of how such subjects as physiology, pharmacology and pathology should

be taught. A corresponding reformation is needed in the third and fourth years. Control of ample clinical facilities is as essential to-day, as large, well-endowed laboratories, and the absence of this causes the clinical to lag behind the scientific education. Speaking for the Department of Medicine, I should say that three or four well-equipped medical clinics of 50 to 75 beds each, with out-patient departments under the control of the directors, are required for a school of maximum size, say 800 students. Within the next quarter of a century the larger universities of this country will have their own hospitals in which the problems of nature known as disease will be studied as thoroughly as are those of Geology or Sanscrit. But even with present conditions much may be done. There are hundreds of earnest students, thousands of patients and scores of well-equipped young men willing and anxious to do practical teaching. Too, often, as you know full well, "the hungry sheep look up and are not fed," and for the bread of the wards given the stones of the lecture-room and amphitheatre. The dissociation of student and patient is a legacy of the pernicious system of theoretical teaching from which we have escaped in the first and second years.

While the title of this paper may seem very strong and indicate too sweeping a conclusion from comparatively small premises, yet the results of the examination of the Army Board are not the only warrant for the statement, as it is notorious that *ward-work*, in the sense in which I have spoken, is not adopted generally in our systems of teaching. The old method and the true method—the method of Boerhaave, of the elder Rutherford of the Edinburgh School, and of the older men of this city and of Boston and of Philadelphia, the men who had been pupils of John

Hunter and of Rutherford and of Saunders—is to make of the hospital a college, in which as clinical clerks and surgical dressers the students slowly learn for themselves, under skilled direction, the phenomena of disease. It is the true method because it is the natural one, the one by which each physician grows in clinical wisdom after he leaves the school—all others are bastard substitutes.

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242

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ANEURISM OF THE DESCENDING  
THORACIC AORTA

A Clinical Lecture delivered at the Johns Hopkins Hospital, Baltimore

BY WILLIAM OSLER, M.D.

Professor of Medicine, Johns Hopkins University; Physician-in-Chief, Johns  
Hopkins Hospital, Baltimore

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FIG. 1.—Small aneurism of the aorta ruptured into the esophagus—the rupture consisting of a linear slit, 1.5 cm. in extent, with clean cut margins.

## ANEURISM OF THE DESCENDING THORACIC AORTA

A CLINICAL LECTURE DELIVERED AT THE JOHNS HOPKINS HOSPITAL, BALTIMORE

BY WILLIAM OSLER, M.D.

Professor of Medicine, Johns Hopkins University; Physician-in-Chief, Johns Hopkins Hospital, Baltimore

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THE unusual experience of three cases within a year affords an opportunity to discuss the general features of the 14 cases of aneurism of the descending thoracic aorta, which have been in the wards since the opening of the hospital.

No portion of the aorta is so little subject to aneurism. The strain of the powerful systole of the left ventricle is expended chiefly on the arch itself, and, while atheromatous changes are common enough in the descending aorta, they are relatively less frequent and less advanced. The absence of large branches is doubtless an important factor, as degenerative changes are much more common about the orifices of vessels. This is well illustrated by the frequency with which we see patches of atheroma about the orifices of the intercostal vessels in an aorta elsewhere sound. The relative frequency is variously given. If you add together the statistics of Crisp, Lebert, and Myers, the descending thoracic aorta was involved in 49 cases, the ascending aorta in 159, the arch in 113, and the abdominal aorta in 83. In 64 cases of aneurism of the aorta among 2060 autopsies in the pathological department of the Johns Hopkins Hospital (Professor Welch), the arch was involved in 40 cases, the descending thoracic aorta in 13, the transverse and descending thoracic aorta in 3, the abdominal aorta in 7, and the thoracic and abdominal aorta in 1.

Clinically, too, we find that aneurism of this part of the thoracic aorta is much the least frequent; in fact, it is much less



common in the wards than it is in the post-mortem room, owing to the latency and absence of characteristic physical signs in many cases. I cannot at the moment tell you accurately the relative frequency with which it has occurred in our wards, but there have been only 14 cases, a number which may be exceeded by aneurism of other parts of the aorta in a single year. Of 88 cases at St. Bartholomew's Hospital analyzed by Oswald Brown,<sup>1</sup> only 8 were of the thoracic aorta.

**ETIOLOGY.**—Syphilis and strain or injury are the two great causes of aneurism, which accounts for the fact that men are so much more often attacked than women. Of the 14 cases, 13 were males and one female. Five of the cases were in negroes. In only 6 of the cases was there a positive history of syphilis. In 7 it was denied; in one no history was obtained. Strain or injury may have been a factor in many of the cases. As in tabes, the more carefully you inquire into the history in cases of aneurism the larger is the percentage with syphilis. In men under thirty-five years of age it is almost the sole factor, and, while there may be nothing histologically to show the nature of the arteriosclerosis, the limitation of the disease usually to the arch or to an area in the descending aorta in a vessel otherwise healthy always seems a suggestive feature. No doubt any of the acute infections may be associated with a patchy mesarteritis, and the weakened wall may in a strain or sudden injury be split as if cut with a knife (as is shown so well in the illustration I pass around). (Frontispiece.)

**SYMPTOMS.**—*Latency* is a special characteristic of a certain proportion of the cases. There may be no symptoms whatever, and the first indication of trouble may be a sudden syncope from internal hemorrhage, or a profuse and fatal vomiting of blood, or hemoptysis. The colored illustration (frontispiece) illustrates this very well. In 1882 I performed for Dr. Rogers, of Point St. Charles, a post-mortem on a woman, aged about 35 years, who had always been very well and strong. One night she got out of bed to go to the water-closet, felt faint, called to her husband, vomited a small amount of blood, fell into a deep syncope, and died in a few minutes. At the post-mortem the stomach contained an enormous mould of blood. The mucous membrane was smooth and clear;

<sup>1</sup> Aneurism of the Aorta. H. K. Lewis, London, 1885.

the liver was not cirrhotic; there was nothing in the gastro-hepatic omentum. On slitting up the esophagus the condition shown in this colored drawing was found. There was an erosion of the mucous membrane which led directly into a small aneurism about 5 x 5 cm. in extent. From the surface of the aorta, as you see in the drawing, there is a linear slit about 1.5 cm. in extent, the margins clean-cut, which leads directly into the aneurismal sac. Three of our cases in the hospital were latent.

*CASE II.—A robust man, aged about 35 years; comminuted fracture of the lower jaw; operation under ether; recovery from the ether; sudden death from hemorrhage into the left bronchus.*

The patient came to the dispensary on September 6, 1890, having had a fracture of the lower jaw, which was wired under ether. During the operation the breathing became very irregular, but the patient recovered and partially dressed himself. He complained of hoarseness and of pain in the left side of the chest. He was left in the recovery room, where he was found shortly after, lying in a pool of blood, with blood streaming from his nose and mouth. He died in a few minutes.

The heart was not enlarged (autopsy No. 100), the valves were normal, the thickness of the left ventricle was 18 mm. Just at the beginning of the descending aorta there was an opening 17 x 15 mm. leading into an aneurismal cavity 7 x 5 cm. in diameter, projecting forward, and at the upper end there was an opening 2 cm. in diameter into the left bronchus, which was partially closed by a mass of fibrin. The bronchi of both lungs were filled with soft clots. The cavity of the aneurism was filled with firm masses of fibrin. There was nothing of note in the other organs.

*CASE V.—Old man, aged 78 years; admitted with dyspnea, edema, and albuminuria; death with uremic symptoms; no suggestion of aneurism.*

Charles Kusklinsky (Gen. Hosp. No. 11,890), aged 78 years, white, was admitted on January 28, 1895, complaining of shortness of breath. Very little history could be obtained, owing to his condition. He had been ill for four months, in bed most of the time, with cough and dyspnea. No history of syphilis.

The patient had edema of the face and eyelids and Cheyne-Stokes breathing, and rapidly became irrational. He had a barrel-shaped chest and signs of emphysema of the lungs. The apex beat was outside the nipple-line, impulse forcible and punctate. There was a rough systolic murmur at the aortic area and a soft diastolic and a loud systolic murmur at the apex. The urine contained albumin and tube-casts.

He died on January 31. There was no suspicion of aneurism.

The autopsy (No. 620) showed dilatation of the arch of the aorta with much atheroma of the intima. The first part of the abdominal aorta formed a spindle-shaped aneurism. At the middle of its course the thoracic aorta measured 14 cm. across; at the diaphragm, 19 cm.; opposite the celiac axis, 14 cm. The spindle was 20 cm. in length. There was extensive sclerosis of the valves and moderate hypertrophy of the left ventricle.

*CASE VI.—Arteriosclerosis; chronic nephritis; dropsy; death in a uremic*

*convulsion; aneurism of the descending thoracic aorta; aneurism of the abdominal aorta.*

Stephen A. Carmack (Gen. Hosp. No. 17,271), aged 54 years; admitted September 11, 1896, complaining of shortness of breath, cough, and swelling of the legs and abdomen. The patient had been a healthy man. He denied syphilis. He had been much exposed and had been a heavy drinker. For two months he had had signs of dropsy, at first in the legs and face. He had ascites and edema of the legs. He passed only a small quantity of urine, which contained albumin and tube-casts. The apex beat was just outside the nipple-line; no murmur. There was general arteriosclerosis. The abdomen was tapped, and nearly four liters of fluid removed. There was no suspicion whatever of aneurism.

At 2 P.M. on the 21st he died in a uremic convulsion.

At the autopsy (No. 852) there were chronic diffuse nephritis, hypertrophy of the heart, great sclerosis of the arteries, cirrhosis of the liver, and marked sclerosis of the ascending aorta. Five centimeters beyond the origin of the innominate there was an adherent fresh clot. In the middle portion of the thoracic aorta was an aneurismal dilatation measuring 8 x 5 cm., which was occupied by a firm thrombus. There was a second aneurism of the aorta, measuring 4 x 5 cm., 1 cm. below the origin of the superior mesenteric artery and extending to within 5 cm. of the bifurcation of the aorta.

Owing to the deep and protected position of the descending thoracic aorta, you can readily understand that the symptoms may be more pronounced than the physical signs. Practically they are the same as those of aneurism of the arch,—pain, dyspnea, cough, and difficulty in swallowing; but aneurism of this part may present three special features: first, the close relation to the spine and the frequency with which the tumor passes backward make pain in the back and pain along the sides from pressure on the nerves very marked features; secondly, the relation of the vessel makes pulmonary symptoms more common; and, thirdly, the close connection of the aorta with the esophagus may cause difficulty in swallowing.

The patient in Ward E, who died last week (Case XIII), and whose aneurism I show you here, illustrates many of these features very well, particularly the intensity of the pain in the chest and the dyspnea. Without any localized, definite pulsation, there was a diffuse heaving of the upper sternum and in the second and third right interspaces. The diagnosis of aneurism was made, but we thought it was of the arch. A puzzling feature about the case was the hematemesis. He had had at intervals abdominal pains which we could not associate with the aneurism. On the night of October 14 and 15, with intense pain, he vomited a small amount of blood

and he had tarry stools. On the night of the 18th he again vomited blood. He had had no sign of pressure on the esophagus, yet we naturally thought the blood was due to rupture of the sac into the gullet. It turned out that the diffuse heaving impulse, which was so definite, was due to a general dilatation of the arch of the aorta. Projecting back just from the termination of the arch and from the first part of the descending aorta there was the aneurism which I show you, about 6 cm. in extent, which rested upon the bodies of the fifth, sixth, and seventh vertebræ, which were slightly eroded. The abdominal pains and the vomiting of blood were due to a latent ulcer of the stomach in the lesser curvature and posterior wall.

Pain is a very variable symptom in thoracic aneurism. While rarely absent throughout the course, it is present only in a marked degree when there is pressure on the thoracic wall. There may be paroxysms of pain, often simulating angina, in small aneurisms of the root of the aorta; in fact, there is a special group of cases in which angina pectoris is the initial symptom of aneurism of the aorta. Trainor, whose aneurism some of you have watched with so much interest for nearly two years, illustrates one feature of the pain very well: at first he suffered most intensely, but as the aneurism eroded the sternum and the first and second ribs and the sternal half of the clavicle, and bulged beneath the skin, he became much more comfortable, and for the past six months he has had no pain whatever. There may be neither pain, cough, nor dyspnea. Case III, a robust, healthy looking fireman (Fig. 2), had no pain while the sac eroded the ribs, but he first noticed a big pulsating tumor of the back. In the cases with erosion of the spine, pain reaches its maximum degree of intensity and persists. This feature was well illustrated in the cases of Colmus (Case VIII) and Leonard (Case XII). These poor victims were never without pain and required at times enormous doses of morphin. Colmus took once as much as thirty-eight grains in the day. These are almost invariably cases in which the sac involves the vertebræ and the ribs. In Case IX, on the first admission aneurism was not suspected, and the patient was supposed to have intercostal neuralgia. There were marked hyperesthesia of the skin in the left axillary region and points of tenderness at the angles of the ribs and at the sternal border. When readmitted nineteen months later the pains had become much more severe, she had difficulty in swal-

lowing, and a well-marked tumor had appeared in the left back. Herpes zoster has been met with in such instances. In Case VIII there was a wide area of anesthesia corresponding to the intercostal nerves, which had been destroyed as the sac grew through the chest wall.

The attitude of some of these patients is very remarkable. Leonard, you remember, lay invariably on his right side and on his abdomen. Colmus would rest prone for hours with a pillow under the abdomen. Pressure always seemed to give relief, and one patient often slept bent double upon his knees.

In thoracic aneurism pulmonary symptoms are always marked. Cough and shortness of breath are perhaps the most constant features in involvement of the arch. They are a little less constant in aneurism of the descending portion of the aorta. Of these 14 cases 10 at some time complained of these two symptoms. Orthopnea with stridor is naturally not so common. In certain of the very chronic cases (as the remarkable ones which I will speak of later under diagnosis) there are recurring attacks of dyspnea with cough and expectoration of blood. Hemoptysis was present in only 3 of the 14 cases. This may be due to a weeping through the lung tissue itself, which forms part of the sac, as in Cases X and XI, or it may be, as in Case II, a terminal hemoptysis, due to perforation of the left bronchus.

A remarkable group of pulmonary symptoms may be caused by pressure on the main bronchus or on one of its chief branches, leading to a bronchorrhea, a diffuse bronchiectasis with the expectoration of large quantities of mucus. Sometimes there is an extraordinary purulent bronchiectasis with peribronchial suppuration and the formation of multiple cavities, so that the patient may present the features of an extensive tuberculosis of the lung. Or there may be the simple atrophy of the lung from pressure, as was present in Cases VIII, XI, and XII. As the sac grows into, and is covered by the pleura, acute inflammation of the membrane is common, leading frequently to union of the two layers. Effusion did not occur in any of our cases. It is sometimes present in aneurism of the arch. Rupture into the pleura occurred in Cases III, X, and XIV.

Considering the close relation to the esophagus, it is surprising that difficulty in swallowing was not a common symptom. It was



FIG. 2.—Aneurism of the descending thoracic aorta showing flat tumor in the left infrascapular region (Case III). The lower prominence is a large subcutaneous blood cyst.

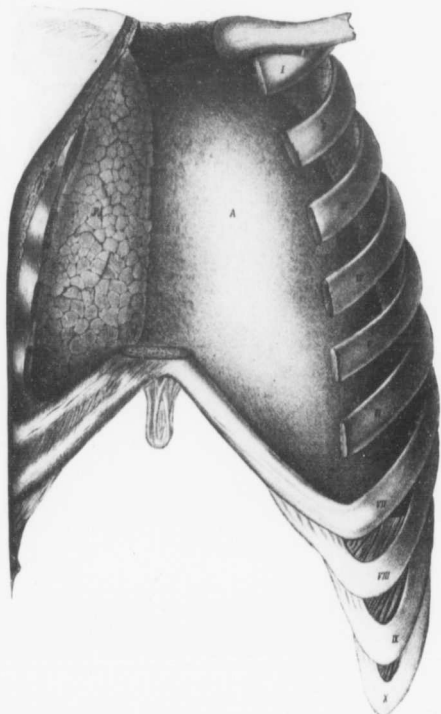


FIG. 3.—Sokolowski's case of aneurism of the ascending aorta, arch, and descending aorta of twelve years' duration. A, Aneurismal sac; I, Lung. (Reproduced from the Deut. Arch. f. klin. Med., 1877, xix, 623.)

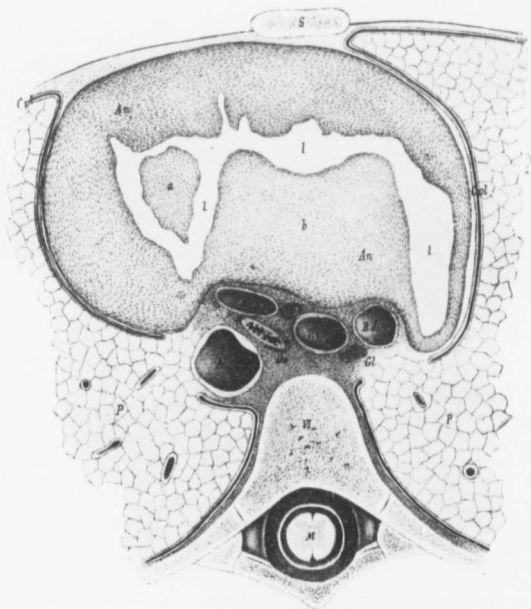


FIG. 1.—Sokolowski's case of aneurism—horizontal section at the level of the sixth thoracic vertebra. *M*, spinal cord; *S*, sternum; *C.pl.*, costal pleura; *P*, lung; *Oe.*, esophagus; *V.c.*, descending vena cava; *B.d.*, right bronchus; *B.s.*, left bronchus; *Gl.*, gland; *An.*, aneurismal sac with coagula of almost cartilaginous consistency (*b*) and a free coagulum (*a*). (Reproduced from the Deut. Arch. f. klin. Med., 1877, xix, 623.)



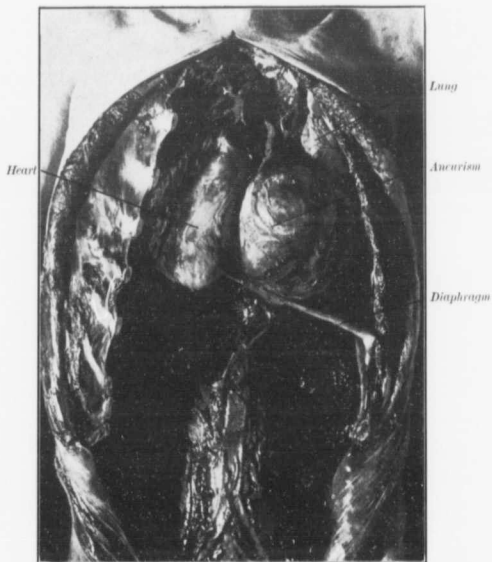


FIG. 5—Aneurism of descending thoracic aorta. Case (Leonard) showing the dislocation of the heart to the right. From a photograph.

present in only two of the cases; and in only one (Case XII) did rupture take place into the gullet.

**PHYSICAL SIGNS.**—There may be none when the sac is small and deeply placed, and death may occur from rupture into the pleura or gullet or trachea. There may be no distinctive signs even when there is a colossal sac, as in Sokolowski's case (Figs. 3 and 4), in which the aneurism filled the left side of the chest.

*Inspection*, carefully and systematically made, rarely fails to give most important information. In eleven of our cases pulsation was visible. In 1887 I had my lesson on the value of routine in examination in this class of cases. I saw at the Girard Hotel, Philadelphia, a patient who presented very unusual and remarkable features. I need not detail his history, but there had been many diagnoses and many doubts. There was a wide area of pulsation in the front of the chest, no bulging, and a loud to-and-fro aortic murmur and a wide area of cardiac flatness. The case had been regarded as one of aortic insufficiency with remarkable hypertrophy. After examination of the front of the chest, some kind spirit, or the routine habit, prompted me to look at his back, where the diagnosis was "writ large" in a prominent pulsating tumor of the left interscapular region. Like Leonard (Case XII), he had a big sac which had pushed forward and flattened the heart against the sternum. In Leonard's case a positive diagnosis was not reached until the pulsation was noticed to the left of the spine. The pulsation, as a rule, is dorsal, and it may be only a diffuse shock, or, as in Cases III, VIII, IX, XI, XII, and XIV, there is a definite expansile tumor, which may form a large, flat prominence, as shown in Fig. 2, or there may be a circumscribed bulging beneath the skin, due to perforation of the sac through the chest wall, as in Case IX. The left interscapular region is the favorite site. In very large sacs the whole of the infrascapular region may pulsate, as it did in the case shown in Fig. 2. The pulsation may appear anteriorly, either in the second, third, and fourth left interspaces, when the sac projects anteriorly from the first part of the descending aorta, or below in the sixth, seventh, and eighth, when, as in Leonard (Case XII) and Colmus (Case VIII), the sac projects anteriorly and pushes aside the heart. A large sac from the anterior wall of the aorta just above the diaphragm may bulge forward and cause pulsation in the epigastrium below the ensiform

cartilage. In Case XIII the pulsation on the manubrium and to the left was probably due to the dilatation of the arch and not to the deep-seated aneurism. There may be only a diffuse shock without localized pulsation. A moderate-sized sac may give a wide-spread shock if the walls are protected by laminae of fibrin. On the other hand, a large sac with dense layers of leathery fibrin may give neither a visible nor a palpable impulse. There is much of interest in the abnormal character of the pulsation of the heart in this group of cases. As shown in the photograph of Case XII (Fig. 5), the organ may be pushed far to the right and there may be a remarkable undulatory impulse—a distinct difference in the time between the heart shock and that of the aneurism. The extraordinary width of the impulse in Cases VIII and XII was a most noticeable feature. The heart seems more often to be pushed up and to the right, but in Sokolowski's case it was pushed down and to the left.

*Palpation.*—There are five possible physical signs to be appreciated by touch. The *diffuse pulsation* or shock is rarely absent, and may be present in quite small tumors. Not to be confounded with the true aneurismal impulse, it is the jar or shock caused by the pulsation of blood into the sac, and it may lift the adjacent chest wall or cause the whole side to throb. It may be present as a diffuse jar without any localized movement in the chest wall. The *aneurismal impulse*, an entirely different thing, conveys the same sensation as the heart impulse, and the fingers feel a forcible systolic heave, not simply a jar or shock. When there is a bulging tumor, the pulsation is felt to be expansile. A *thrill* is not often felt in aneurism of the descending thoracic aorta. It was present in only one case and was systolic in time. The *shock of the heart sounds* is usually felt over an aneurism, particularly the diastolic, which is sometimes very snapping. And lastly, a *bulging tumor* may occasionally be grasped, as in Case IX. Tracheal tugging is not so common as in aneurism of the arch. It was present in five cases.

*Percussion* shows changes in the normal resonance only when the tumor is large and reaches the surface. Pressure on the left bronchus may lead to changes in the lung and extensive impairment of resonance, but the areas of flatness on the chest wall, as shown in the diagrams, are small, as a rule, in consequence of the protection of the left lung. It is well to bear in mind how exten-

sive the flatness may be—the whole left front and sides of the chest in a huge sac as shown by Sokolowski's case (Figs. 3 and 4).

On *auscultation* a systolic bruit is usually heard in the cardiac region, sometimes a diastolic. The former was present in 10 cases, the latter in 7 cases, all in connection with aortic insufficiency. In small deep-seated sacs, or in the very large ones with thick walls, there may be no murmur.

The radial pulse may be smaller on the left side than on the right (4 cases), or it may be obliterated (1 case). The left carotid may be occluded.

It is to be borne in mind that aneurisms of the aorta are often multiple, and, as in Case XIII, certain of the most prominent signs may be caused by the tumor or diffuse dilatation of the arch.

DIAGNOSIS.—Of the 14 cases, in 3 the condition was latent and unrecognized clinically. In the others the symptoms and physical signs were characteristic of aneurism. Difficulties were present in Case IX, which on the first admission was regarded as one of severe intercostal neuralgia; and in Case XII, which we thought at first might be adherent pericardium. There are three groups of cases which present serious difficulties:—

(I) When there are symptoms only and no physical signs, or the signs are not characteristic. A small sac projecting from the first part of the descending aorta may compress the bronchus, the esophagus, and the recurrent laryngeal nerve, and there may be not a single physical sign, but all the pressure symptoms of tumor—cough, dyspnea, pain, cracked voice, and dysphagia. Or there may be a huge sac causing many symptoms and lasting for many years without a single characteristic sign of aneurism. In 1882 I saw for Dr. Howard, of Montreal, a gentleman, aged 70 years, who had for many years cough, with pulmonary symptoms, and a cracked voice. He had symptoms pointing to some trouble in the chest for fully 14 years; cough in severe paroxysms, husky voice, a recurrent laryngeal paralysis, and attacks of hemoptysis. There was flatness over the left back from the spine of the scapula; no pulsation; no bruit, but the breathing was enfeebled. At the post-mortem the descending aorta was found to be dilated in its course, and from its anterior surface two aneurisms projected; one, the size of a large fist, lined with very dense laminae of fibrin, had compressed the left lung and flattened and almost occluded

the left bronchus; the other sac sprang from the vessel just above the diaphragm.

Perhaps the most remarkable case of this sort in the literature is reported by Sokolowski.<sup>1</sup> The patient held a prominent position in the German government. In 1864 he had a severe attack of dyspnea. A physician, a friend, happened to come in during the attack, made a careful examination, and found, to his astonishment, flatness in the upper left half of the thorax with absence of the respiratory murmur. The heart impulse was dislocated a little down and to the left. From this time the patient had at irregular intervals severe attacks of dyspnea of short duration, during which very often the left radial pulse was not palpable. In 1869 the attacks were more numerous. In March of that year he consulted Professor Oppolzer, who diagnosed an aortic aneurism, and Professor Skoda, who diagnosed a mediastinal tumor, probably carcinoma. The patient improved during the summer and was worse in the winter. He was able to get about, although he had shortness of breath on exertion. In the winter of 1875-76, for the first time, he had bloody sputum. In the spring of the latter year he had a left-sided pleural exudate. In July, 1876, he was in Brehmer's Institution, where he came under the observation of Dr. Sokolowski. He was then 43 years old, well built and well nourished, but was extremely dyspneic and slightly cyanotic. The pulse was absent in the left radial, equal in the carotids. The heart-beat was in the seventh intercostal space in the axillary line. There was no heaving impulse anywhere over the chest. Extensive absolute flatness was present over the greater part of the left half of the thorax. There was a loud tracheal rhonchus over the whole of the front of the thorax. Nothing was audible over the greater part of the area of flatness. The tactile fremitus was lessened. Behind there was a slight vesicular murmur to be heard. The dyspnea increased, and he died July 29, 1876. On opening the thorax the right lung extended to the middle line, but the whole of the rest of the visible field was occupied by a thick mass of connective tissue. The pericardium near the left lung was visible. The latter was pushed up from behind, strongly compressed and airless. After some difficulty the heart was discovered at the left

<sup>1</sup> Deut. Arch. f. klin. Med., 1877, xix, 623.

angle of the large mass, which was found to be a huge aneurismal tumor of the entire thoracic aorta. The heart was not enlarged and the valves were normal. The aneurism lay between the sternum and the vertebral column and the ribs on the left side, filling the greater part of the left chest. The esophagus and trachea lay in a groove in the back of the tumor. The aneurismal sac began just 2 cm. above the orifice of the aorta. Its walls were of unequal thickness; the hinder wall was covered with a dense coagulum as thick as the fist and of the hardness of cartilage and much laminated; the anterior wall was also covered by a dense, thick coagulum. As the cross-section of the sac showed (Fig. 4), the blood passed through the center of the tumor in a very irregular, sinuous channel. Evidently it was the enormous thickness of the laminæ of fibrin that prevented the usual characteristic pulsation. It is specifically stated that there was no pulsation in the thorax and no murmur. The pictures (Figs. 3 and 4) of this phenomenal aneurism, which I do not remember to have seen referred to in the literature, are here reproduced.

(II) In a second group the symptoms and signs suggest malignant growth. Aneurism, in fact, rarely simulates new growth; thus, the question was not raised in one of our cases; on the other hand, new growth in the mediastinum, lung, or pleura may simulate aneurism very closely. The difficulty in diagnosis may be very great, and, as I have just told you, such masters in Israel as Skoda and Oppolzer took opposite sides in Sokolowski's case. In illustration of how difficult it may be, let me tell you an experience of a few days ago. I saw with Dr. Bolgiano a fairly well-nourished woman of 40 years, decubitus on the right side. Even before the night-dress was removed, I noticed a pulsation at the left side of the chest. Turned on her back, a visible impulse extended from the left sternal margin in the second, third, and fourth interspaces, lifting the chest wall with each systole. There was no bulging. On palpation there was a diffuse shock; no punctate impulse; no thrill; the second sound was felt over the area of pulsation. On percussion there was flatness over the manubrium and extending from the clavicle to the fourth interspace. On auscultation the breathing was feeble and distant; there was a systolic bruit to the left of the sternum. The apex beat was in the fifth interspace, a little outside the nipple. There was well-marked tracheal tugging;

the left recurrent laryngeal nerve was paralyzed, so that the voice was cracked. Nothing was lacking to the diagnosis of aneurism but a definite palpable impulse over the area of shock or pulsation. Had this been my first introduction to the case, I should have been in great doubt, but the conditions had been only too evident. I had seen the patient in June, with a small tumor of the left lobe of the thyroid and an enlarged gland above the clavicle. As she was about to go to Europe, we advised her to consult Professor Kocher, who diagnosed cancer of the thyroid with mediastinal extension. On her return, Dr. Finney took out a gland in the neighborhood, which proved to be cancerous. The mediastinal growth extended to the pleura and probably to the lung on the left side, the left recurrent became involved, brain symptoms came on, with double optic neuritis. There was no question here of aneurism, but the pulsation, the accentuated second sound, the systolic bruit, the involvement of the recurrent laryngeal nerve, and the tracheal tugging gave a picture more suggestive of aneurism than any I had ever before met with in malignant growth. It was the first time I had felt tracheal tugging in a case of new growth.

It is well to bear in mind that rapid loss in weight may occur in aneurism. One of our patients lost many pounds in a few months. Bramwell refers to this point in No. 2 of his recent "Clinical Studies," and suggests that it may occur in connection with pressure on the thoracic duct. This was present, however, in Case X of our series without special loss in weight.

X-ray examination may give evidence of the greatest value in those doubtful cases in which symptoms only are present. It was helpful in Case XIII. In both Colmus and Leonard, in whom an early diagnosis was not reached, we could not get much assistance from the X-ray examination. Some of you may call to mind the case in Ward F, in the early part of the year, which had been diagnosed sarcoma and in which the X-ray gave us most positive signs.

(III) In a third group of cases there are obscure and puzzling chest symptoms suggestive neither of aneurism nor of tumor. Pressure on a bronchus or the growth of the sac directly into the lung may give very obscure pulmonary symptoms—persistent cough, fever, purulent bronchiectasis, or hemoptysis. The symptoms may be those of chronic obstruction of the esophagus, and it is stated

that in attempting to pass a probang the sac has been pierced. Pressure on the intercostal nerves may cause an intense neuralgia, which may mask the other features (Case IX), or agonizing pain in the back may be the only symptom. Herpes zoster may occur, or a sudden paraplegia from rupture into the spinal canal.

The PROGNOSIS in aneurism of any part of the thoracic aorta is bad. Complete cure of an aneurism after it has attained any size is scarcely possible, but a practical cure may sometimes be effected by the lamination and obliteration of the sac. When a student in Toronto, I occasionally visited the jail with our teacher of anatomy, Dr. J. H. Richardson,—still with us, hale and hearty,—and among the prisoners was an old soldier who had been discharged from the army after the Crimean War for aneurism of the aorta, so his papers said, and, considering the large experience of the army surgeons with the disease, it is not likely that there could have been any mistake. The old man died in 1885, 30 years after the Crimean War, and the late Dr. J. E. Graham, of Toronto, sent the specimen to me to have drawn and described. At the junction of the arch and descending aorta was a healed sacular aneurism projecting forward. At the distal margin of the sac were two openings, one of which communicated with the natural lumen of the vessel, the other with a dissecting aneurism which had split the coats of the aorta in its entire length and in the greater part of its circumference, as shown in the figure in Dr. Graham's paper.<sup>1</sup> The aneurism in this case, if we take the diagnosis on the patient's discharge papers, must have lasted 30 years. This is not unlikely. Dr. Whipham, of St. George's Hospital, gives an account of a man whose thoracic aneurism had been recognized for twenty-five years. I saw at the Philadelphia Hospital in a very old woman three healed aneurisms in the aorta, all filled level with firm, gray coagula. We must remember that an aneurism is not always a progressive lesion. There may be an arrest, and, with a gradual deposition of fibrin and condensation of the coagula, the further distention may be prevented and the blood may run smoothly over the mouth of a sac the surface lamella of which may be as smooth as the palm of the hand. The prognosis, so far as duration of life goes, is rather better, I think, in aneurism of the descending part

<sup>1</sup> Amer. Jour. of the Medical Sciences, 1886, xci, 155.



of the thoracic aorta. Sokolowski's celebrated patient lived twelve years after the discovery of the lesion, which must have already existed for some years. The probability is that in Dr. Howard's case, of which I spoke, the disease had been present 14 years.

TREATMENT.—Aneurism of any part of the thoracic aorta is a very hopeless disease. A few rare cases are cured spontaneously or by artificial means; in a few the condition becomes chronic and the patients linger for years, usually in distress and pain, not often in comfort.

The treatment has in view three objects:—

First, the relief of the more urgent pressure symptoms. The patients often come into the wards with orthopnea and cyanosis, or there is pressure on the superior cava. In no condition is a full and free bleeding more useful, relieving the pain, the distress in breathing, and the cough. In no way can the blood-pressure be lowered more promptly. Plenty of blood should be taken, 25 or 30 ounces. Nowadays we are afraid of the lancet, and, while we are bleeding more often, we are not bleeding freely enough. The rest in bed alone may be followed in a few days by a great change in the patient's condition, relief of the cough, the dyspnea, and the pain.

Secondly, to reduce the strain upon the aneurismal sac. Certain measures reduce the number of heart-beats, lessen the frequency with which the sac is distended, and reduce the pressure with which the blood flows in the sac. Complete rest lowers the heart-rate from twenty to thirty per cent., and if we take a heart-rate at 70 per minute, or 100,000 in the twenty-four hours, lowering only ten or fifteen beats in the minute saves many thousands of strong throbs in the sac. Absolute rest lowers, too, the blood-pressure, but this is effected much more surely by a reduction to the minimum of the amount of food and drink. Tufnell's diet consists of: breakfast—two ounces of bread and butter and two ounces of milk or tea; dinner—three ounces of mutton, three ounces of potatoes or bread, and three ounces of claret; supper—two ounces of bread and butter and two ounces of tea. There is at present in the hospital a patient who has had the courage to undergo a rigid Tufnell treatment for four months. His pulse-rate fell from 100 to 70, the blood-pressure gradually sank from 160 mm. to 95 mm., and the visible pulsation to the left of the sternum has

gradually disappeared. His voice, which was cracked, has been very much improved, the pains have ceased, and all signs of suffusion and congestion of the face have disappeared. How far the sac has been permanently consolidated it is difficult to say, as you must bear in mind that simple rest in bed will sometimes cause very marked diminution in the size of the sac.

Thirdly, measures which promote coagulation of the blood in the sac. Rest and the low diet favor coagulation, as was known to Valsalva, diminishing the rapidity of the flow of blood and increasing the fibrin-forming factors. Of medicines, the iodide of potassium is most helpful. Whether or not it increases the coagulability of the blood is doubtful, but it relieves the pain, and perhaps, as Balfour suggests, it promotes thickening and contraction in the sac. One has to bear in mind that syphilis is an important factor in a majority of the cases of aneurism, and the iodide may help against it. The drug need not be given in very large doses: we get all the good effects from 10 or 15 grains (0.6-1.0) three times a day. Gelatin, which was introduced of late years by certain French writers, has been given a thorough trial here, and, while it has seemed to help in some cases (particularly that of Colmus) in relieving the pain, we have had no case in which the aneurism has been cured. We have in a few instances used calcium chloride to promote coagulability of the blood.

In suitable cases surgical measures may be employed. We have not had a single instance of aneurism of the descending thoracic aorta in which we thought it well to employ the method of wiring, with electrolysis, which has been done here so frequently by Dr. Finney, and in some cases successfully. In Case III the wall of the sac was scraped by the method recommended by Macewen.

Fourteen cases with 13 deaths is a comment upon treatment! But it is satisfactory to feel that in a majority of these patients the suffering was greatly relieved, and that they were made as comfortable as our art and good nursing could make them,—and, after all, in such a hopeless disease, this is to fulfil the highest mission of the physician.

## APPENDIX

CASES OF ANEURISM OF THE DESCENDING THORACIC AORTA<sup>1</sup>

CASE I.—*Cough and dyspnea for two and one-half years. Well-marked signs of aneurism. Hemoptysis; death. Dilatation of the arch. Aneurism of the descending aorta, erosion of the lung and of six upper dorsal vertebrae.*

William Lewarn (Gen. Hosp. Nos. 897, 1099, 2020, 2233, 2518), aged 46 years, white, a baker, was admitted for the first time on February 26, 1890, complaining of cough and shortness of breath. The family history was unimportant. He had had lues at 15; hematuria at 26. The present illness began in November, 1889, with painful micturition.

The patient's condition was improved during each stay in the hospital. At the third admission the following note was made: There is a marked heaving pulsation of the upper left section of the chest in front. There is no thrill. The second sound at the apex is replaced by a diastolic murmur propagated into the axilla and toward the sternum, where it becomes more intense. Over the area of dulness, which extends from the upper border of the clavicle to the third rib on the left side, and laterally from the left sternal border to the middle of the clavicle, both sounds are of a booming character, and there is a soft systolic murmur in addition to the diastolic. The systolic murmur is particularly loud over the clavicle. There is no diastolic shock. Marked tracheal tugging.

The patient was brought to the hospital for the last time on February 2, 1892, having had a hemoptysis the night before, during which he became quite unconscious.

On admission there were great prostration, lividity of the face and hands, great dyspnea, and a small, soft pulse. There had been great emaciation since the previous admission, and the dyspnea and cough were increased. The patient now frequently coughed up thick, bloody-looking mucus. The left radial pulse was only perceptible at times. Both pupils were contracted. Breathing was almost entirely diaphragmatic. The area of dulness over the aneurism noted at the previous admission extended to the anterior axillary line and downward to the third rib on the left side.

On February 6, after a sharp hemorrhage of bright-red blood, the patient was suffocated, and respiration ceased immediately.

*Anatomical Diagnosis (Autopsy No. 167).—*Aneurism of the ascending, transverse, and descending parts of the aorta, with erosion of the bodies of the first six thoracic vertebrae. Ulceration into the lung. Congenital cyst of the right kidney, with atrophy. Old tuberculosis of the left lung.

The left lung voluminous; does not retract on opening thorax. Immediately below the upper margin of the sternum is a firm mass. The heart is slightly twisted to the left side. Behind the ascending aorta is a large aneurism, intimately adherent to the vertebrae. The sac is closely attached to the left lung, which really forms a part of the sac and which has been ulcerated into by the aneurism. There is a cavity in the upper lobe filled with blood. The aneurism springs from the transverse and descending portions of the aorta and is 12 cm.

<sup>1</sup> Dr. Fletcher and Dr. Hume have very kindly helped in making the abstracts of these cases.

in diameter at its widest part. The erosion of the bodies of the first to the sixth vertebrae extends almost into the spinal canal. The intervertebral cartilages are intact.

CASE III.—*Syphilis at 29 years. Injury of back 12 years before admission. Five years before numbness and pain in left hypochondrium. Pulsating lump in the back; large superficial blood-sac; Macewen's operation. Rupture into left pleura; death. Large sacculated aneurism of the descending aorta, with erosion of the seventh and eighth vertebrae and the sixth, seventh, and eighth ribs; perforation of sac through the chest wall. (Fig. 2.)*

E. B. (Gen. Hosp. Nos. 7290 and 7479), male, aged 44 years, colored, a fireman, was admitted on May 6, 1893, complaining of pain in the left side.

The family history was unimportant.

The patient had malarial fever at 21, syphilis at 29, gonorrhoea several times. His wife had had seven children and one miscarriage.

Five years ago he began to have pain in the left hypochondrium, which radiated to the back. There was numbness in the same region. The patient had been sleepless, but had been able to work until ten weeks before admission. He had no cough or dyspnea. Three weeks previously he had noticed a lump in the back, which "beat tremendously" sometimes. This caused him no pain, but made him uncomfortable. Twelve years previously a man weighing 200 pounds had fallen on his back, but had caused him no trouble at that time.

On admission the patient was found to be a well-developed negro, not anemic and without congestion in the face. His pupils were equal and reacted normally. The pulse was 76; the left radial was only just perceptible. The apex beat was not distinctly visible, but there was a diffuse throbbing in the nipple region and an impulse in the fifth space inside the nipple-line. At the fourth rib the cardiac dullness extended a little outside of the nipple-line. Over the sternum there was slight throbbing. On auscultation a diastolic murmur was heard at the level of the fourth rib and over the upper two-thirds of the sternum, as well as in the carotids. There was no tracheal tugging. There was a large hemispherical bulging tumor in the lower interscapular region, occupying the space between the spine and the angle of the scapula, and extending 3 cm. below the angle of the scapula. Its upper border corresponded to the fifth thoracic vertebra. (See Fig. 2.) There was an expansile pulsation, but no thrill, over the mass. A systolic and a diastolic shock were present, the former more marked. The ribs were apparently eroded and the sac of the aneurism seemed close to the skin. When the patient held his breath, there was a soft, distant to-and-fro murmur, probably transmitted. There was no sensitiveness over the tumor or affected ribs, but lower down there was tenderness over the unaffected ribs. There was no throbbing in the abdominal aorta.

On June 1 the patient was transferred to the surgical wards.

Between June 11 and July 23 Macewen's needling operation was done by Dr. Halsted on twelve or more occasions, and on the latter date it was noted that there was great improvement in the patient's general condition. He could lie with comfort on either side, could use the left arm better than before, slept better, and had less pain. The aneurism, though pulsating less, was about the same size as before.

On the night of August 4 the patient began to have a rapid, weak pulse and dyspnea. By August 7 he began to complain of great pain in the left side and could not lie down unless given morphin. The pulse ranged between 110

and 140, the respirations between 25 and 40, and the patient was very weak and depressed. On August 10 a moderate degree of ascites was noted.

On August 12, after a good deal of pain, the patient died.

Only on one examination did the urine show any albumin; no casts were seen.

*Anatomical Diagnosis (Autopsy No. 440).—*Saccular aneurism of descending thoracic aorta; rupture into left pleural cavity; erosion of ribs and vertebrae; appearance of aneurism in the back; retraction of the left lung; displacement of the heart and pericardium; general arteriosclerosis.

In the left back, extending from the spine of the scapula to the tenth thoracic vertebra, is a large, oval, fluctuating swelling.

Heart-muscle flabby. In the aorta, commencing just above the valves, are many patches of sclerosis, most numerous around the openings of the innominate, the left carotid, and the left subclavian arteries. Arising from the postero-lateral wall of the descending aorta is a large aneurismal sac, the orifice measuring 6.5 cm. across. The walls of the sac are thinner as they leave the aorta, until the intima and media finally seem to disappear. The sac forms a large irregular mass, projecting into the left pleural cavity, its upper border corresponding to the fifth intercostal space and the lower to the tenth rib. At the upper part of the mass is a small opening partially closed with clot. The left pleural cavity is filled with a huge, soft, dark-red blood-cast, while the left lung, pressed upward and backward, is completely collapsed and occupies as small a space as possible. The heart and pericardial cavity are displaced to the right. The sac has eroded the sixth, seventh, and eighth ribs, the seventh having completely disappeared for a considerable distance. The cavity of the sac communicates, through an opening in the thoracic wall, with a large blood-sac, 18 x 10 cm., over which the muscles are stretched exceedingly thin. Further, passing backward, the sac has eroded the bodies of the seventh and eighth thoracic vertebrae, and a sac the size of a robin's egg projects to the right of the spine. The intervertebral discs have suffered less than the bodies of the vertebrae.

The sac is filled throughout with soft clots; there are no laminated thrombi and no evidence of granulation tissue in the walls. The right lung shows slight passive congestion. The other organs are not markedly abnormal.

*CASE IV.—Alcoholic history; pain in the side and dyspnea; pulsation to the right of the sternum; paralysis of the left vocal cord; urgent dyspnea; death. Dilatation of the arch; fusiform dilatation of the thoracic portion; erosion of the fourth and fifth vertebrae; small ulcer of stomach.*

P. H. D. (Gen. Hosp. No. 11,469), aged 49 years, colored, a waiter, admitted on November 22, 1894, complaining of pain in the left side and shortness of breath. The family history was unimportant.

Gonorrhoea ten years previously. No history of syphilis. Until a few years before admission the patient used to drink a great deal of whiskey and smoked to excess. He chewed tobacco very freely. He had erysipelas 13 years ago, and smallpox 30 years ago. Three years before admission the patient had "rheumatism" in one foot, the front of the foot being swollen and very tender, but no other joints were involved.

For three weeks the patient had had pain in the left lower chest, which had been constant and aching in character, with occasional sharp, shooting pains passing upward. The pain was worse on walking or deep breathing. For five days the patient had been short of breath. He had had severe attacks of

vertigo at times. The digestion was good; the patient slept well and did not complain of dyspnea at night. Eight years previously he had noticed in front of his right knee a small, shot-like lump. Four or five months later a similar lump appeared over the left knee, and still later others on each elbow. The patient could move the skin freely over these and could move the lumps on the tissues. They had grown slowly up to a year before admission, since when they had remained of the same size. They were painless.

On January 24, 1895, I dictated the following note: There is a very pronounced throbbing in the second right interspace and over the second right costal cartilage. This is visible as well as palpable, and is in contrast to the same area on the opposite side. There is some dullness over this area, and a loud, rasping systolic murmur is heard everywhere over the manubrium, as well as a loud diastolic murmur down the border of the sternum. Tracheal tugging apparently present. A systolic thrill in the vessels of the neck.

On January 29 the patient complained of severe palpitation of the heart and of dyspnea and vertigo. He also had numbness in the fingers of the right hand. The pulse was rapid and intermittent.

On January 31 Dr. Thayer noted a well-marked heaving impulse in the first right interspace and about the sterno-clavicular joint, as well as in the suprasternal notch. The sternal end of the clavicle was forcibly raised at each impulse. The cardiac flatness was quite obliterated by pulmonary resonance. There was a systolic murmur at the apex, transmitted into the axilla.

On February 8 I noted the striking contrast in the size of the two radial pulses, the right being much the smaller. The pupils were not unequal. There was no thrill, but an unusual grade of shock felt throughout the chest.

On February 26 the patient was very hoarse and had a distressing cough. The area of pulsation was 6.5 cm. in extent, and over it there was a double murmur. The right pupil was slightly larger than the left.

After March 1 there was a great deal of viscid sputum, containing muchropy mucus. No elastic tissue or tubercle bacilli were seen.

On March 8 Dr. Warfield noted a complete paralysis of the left vocal cord.

On March 14, after several attacks of dyspnea and two attacks of vomiting, the patient's face became puffy on the right side. He soon became unconscious and fell out of his bed, dying soon after being put back.

The urine had never contained more than a mere trace of albumin until the last two weeks, when albumin was present in somewhat larger amount. There were a few hyaline and granular casts present throughout his illness.

*Anatomical Diagnosis (Autopsy No. 636).*—Fusiform aneurism of the descending thoracic aorta; pressure upon and erosion of the dorsal vertebrae; chronic endocarditis of aortic valve; arteriosclerosis; heart hypertrophy and dilatation; chronic passive congestion of the viscera; chronic diffuse nephritis; pressure upon the recurrent laryngeal nerve; ulcer of the stomach.

The peritoneal cavity contains 1000 c.c. of clear yellow serum. Precordial space 22 x 16 cm. in extent. The left lung is retracted in large part.

The pericardium shows minute hemorrhages on the left side, in the parietal layer, where it is adherent to the lungs. There are old adhesions between the pericardium and the aorta. The heart is hypertrophied, especially the left side. It is also dilated. The aortic valve segments are thickened and the edges retracted, not, however, beyond the corpora Arantii. There is a diffuse dilatation of the aorta, commencing just above the valve and extending through

the ascending and transverse portions. At the origin of the innominate it measures 10 cm. At the beginning of the thoracic portion is a further dilatation, which extends 17 cm., is fusiform, and involves all the coats. Its central part is covered with lightly adherent, laminated fibrin. The dimensions of the aneurism are, at its beginning, 12 cm.; at its widest part, 13 cm.; at its lower end, 8.5 cm. It extends backward and to the left, and is firmly adherent to the fourth and fifth thoracic vertebrae, whose bodies it has eroded. The aorta is the seat of extensive nodular endarteritis. In the adhesions between the aorta and the lung is a calcified and pigmented gland which compresses the origin of the recurrent laryngeal nerve.

The kidneys are the seat of a diffuse nephritis, with atrophy.

A small ulcer, extending into the submucosa, is situated on the superior surface of the lesser curvature of the stomach.

The other viscera show considerable chronic passive congestion.

*CASE VII.—History of syphilis; alcoholism; pain in chest and dyspnea, with loss of 36 pounds in weight in three months. Bulging with pulsation of manubrium; tracheal tugging; impaired resonance in the left upper interscapular region; much dyspnea and cyanosis; fever; saccular aneurism of the upper part of the descending aorta; erosion of the second and third vertebrae; compression of the trachea.*

John Connolly (Gen. Hosp. Nos. 26,523 and 26,797), aged 39 years, white, a sailor, admitted on May 18, 1899, complaining of difficulty in breathing and of pain in the chest. The family history was unimportant.

Syphilis 12 years previously. Alcohol to excess; had often been drunk. Four months before admission, while on a sea-voyage, the patient had a sharp pain in the left side near the heart and passing to the left shoulder-blade. The pain had continued ever since, but was severer at times and made him short of breath, so that work had become impossible. Two months previously his voice became roughened and he began to cough; no dysphagia. He had lost 36 pounds in three months.

On May 19 Dr. Futeher made the following note: Dyspnea marked; voice husky; cough has a suggestive brazen quality. Tracheal tugging palpable. Bulging over the manubrium and precordial area, where there is a slight systolic pulsation. No bulging in the left infrascapular region. Heart sounds are well heard over the area of bulging at the base of the sternum, the second sound being ringing. No murmurs are heard. There is no palpable thrill over the precordium, but a fairly distinct diastolic shock.

On May 22 the patient received 250 c.c. of one per cent. gelatin solution. The coagulation time was not, however, reduced by this procedure.

On May 31 Dr. Futeher noted distinct pulsation at the top of the manubrium, with lifting of both clavicles. The patient was discharged on June 3, and returned on June 15, 1899, complaining of shortness of breath. During the two previous days, while walking, he had had pain in the lower abdomen and testicles, followed by swelling of the testicles. The patient had been rowing the day before, but had to stop suddenly on account of dyspnea. There was slight pain occasionally under the left scapula. The patient's condition had not altered much since his previous admission, except that in the left upper interscapular area there was now a slight dullness. No murmurs were heard in this area.

On June 16 Dr. Futeher noted that the right radial pulse was larger than the left, that tracheal tugging was very distinctly palpable, and that there

was marked bulging over the base of the sternum. The heart sounds were everywhere clear.

On June 20 the patient received a second gelatin injection and his coagulation time was reduced from three and a half minutes to one and a half minutes. Several further gelatin injections were given during June and July, but they caused him so much pain that they were discontinued.

On July 20 it was noted that the right pupil was smaller than the left.

On September 8 the patient commenced to have severe attacks of coughing, the face and hands becoming cyanotic. There was much vomiting. The patient became afraid to go to sleep, fearing suffocation. No bulging was made out in the back at any time, nor any thrill.

On September 10 superficial pleuritic rubs were noted at the bases, with coarse râles on the left side.

The patient's temperature, which had hitherto been normal, rose to between 103° and 104° F. The leukocyte count on September 12 was 33,000, and there was considerable expectoration of mucopurulent material. There was tubular breathing in the right interseapular region, with impairment of the percussion note in the subscapular regions.

On September 14 Dr. Fitcher noted considerable impairment in resonance over the right lower lobe.

On September 15 the patient, after being unconscious nearly all day and showing twitching of the head and arms, began to gasp and struggle for breath. All efforts to revive him were futile.

Albumin was only present in the urine during the last three days before death and a few hyaline casts were present near the end.

*Anatomical Diagnosis (Autopsy No. 1417).—*Arteriosclerosis. Scar on the penis. Sacular aneurism of the descending aorta. Slight cardiac hypertrophy. Patent foramen ovale. Compression of the trachea. Slight bronchiectasis. Pneumonic consolidation and bronchitis of the right lung. Double old pleuritic adhesions.

The left bronchus where it passes below the aorta is compressed and its lumen diminished by one-half. The trachea is filled with watery pus. Beginning 2 cm. above the bifurcation, its walls are greatly compressed laterally and its mucosa covered with ecchymoses. The heart is moderately enlarged. The coronaries are slightly sclerotic and the aorta shows patchy sclerosis. Immediately beyond the origin of the left subclavian artery the aorta becomes dilated into an aneurism which involves the vessel for a distance of 12 cm. The diameter of the aneurism is 8 cm. On the right it compresses the trachea; posteriorly the esophagus is plastered close against it, and the bodies of the second and third thoracic vertebræ, which form the posterior wall of the aneurism, have been eroded to a depth of 4 or 5 mm. On the left the apex of the lung is adherent and the parietal pleura forms the lateral wall of the sac. The aneurism contains several layers of laminated fibrin.

CASE VIII.—*Hard work and alcohol; no syphilis. Pain in the back in 1895; gradual increase in severity. Admission in 1898; girdle-pains and paroxysms of pain. Wide-spread area of pulsation in front of chest; pulsation in the left infrascapular region; dysphagia. Pain the prominent symptom. Death in July, 1900, five years after onset of pain. Large aneurism of the descending aorta; dislocation of the heart to the right; erosion of the eighth, ninth, tenth, and eleventh dorsal vertebræ; compression of left lung.*

U. Colmus (Gen. Hosp. Nos. 22,638, 23,641, and 24,636), male, white,



aged 41 years, a laborer in a glass factory, was admitted for the first time on April 19, 1898, complaining of pain in the left side of the back and in the abdomen. There was nothing of importance in the family history.

The patient had malaria at 16. When he was 24 he had rheumatism, involving several joints, but was not incapacitated from work. From 12 to 24 years of age he did hard manual labor on a farm. Since then he had been engaged in a glass factory. He had been a heavy drinker: for many years he took two glasses of whiskey before breakfast and eight or nine glasses of beer during the day. He smoked a good deal and was a hearty eater. When 21 he had gonorrhoea. He denied ever having had syphilis.

During the summer of 1896 he did some heavy lifting of lumber, and noticed some pain in the left side a little anterior to that complained of on entrance to the hospital. About nine months previous to admission the patient began to complain of pain in the back when he got up in the morning. This would usually disappear after moving about. The pain was in the region of the eleventh and twelfth ribs behind and in the flank on the left side. It gradually increased in severity. Two weeks ago the pain spread to the abdomen, over the area between the costal cartilage of the tenth rib and the umbilicus. The pain in the back also increased, and could not be worked off, but was increased on standing or walking. It kept him awake at nights. He was unable to sleep on his back, being most comfortable lying prone with a pillow under his abdomen. The character of the pain varied: that in the back was shooting and more marked on inspiration, whereas that in the abdomen was boring. The pain is now continuous, but at some times is much sharper than at others. During the paroxysms of pain he gets relief by lying over the foot-board of the bed or by other means of pressure. Occasionally he had experienced some pain on the right side of the abdomen at the level of the costal cartilage of the tenth rib, when the pains were more or less of the nature of "girdle"-pains. He was often incapacitated from work, but did not give up entirely until six weeks ago. The patient had a specially severe attack of pain early in January, 1898. This attack lasted for about three weeks, and he spent most of the time standing pressing his abdomen against the table-edge or leaning over the back of a chair in order to relieve the pain. At this time he noticed considerable swelling of the feet, which lasted two days. He had not been dyspnoic.

On April 21, two days after admission, I dictated the following note: Over the left side of the thorax there is a visible pulsation as high as the second rib. Sternum is also lifted. Pulsation extends up to the third rib in the axilla. When he turns on the right side, the pulsation is seen chiefly in the lower axilla. The pulsation is diffuse, nowhere punctuate, and extends as far over as the posterior axillary line. Well-marked systolic retraction behind just below the eleventh rib. Maximum impulse on palpation is in the left parasternal line over the cartilages of the fifth and sixth ribs. No thrill. No pulsation in vessels of neck. No visible point of maximum impulse. On auscultation at the aortic area there is a soft systolic murmur. With the second sound there is a soft diastolic murmur. In the second left interspace, a loud systolic murmur and a soft diastolic. The systolic murmur is heard down the left parasternal line, and is of maximum intensity over the fourth rib. In the mitral area both sounds are feeble; a soft systolic murmur with the first sound. In the tricuspid area both sounds are well heard; no murmur. Below the left costal margin there is no murmur in the area of pulsation. No murmur in

the mid-axillary region. Over the body of the heart in the fourth interspace there is a well-marked, loud cardio-respiratory murmur. No pulsation behind, along the spine. No bruit over the area of pulsation in the lower axilla. The abdominal aorta cannot be felt. Pulsation in both femorals. In the knee-chest position there is no trace of pulsation in the back below the ribs.

In addition to the above note a rather striking feature was the marked pulsation in the epigastrium, particularly in the left side.

On April 25 Dr. Thayer noted for the first time that when the patient sat up in bed there was a quite marked pulsation in the lower left back over the eleventh and twelfth ribs in the scapular line. The relative cardiac dulness on this date extended 5.25 cm. to the right of the median line opposite the fourth interspace.

The patient remained in the hospital until July 4, 1898, when he was discharged. The pain varied a good deal from time to time, but on the whole it was less severe. The physical signs over the precordial area had not changed. He had been kept at rest and given potassium iodide, and gained 25 pounds in weight. The diagnosis on discharge was "Aneurism of the thoracic aorta."

He was admitted a second time on August 2, 1898. The pain had persisted and he had had two very severe attacks, commencing in the left side, radiating into the back and to the right side. Morphine did not relieve the pain. The physical signs were practically as they were on his first admission. At his own request, he was discharged on September 6, 1898.

The patient was admitted a third time on November 5, 1898. He remained in the hospital until his death 20 months later, on July 30, 1900. The pain had persisted, and he thought that it was a little higher up behind than on previous admissions. The abdominal pain was more cramping in character. Recently he had noticed that he had difficulty in swallowing fluids and to a less degree solids. He could not clearly locate the point of obstruction, but thought that it was in the upper part of his chest.

Soon after this admission the physical signs began to indicate that the heart was being pushed toward the right by the aneurism exerting its pressure from the left. On December 1, 1898, I made the following note: Patient says he can rest more comfortably (this was after he had received a number of gelatin injections). The pulsation is still very extensive. There is visible pulsation in the third, fourth, and fifth interspaces on the right side close to the sternum and in the right costo-xiphoid angle. To the left of the sternum there is retraction, to the right protrusion. On palpation a forcible impulse is felt to the right of the sternum as far out as the nipple-line. It is most forcible over the lower sternum. There is no forcible impulse below the fifth rib on the left side. The cardio-respiratory murmur is still extremely well marked. There is no murmur to the right of the sternum. The heart sounds over the right side are loud and both accentuated.

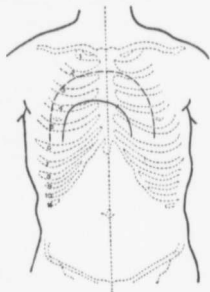
About this time we were giving the gelatin treatment of aneurism (introduced by Lancereaux) a trial. From November 9, 1898, to December 31, 1899, the patient was given 96 subcutaneous injections of 250 c.c. of 1 per cent. gelatin solution. This was an unusually large number and the treatment was continued longer than usual, owing to the very marked relief of pain which nearly always followed the injections. There were no material changes produced in the physical signs of the aneurisms.

On March 29, 1900, the following note was recorded and the area of dulness over the front of the chest was as is outlined in Fig. 6. Since the last note

the patient has been suffering rather severe pain just below the left costal margin about in the mammillary line. The pain is more or less paroxysmal in character. Patient sleeps on his face with a pillow pressed against his abdomen for relief. He is getting about 2.5 grains of morphin at a dose and requires an injection on an average every three hours. The pupils are of normal size, equal, and react to light and accommodation. The radial pulses are equal and synchronous on the two sides. The pulse is regular in force and rhythm, 92 to the minute; vessel wall slightly thickened. No tracheal tugging. Veins over the upper part of the chest and shoulders, particularly on the right side, are considerably dilated. The breath sounds are particularly clear throughout and of about equal intensity on both sides.

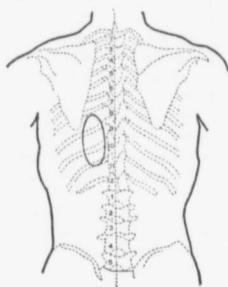
The point of maximum cardiac impulse is not clearly seen nor felt. There is a slight systolic retraction in the fifth left interspace, 9.5 cm. from the mid-sternal line. With each cardiac systole there is a visible inward tugging of the whole of the left side of the chest. A slight wavy impulse is seen in

FIG. 6.



Dash line, relative dulness; full line, absolute dulness.

FIG. 7.



Area of visible pulsation.

the third, fourth, fifth, and sixth right interspaces at the sternal border. The bulging to the right of the sternum is possibly not quite so marked as on last examination. There is no prominence over the base of the sternum. A diastolic shock is fairly well felt to the right of the sternal margin. No palpable thrill over the precordia. The relative cardiac dulness commences over the middle of the second left interspace in the parasternal line, and extends from a point in the fifth left interspace 9.5 cm. from the median line to a point in the fourth right interspace 11 cm. from the median line and just in the mammillary line. The absolute cardiac dulness is largely to the right of the median line. It extends from a point in the fifth left interspace 3.5 cm. from the mid-sternal line to a point in the fourth right interspace 8 cm. from the median line. The heart sounds are of maximum intensity to the right of the sternum. In the fifth left interspace, at the usual situation of the point of maximum impulse, the sounds are enfeebled, but both are audible. No murmur at this point. At the pulmonic area both sounds are audible and clear. The first

aortic sound is audible and accompanied by a slightly rough systolic murmur traceable upward. The second aortic is clear and relatively accentuated. Over the area of pulsation between the right sternal border and the right mammillary line the first sound has a murmurish quality, the second being rather ringing. When the patient sits up in the erect posture, there is little or no visible pulsation nor bulging made out in the lower part of the right back. When he lies on his right side, there is a distinct visible pulsation seen over the lower part of the left interscapular and upper part of the subscapular region extending from about the eighth to the eleventh ribs (see Fig. 7). This is a pulsation thrill rather than a retraction. There is no palpable thrill over this area. The note is distinctly impaired on percussion. There is no special tenderness on palpation. No bruit is heard over the area of pulsation.

From this date the patient's symptoms gradually became worse. The pain became intense. On the nights of July 13 and 14 he did not go to bed at all. He spent the entire night leaning over a window-sill with a pillow pressed against his abdomen. On July 20 he was given 38 grains (2.4 gm.) of morphin, 40 grains (2.5 gm.) of chloral, and 160 grains (10.4 gm.) of potassium iodide, with only moderate relief of the pain.

From July 22 to the date of his death he was irrational most of the time. His temperature gradually rose from this date until it reached 106.2° F. on July 30, the date of his death. During the last week he had had a double purulent otitis media, and he died with symptoms of edema of both lungs.

*Anatomical Diagnosis (Autopsy No. 1582), Dr. Opie.*—Aneurism of the thoracic aorta projecting into the left pleural cavity. Erosion of the vertebrae and of the ribs, with fracture of the tenth. Thrombosis within the aneurismal sac. Slight arteriosclerosis. Atelectasis (partial) of the left lung; edema of the right lung. Edema of the brain.

Immediately above the diaphragm there is a very large tumor mass springing from the region of the thoracic aorta, firmly fixed to the chest wall to the left of the vertebral column, almost entirely filling the lower half of the left cavity. The lower surface of the mass rests on the diaphragm. Its highest point is midway between the second and third ribs in the parasternal line. Its inner border is in the median line, but, being convex, it comes in contact with the chest wall at a point 2 cm. farther out. The heart is displaced to the right, so that its left margin immediately below the sternum is 0.5 cm. to the left of the median line and the tip of the left auricle is 2.5 cm. to the left of the median line. The right border of the heart is 10 cm. to the right of the median line.

The lower surface of the left lung is bound by light adhesions to the tumor mass. The right lung is almost universally bound to the chest wall by fibrous adhesions. The tumor mass, which is evidently an aneurismal sac, begins immediately above the diaphragm, the dilatation of the aorta being here limited by the pillars of the diaphragm. The sac lies behind the pleura and is covered on its right side by the pericardium. The bodies of the eighth, ninth, tenth, and eleventh dorsal vertebrae are eroded, so that the aneurismal mass projects very slightly to the right of the vertebral column. The erosion is most marked on the left side and the adjacent ribs are involved. The bodies are most affected, so that the intervertebral discs and a slight amount of bone on either side project. The tenth rib is completely eroded.

The dilatation of the aorta begins at the junction of the descending portion of the arch with the thoracic portion. It measures 17 cm. in length and

about 16 cm. in diameter, and is fusiform in shape. Its posterior wall is partly formed by the eroded vertebræ. The sac contains a very great quantity of clotted blood, and in addition, adhering particularly to the posterior wall, there is a large flattened mass, grayish red on section, firm and lamellated. This mass covers the eroded vertebræ. Adherent to the left lateral wall is also a clotted thrombotic material. The wall of the aneurism is thin,—often hardly more than a millimeter thick. Upon the anterior wall the intima resembles that of the aorta above, but is rougher, shows numerous irregular yellow places and many thin calcareous plates. The remainder of the wall which forms the posterior and lateral surfaces is red and irregular, and to the right adhere thrombus masses. The intimal surface, which has a relatively normal appearance, forms an area about 9.5 cm. across, extending from the relatively normal aorta above to that below. The circumference of the aorta before it begins to dilate is 7 cm.; where the dilatation ceases it is 7 cm. The intima of the aorta above the aneurism is very slightly irregular, there being raised areas of a yellow color. Below it is remarkably smooth, but there also exist a few similar areas. The circumference of the aorta above the valve is 8.3 cm.

The aneurism has apparently sprung from the posterior wall and grown backward toward the vertebral column. The posterior wall has been eroded so that the aneurismal cavity has come in contact with the vertebræ.

CASE IX.—*First admission for intercostal neuralgia; second admission with increase of pain and dysphagia. Pulsation over manubrium and sternal end of left clavicle; pulsating tumor in left interscapular region. Discharged unimproved.*

M. B. (Gen. Hosp. Nos. 25,135 and 35,837), female, married, aged 50 years, was admitted for the first time on December 31, 1899, complaining of shortness of breath and of a sticking pain between the shoulders and beneath the sternum.

The patient's father died of some pulmonary disease; otherwise the family history was unimportant. The patient herself had for several years suffered from malarial attacks in the spring. These were contracted during trips to the country, where she was engaged in berry-picking. She had never had any other serious illness. She had borne six children, two of whom died in infancy. The others were healthy. She had never miscarried. She had been a moderate user of alcohol and had always been a hard-working woman. No history of syphilis was obtained.

Seven months previous to her admission she began to suffer pain in the left axillary and interscapular regions. The pain was sudden in its onset and was worse on deep inspiration. It was intense and at times was referred to the left shoulder. She sometimes had headache, vertigo, and weakness in the arms and legs. She suffered from some dyspnea, but had no cough.

The patient was of small stature and poorly developed. Rather emaciated and anemic. The pupils were equal. The radial pulse was of moderate volume, low tension, and regular in force and rhythm. The vessel wall was markedly sclerosed, the sclerosis being of the annular character.

The thorax was fairly well formed and showed nothing abnormal on inspection. There was no visible bulging or pulsation in the interscapular region nor was any dulness made out in this area. At the base of the left lung the breath sounds were a little enfeebled; there were a few fine, moist râles. No pleuritic friction rub audible. An interesting feature was the existence of marked hyperesthesia of the skin in the left axillary region. There seemed to

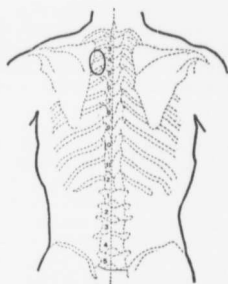
be points of special tenderness at the angles of the ribs, in the mid-axillary region and at the sternal border.

The point of maximum cardiac impulse was not visible, but was indistinctly palpable in the fourth left interspace 7 cm. from the median line. There was no evidence of enlargement of the heart on percussion and the heart sounds were everywhere feeble but clear.

The abdominal examination was negative. The urine had a specific gravity varying between 1012 and 1020. It contained a trace of albumin and a few hyaline and finely granular casts.

Owing to the negative physical signs and the hyperesthesia and tender points on the left side of the thorax, it was thought that the patient was suffering from intercostal neuralgia. The thermocautery was applied locally and she was given strychnin and iron internally. The patient improved steadily and the pain diminished gradually, so that she was able to go about the ward with comfort. She was discharged much improved on January 16, 1900.

FIG. 8.



Area of visible pulsation.

The patient was readmitted on August 12, 1901, still complaining of pain in the shoulder and back. The pain had steadily grown worse in the past year. It was of a sharp, stabbing character and kept her awake at night. She had had some difficulty in swallowing for the past few months.

The patient's general condition was much worse than on her first admission. She was suffering intense pain. The left pupil was a trifle larger than the right. The left radial pulse was a little smaller than the right. There was no visible nor palpable tracheal tug.

The thorax was symmetrical in front. The superficial veins over the front of the chest on the left side, as well as over the left shoulder, were quite markedly dilated. In the left interseapular region, commencing at the level of the spine of the scapula and extending about half-way to the angle of the scapula, as seen in Fig. 8, there was a distinct visible pulsating tumor. The most prominent point projected fully 2 cm. above the chest level and the swelling could be actually grasped. The pulsation was definitely expansile in character and was very sensitive on palpation. There was no palpable thrill

or diastolic shock made out. The percussion-note over the most prominent part of the swelling was flat. There was no audible bruit, but a very distinctly accentuated second heart sound was heard over it.

The point of maximum cardiac impulse was not clearly seen nor felt. The sounds were best heard in the fifth interspace 11 cm. from the mid-sternal line. There was distinct visible lifting of the manubrium and slightly also of the sternal end of the left clavicle. There was no apparent increase in the area of cardiac dulness. There was an area of relative dulness over the manubrium, extending from a point in the first right interspace 3 cm. from the median line to a point in the first left interspace 7 cm. from the median line. It extended in a vertical direction to the level of the third rib in the mid-sternal line. There was very slight bulging over this area. A faint diastolic shock was felt over the manubrium. At the point of maximum impulse the heart sounds were audible and practically clear. In the fourth and fifth left interspaces at the sternal border there was a soft diastolic murmur. At the aortic area the first sound was rather rough; the second sound was markedly accentuated and accompanied by a fairly soft diastolic murmur which was also fairly well transmitted down the right sternal border. There was no murmur over the manubrium, but the second sound was of a ringing quality.

The lungs were clear on percussion, excepting over the prominent pulsating tumor in the back. The breath sounds were of equal intensity on the two sides, and were everywhere clear, excepting below the right clavicle, where they had a slight tubular modification.

The abdomen was negative on examination. There were some copper-colored pigmented scars over the left knee and leg.

The patient continued to suffer intense pain during her stay in the hospital, requiring frequent doses of morphin. She was discharged unimproved on August 25, 1901.

CASE X.—*Syphilis 18 years before; pain in chest, cough, and dyspnea; left recurrent nerve paralysis; impaired resonance in left interscapular area; hemoptysis; death. Small aneurism of ascending aorta. Aneurism of the first part of the descending aorta projecting into the upper lobe, "which is almost entirely converted into an aneurismal mass;" rupture into pleura.*

A. B. K. (Gen. Hosp. No. 34,676), aged 47 years, colored, waiter, admitted to hospital on May 1, 1901, complaining of shortness of breath, cough, and hoarseness. The family history was unimportant.

The patient had used alcohol in moderation and had smoked a good deal, but had not been a hard worker. He was a heavy eater. Gonorrhœa 20 years previously and syphilis 18 years previously.

His present illness began five months before admission, with a cough, which was worse at night and accompanied by an abundant expectoration, in which blood was only noticed on the day before admission. Three months previously he began to be short of breath and had to give up work on account of it one week before. There had been pain in the left shoulder and down the left arm, as well as in the left side of the chest.

On May 2 Dr. Futeher made the following note: Cheyne-Stokes breathing is fairly well marked. There is slight puffiness of the face, huskiness of the voice, and edema of the feet. Percussion is fairly clear throughout the right front. Over the right interscapular region the note is impaired. The breath sounds are tubular below the level of the spine of the left scapula. Moist râles are heard in the subscapular region. The percussion note is impaired

above the clavicle and in the lower axilla on the left side. Synchronous with the impulse in the sixth interspace there is a suggestive retraction in the fourth and fifth interspaces. The second aortic sound is followed by a soft diastolic murmur.

On May 7 Dr. Warfield noted a complete recurrent paralysis of the left vocal cord, with partial paralysis on the right side. No evidence of tuberculosis in the larynx. Two areas of dulness with tubular breathing were noted in the right interscapular region close to the angle of the scapula. There was whispered bronchophony at this point.

On May 8 the patient complained of pain in the left chest. During the night he spat up from 30-40 c.c. of blood, which contained white lumps. No tubercle bacilli were found. The patient died suddenly.

The urine contained a trace of albumin and hyaline casts.

*Anatomical Diagnosis (Autopsy No. 1731).*—Small aneurism of the ascending arch of the aorta; large aneurism of the descending arch, extending into the left lung; rupture of the aneurism, with hemorrhage into the lung, bronchi, and left pleural cavity; cardiac hypertrophy and dilatation; sclerosis of the tricuspid, mitral, and aortic valves; arteriosclerosis with atheroma of the mitral valve; pale, fatty appearance of all the organs except the kidneys; inequality of the pupils; obstruction of the thoracic duct by aneurism; scar on the penis; syphilitic scars in the liver.

The epicardium is thickened, diffusely over the right ventricle and along the coronaries; the auricles are much dilated and hypertrophied. The aorta is sclerotic and atheromatous. Following up the aorta from the valves, it is diffusely dilated, and on the convexity of the arch just before reaching the innominate there is an aneurism 5 cm. in diameter, nearly filled with old firm clot. Just beyond the origin of the left subclavian artery the aorta becomes inseparably adherent to the upper lobe of the left lung, which is almost entirely converted into an aneurismal mass. This springs from the descending aorta, its mouth being the size of a silver dollar. The aneurism is entirely confined to the lung and is not adherent to the trachea, esophagus, or other structures. Over the pleural surface as well as between the lung and pericardium there are large clots and much fresh blood.

On the convexity of the right lobe of the liver is a slightly depressed scar and on section coarse scars radiating from this into the liver.

The vessels of the kidney are congested; the parenchyma is very pale.

The thoracic duct is pressed upon by the aneurism and much dilated as far down as the mesenteric radicles.

*CASE XI.—Syphilis and alcoholism; hard work. Onset with pain in chest, loss of voice, and dyspnea; pulsation in left upper chest in front; tracheal tugging; dysphagia; fulness and pulsation in the left interscapular space; rupture into left pleural cavity. Dilatation of the arch; sacculated aneurism of descending aorta; erosion of third, fourth, fifth, sixth, and seventh vertebrae.*

W. M. J. (Gen. Hosp. Nos. 34,196 and 37,276), aged 46 years, colored, a waiter, admitted to hospital on March 17, 1901, complaining of pain in the chest and back. The family history was unimportant.

Since boyhood the patient had been a steady drinker of whiskey and gin in considerable amounts. He had gonorrhoea 14 years previously and syphilis 30 years previously. For two years he had been doing very heavy lifting in the steel works.



The present illness commenced 20 months before admission, the patient being suddenly seized with severe pain in the left chest, the pain being definitely localized in the second and third interspaces, a hand's-breadth from the sternum. The pain was so severe that the patient gave up work. After four days it became less and he went to a physician, who treated him for three months, during which time he had (a) constant pain, with paroxysms which were worse at night, the pain shooting to the axilla and left side of the abdomen, as well as to the left interscapular region; (b) gastric symptoms, frequent vomiting directly after eating, with irregularity of the bowels; (c) loss of voice, almost complete by the end of the three months; (d) marked dyspnea, especially on exertion; and (e) frequency of micturition, especially at night. The diagnosis of aneurism had been made in the Germantown Hospital. During the past three months the gastric symptoms had been prominent. He had been greatly troubled with constant watering of the left eye. The patient had lost considerable weight.

On March 18 I made the following note: There is a very well-marked, diffuse, heaving impulse over the left upper chest. No tumor is seen. The voice is a little cracked. There is a little more prominence above the left clavicle than above the right, and the left jugular vein is more prominent. The shock of the second sound is very distinct. There is no pulsation in the sternal notch. Tracheal tugging is not seen, but is distinctly felt. The radial pulses are equal. The apex beat is a little out, and is in the fifth interspace. Over the pulsating area there is decided flatness. On auscultation the heart sounds are clear at the apex and there is a loud, ringing, accentuated second aortic. The patient shows the following symptoms: (1) pain, (2) slight cough, (3) change of voice, (4) vomiting, (5) watering of the left eye; and the following signs: (1) diffuse pulsation, (2) tracheal tugging, (3) distended jugular vein on the left side, (4) diastolic shock, (5) impaired resonance. The aneurism is mainly one of symptoms.

On March 18 Dr. Warfield noted a complete recurrent laryngeal paralysis, the left cord being in the median line and motionless.

On April 2 Dr. Fitcher made the following note: The patient has had more pain in the left interscapular region for the last few days. There is appreciable fulness and bulging from the level of the fourth to the sixth thoracic vertebrae on the left of the middle line. No visible pulsation. Palpation of this area and of the spines of the fourth to the sixth thoracic vertebrae causes considerable pain. There is no thrill and no audible bruit, but the second heart sound is distinctly heard.

On May 6 the patient was discharged decidedly improved. The urine contained a trace of albumin throughout his stay, and occasionally showed a few hyaline casts.

He was readmitted on December 16, 1901, complaining of intense pain in the chest. Since his previous stay in the hospital he had been temperate and had done no heavy work. For three months previously, however, the old symptoms began to return, and had been accompanied by dysphagia, which had become very intense during the three days previously. The pain at this time was very intense, especially at night, starting apparently under the left scapula and radiating under the arm to the left side of the chest. Aside from this intense pain and the pain of swallowing, the whole chest ached continually. The left arm and the fingers of the left hand ached occasionally and became weak and tired. Cough had not been a prominent symptom. A few days before

admission the left side of the neck was swollen and painful. Since the onset of the dysphagia he had lived on liquid diet. The bowels had been constipated. There had been no hemoptysis.

On December 17 Dr. Cole made the following note: There is marked heaving of the sternum and upper chest, especially on the left side. The clavicles are definitely lifted with systole. A very large area of dullness is present over the front of the chest, but no area of flatness. A soft systolic murmur is heard at the apex and is transmitted outward. Over the second right interspace there is a murmur of great intensity. Slight fulness is seen in the left interseapular space below the spine of the scapula. There is a definite pulsation in this area, most marked 3 cm. below the spine of the scapula. The breath sounds are suppressed over the left supraspinous fossa, but are well heard over the pulsating area.

The leukocyte count was 10,100; hemoglobin 55 per cent.

On December 18 the patient was found exsanguine at 10.45 A.M., with no pulse at the wrist. The heart sounds were very feeble, and percussion over the left chest elicited dullness as high as the fifth rib in the axilla and flatness in the left back. In five minutes the breathing ceased.

*Anatomical Diagnosis (Autopsy No. 1836), Dr. Opie.*—Aneurism of descending thoracic aorta projecting into left pleural cavity and eroding thoracic vertebrae; rupture into left pleural cavity; second small aneurism of transverse arch of aorta; diffuse arteriosclerosis; chronic pulmonary tuberculosis of upper lobe of right lung; obliteration of right pleural cavity.

The heart is pushed to the right. The left pleural cavity contains 800 c.c. of blood-stained serum and 1800 grams of firm, fresh blood-clot. In upper and posterior portion of cavity is an aneurismal sac, firmly united to the chest wall. The lung is adherent to surface of aneurism.

The heart weighs 410 grams. Muscle firm. Wall of left ventricle 17 mm. thick; of right, 5 mm. Valves normal. Coronary arteries thickened, with a very few patches of sclerosis. Foramen ovale is patent, the orifice measuring 0.5 cm. The aorta above the valve has a very irregular, nodular surface, and there is a diffuse thickening of the intima, with but little sclerosis. The aorta becomes dilated immediately above the valve and at the innominate has a circumference of 12.5 cm., at which level, in the lower and anterior wall, there is the orifice of a small aneurismal sac. The orifice is 16 mm. in diameter, and the sac 2 cm. across; the latter is filled with firm yellow coagulum. The sac lies upon the left pulmonary vein. In the posterior wall of the descending aorta, 3 cm. beyond the left carotid, is the orifice of the large aneurism, projecting into the left pleural cavity. The orifice measures 4.5 cm. across and the sac 10 cm., the latter being partially filled with reddish-yellow coagulum. Within the sac the intima soon disappears, and the wall is formed by the chest wall. Ends of ribs, third to seventh, and the bodies of the thoracic vertebrae, third to seventh, are eroded. The aneurism crosses the middle line and projects into the right pleural cavity. In its outer wall is a rent through which the blood has escaped into the pleura.

The left lung is much compressed. The right lung is bound to the pleura by old fibrous adhesions. Its upper lobe contains numerous fibrous and caseous nodules. One of the bronchi contains miliary tubercles.

The liver shows slight chronic passive congestion.

CASE XII.—*Syphilis, hard work, and alcohol. In 1894 pains in abdomen; for two years cough and recently much pain in the back. Decubitus on right*

*side; wide area of impulse in front of chest with wide area of cardiac dulness; tracheal tugging; prominence of left costo-chondral margin. Five admissions. At the second admission pulsation noted in left interscapular region; constant pain; occasional attacks of dyspnea; hemorrhage, death. Dilatation of ascending arch; large sacular aneurism of the descending aorta projecting back and eroding the fifth to tenth vertebrae, with seventh eighth, and ninth ribs; compression and erosion of esophagus.*

C. Leonard (Gen. Hosp. Nos. 24,406, 29,677, 30,526, 33,586, 37,393), male, colored, laborer, aged 48 years, was admitted on October 14, 1898, complaining of pain in the back and sides.

The patient's father and an uncle died of tuberculosis. A sister, when a young girl, had suppurating glands of the neck. Otherwise the family history was negative.

The patient had the usual diseases of childhood. There was a history of malaria beginning at the age of nine years and recurring almost annually for a great many years. He contracted syphilis at 17. When a young man he had arthritis of the knee and hip joints which kept him from work for two months. He had been a heavy drinker and smoker. While on a farm he had done hard manual labor. For the last six or seven years he had frequently passed blood in his stools. The frequency of this symptom had gradually increased.

In 1894 he was suddenly seized with an attack of severe pain in the lower part of the abdomen on the left side. He was forced to go to bed, the attack lasting about two weeks. The pain was relieved by flexion of the thighs. These attacks of pain had recurred each year since. They generally came on in the winter, and the patient thought that they were brought on by exposure. More recently he had suffered pain in the back. This was sometimes shooting in character, usually radiating around toward the left flank. The pain gradually became more persistent and severe and he was forced to stop work five days before admission. For the last two years he had had a persistent cough and expectoration.

On admission the patient was a large-framed, well-nourished man. He was a trifle anemic. The pupils were normal in size and equal. The radial pulse was of rather small volume, low tension, synchronous on the two sides, regular in force and rhythm, and 84 to the minute. The patient almost constantly lay on his right side. Turning on his back always increased the pain in the left side of the chest near the costal margin.

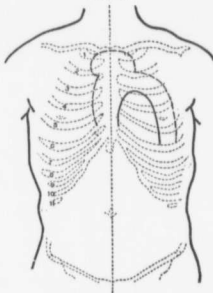
The thorax was somewhat elongated. The costal angle was about 90°. The costal margins, particularly the left, were unusually prominent. On deep inspiration the expansion was appreciably diminished throughout the lower left axillary and subscapular regions. Over these areas also the percussion-note was decidedly impaired and the breath sounds were markedly enfeebled.

On October 22 the following note on the heart was made and the accompanying chart outlined: There is distinct heaving of the whole precordial area. It involves the body of the sternum and extends as far out as the right mammillary line. The lifting is also seen at the base of the sternum and over both sterno-clavicular articulations, particularly the left. The point of maximum cardiac impulse is in the fifth interspace 8.25 cm. from the median line. At this point there is systolic retraction. A distinct wavy impulse is seen in the second, third, and fourth left interspaces. There is slight pulsation in the episternal notch and in the vessels of the neck. In the eighth, ninth, and tenth interspaces below the angle of the left scapula a quite distinct systolic retraction

tion is seen. Over the fourth and fifth interspaces is felt a distinct systolic thrill. There is a marked diastolic shock over the heart. The relative cardiac dulness begins at the level of the second left rib in the parasternal line. It extends from a point on the fourth rib 3.5 cm. to the right of the median line to a point 12 cm. to the left of the median line on the fifth rib. As seen in Fig. 9, it is continuous with an area of relative dulness over the manubrium. The absolute cardiac dulness begins over the middle of the third left rib and extends from the left sternal border to the point of maximum impulse. There is reduplication of the first sound at the apex, but no murmur. Along the left sternal border in the third, fourth, and fifth interspaces the first sound had a murmurish quality. The second pulmonic is accentuated and reduplicated. The aortic second is loud and ringing in quality. The second sound under the manubrium is very loud and distinct and the first has a slight murmurish quality.

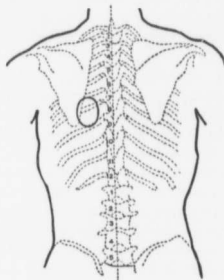
On inspection of the abdomen there was quite marked prominence of the left costo-chondral margin. There was marked tenderness on palpation below

FIG. 9.



Dash line, relative dulness; full line, absolute dulness.

FIG. 10.



Area of visible pulsation.

the margins of the ribs on the left side, where the pain he complained of was always most severe and nearly constant. The muscular resistance was increased on the left side, but no tumor was palpable. The spleen was just palpable, the left kidney was not felt.

On November 5 tracheal tugging was first noted.

Owing to the suggestive signs of aortic aneurism, the patient was started on subcutaneous injections of gelatin. From November 9 to March 14 he received in all 34 injections. The injections usually caused considerable relief from the pain, but otherwise there was no material effect from the treatment. The additional treatment consisted of rest, restricted diet, and potassium iodide.

The patient was discharged on May 2, 1899. From the physical signs presented at this time, a diagnosis was made of aortic aneurism, with adherent pericardium.

From this date to his death, October 25, 1902, the patient was readmitted

four times. In March, 1900, during his second admission, some dulness in the left interscapular region with visible pulsation at the angle of the scapula was observed for the first time. On April 13, 1901, during the patient's fourth admission, I made the following note: When on his right side there is an area of bulging in the left interscapular region opposite the sixth, seventh, and eighth dorsal vertebrae (Fig. 10). It fills up the dorsal groove. There is here a marked, visible pulsation which moves the ribs. The tumor is very painful and there is a little edema of the skin over it. The impulse is very forcible. The second heart sound is heard over the tumor. There is a marked change on sitting up: the pulsation is very much less, but is still visible. There is very little pulsation in the femorals.

From this time it was evident that the patient had an aneurism of the descending thoracic aorta. After his fourth discharge from the hospital on June 3, 1901, he was able to work for six months.

He was admitted for the fifth and last time on December 28, 1901, having been seized two days before with severe pain near the costal margin on the left side. On December 31, 1901, the patient had eight bloody movements. The blood was bright red in color and amounted altogether to about 600 c.c. About this time a skiagraph of the patient's chest was made and a large mass was found to occupy the mediastinum; the portion extending to the right of the median line was believed to be largely heart and that to the left the aneurism.

On January 1, 1902, I made the following note: The character of the precordial pulsation is unlike that seen in ordinary heart hypertrophy. The whole front of the chest is lifted. There is a punctate maximum visible apex impulse in the middle line, but the pulsation is even more marked to the right than to the left of the sternum. From behind the shock of the impulse is noticed in the lower thorax on both sides. The pulsation in the left interscapular region is much more evident in the recumbent posture; not nearly so distinct but still evident in the lower interscapular region while in the erect posture. Over the pulsating area in the back the heart sounds are loud and there is a distinct rough murmur. There is a rough systolic murmur at the aortic area and a rubbing systolic at the lower sternum. Both sounds are loud.

The pain in the back and the lower left side became a very persistent symptom and was often very severe. Morphin was required frequently to alleviate it. While under observation the heaving over the front of the chest gradually became more marked, especially toward the right. On April 17, 1902, the maximum impulse was exactly under the ensiform cartilage. The pulsation in the back gradually increased in distinctness. A thrill was never made out over it. Broadbent's sign in the lower subscapular region persisted. About the middle of August an area of anesthesia to pain, heat, and cold developed at the level of the sixth to the eighth left ribs in the axilla and extending to the front of the thorax. In September dyspneic attacks became more marked and about October 1 difficulty in swallowing was first noticed. For the relief of the pain the patient would go to sleep in a chair with his hands resting on his insteps and his trunk on his thighs.

During the night of October 24 the patient suffered from unusually severe pain and dyspnea. On two occasions without any cough he spat up from 25 to 50 c.c. of bright-red blood. Large doses of morphin, as much as 2.25 grains (C.15) in two hours, were given without material diminution of the pain. At

2.15 A.M. on October 25, 1902, the patient brought up fully 500 c.c. of fresh blood and shortly after died.

*Anatomical Diagnosis (Autopsy No. 2020), Dr. MacCallum.*—Aneurism of descending part of arch of aorta; erosion of vertebrae and ribs; lamellated clot in aneurism; contraction of left bronchus; compression, erosion, and perforation of esophagus; hemorrhage. General arteriosclerosis. Compression of lower lobe of left lung. Displacement of heart; chronic adhesive pericarditis.

As shown in Fig. 5, the heart is much flattened and pushed to the right. The left pleural cavity is obliterated by old adhesions; the right pleural cavity is almost free, but on lifting forward the lung a large round mass is found to be in contact and slightly to the right of the vertebrae. The right ventricle reaches to about 8 cm. to the right of the median line. The pericardium contains a yellow, clear fluid. There are adhesions over the posterior parts of the heart. The adhesions over the left auricle and coronary veins are rather firm.

The left lung is much compressed. It is thinned out over a large mass. The vessels and bronchi are especially flattened out over this mass. The mid-portion of the lung is very densely adherent to the sac. The lower lobe of the lung is completely flattened out over the large sac. The lower lobe is made up almost entirely of vessels and bronchi.

It is found that a large sac measuring 18 x 14 x 9 cm. extends fully 7 cm. to the left of the vertebral column. It is quite firm and is filled with a dense clot, part of which is fresh post-mortem while the remainder, almost filling the sac, is distinctly mural and shows beautifully the islands of Zahn. All of this material can be lifted up. The sac begins just at the descent of the arch, where it lies at the posterior side of the aorta proper. It is really somewhat sacculated, there being a projection both at the top and at the bottom, where the sac leaves the ordinary course of the aorta. That part of the arch which forms the front of the sac is somewhat distended and is extremely sclerotic, even having calcified patches. The ascending portion of the arch of the aorta is also dilated and is extremely sclerotic, and the branches are similarly sclerotic, but to a less extent. The aortic valves are practically normal, and below the aneurism the aorta shows scattered patches of sclerosis which extend down to the bifurcation. Just above the bifurcation there is an extensive pigmented patch, which is somewhat ulcerated. The left bronchus is much depressed in passing over this mass. On dissecting away the sac from the vertebral column, the vertebrae from the fifth to the tenth are found to be eroded, especially on the left side. The intervertebral discs are quite prominent. The seventh, eighth, and ninth ribs are somewhat eroded and left bare. The posterior portion of the sac is of a yellowish-white color. In places it is completely gone and the clot lies directly upon the bone. The clot is very friable and in some places is broken into a somewhat grumous mass.

The esophagus is especially compressed just at the level of the bifurcation of the trachea. At this point it lies directly on the aneurismal sac. Here the wall has become eroded through and there is an opening in the esophagus about 2.5 cm. in diameter, through which no doubt a hemorrhage has taken place. The edges of this aperture are quite ragged and necrotic-looking. The tissue round about is dark grayish-green in color.

The stomach contains a considerable quantity of deeply blood-stained fluid containing a large clot. Nearly a liter of blood-clot was removed from the stomach. The gastric mucosa shows no apparent abnormality.

The duodenum contains a large quantity of bloody fluid. The rest of the intestines, especially the large intestine, is filled with a deeply blood-stained fluid. The intestinal mucosa is deeply blood-stained throughout. Otherwise the intestines are apparently normal.

CASE XIII.—*Shortness of breath and pain in the chest since the summer of 1900; wasting; marked pain in the side; shooting pains through the epigastrium; pulsation at the sternum and over the manubrium and to the left, with slight impairment of the percussion-note; inspection of the back negative; blood in the stools and on three occasions vomiting of blood; diffuse dilatation of the arch; sacular aneurism of the first part, with general dilatation of the remainder, of the descending thoracic aorta; latent ulcer of the stomach.*

R. R. (Gen. Hosp. Nos. 33,961, 35,871, 39,953, 40,503), male, white, aged 43 years, a machinist, was admitted for the first time February 25, 1901, complaining of pain in the left side and back and of shortness of breath.

The only point of interest in the family history was that his father died of "rheumatism" and dropsy.

The patient came to America from Germany when 28. He had served three years in the German army. His occupation as a machinist had subjected him to heavy lifting. Nine years ago he had an attack of acute rheumatism. Numerous joints were involved and the patient was confined to bed for weeks. Had malaria 13 years ago. He had taken alcohol in moderation, drinking two or three glasses of beer daily. No history of gonorrhea or syphilis obtainable.

During the summer of 1900 the patient began to suffer from shortness of breath and pain in the left side of the chest. The pain was severe and increased by exertion. It gradually became worse and later he had pain in the back of the chest. He complained of pain over the abdomen and back while in the recumbent posture and was forced to sleep in the sitting posture. He had been able to do light work until about one week before admission. Since then the pain in the left side and back had gradually increased. He has palpitation of the heart on exertion. Recently he has lost in weight.

On April 26 I made the following note: The patient has a cardiac facies. The cardiac impulse is diffuse, with systolic jar under the right nipple. There is no punctate localized pulsation. The shock is palpable chiefly over the body of the heart, where palpation is painful. The shock of the first sound is well felt. The back is negative on inspection. The tracheal tug is absent. There is an apex systolic murmur. There is an aortic systolic murmur of maximum intensity in the second right interspace. At the second left costal cartilage and interspace there is a systolic murmur of entirely different pitch. This murmur is also heard at the left sterno-clavicular articulation.

During the observation of the patient in the hospital it was noted that the left radial pulse was much smaller than the right. On firm pressure over the base of the heart there was a diffuse pulsation. There was distinct impairment of the percussion-note over the manubrium. There was no paralysis of either vocal cord. The breath sounds were a little more feeble on the left than on the right side. On February 27 he had a very severe attack of pain in the left side of the chest. There was intense pain in the left back in the lower dorsal region shooting through into the epigastrium. Morphine alone eventually relieved the pain.

The patient left the hospital on March 13, feeling much better. Although the physical signs were a little indefinite, a diagnosis of aneurism was made. At this time the impression was that the arch of the aorta was involved.

The patient was admitted a second time on August 14, 1901. The physical signs and symptoms had not materially changed. He entered a third time on August 20, 1902. Two days before admission he was seized suddenly with violent pains in the abdomen and legs. That night he fainted, owing to the intensity of the pain. He had a similar attack on the morning of admission. There was still a diffuse visible heaving of the upper sternal region, and there was impairment of the percussion-note. Inspection of the back was negative. The only change in the physical signs worthy of note was the fact that there was now a distinct aortic diastolic murmur.

The last admission was on October 11, 1902. Since he left the hospital the pain had been a very prominent and persistent symptom. It was most severe in the back between the scapulae, where it was of a dull aching character. In addition he also had pain of a stabbing character in the right side of the chest and in the epigastrium. Several times during the week previous to admission he had noticed blood in his stools.

The patient on admission looked paler than usual and sallow. The blood-count showed a secondary anemia: the red cells were 5,048,000, leukocytes 12,400, hemoglobin 32 per cent. There was always a distinct difference in the blood-pressure in the two brachial arteries: one observation showed a pressure of 118 mm. of mercury in the right and only 64 mm. in the left. He vomited on the nights of October 14 and 15; 30 c.c. on each occasion. Both attacks of hematemesis were accompanied by intense pain. The patient's stools became tarry and he gradually became paler. On October 16 the blood-count was as follows: red cells 1,272,000, leukocytes 10,160, hemoglobin 19 per cent.

On October 17 I made the following note: Very much blanched. Pulsation in the second and third right interspaces. Diffuse heave over the manubrium. Nowhere any positive punctate pulsation. No abnormal throbbing in the epigastrium. Moderate distention in lower sternum and over ensiform cartilage. Apex beat in normal situation. No pulsating tumor below ensiform. A loud double murmur in the aortic area; of great intensity and very loud at the lower sternum. No pulsation in back. Breath sounds clear and equal on both sides. No tenderness over the lower dorsal spine.

During the night of October 18 he again complained of a great deal of pain and vomited about 15 c.c. of blood at 2.30 A.M. on October 19. The pain persisted, the pulse gradually became weaker, and he died at 8.50 A.M.

*Anatomical Diagnosis (Autopsy No. 2013), Dr. Opie.*—General arteriosclerosis; dilatation of the arch of the aorta; sacular aneurism of the descending part, eroding the thoracic vertebrae; thrombosis within the sac. Dilatation of the thoracic aorta; endocarditis of the aortic valves. Gastric ulcer with erosion of an artery; hemorrhage into the stomach and the intestines. Perforation of the stomach with beginning erosion of the pancreas. Fatty degeneration of the heart, liver, and kidneys.

The muscle of the right ventricle of the heart measures 3 mm., that of the left ventricle about 17mm. in thickness. It is firm in consistence and of a pale reddish-brown color. The mitral valve is apparently normal. The aorta immediately above the valve is very irregular and has a nodular appearance; in a few places it is opaque and yellow. On section the intima is found to be considerably thickened. The orifice of the left coronary artery is patent; that of the right is considerably encroached upon by sclerotic patches, so that it is reduced to a diameter of 1.5 mm. The segments of the aortic valves near their free edges are thickened; the semilunar folds are in large part obliterated.



Where the semilunar folds are still preserved, there is thickening around the line of closure.

The aorta immediately above the valve and throughout the arch shows the same irregular thickening, and the intima, which is nodular, contains opaque patches in considerable number. The aorta is very greatly dilated, reaching its maximum about the mid-part of the arch, where it measures 12 cm. in circumference.

From the descending part of the aorta, extending backward on the left side, is a sacular aneurism measuring about 6 cm., opening by an oval orifice 4.5 x 2.5 cm. The sac rests against the bodies of the vertebræ and the ends of the fifth, sixth, and seventh ribs. The sac slightly erodes the bodies of the vertebræ with which it is in contact. It contains firm yellowish clots. In contact with the wall of the sac, only filling a small part of it, is a layer of firm yellow clot. The edges of the aneurismal orifice are rounded and quite smooth. The dilatation of the aorta extends below the aneurism throughout the arch.

The thoracic aorta is somewhat dilated, having a diameter of 7 cm., and shows a number of puckered areas which have the appearance of beginning aneurismal pouches. About four of these occur in the thoracic part, and at their site the wall is distinctly thinned.

Both lungs showed marked edema.

The stomach contains about 500 c.c. of fresh clotted blood of a deep-red color. On opening it, a large eroding ulcer is found situated upon the lesser curvature and posterior wall, with its edge 3 cm. from the pyloric orifice. It has a diameter of about 4 x 6 cm. The edge is quite abrupt and not raised. The base is formed by fibrous tissue, very little indurated. The muscularis appears to be completely eroded. In the base of the ulcer, which is fairly smooth and contains areas of black pigmentation, are exposed a group of lymphatic glands which are enlarged, each about 2 cm. across. At the end of the ulcer toward the pylorus the wall has been completely perforated and the pancreas lies exposed in the base. The lobules of the pancreas, for a considerable distance (about 2 cm.), occupying the anterior surface of the body about one-third its length from the splenic extremity, are dissected free from one another and appear to be very little eroded. The splenic artery, which is thickened, tortuous, and eroded, lies in contact with the base of the ulcer, but appears nowhere to be perforated. The splenic vein is not perforated. The mucosa of the stomach elsewhere is blood-stained, but does not show very noteworthy alterations.

On dissecting the vessels in the neighborhood of the ulcer, it is found that the artery passing along the lesser curvature of the stomach reaches quite half-way across the ulcer. Here it ends abruptly in the base of the ulcer, evidently having undergone complete erosion. The mouth of the vessel is covered by a small coagulum.

*CASE XIV.—Pain in side and shortness of breath. Pulsation in the left interscapular space and over the manubrium and lifting of clavicle; rupture into the left pleura. Aneurism of the upper part of the descending aorta; erosion of the third to seventh vertebræ, almost to the spinal canal; arch atheromatous and dilated.*

J. C. M. (Gen. Hosp. No. 38,516), aged 39 years, white, a tobaccoconist, was admitted April 9, 1902, complaining of indigestion and of pain and soreness in the left side.

Three of the patient's uncles died of consumption. There is no family history of rheumatism.

The patient had been a healthy man. He had had whooping-cough two years previously. At the age of 17 he had two attacks of gonorrhoea, but he denied ever having had syphilis. Before his illness he used alcohol very moderately, but had entirely given it up of late. He used tobacco quite freely. Until two years previously he had been troubled with frontal headache, which was apparently neuralgic, being most severe in damp weather.

Fourteen months before admission the patient began to have attacks of indigestion, accompanied by pain of a dull, pressing character, which at first came on after eating and continued about half an hour, but which had come to be constant. He now felt better with a full stomach. There had been no vomiting. He had always been obliged to use cathartics. Ten months previously he thought he had an attack of pleurisy, and had his wife apply plasters and blisters to the affected area on his left side. His physician, however, said that it was indigestion. Eight months previously he began to have shortness of breath on exertion. This had increased until it was now necessary to sit down after even slight exertion to regain his breath. There had been attacks of smothering when the patient would have to go to the window for air. Over the sixth left rib he had had a sharp burning pain, which radiated down to the costal margin and up into the axilla and shoulder.

On April 12, three days after admission, pulsation was first seen and felt in the left interscapular space, its maximum being at the level of the fifth thoracic spine. On the same day, on examination with the fluoroscope, there was seen a definite pulsating shadow, saccular in form, lying almost entirely to the left of the sternum and nearer the back than the front. There was also a rather heavy vertical shadow to the right of the sternum below the saccular portion.

On April 16 I dictated the following note: Fairly healthy-looking fellow. No distention of the veins. No inequality of the pupils. There is a marked pulsation at the top of sternum; throbbing in vessels of neck; wide-spread, diffuse cardiac impulse as far out as the nipple below. The backs are equal and the respiratory movement is equal. There is no bulging in upper interscapular region. Just below the level of the spine of left scapula, in an area 4 x 4 cm., without much bulging, is a distinct, well-defined pulsation, synchronous with the pulsation in the carotid. On palpation there is a very definite, distinct, heaving pulsation. The pulsation over the sternum is not a distinct, punctate impulse, but is diffuse, accompanied by lifting of the clavicle. There is no thrill. The apex beat is in sixth left intercostal space. The shock of neither sound is felt. There is no tracheal tugging. The note is clear over right side of sternum; a little impaired to left. In aortic region, second right interspace, there is a rough systolic and a loud diastolic murmur, maximum in second and third right interspace, no intensification down the sternum; just heard to left of sternum. Both sounds are well heard at the apex; no murmur. There is a rough systolic in sternal notch; no diastolic over pulsation behind. Both sounds are well heard; no bruit; no special signs of pressure on the lung.

On April 25 the patient complained much less of pain. The maximum blood-pressure in the left brachial is 105 mm. Hg.

On May 2 the maximum blood-pressure in the left brachial was 104 mm. Hg.

On May 14 the aneurism seemed to project much more; the pulsation was more marked behind. The patient's condition was apparently much worse.

On May 15 the patient's temperature has been elevated since yesterday afternoon. The pulse is rapid; respirations rapid but not labored. Examination of lungs shows right side clear; left side clear over upper left front; impairment of note and tubular breathing below third rib in axillary line.

On May 15, 2.30 P.M., patient had some dyspnea; no special cyanosis. Pulse was 120, small in volume, still collapsing. Unusual degree of visible pulsation over the whole thorax. Over upper left front there is distinct tympany down to anterior axillary fold; dullness throughout axilla. Over the left front the breath sounds are harsh, high-pitched; expiration prolonged. There is tubular breathing throughout axilla, with crackling râles at end of inspiration. Left back: tympanitic quality above; dullness below. Well-marked tubular breathing below; modified tubular above. Area of pulsation behind has markedly increased during last forty-eight hours.

The patient sank rapidly during the day. The temperature became subnormal at 8 P.M., and the patient passed into unconsciousness, dying at 9.50 P.M.

*Anatomical Diagnosis (Autopsy No. 1917), Dr. MacCallum.*—Extreme arteriosclerosis; sacular aneurism of aorta, with rupture into left pleural cavity; compression atelectasis of the lung.

The left pleural cavity is found filled with clotted blood, two liters of clots being removed. At the margin of the vertebral column on the left there can be felt a large mass with a ragged central cavity. The right pleural cavity is obliterated by old adhesions. The pericardium is smooth and glistening. The heart is a little enlarged. The aortic valves are very slightly thickened, but are not incompetent. The other valves are normal. The coronary arteries are slightly sclerotic. The heart muscle is soft and flabby.

The right lung is roughened by old adhesions. The posterior portions are collapsed and completely airless. The left lung, excepting a small portion of the upper lobe, is completely collapsed. Otherwise it is normal in appearance, except for the fact that there is a thin, fibrinous coagulum extending over the pleuro-pericardial surface.

The trachea was not at all compressed.

The esophagus lies between the trachea and the aneurism, but is quite free. From the posterior surface of the aorta there projects a great mass, densely adherent to the apex of the left lung. It is also adherent to the vertebrae, there being deep erosion of the bodies of the third to the seventh dorsal. The intervertebral discs are separated and project in a characteristic way between the deep fissures in the vertebral column. The third, fourth, and fifth vertebrae are eroded almost to the spinal canal, the sixth and seventh less so, and there seems to be a regenerative formation of bone on their anterior surfaces. The ribs on the left side are also eroded through at their juncture with the vertebrae.

The aneurism measures about 8 cm. in diameter, and is for the most part smooth internally, although the walls are nearly everywhere covered with thrombi. In some places it is corrugated by the lines of Zahn. The course of the arch of the aorta is not altered.

The aorta itself is extremely sclerotic, its walls being almost entirely made up of calcified plates. Just above the aortic orifice there is a great widening which reaches almost to the mouths of the vessels.

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243

# On the Educational Value of the Medical Society

BY

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ON THE EDUCATIONAL VALUE OF THE  
MEDICAL SOCIETY.<sup>1</sup>

BY WILLIAM OSLER, M.D., BALTIMORE, MD.,

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As the Autocrat remarks :

“ Little of all we value here  
Wakes on the morn of its hundredth year.”

All the more reason to honor such occasions as the present in an appropriate manner. The tribute of words that I gladly bring—and that you may take as expressing the sentiments of your brethren at large—necessarily begins with congratulations that your society has passed into the select group of those that have reached a century of existence. But congratulations must be mingled with praise of the band of noble men who, in 1803, made this gathering possible. It is true they did but follow the lead of their colleagues of Litchfield County and their own example when, in 1784, the physicians of this county organized what is now one of the oldest medical societies in the land. In the introduction to the volume of “Transactions of this Society,” published in 1788, the following brief statements are made as to the objects of the organization, which may be transposed from the parent to the child, and which I quote in illustration of the character of the men and as giving in brief the chief uses of a medical society: “This society was formed on the most liberal and generous principles, and was designed first to lay a foundation for that unanimity and friendship which is essential

<sup>1</sup> Remarks made on the occasion of the centennial celebration of the New Haven Medical Association, New Haven, Jan. 6, 1903.

to the dignity and usefulness of the profession ; to accomplish which, they resolved, secondly, to meet once in three months ; thirdly, that in all cases where counsel is requisite they will assist each other without reserve ; fourthly, that all reputable practitioners in the county, who have been in the practice for one year or more, may be admitted members ; fifthly, that they will communicate their observations on the air, seasons and climate, with such discoveries as they may make in physic, surgery, botany or chemistry, and deliver faithful histories of the various diseases incident to the inhabitants of this country, with the mode of treatment and event in singular cases ; sixthly, to open a correspondence with the medical societies in the neighboring states and in Europe, for which purpose they have a standing committee of correspondence ; seventhly, to appoint a committee for the purpose of examining candidates for the profession, and to give certificates to the deserving." Changed conditions have changed some of these objects, but in the main they hold good today.

Some of the paragraphs have suggested to me the subject of my address — the educational value of the medical society. There are many problems and difficulties in the education of a medical student, but they are not more difficult than the question of the continuous education of the general practitioner. Over the one we have some control, over the other, none. The university and the state board make it certain that the one has a minimum, at least, of professional knowledge, but who can be certain of the state of that knowledge of the other in five or ten years from the date of his graduation? The specialist may be trusted to take care of himself — the conditions of his existence demand that he shall be abreast of the times ; but the family doctor, the private in our great army, the essential factor in the battle, should be

carefully nurtured by the schools and carefully guarded by the public. Humanly speaking, with him are the issues of life and death, since upon him falls the grievous responsibility in those terrible emergencies which bring darkness and despair to so many households. No class of men needs to call to mind more often the wise comment of Plato that education is a life-long business. The difficulties are partly adherent to the subject, partly have to do with the individual and his weakness. The problems of disease are more complicated and difficult than any others with which the trained mind has to grapple; the conditions in any given case may be unlike those in any other; each case, indeed, may have its own problem. Law, constantly looking back, has its forms and procedures, its precedents and practices. Once grasped, the certainties of divinity make its study a delight and its practice a pastime; but who can tell of the uncertainties of medicine as an art? The science on which it is based is accurate and definite enough; the physics of a man's circulation are the physics of the water works of the town in which he lives, but once out of gear, you cannot apply the same rules for the repair of the one as of the other. Variability is the law of life, and as no two faces are the same, so no two bodies are alike, and no two individuals react alike and behave alike under the abnormal conditions which we know as disease. This is the fundamental difficulty in the education of the physician, and one which he may never grasp, or he takes it so tenderly that it hurts instead of boldly accepting the axiom of Bishop Butler, more true of medicine than of any other profession: "Probability is the guide of life." Surrounded by people who demand certainty, and not philosopher enough to agree with Locke that "*Probability supplies the defect of our knowledge and guides us when that fails and is always conver-*

sant about things of which we have no certainty," the practitioner too often gets into a habit of mind which resents the thought that opinion, not full knowledge, must be his stay and prop. There is no discredit, though there is at times much discomfort, in this everlasting *perhaps* with which we have to preface so much connected with the practice of our art. It is, as I said, inherent in the subject. Take in illustration an experience of last week. I saw a patient with Dr. Bolgiano who presented marked pulsation to the left of the sternum in the second, third and fourth interspaces, visible even before the night-dress was removed, a palpable impulse over the area of pulsation, flatness on percussion, accentuated heart sounds and a soft systolic bruit. When to this were added paralysis of the left recurrent laryngeal nerve, smallness of the radial pulse on the left side and tracheal tugging, there is not one of you who would not make, under such circumstances, the diagnosis of aneurism of the aorta. Few of us, indeed, would put in the *perhaps*, or think of it as a probability with such a combination of physical signs, and yet the associate conditions which had been present — a small primary tumor of the left lobe of the thyroid, with secondary nodules in the lymph glands of the neck and involvement of the mediastinum and metastases in the brain with optic neuritis — left no question that the tumor causing the remarkable intrathoracic combination was not aneurismal but malignant. Listen to the appropriate comment of the Father of Medicine, who twenty-five years ago had not only grasped the fundamental conception of our art as one based on observation, but had labored also through a long life to give to the profession which he loved the saving health of science—listen, I say, to the words of his famous aphorism: "*Experience is fallacious and judgment difficult!*"

But the more serious problem relates to the edu-



cation of the practitioner after he has left the schools. The foundation may not have been laid upon which to erect an intellectual structure, and too often the man starts with a total misconception of the prolonged struggle necessary to keep the education he has, to say nothing of bettering the instruction of the schools. As the practice of medicine is not a business and can never be one,<sup>2</sup> the education of the heart — the moral side of the man — must keep pace with the education of the head. Our fellow creatures cannot be dealt with as man deals in corn and coal; "the human heart by which we live" must control our professional relations. After all, the personal equation has most to do with success or failure in medicine, and in the trials of life the fire which strengthens and tempers the metal of one may soften and ruin another. In his philosophy of life the young doctor will find Rabbi Ben Ezra<sup>3</sup> a better guide, with his stimulating

"Then, welcome each rebuff  
That turns earth's smoothness rough,  
Each sting that bids nor sit, nor stand but go!"

than Omar, whose fatalism, so seductive in Fitzgerald's verses, leaves little scope for human effort.

For better or worse, there are few occupations

<sup>2</sup>In every age there have been Elijahs ready to give up in despair at the progress of commercialism in the profession. Garth says in 1699 (*Dispensary*),

"How sickening Physick hangs her pensive head  
And what was once a Science, now 's a Trade."

Of medicine, many are of the opinion expressed by one of Aken-side's disputants at Tom's Coffee House, that the ancients endeavored to make it a science and failed, and the moderns to make it a trade and have succeeded. Today the cry is louder than ever, and in truth there are grounds for alarm; but, on the other hand, we can say to these Elijahs that there are many more than 7,000 left who have not bowed the knee to this Baal, but who practice *caute et probe*.

<sup>3</sup>See Browning's poem. A good little edition has just been issued (with an introduction by William Adams Slade) which I commend to young graduates.

of a more satisfying character than the practice of medicine, if a man can but once get orientirt and bring to it the philosophy of honest work, the philosophy which insists that we are here, not to get all we can out of the life about us, but to see how much we can add to it. The discontent and grumblings which one hears have their source in the man more often than in his environment. In the nature of the material in which we labor and of which, by the way, we are partakers, there is much that could be improved, but, as Mrs. Poyser remarks, we must accept men as the Lord made them, and not expect too much. But let me say this of the public: it is rarely responsible for the failures in the profession. Occasionally a man of superlative merit is neglected, but it is because he lacks that most essential gift, the knowledge how to use his gifts. The failure in 99% of the cases is in the man himself; he has not started right, the poor chap has not had the choice of his parents, or his education has been faulty, or he has fallen away to the worship of strange gods, Baal or Ashitoreth, or worse still, Bacchus. But after all the killing vice of the young doctor is intellectual laziness. He may have worked hard at college, but the years of probation have been his ruin. Without specific subjects upon which to work, he gets the newspaper or the novel habit, and fritters his energies upon useless literature. There is no greater test of a man's strength than to make him mark time in the "stand and wait" years. Habits of systematic reading are rare, and are becoming more rare, and five or ten years from his license, as practice begins to grow, may find the young doctor knowing less than he did when he started and without any fixed educational purpose in life.

Now here is where the medical society may step in and prove his salvation. The doctor's post-grad-

uate education comes from patients, from books and journals and from societies, which should be supplemented every five or six years by a return to a post-graduate school to get rid of an almost inevitable slovenliness in methods of work. Of his chief teachers, his patients, I cannot here speak. Each case has its lesson — a lesson that may be, but is not always, learnt, for clinical wisdom is not the equivalent of experience. A man who has seen 500 cases of pneumonia may not have the understanding of the disease which comes with an intelligent study of a score of cases, so different are knowledge and wisdom, which, as the poet truly says, “far from being one have ofttimes no connection.” Nor can I speak of his books and journals, but on such an occasion as the present it seems appropriate to say a few words on the *educational value of the medical society*.

The first, and in some respects the most important, function is that mentioned by the wise founders of your parent society — to lay a foundation for that unity and friendship which is essential to the dignity and usefulness of the profession. Unity and friendship! How we all long for them, but how difficult to attain! Strife seems rather to be the very life of the practitioner, whose warfare is incessant against disease and against ignorance and prejudice, and, sad to have to admit, he too often lets his angry passions rise against his professional brother. The quarrels of doctors make a pretty chapter in the history of medicine. Each generation seems to have had its own. The Coans and the Cnidians, the Arabians and the Galenists, the humoralists and the solidists, the Brunonians and the Broussaisians, the homeopaths and the regulars, have, in different centuries, rent the robe of Æsculapius. But these larger quarrels are becoming less and less intense, and in the last century no new one of moment sprang up, while it is easy

to predict that in the present century, when science has fully leavened the dough of homeopathy, the great breach of our day will be healed.<sup>4</sup> But in too many towns and smaller communities miserable factions prevail and bickerings and jealousies mar the dignity and usefulness of the profession. So far as my observation goes, the fault lies with the older men. The young fellow, if handled aright and made to feel that he is welcomed and not regarded as an intruder to be shunned, is only too ready to hold out the hand of fellowship. The society comes in here as professional cement. The meetings in a friendly social way lead to a free and open discussion of differences in a spirit that refuses to recognize differences of opinion on the non-essentials of life as a cause of personal animosity or ill feeling. An attitude of mind habitually friendly, more particularly to the young man, even though you feel him to be the David to whom your kingdom may fall, a little of the old-fashioned courtesy which makes a man shrink from wounding the feelings of a brother practitioner,—in honor preferring one another; with such a spirit abroad in the society and among its older men, there is no room for envy, hatred, malice or any uncharitableness. It is the confounded tales of patients that so often set us by the ears, but if a man makes it a rule never under any circumstances to believe a story told by a patient to the detriment of a fellow-practitioner,—even if he knows it to be true!—and though the measure he metes may not be measured to him again, he will have the satisfaction of knowing that he has closed the ears of his

<sup>4</sup>As an indication of the leaven which is at work in our brethren of the homeopathic school, I may call your attention to the work on Clinical Medicine (Diagnosis), by Dr. Clarence Bartlett of the Hahnemann Medical College, Philadelphia. Accurate, thoroughly scientific and fully up to date, the students fed on such a diet will not be content with the husks of Hahnemann any more than the students of our regular schools are with the husks of Brown or Broussais, but they will practise as rational physicians, untrammelled by the shibboleth of any school.

soul to ninety-nine lies, and to have missed the hundredth truth will not hurt him. Most of the quarrels of doctors are about non-essential, miserable trifles and annoyances, — the pin pricks of practice, — which would sometimes try the patience of Job, but the good-fellowship and friendly intercourse of the medical society should reduce these to a minimum.

The well-conducted medical society should represent a clearing house, in which every physician of the district would receive his intellectual rating, and in which he could find out his professional assets and liabilities. We doctors do not "take stock" often enough, and are very apt to carry on our shelves stale, out-of-date goods. The society helps to keep a man "up to the times," and enables him to refurnish his mental shop with the latest wares. Rightly used, it may be a touch-stone to which he can bring his experiences to the test and save him from falling into the rut of a few sequences. It keeps his mind open and receptive, and counteracts that tendency to premature senility which is apt to overtake a man who lives in a routine. Upon one or two specially valuable features of the society I may dwell for a moment or two.

In a city association the demonstration of instructive specimens in morbid anatomy should form a special feature of the work. After all has been done, many cases of great obscurity in our daily rounds remain obscure, and as postmortems are few and far between, the private practitioner is at a great disadvantage, since his mistakes in diagnosis are less often corrected than are those of hospital physicians. No more instructive work is possible than carefully demonstrated specimens illustrating disturbance of function and explanatory of the clinical symptoms. It is hard in this country to have the student see enough morbid anatomy,

the aspects of which have such an important bearing upon the mental attitude of the growing doctor. For the crass therapeutic credulity, so widespread today, and upon which our manufacturing chemists wax fat, there is no more potent antidote than the healthy scepticism bred of long study in the post-mortem room. The new pathology, so fascinating and so time-absorbing, tends, I fear, to grow away from the old morbid anatomy, a training in which is of such incalculable advantage to the physician. It is a subject which one must learn in the medical school, but the time assigned is rarely sufficient to give the student a proper grasp of the subject. The younger men should be encouraged to make the exhibition of specimens part of the routine work of each meeting. Something may be learned from the most ordinary case if it is presented with the special object of illustrating the relation of disturbed function to altered structure. Of still greater educational value is the clinical side of the society. No meeting should be arranged without the presentation of patients, particularly those illustrating rare and unusual forms of disease. Many diseases of the skin and of the joints, a host of nervous affections, and many of the more remarkable of general maladies, as myxedema, cretinism, achondroplasia, etc., are seen so rarely and yet are so distinctive, requiring only to be seen to be recognized, that it is incumbent upon members to use the society to show such cases. A clinical evening devoted to these rarer affections is of very great help in diffusing valuable knowledge. The importance of a clinical demonstration was never better illustrated than at the International Congress in London in 1881, when Dr. Ord and others presented one morning at the Clinical Museum a group of cases of myxedema. There were men from all parts of the world, and the general recognition of the disease outside of England dates

from that meeting. The physiognomy of disease is learned slowly, and yet there are a great many affections which can be recognized, sometimes at a glance, more often by careful inspection, without any history. The society should be a school in which the scholars teach each other, and there is no better way than by the demonstration of the more unusual cases that happen to fall in your way. I have gone over my history cards of private patients brought or sent to me by last-year physicians, in which the disease was not diagnosed though recognisable *de visu*. Gout, pseudo-hypertrophic muscular paralysis, hysterical lordosis, spondylitis deformans, preataxic tabes (myosis, ptosis, etc.), Graves' disease, Parkinson's disease, anorexia nervosa, Raynaud's disease, pernicious anemia, spastic diplegia, spastic hemiplegia and cyanosis of chronic emphysema were on the list. Some of these are rare diseases, but at an active society in the course of a few years every one of them could be demonstrated.

The presentation of the histories of cases may be made very instructive, but this is often a cause of much weariness and dissatisfaction. A brief oral statement of the special features of a case is much to be preferred to a long, written account. The protocol or daily record of a long case should never be given in full. The salient points should be brought out, particularly the relation the case bears to the known features of the disease and to diagnosis and treatment. The volume of the Transactions of the New Haven County Medical Society, 1788, contains many admirably reported cases. I select one for special comment, as it is, so far as I know, the first case on record of a most remarkable disease, to which much attention has been paid of late,—the hypertrophic stenosis of the pylorus in children (see full discussion in the *Lancet* of Dec. 20, 1902). Dr. Hezekiah Beardsley reports a *Case of*

*Schirrhous of the Pylorus of an Infant.* Every feature of the disease as we know it now is noted—the constant puking, the leanness, the wizened, old look of the child are well described, and the diagnosis was made four months before death! The postmortem showed a dilated and hypertrophied stomach and “the pylorus was invested with a hard, compact substance or schirrosity which so completely obstructed the passage into the duodenum as to admit with the greatest difficulty the finest fluid.” If other men had been as accurate and careful as Dr. Beardsley, and if other societies had followed the good example set so early by the New Haven County Medical Association, not only would this rare disease have been recognized, but by the accumulation of accurate observations many another disease would have yielded its secret. But it illustrates the old story—there is no more difficult art to acquire than the art of observation, and for some men it is quite as difficult to record an observation in brief and plain language.

In no way can a society better help in the education of its members than in maintaining for them a good library, and I am glad to know that this is one of your functions. It is most gratifying to note the growing interest in this work in all parts of the country. In the last number of the *Bulletin* of the Association of Medical Librarians there is a list of twenty-five societies with medical libraries. An attractive reading-room, with the important weekly journals, and with shelves stocked with the new books in different departments, becomes an educational center in which the young man can keep up his training and to which the older practitioner can go for advice when he is in despair and for reassurance when he is in doubt. The self-sacrifice necessary to establish and maintain such a library does good to the men who take part in it; harmony is promoted, and, in the words of your fathers, the



dignity and usefulness of the profession are maintained.

Why is it that a large majority of all practitioners are not members of a medical society? Dr. Simmons estimates that there are 77,000 physicians in the United States who do not belong to any medical society whatever! In part this is due to apathy of the officers and failure to present an attractive program, but more often the fault is in the men. Perhaps given over wholly to commercialism a doctor feels it a waste of time to join a society, and so it is if he is in the profession only for the money he can get out of patients without regard to the sacred obligation to put himself in the best possible position to do the best that is known for them. More frequently, I fear, the "dollar-doctor" is a regular frequenter of the society, knowing full well how suicidal in the long run is isolation from the general body of the profession. The man who knows it all and gets nothing from the society reminds one of that little dried-up miniature of humanity, the prematurely senile infant, whose tabetic marasmus has added old age to infancy. Why should he go to the society and hear Dr. Jones on the gastric relations of neurasthenia when he can get it all so much better in the works of Einhorn or Ewald. He is weary of seeing appendices, and there are no new pelvic viscera for demonstration. It is a waste of time, he says, and he feels better at home, and perhaps that is the best place for a man who has reached this stage of intellectual stagnation.

Greater sympathy must be felt for the man who has started all right and has worked hard at the societies, but as the rolling years have brought ever-increasing demands on his time, the evening hours find him worn out yet not able to rest, much less to snatch a little diversion or instruction in the company of his fellows whom he loves so well. Of

all men in the profession the forty-visit-a-day man is the most to be pitied. Not always an automaton, he may sometimes by economy of words and extraordinary energy do his work well, but too often he is the one above all others who needs the refreshment of mind and re-creation that is to be had in a well-conducted society. Too often he is lost beyond all recall, and, like Ephraim joined to his idols, we may leave him alone. Many good men are ruined by success in practice, and need to pray the prayer of the Litany against the evils of prosperity. It is only too true, as you know well, that a most successful—as the term goes—doctor may practice with a clinical slovenliness that makes it impossible for that kind old friend, Dame Nature, to cover his mistakes. A well-conducted society may be of the greatest help in stimulating the practitioner to keep up habits of scientific study. It seems a shocking thing to say, but you all know it to be a fact that many, very many men in large practice never use a stethoscope, and as for a microscope, they have long forgotten what a leucocyte or a tube cast looks like. This in some cases may be fortunate, as imperfect or half knowledge might only lead to mistakes, but the secret of this neglect of means of incalculable help is the fact that he has not attained the full and enduring knowledge which should have been given to him in the medical school. It is astonishing with how little outside aid a large practice may be conducted, but it is not astonishing that in it cruel and unpardonable mistakes are made. At whose door so often lies the responsibility for death in cases of empyema but at that of the busy doctor, who has not time to make routine examinations, or who is “so driven” that the urine of his scarlet fever or puerperal patients is not examined until the storm has broken?

But I hear it sometimes said you cannot expect

the general practitioner, particularly in country districts, to use the microscope and the stethoscope — these are refinements of diagnosis. They are not! They are the essential means which can be used and should be used by every intelligent practitioner. In our miserable, antiquated system of teaching we send our graduates out wholly unprepared to make a rational diagnosis, but a man who is in earnest — and, thank heaven! most of the young men today in the profession are in earnest — can supply the defects in his education by careful study of his cases, and can supplement the deficiency by a post-graduate course. A room fitted as a small laboratory, with the necessary chemicals and a microscope, will prove a better investment in the long run than a static machine or a new-fangled air-pressure spray apparatus.

It is not in the local society only that a man can get encouragement in his day's work and a betterment of mind and methods. Every practitioner should feel a pride in belonging to his state society, and should attend the meetings whenever possible, and gradually learn to know his colleagues, and here let me direct your attention to an important movement on the part of the American Medical Association, which has for its object the organization of the profession throughout the entire country. This can be accomplished only by a uniformity in the organization of the state societies, and by making the county society the unit through which members are admitted to the state and national bodies. Those of you interested will find very instructive information on this subject in the *Journal* of the association in a series of papers by Dr. Simmons, the editor, which have been reprinted in pamphlet form. As now managed, with active sections conducted by good men from all parts of the country, the meeting of the National Association is in itself a sort of brief post-graduate course. Those of you

at the receptive age who attended the Saratoga meeting last June must have been impressed with the educational value of such a gathering. The Annual Museum was itself an important education in certain lines, and the papers and discussions in the various sections were of the greatest possible value. But I need say no more to this audience on the subject of medical societies; you of New England have not "forsaken the gathering of yourselves together as the manner of some is," but have been an example to the whole country.

In the dedication of his "Holy War," Thomas Fuller has some very happy and characteristic remarks on the bounden duty of a man to better his heritage of birth or fortune, and what the father found glass and made crystal, he urges the son to find crystal and make pearl. Your heritage has been most exceptional, and, I believe, from all that I know of the profession in this city and State, that could your fathers return they would say that of their crystal you had made pearl. One cannot read their history as told by Bronson, or as sketched by your distinguished citizen, my colleague, Dr. Welch, without a glow of admiration for their lofty ideals, their steadfastness and devotion, and for their faith in the profession which they loved. The times have changed, conditions of practice have altered and are altering rapidly, but when such a celebration takes us back to your origin in simpler days and ways, we find that the ideals which inspired them are ours today—ideals which are ever old, yet always fresh and new, and we can truly say in Kipling's words:

"The men bulk big on the old trail, our own trail, the old trail,  
They're God's own guides on the Long Trail, the trail that is always new."

A CASE OF CHRONIC PURPURIC ERYTHEMA  
(EIGHT YEARS DURATION), WITH PIG-  
MENTATION OF SKIN AND ENLARGE-  
MENT OF LIVER AND SPLEEN.

BY WILLIAM OSLER, M.D.,

Professor of Medicine, Johns Hopkins University.

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THE following remarkable case presents two points of interest, the character and duration of the skin lesion and the associated induration of the liver and spleen.

A glance at the Plate shows the condition of the skin of the legs, and Mr. Horn (one of the staff of artists of my colleague, Professor Kelly), has beautifully depicted the lesions, of which the more striking is the uniform pigmentation. Scattered over this brown skin are areas of hæmorrhage in all stages of transformation, shown as the deep red spots, slightly raised and in part hyperæmic, though not disappearing on pressure. There is a general brawniness and induration of the skin of both legs, and the picture serves to illustrate any section of either leg. Just above the iliac crests the pigmentation is less intense and there are numerous isolated areas, slightly raised, of hyperæmia, hæmorrhage and infiltration, the color of which does not disappear entirely on pressure. Then at a greater distance there are early, raised, hyperæmic lesions, which look a little infiltrated like wheals and disappear completely on pressure. These purely erythematous and wheal-like lesions are seen also on the neck and arms.

The chronicity is one of the most unusual features; the recurrence in crops is a common characteristic of lesions of the erythema group. I have reported a number of instances of recurrence of attacks during a long period of years,<sup>1</sup> but in this one, scarcely a day passed without the appearance of fresh spots. Such an extraordinary degree of pigmentation is rare.

The associated enlargement of the liver and spleen gives to the case an additional interest. From the uniform increase in size and the hardness the condition of the former is probably one of hypertrophic cirrhosis, and is related directly to the recurring hæmorrhages. The numerous skin lesions which occur in cirrhosis of the liver are rarely seen early in the disease. Recurring purpura, purpuric erythema and urticaria, sometimes quite large subcutaneous hæmor-

<sup>1</sup>The Visceral Lesions of the Erythema Group, *Amer. Jour. of Med. Sciences*, 1895, and *British Jour. of Dermatology*, Vol. 12, 1900.

rhages are occasionally met with. They are, I think, more frequent in the hypertrophic than in the atrophic form. A patient brought to me by Dr. Tompkins, of Charleston, W. Va., a large, robust, temperate man, had a very greatly enlarged liver and an enlarged spleen, with, for nearly three years, recurring attacks of hæmorrhage and urticarial wheals on the legs.

There appears, however, to be a group of cases, of which the one here reported is an illustration, in which the recurring cutaneous hæmorrhage is the primary trouble, and leads to the cirrhosis of the liver and the enlargement of the spleen. In the remarkable condition known as hæmochromatosis there is a wide-spread destruction of the red blood corpuscles (in a majority of the cases due to some unknown toxic agent), leading to a pigmentation of the skin and a deposition of the iron-containing pigment in the internal organs, and in time to cirrhosis of the liver and of the pancreas, and finally to a diabetes—the so-called bronzed diabetes. In at least four of the cases in Anschutz's paper (*Deutsches Archiv f. Klin. Med.*, Bd. 72), extensive purpuric eruptions occurred. In one of my cases the patient had had during three years, scores of outbreaks of purpura and urticarial blotches on the legs, sometimes with fever and the occurrence of great erythematous welts.<sup>2</sup> He had general pigmentation of the skin with great enlargement of the liver and spleen. There have also been cases of hæmochromatosis associated with hæmorrhagic pleurisy, so that it is quite possible the irritation caused by the deposition of a very large amount of the blood pigment in the liver and spleen may be sufficient to cause cirrhosis with enlargement.

The arthritis, a common enough feature in forms of erythemic purpura, and usually regarded as rheumatic in its origin, may possibly be of a character similar to the arthritis described by the surgeons in cases of extensive hæmorrhage, and of which I have seen two cases, one following a fracture of the kidney, and the other the recurring hæmorrhages into a pancreatic cyst.

*CLINICAL SUMMARY.*—*Healthy man of good habits; for eight years recurring erythemic purpura of the legs, leading to general pigmentation of the skin, with patchy erythema and purpura of the trunk and of the extremities; enlargement of the liver and spleen.*

John W. Oliver, aged 33, stone-mason, admitted to the Johns Hopkins Hospital May 27th, 1901, complaining of an extensive skin rash and soreness in the wrists, ankles and knees.

<sup>2</sup>Hæmochromatosis and Hypertrophic Cirrhosis of the Liver, *British Medical Journal*, Dec. 9th, 1899.

His family history was good; no similar troubles in any of the members.

*Personal History:* As a child he had pneumonia, and when twelve years of age was ill for three weeks with inflammatory rheumatism. Nine years ago he had a short attack of malaria. He has had gonorrhœa twice; never had syphilis. He has never had any skin rash except the present one. He has had no bleeding from the gums and has never bled profusely from cuts. He is a temperate man.

*Present Illness:* In September, 1894, he first noticed a few red spots about the ankles. From this time his legs have never been free from blotches and red and brown stains. The condition has gradually grown worse, extending slowly up both legs. Within four years both were as completely covered as at present. Two years ago the patient first noticed a few spots on his left arm. Six months ago he began to have them on the right arm. His face has remained free. He has had no itching. For the first six years he lost no time from work on account of this trouble. He got accustomed to it. He has been treated by scores of doctors, usually, he says, for syphilis, and has taken a good deal of mercury and iodide of potassium. For twelve months he has had a good deal of pain in the joints, chiefly a soreness in moving the joints; no redness; no swelling. On several occasions the soreness has been such as to incapacitate him from work. Three years ago he had varicose veins and small ulcers on both legs. Within the past year he has had several attacks of giddiness and once or twice felt nauseated. For seven years his general health remained excellent. During the past year he has lost about ten pounds in weight, and thinks he is not so strong as he was.

*Examination:* A very robust, healthy-looking man, not anæmic, with a very well developed muscular system. The skin of the face is perfectly normal. When stripped he presents a most remarkable appearance from the extensive brown discoloration and extravasation of blood into the skin of the legs. As will be seen in the Plate, which is a very vivid representation of the condition of the outer portion of the left leg, there are: (1) a general, deep, brownish pigmentation, almost uniform, showing here and there a few areas on which it is less intense; (2) widespread areas of hæmorrhagic infiltration into the skin; (3) in places more localized and distinctly raised areas with hyperæmia and hæmorrhage, like the lesions of a purpura urticans; these could be seen in all phases and grades of infiltration; (4) a general scaliness. The skin everywhere feels hard and brawny. The condition extends to the groins and behind just to the sacral region.



#### ORIGINAL COMMUNICATIONS.

In the upper part of the thighs the skin is not so thick and indurated. Toward the groins, too, where the hæmorrhagic exudate is much less intense, the isolated raised spots surrounded by areas of hyperæmia are more numerous. In the skin just above the iliac crest the same features are present, the hæmorrhagic pigmentation, the isolated areas of infiltration, which are slightly raised and chiefly hyperæmic. At a considerable distance is seen a single spot a little more than a centimeter in diameter, slightly raised, hyperæmic, which disappears entirely on pressure. The greater part of the skin of the back is free. There are only a few spots above the sacral region. In the left interscapular area is a patch 4 cm. in extent with erythema, exudation and a few small hæmorrhages. On the back of the neck, just above the line of the collar, there is an area of diffuse erythema with infiltration. On the front of the chest the skin is normal, except for a couple of small patches toward the axillary fold.

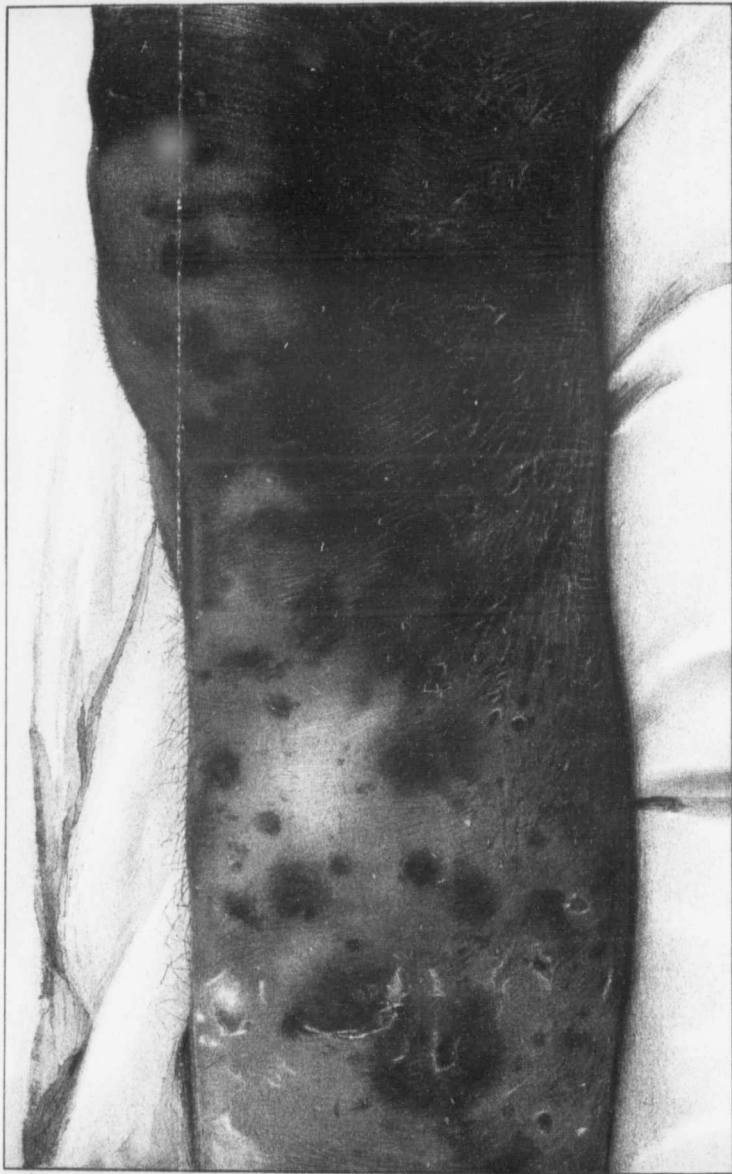
On the left arm there are curious linear ecchymoses along the posterior axillary fold and over the region of the shoulder. Some of these are fresh; others fading. There are a few isolated spots of hæmorrhage and infiltration on the skin over the biceps. On the extensor surfaces of the fore-arms there are numerous isolated, slightly elevated areas, many of which have become deeply hæmorrhagic; others resemble infiltrated wheals. There are a few small areas upon the back of the hand.

On the right arm there is some diffuse staining of the skin from old hæmorrhages, and there are scattered wheal-like bodies which disappear entirely on pressure. On the outer surface of the fore-arm there are several fresh nodular areas, some erythematous, others hæmorrhagic.

The joints are nowhere enlarged. The lymph glands in the groin are considerably enlarged. Genitalia normal. Examination of heart and lungs shows no special change.

*Abdomen:* The liver is considerably enlarged; the edge of the left lobe could be felt midway between the ensiform cartilage and the navel, firm and hard. In the nipple line it is 7 cm. below the costal margin. The spleen is enlarged; the edge can be felt  $4\frac{1}{2}$  cm. below the costal margin.

The patient had no fever. Numerous blood counts were made. On admission the reds were nearly 5,000,000, leucocytes 3,000 per cubic millimeter, hæmoglobin 70 per cent. Coagulation time, 3 minutes. Differential counts were made on four or five occasions. On admission the only striking change was that the eosinophiles were



A Case of Chronic Purpuric Erythema (Eight Years Duration), With Pigmentation Of Skin  
And Enlargement Of Liver And Spleen.

8 per cent., small mononuclears 12 per cent., polymorphonuclears 74 per cent.

During his stay in hospital he improved very much and his hæmoglobin rose to nearly normal.

The continuous warm bath was used in this case for several weeks, the patient remaining seventeen or eighteen hours a day in the tub. The condition of the skin of the legs improved very much, but fresh crops of hæmorrhage occurred at intervals. He complained of some pains in the joints; never any acute swelling.

Cultures were made from the blood, but nothing grew.

The urine was examined repeatedly. The specific gravity was always high, above 1,020; there was no bile, no albumen, no sugar, no tube casts; there were no abnormal ingredients.

A portion of the skin of the leg was excised and showed much iron-containing pigments in the connective tissue of the corium and an increase in the small mononuclear elements. There was no special distribution of the pigment about the cutaneous glands.

The patient remained in hospital until August 12th, and he left with the local condition somewhat improved.

Patient seen again February 18th, 1902. He thinks there is no special change. So far as the legs are concerned very little change; still deep brown pigmentation and marked superficial scaliness. Evidently a period with very few fresh spots; one or two about the knees. A quite marked change is the increase in the size of the inguinal glands, which both above and below Poupart's ligament are seen as large bunches. The outer sides of the thighs are very much indurated and the skin quite hard and sclerotic. In places there are little dried scabs. Very few fresh spots over the body. The edge of the liver can be felt about 4 cm. below the costal border in the parasternal line, hard and firm. In the middle line it reaches to mid-way between the navel and the ensiform cartilage. The spleen is about the same size as it was, hard and firm. The face is quite clear. The appetite is good; general condition good. The hands are a little involved. There is general erythema over the ankles and over the backs of the hands.

The patient died of pernicious malaria on February 6th, 1903, and I am indebted to Dr. A. H. Briscoe, of Tioga, Louisiana, for an account of his last illness. There was no autopsy.

CCXLV.

245

ON OBLITERATION OF THE SUPERIOR VENA CAVA.

BY WILLIAM OSLER, M. D.,

*Professor of Medicine, Johns Hopkins University.*

## ON OBLITERATION OF THE SUPERIOR VENA CAVA.

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While signs of compression of the superior vena cava are [169] not very uncommon in cases of aneurism of the aorta and in mediastinal tumors, instances of complete obliteration of the vessel, with the establishment of collateral circulation, are extremely rare. I here report one case which was under our observation for nearly three years, long enough to make the diagnosis of fibroid obliteration by exclusion, and a second in which the obliteration was due to compression in Hodgkin's disease. A third case due to aneurism I have already reported.<sup>1</sup>

Dr. Hume has collected for me from the literature the histories of 29 cases of complete obliteration of this vessel. Many of the reports are imperfect, and only the anatomical record is given. Of the cases 13 were males, 12 females and in 4 the sex was not specified. Eighteen of the patients were between the ages of 30 and 60. So far as the cause could be ascertained the cases could be grouped as follows: I. Thrombosis due to disease within the vein, 10 cases. Of these, 8 seem to have been due to a simple phlebitis; one, the case of Duchek, was a propagated thrombus from the periphery, and one a remarkable case of tuberculosis endophlebitis (Banti). By far the largest number of cases were due to: II. Disease outside the vein, 19 cases, grouped as follows: (a) tuberculosis, 4 cases; (b) mediastinitis, 4 cases; (c) aneurism, 4 cases; (d) syphilis, 3 cases; (e) periaortitis, 2 cases; (f) carcinoma, 1 case; (g) fibroma, 1 case.

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<sup>1</sup>Journal of the American Medical Association, June 7, 1902.

[169] The symptoms of the condition depend entirely upon the degree to which compensatory circulation has been established. Obliteration of any one of the three great veins of the body may exist for many years with even good health and a completely effected collateral circulation. There seem to be two groups of cases, one in which the patient has had for years complete compensation and good health and the symptoms set in acutely. This was well illustrated in a case at the Montreal General Hospital, reported by Wilkins (Case 6), in which I made the dissection. The patient was a robust, hale man, aged 34, who twelve months before, while lifting, felt something give way. He had occasional attacks of dyspnoea and a smothering feeling. His urgent dyspnoea came on somewhat suddenly, and for three months he had a great deal of [170] oppression of breathing, due in large part to recurring effusion into both pleural sacs. There was complete fibroid obliteration of the superior vena cava.

In the second group the symptoms of obstruction of the venous circulation are constantly present, though varying in intensity, as in the case here reported, and the condition may be consistent with a fair measure of health.

CASE I.—*Clinical Summary: Hard work, alcohol and exposure; dyspnoea, swelling of the neck and face; gradual distension of the superficial thoracic and epigastric veins; improvement for a time; gradual increase in the size of the superficial veins; on third admission tubercle bacilli were found; final admission with fever and delirium and unconsciousness; lumbar puncture, tubercle bacilli in exudate; tuberculous caries of spine; fibrous mediastinitis with obliteration of the superior vena cava and innominate veins; tuberculous meningitis.*

Charles Diggs, colored, butcher.

First admission was on Dec. 7, 1898. The patient was at this time 22 years old. He complained of tightness across the chest, dyspnoea and swelling of the neck.

The family history was unimportant.

*Personal History.*—Patient had had no rheumatism, typhoid fever, malaria or pneumonia. He had not been sub-

ject to headache, nor had he any sensory disturbance. Ven- 11701  
ereal history; gonorrhœa six times. Patient says he has had  
a chancre, but from the description the sore was probably  
chancroid, and there have been no secondary symptoms. To-  
bacco: patient began smoking at eight years of age, and  
smokes several packages of cigarettes a day. Alcohol: gin,  
whiskey and beer have been used abundantly, fifteen glasses of  
beer at least a day. He has often been drunk. He is a  
heavy eater. He is often exposed to the weather, and has a  
great deal of heavy work.

The present illness began six days before admission. The  
patient went to bed feeling well, and woke up with dyspnœa.  
He noticed that his neck was swollen, and felt as if some-  
thing were pressing against his chest tightly. The pain in  
his chest was not definitely localized. He noticed that his  
face was flushed. The patient had not been drinking on the  
night of the first symptoms, but had been drunk the previous  
night. The condition had grown worse each day. He had  
been treated before admission with doses of nitroglycerin,  
1-100 of a grain, and had been given irrigations for his  
urethritis. The appetite was good and his bowels were regu-  
lar. He thinks he has lost ten pounds since the onset of the  
symptoms.

*Present condition.*—The patient is a strong, well-nourished  
mulatto. The face and eyelids are puffy. The tongue is  
coated with a yellowish fur. No anæmia of the mucous  
membranes. The neck is full; the vessels are dilated and dis-  
tended with blood. Slight general pulsation of the neck. No  
tracheal tugging. The chest is well formed; respiratory  
movements equal. There is distinct tenderness on pressure  
in the epi-sternal notch. The right clavicle is more promi-  
nent than the left.

The lungs are clear throughout on auscultation and per-  
cussion. There is no dulness below the sternum suggestive  
of mediastinal growth. Superficial veins on the thorax and  
of the upper right arm and shoulder are dilated.

Heart not enlarged; sounds quite clear. Pulse 78 to the  
minute, of fair volume and tension. The right radial is  
slightly fuller than the left; the vessels are palpable.

[170] Glands: The inguinal, the left epitrochlear, the posterior cervical and the submaxillary are enlarged. There is no œdema of the legs. The reflexes are apparently normal. The differential count shows a practically normal ratio of leucocytes. The X-ray picture was negative and nothing abnormal could be seen with the fluoroscope.

Two weeks after admission a slight pleuro-pericardial friction rub was noted. On December 21 the patient was discharged, distinctly improved. The veins of the neck were less distended than on admission. During the first three days he had had a slight temperature, but since that time had been practically free from fever.

The patient was admitted a second time on December 1, 1899, complaining of pain in the chest and of swelling of the face. Since leaving the hospital he had been unable to do any hard work. Every exertion would cause swelling of the face and neck. He had been "drinking and sporting" until two months before the present admission, and during these two months there had been a steady pain in his chest, sometimes extending into the arms. He had slept poorly. On examination the superficial veins were found dilated in the forearms as well, and the thoracic subcutaneous veins were found to anastomose with the superficial and deep epigastrics. The current in these thoracic veins was distinctly from above downwards. The radial pulses were equal. No thrill and no diastolic shock were observed during his stay in the hospital. The patient was discharged improved on January 2, 1900, again with a diagnosis of probably intra-thoracic tumor.

On several occasions during the spring of 1900 the patient was demonstrated to the students at the out-patient clinic. The absence of all signs of aneurism and of enlargement of the glands, the negative character of the X-ray picture, the slow course of the disease, led to the diagnosis of fibroid obliteration of the superior vena cava.

He was admitted for the third time on June 20, 1900, complaining of pain in the chest and in the right arm and of a cough. While away from the hospital he had been comfortable so long as he took care of himself. The cough had lasted three weeks and had been accompanied by much expectora-



tion. The right radial pulse was now distinctly fuller than [170] the left. The veins were more dilated on the right side of the thorax. The right lung was distinctly impaired. Tubercle bacilli were found on June 23. The expectoration was muco-purulent in character and very foul. There was a great deal of insomnia due to the cough. The patient insisted upon leaving the hospital on June 25. Fig. 1 shows the distension [171] of the superficial veins.

The fourth and last admission was on February 16, 1901, when the patient came in complaining of cough which had lasted three weeks. He had been spitting blood at intervals for a year and had night sweats. His appetite was poor, and he had had a good deal of vomiting. He had also had constipation. Two days after admission tubercle bacilli were again found, and the condition of the right lung was worse than on the previous admission. His cough was racking and very severe. On February 31 he became noisy and profane and refused to keep on his clothes, and during the afternoon was found lying on the floor, and irregular convulsive movements of the extremities were noted, and the patient was apparently unconscious. The temperature rose to 102.6°. On being put to bed the patient kept making peculiar grimaces, but soon became rational and did not remember the period of unconsciousness. His speech was distinctly thick like that of a drunken man. On February 24 the patient became restless; there was marked cyanosis of the face and extraordinary injection of the conjunctivæ; there was definite nystagmus; the pupils were unequal, the left being larger; there was frothing at the mouth. The dilatation of the veins had become appreciably greater. Later in the day the cyanosis increased. Bleeding was resorted to and temporarily quieted the patient. The respirations were very stertorous throughout the day. Soon after midnight, after a violent convulsive attack, the patient became quieter and died at 1.50 a. m. on February 25.

Lumbar puncture was done at the time of death and the fluid showed leucocytes and tubercle bacilli.

Autopsy by Dr. MacCallum on February 25, 1901, nine hours after death.

*Anatomical Diagnosis.*—Chronic tuberculosis; tuberculous

[171] carries of spine; fibrous tissue growth in the adjacent regions, with involvement and occlusion of vena cava superior and of innominate veins; establishment of extensive collateral venous circulation; tuberculous meningitis.

The body of a young negro, 170 cm. long. Over the anterior thoracic and abdominal regions, reaching down to the inguinal regions, there are many tortuous and distended subcutaneous veins. To facilitate the dissection of the venous system hot water and then colored wax were injected into the femorals. The dissection reveals the following condition of the venous system: The right jugular and the right subclavian, much dilated, formed the right innominate, which is immediately obliterated to form a dense thick cord. The right internal mammary is obliterated at its junction with this innominate. The left internal jugular is obliterated, or partly so, in the neck. It joins the left subclavian to form again a fibrous mass which represents the innominate on the left side. The two innominates unite to form a fibrous mass which represents the superior vena cava (Fig. 2). Within the pericardium, however, this vessel is patent from the point where it receives the wide azygos vein to the heart, but it is not more than 15 mm. wide and its walls are quite thick. The azygos vein is 1 cm. in diameter, and there is no obstruction at its mouth. The anterior perforating branches of the internal mammary are very wide and connect with the long tortuous subcutaneous veins. The superficial brachial veins communicate similarly with these tortuous veins, forming a pre-pectoral anastomosis (Fig. 3). The tortuous veins communicate with the superficial and probably with the deep pectoral veins in the inguinal region. The sinuses in the cranial cavity are dilated and contain non-adherent thrombi. The left jugular vein being occluded, blood from the head must have passed out mainly by way of the right jugular, through the right subclavian, through the pre-pectoral anastomosis with the anterior perforating branches of the internal mammary and with the subcutaneous tortuous veins to the superficial epigastrics and thence to the inferior vena cava, which was normal throughout its course. An alternate course would have been from the subclavian to the upper right intercostal veins through the

perforating branches of the latter and thence to the azygos, [171] which was very large (12 cm. in diameter). On the left the blood from the subclavian vein followed a similar course. The obliterated portions of the innominate and jugular veins lie as a firm mass of fibrous tissue firmly adherent to the spinal column. Peritoneum and pericardium normal.

Lungs: Both adherent to the pleura at the apices; bronchial glands enlarged; considerable œdema present. Many tubercles at each apex and throughout the lung. A cavity 2 cm. in diameter present in the right lung. Between the tubercles the intervening lung is scarred, but there is no pneumonia. Both lungs are adherent to the vertebral column at their upper portions.

Spleen: Substance is pale and flabby.

Liver: Near the edge there is a puckered white opaque thickening of the capsule.

Stomach, pancreas, kidneys, testes normal.

Vertebræ: Removal of the fibroid mass surrounding the innominate veins reveals an erosion of the centra of the last cervical and the first two or three thoracic vertebræ, with complete denudation of the bone. There is a focus of disease in the last cervical and first thoracic vertebral centra. These have collapsed and caused a slight scoliosis and possibly some kyphosis. The cavity thus formed extends into the spinal canal but causes no special compression of the cord. The adjacent centra are much eburnated. The fibrous tissue lying upon this cavity in the vertebræ is continuous with that about the innominate veins. There is no marked abnormality in the cranial vessels. The pia, especially in the fissure of Sylvius about the cerebellum, the base of the brain and the medulla, shows many miliary tubercles. The lateral ventricles are slightly distended with fluid. The ependyma shows a fine granulation.

CASE II.—*Hodgkin's Disease; Compression of Superior Vena Cava; Extensive Collateral Circulation; Formation of Phleboliths; Unusual Chronic Course; Autopsy.*

M. H., aged 31, varnisher, applied at the Medical Dispensary, October 4, 1889, complaining of swelling of the neck [172]

[172] and of the face. Family history is good. None of his relatives have had any glandular enlargements.

He himself has always been well and strong, with the exception of the usual diseases of childhood.

About 1884 he first noticed swelling of the glands of the neck, chiefly on the right side. It did not increase much, but shortly afterwards he noticed the glands on the left side were a little large. They, however, did not interfere with his work. Throughout the year 1887 there was a decided increase in the glandular enlargement, and about Christmas of that year the face was a good deal swollen and the veins of the face and of the arms and front of chest began to swell. He also [173] had shortness of breath on slight exertion. Through last year and the present year this condition has persisted. The glandular enlargement has been progressive; the swelling of the veins very marked, and on exercise he gets extremely livid.

On October 4, 1889, I dictated the following note: The patient is a small, spare man; the face is greatly suffused and swollen, the conjunctiva moist and injected, and about the lips and cheeks there is slight lividity. The tongue also is somewhat cyanosed. The venules are prominent and the veins of the cheeks and forehead are distinct. There is great enlargement of the glands of the neck, particularly on the right side. They are firm and hard, extending on both sides of the sterno-mastoid muscles and reaching to the clavicles, the outlines of which are obliterated by the swelling. The axillary glands are not enlarged. When stripped the most striking feature is the enormous distension of the thoracic and abdominal veins. The manubrium looks prominent and the first and second interspaces near the sternum look full. Beneath the skin of the sternum and over the whole front of the thorax large veins can be seen, and on palpation there is felt a soft plexus of distended vessels. Palpation causes great pain over the manubrium and the first and second left interspaces.

On percussion there is absolute flatness on the manubrium, extending into the infra-clavicular space and as low as the nipple, where it is continuous with that of the heart. The dullness extends only about two inches from the sternal margin. The apex beat is neither visible nor palpable. Percus-

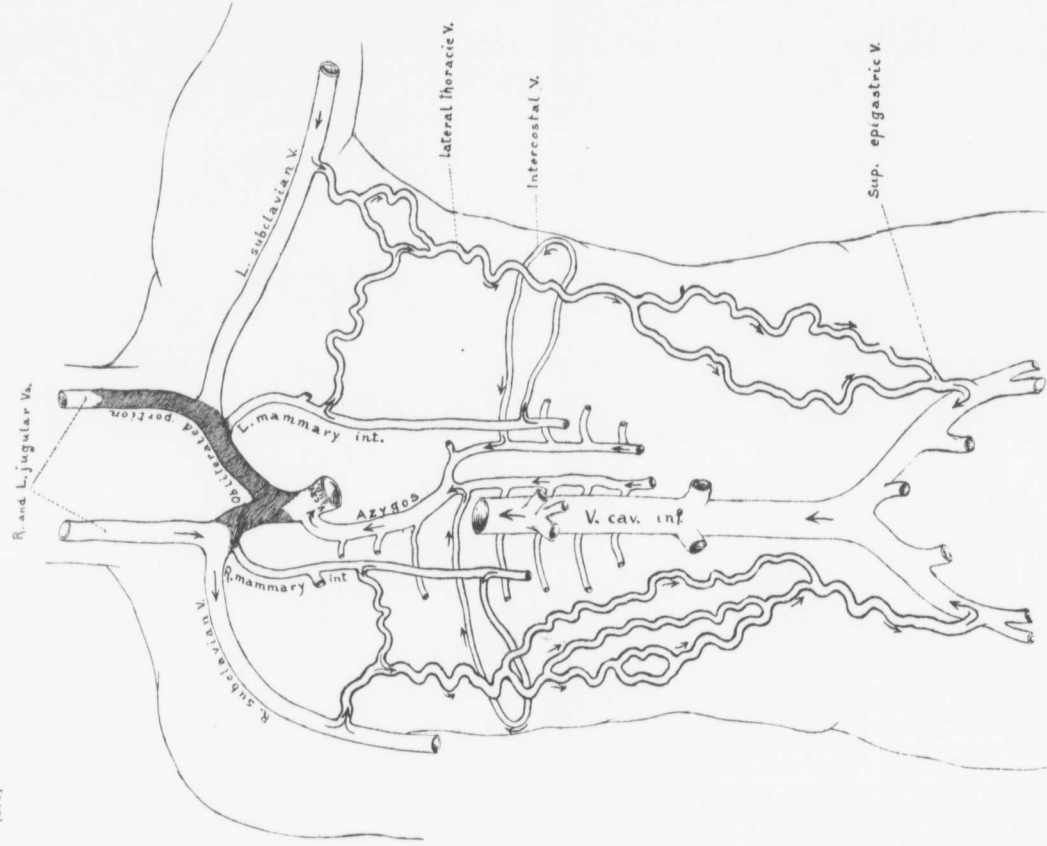


FIG. 3.

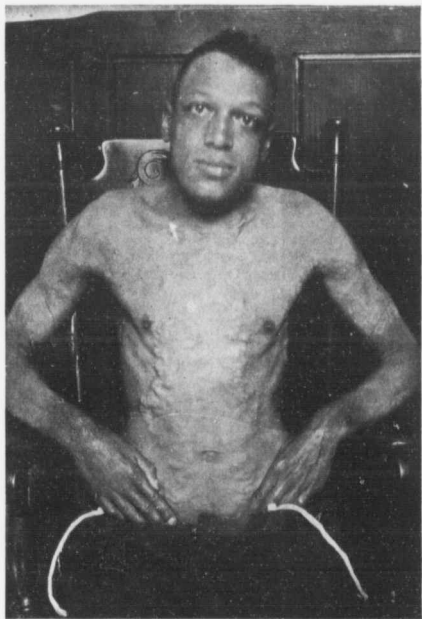


FIG. 1.



FIG. 2.

sion is clear on the right side in front and on both sides be- (173)  
hind.

On auscultation, the heart sounds are clear, the aortic second accentuated; no murmur in aortic region or at apex. Respiration is very feeble and distant in left infra-clavicular and mammary regions. The radials are equal. There is no lividity of the hands; no enlargement of the veins; no clubbing of the fingers.

The abdomen looked full and beneath the skin there could be seen the superficial epigastric veins enormously distended; the right one almost as large as the index finger. The blood current in them is from above downwards.

The patient was placed upon Fowler's solution, minims v, to be increased. From this time until his death, 1893, that is for fully three years and a half, this patient was under our observation, and I showed him repeatedly at the clinics, and once at the Hospital Medical Society.

I will note here some of the special features in his case as dictated by me at different periods.

December 7, 1889, venous engorgement not so marked. He has had two smothering attacks at night and has had blood spitting.

January 18, 1890, he was better, the glandular enlargement was not so marked, eyes not so suffused. He has been taking Fowler's solution of arsenic up to 15 minims three times a day and has had a little diarrhoea. The swelling of the glands has distinctly lessened. He has a good appetite.

February 25, 1890, the note is: Feels very well; has improved wonderfully; scarcely any more swelling on the right side than on the left; the glands of the lower part of the neck are still enlarged, and only slightly tender. Difference in the pulses still apparent.

March 24: Glandular enlargement even smaller than before; less tender. He has had a distressing papular eruption on the face, hands and neck, which itches very much. Throughout the summer he improved a great deal and felt very much stronger.

On September 4 I dictated the following note: There is a red papular rash which itches. The swelling on the right side



[173] of the neck is still painful to the touch. Though the swelling in the neck has diminished, the cervical glands are still enlarged; the distension of veins over the front of the chest is now enormous, extending on either side to the nipple line; the epigastric veins are also enormously enlarged and plexiform. In some of the larger veins over the manubrium thrombi are to be felt. The large cutaneous veins extend over the right shoulder and biceps. The face is still suffused, but not nearly so much as before. The dulness persists over the manubrium and the left infra-clavicular space. Heart sounds are clear; there is no murmur; no venous hum. There is very marked difference between the breath sounds in the left and right infra-clavicular regions; in the former they are scarcely audible.

Throughout the year 1891 he was frequently under observation and there was very little change. I examined the heart repeatedly. There was never any venous hum, never any murmur. He took the Fowler's solution at intervals; towards the end of the year he had some pain in the left arm and the left side of the chest.

On April 5, 1892, I made the following note: General condition remains unchanged, though the glands of the right side of the neck are now not very much swollen. They are well marked on the left side. The sternum is perhaps more prominent, but it is difficult to say whether this is due to increase in the bone itself or to the enormous veins in the subcutaneous tissue. The skin is not abraded or reddened. The plexuses of veins already referred to is very marked. Just under the left nipple one of the larger veins contains a thrombus and higher up towards the manubrium there are several phleboliths the size of peas. The right epigastric vein is still larger. There is a slight heaving of the whole chest with each cardiac impulse. The heart sounds are clear, aortic second not accentuated. No venous hum over the plexus. Face a little suffused; no change in the pulmonary condition.

In July the patient had a hemorrhage, stated to be from the lungs. In September he said that he had been fairly well all summer and had tried to do a little work. The face was [174] congested and full; the glands on the right side of the neck

still considerably enlarged. The superficial epigastric veins [174] were distinctly smaller, but there seemed to be no change in the condition in those of the sternum. Early in January I showed the patient at the clinic. The condition was practically the same, though the epigastric veins were certainly not quite so large.

The patient died in March, 1893, and an autopsy was obtained by Dr. Flexner, but under most unfavorable circumstances, and the thoracic organs had to be hurriedly examined, so that no complete dissection could be made in situ. The superior cava was completely obliterated by the enlarged mediastinal glands.

#### SUMMARY OF CASES.

(Cases from the literature of fibroid obliteration of the superior vena cava, collected by Dr. E. H. Hume.)

##### A. THROMBOSIS DUE TO DISEASE WITHIN VEIN.

###### I. (a) *Phlebitis.*

1. Breschet: *Traité des maladies des artères, &c.*, Paris 1819 (translation of Hodgson's *Diseases of Arteries*), No. 150; Preparation in Museum of Faculty of Medicine, Paris; a wax model made under direction of Dupuytren. Thrombosis of vena cava superior.

2. Wolff: *Mag. f. d. ges. Heilk.*, Berlin, 1823, XIV, 570. Female, 19; sarcoma of shoulder. P. M., inflammation of right auricle and pericardium; thrombosis of vena cava superior.

3. Claverie, G. E.: *Thèse de Paris*, 4°, 1858. Male, 52, jeweler; onset of symptoms gradual, lasting thirty years; gout three years previously; death from gangrene of foot following gout. P. M., vena cava a fibrous cord; pericardium adherent; lungs, chronic phthisis.

4. Rees: *Lancet*, 1860, II, 585. Female, 48; œdema of upper and lower extremities. P. M., complete obliteration; thrombosis of vena cava superior, evidently phlebitis; disease evidently propagated from right auricle.

5. Rees: *Guy's Hospital Reports*, 1861, 3. s., VII, 113.

[174] Female, 54; heart disease. P. M., entrance to vena cava superior obliterated by phlebotic thrombi.

6. Wilkins: *Lancet*, 1883, I, 812. Male, 34, naval officer; strain twelve months previously. P. M., thrombosis with complete obliteration of vena cava superior.

7. García Rijo: *Crón. méd. quir. de la Habana*, 1887, XIII, 412. Male, 38, soldier. P. M., complete obliteration of vena cava superior by thrombosis.

8. Hirschlaff: *Inaug. Diss.*, Berlin, 1893. Female, 51; diphtheria at eighteen; rheumatism at twenty. P. M., mitral stenosis; aortic and mitral insufficiency; marantic thrombosis of vena cava superior, with complete obliteration.

(b) *Propagated Thrombus.*

9. Duchek: *Prager Vierteljahrsschrift*, 1854, XLI, 109. Pathological specimen in Museum at Vienna. No clinical history. Vena cava superior obliterated by thrombus propagated from periphery.

(c) *Tuberculous Endophlebitis.*

10. Banti: *Sperimentale*, Mem. Orig., Firenze, 1891, XLV, 408. Male, 46; carpenter; death from acute miliary tuberculosis. P. M., vena cava superior a hard cylinder; a vegetative mass occupying the auricular entrance to vena cava superior; microscopically, tuberculous endophlebitis.

B. THROMBOSIS DUE TO DISEASE WITHOUT THE VEIN.

I. *Tuberculosis.*

11. Tonnelé: *Jour. Hebd. de Méd.*, 1829, V. Male, 2; cough, diarrhoea, vomiting. P. M., complete obliteration; encysted tuberculous mass, caseous at centre, connected vertebræ to vena cava superior and obliterated the latter; thrombosis of superior longitudinal sinus propagated to vena cava superior.

12. Reid, J.: *Edinb. Med. & Surg. Jour.*, 1835, XLIII, 297. Female, 40, of irregular habits. P. M., vena cava superior a cartilaginous cord connected to right bronchus. Process probably originated in tuberculous bronchial glands.

13. Paulus: Oesterreich med. Woch., 1842, 2 quartal., [174] No. 14. Clinical history not given. P. M., secondary caries of right petrous bone; complete obliteration of vena cava superior by propagated thrombus.

14. Duchek: Loc. cit. Male, 52. P. M., vena cava superior obliterated and attached by fibrous tissue to right bronchus. The process evidently originated in a tuberculous gland.

## II. Mediastinitis (unclassified).

15. Oulmont: Mem. Soc. Méd. d'obs., Paris, 1856, III, 391, 468. Female, 49, cook. P. M., a fibrous mass in mediastinum attaching bronchial gland to left bronchus and vena cava superior; vena cava superior completely thrombosed.

16. Habershon: Lancet, 1875, II, 837. Male, 37, coal-heaver. P. M., complete obliteration; chronic mediastinitis leading to fibrous transformation of vena cava superior; evidently congenital, certain valvular defects being present.

17. Williams: Proc. Path. Soc., Dublin, 1877, n. s. VIII, 8. Female, 27; rheumatism eight years before. P. M., vena cava superior a fibrous cord, probably due to inflammation around mediastinal glands.

18. Roberts: Lancet, 1893, II, 1386. No clinical history. P. M., complete obliteration; fibrous transformation of vena cava superior, probably due to mediastinitis. [175]

## III. Aneurism.

19. Martin-Solon: Arch. de Méd., 1836, 2. s., X, 296. Female. P. M., enormous aneurism of aorta; vena cava superior obliterated in walls of sac.

20. Duchek: Loc. cit. Male, 39. P. M., vena cava superior obliterated and lost in the walls of an aneurismal sac.

21. Watson: Practice of Physic, Ed. Condie, 1866, 798. Male, 33. P. M., complete obliteration, vena cava superior being lost in walls of sac of an aneurism of aorta.

22. Russell: Medical Times and Gazette, 1871, II, 130. Male; injury to chest three years previously. P. M., complete obliteration; vena cava superior lost in walls of sac of huge aneurism of aorta.

*IV. Syphilis.*

23. Willigk: Prager Vierteljahrsschrift, 1853, XXXVIII, 20. Female, 44, laborer. P. M., complete obliteration; fibrous vena cava superior included in syphilitic scar tissue in right bronchus.

24. Duchek: Loc. cit. Female, 47. P. M., Vena cava superior obliterated and attached by fibrous scar tissue, evidently syphilitic, to right bronchus.

25. Fraenkel: Deutsche Med. Woch., 1891, XVII, 1378. Male, 45, history of syphilis and alcoholism. P. M., complete obliteration; compression of vena cava superior by mediastinal syphilitic granuloma; thrombosis of vena cava superior.

*V. Periaortitis.*

26. Rigler: Wien Med. Woch., 1858, VIII, 1. Male, 70; painter; rickets and typhoid; acute rheumatism often after 28. P. M., dilatation of aorta; periaortitis; thrombosis of vena cava superior.

27. Meigs: Transactions of the Coll. of Phys., Phila., 1886, 3. s., VIII, 13. Male, 72; general arterio-sclerosis; sudden vertigo on day of admission. P. M., complete obliteration; mediastinitis and periaortitis, leading to thrombosis of vena cava superior.

*VI. Carcinoma.*

28. Barth: Bull. soc. anat., Paris, 1853, XXVIII, 4. Female, 36, healthy, 5-para. P. M., cancer of lung and heart; vena cava superior obliterated by organized clot from the auricle upwards.

*VII. Fibroma.*

29. Pastau: Virch. Arch., 1865, XXXIV, 236. Female, 42. P. M., fibroma pressing on innominate artery and vena cava superior; complete thrombosis of vena cava superior, with calcification of walls.

CCXLVI.  
246

ON THE SO-CALLED  
STOKES-ADAMS DISEASE

(SLOW PULSE WITH SYNCOPAL ATTACKS, ETC.)

BY

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DISEASE (SLOW PULSE WITH  
SYNCO PAL ATTACKS, &c.)

DEFINITION.

Stokes-Adams disease is a clinical condition characterised by (1) a profound disturbance in the automatic mechanism of the heart—true bradycardia, hemistole (false bradycardia), and allorhythmia; (2) nervous symptoms—vertigo, syncope, pseudo-apoplexy, and epileptiform attacks; and (3) secondary symptoms—Cheyne-Stokes breathing, cardiac asthma, angina pectoris, and the vaso-motor accompaniment of profound heart-shock. The post-mortem changes are not constant. In a few cases coarse lesions of the nervous system have been found, in a small number no lesions whatever; in a large proportion of the cases arterio-sclerosis is present. The clinical picture is very variable—there are acute, rapidly fatal cases, chronic cases in which for years the patient has slow pulse with syncopal or pseudo-apoplectic attacks, and forms in which slight but well-characterised attacks occur at intervals in persons apparently well.

HISTORICAL NOTE.

Adams's description is of interest.<sup>1</sup> His patient, a man, aged 68 years, was of full habit and subject to oppression of breathing and cough. When seen he was just recovering from the effects of an apoplectic attack which had suddenly seized him three days before, but he was well enough to be about the house and even to go out. What attracted Adams's attention were the character of the breathing and the remarkable slowness of the pulse (30 to the minute). His regular attendant informed Adams that during seven years this patient had had not less than 20 apoplectic attacks. After a day or two of heaviness and lethargy he would fall down completely insensible and on several occasions he had hurt himself. The pulse would become slower than usual and the breathing loudly stertorous. He never had any paralysis after the attacks. Death followed an attack and

<sup>1</sup> Dublin Hospital Reports, vol. iv., 1827, p. 396.

the heart was found to be very fatty. The valves were sound. There was no statement about the coronary arteries. R. W. Smith<sup>2</sup> refers to this case, and states that he had also noted a condition of slow pulse with fatty heart.

Stokes's much more important contribution is entitled "Observations on some Cases of Permanently Slow Pulse."<sup>3</sup> He describes the case of a man, aged 68 years, who had recurring fainting fits which left him without any unpleasant effects. During three years he had had at least 50 seizures. They were induced by any circumstance tending to impede or to oppress the heart's action, as sudden exertion or distended stomach. He was never convulsed. The duration of the attack was seldom more than four or five minutes and during this time he was perfectly insensible. He had never been paralysed. When admitted his general health seemed to be very good. There was an apex systolic bruit and the pulse was 28 to the minute. The arteries appeared to be in a state of permanent distension, "the temporal arteries ramifying under the scalp just as they are seen in a well-injected subject." An interesting feature in this case was that the patient could ward off attacks by a peculiar manoeuvre. "As soon as he perceived symptoms of the approaching attack he directly turns on his hands and knees, keeping his head low, and by this means he says he often averts what otherwise would end in an attack." While his heart was beating only at 28 Stokes noticed that there were occasional semi-beats between the regular contractions, eight of them in the minute. On his readmission there was noted a new symptom, a remarkable pulsation in the right jugular vein, which was more than double the manifest ventricular contractions.

Beyond the occasional reports of cases not much of special importance has appeared in England on the subject. The condition is only mentioned incidentally in Allbutt's "System of Medicine." Gibson discusses it in a very good section in his "Diseases of the Heart." In France Charcot called attention to it in 1872, but to Huchard we owe a revival of interest, and in the various editions of his "Traité des Maladies du Cœur," under the name Stokes-Adams disease is found the best description in literature. In Germany the condition has not attracted attention, but within the past two years excellent papers have appeared by His, jun., Hoffmann, Jaquet, and Luce in the *Deutsches Archiv für Klinische Medizin*. In the United States a most comprehensive study of the slow pulse was made by the late Dr. D. W. Prentiss<sup>4</sup> of Washington when he presented before the Association of American Physicians a remarkable case in which the condition had persisted for a period of nearly two years in association with very frequent fainting fits. Of the

<sup>2</sup> Dublin Journal of Medical Science, vol. ix., 1836.

<sup>3</sup> Dublin Quarterly Journal of Medical Science, 1846.

<sup>4</sup> Transactions of the Association of American Physicians, vol. iv.

94 cases which he abstracted from the literature there were 32 which belong to the condition under consideration. In the case reported by Dr. Prentiss there was a necropsy, and it is stated that neither the aorta nor the coronary artery was atheromatous, which is somewhat remarkable considering the extreme grade of sclerosis in the peripheral arteries. There were no lesions of the pneumogastric nuclei. In the discussion which followed the above case Dr. F. P. Kinnicutt and Dr. Jacobi narrated typical cases. In 1895 I described the condition briefly in my lectures on angina pectoris. Dr. R. T. Edes<sup>5</sup> has reported a series of cases and given an exhaustive analysis of the literature of the subject. Babcock has a good chapter in his recently issued work on "Diseases of the Heart."

#### CONDITIONS IN WHICH SLOW PULSE IS MET WITH.

1. *Physiological*.—The statement is made that dark persons and the dark races—e.g., Bretons—have a pulse rate below the average. It does not appear to be the case with the African race. I know a family most of the members of which have a pulse-rate of about 60; one son died from Stokes-Adams disease, another, perfectly healthy, has sometimes a pulse rate of only 48. Cases which can be called physiological are not very common. The slow pulse of Napoleon rests upon tradition;<sup>6</sup> it has been suggested that his epilepsy and attacks of apathy may have been associated features in a chronic form of Stokes-Adams disease. There are remarkable instances in the literature, many of them quoted by Dr. Edes, of persons in good health for years with a pulse-rate from 30 to 40. The slow pulse of old age may be considered normal, but the physiological limit is passed when with advancing arterio-sclerosis there are attacks of vertigo or syncope.

2. *Neurotic*.—1. Organic disease of the brain, the cord, or the nerves. In tumours, in meningitis, in injury of the spinal cord, and in pressure on the vagi bradycardia may occur. Dr. Edes gives a list of cases in the literature. 2. *Functional*. In nervous debility, in perverted states of the higher centres, as in melancholia and hypochondriasis, the pulse-rate may fall below 60; in neurasthenia bradycardia may be a special feature. We must recognise, too, that severe and fatal attacks of Stokes-Adams disease may occur without any discoverable lesion in the nervous system, the heart, or the arteries.

3. *Toxic*.—(1) Inorganic poisons, such as lead; (2) bacterial poisons, as in diphtheria and typhoid fever; (3) vegetable poisons, as digitalis and tobacco; and (4) metabolic poisons, as in jaundice, uræmia, the puerperal state, and after prolonged exertion.

<sup>5</sup> Philadelphia Medical Journal, 1901, and Transactions of the Association of American Physicians, 1901.

<sup>6</sup> Ogle: THE LANCET, Jan. 30th, 1897, p. 296.

4. *Cardiac and cardio-vascular lesions.*—Valvular, myocardial, and arterial, alone or in combination; a large majority of the cases of bradycardia with nervous symptoms belong to this group.

#### VARIETIES OF STOKES-ADAMS DISEASE.

What is called Stokes-Adams disease is in reality a syndrome or symptom-complex, not a disease with constant anatomical lesions and a uniform etiology. The cases may be arranged in three categories.

1. *Post-febrile group.*—Following, more rarely in the course of, an acute infection—such as typhoid fever, diphtheria, pneumonia, scarlet fever, or rheumatism—bradycardia may occur with vertigo, syncope, or epileptiform seizures. A fair number of such cases are on record, and while Huchard is not inclined to regard them as instances of Stokes-Adams disease the main features are not to be distinguished. The attacks may recur for weeks, as in Schuster's case.<sup>7</sup> This form seems more hopeful, though the first attack may prove fatal. The following is a good illustration.

CASE I.—A physician, aged 35 years, had on Feb. 8th, 1901, a streptococcus pharyngitis of moderate intensity, followed by acute nephritis. He convalesced satisfactorily and went to Florida on March 12th. He felt very well and had been taking a fair amount of exercise. At 4.55 A.M. on the 21st he was awakened out of sleep with a very peculiar sensation of numbness in the fingers and he felt faint and was covered with sweat. The pulse was only 16 to the minute but very forcible at the radial artery. He fainted and the physicians found him in a condition of extreme cyanosis and collapse, the sweat pouring from him, with a pulse-rate of about 20, quite regular, and the same at the heart and wrist. He was given hypodermic injections of ether and inhalations of oxygen. At 9 o'clock his pulse was 30. In the afternoon he regained consciousness and the pulse rose to 50. He was dazed and had no recollection of the attack. The cyanosis was extreme. On the next day his pulse was 60 but it was two or three days before he recovered completely. From the statements made by his physicians it was evident that his condition must have been critical. When I examined him on April 20th he was a robust, healthy-looking man, rather stout. The pulse was regular, with no intermission, and 76 to the minute. The apex beat was within the nipple line. The sounds were clear and of normal relative intensity; there was no change in the recumbent posture or bruit after exertion. The pupils were equal. The knee-jerks were

<sup>7</sup> Deutsche Medicinische Wochenschrift, 1896.

present. There were no signs of any disturbance in the nervous system. In such a case it is reasonable to suppose that myocardial changes had followed the acute infection and were responsible for the profound disturbance in the automatic action of the heart with an associated acute dilatation. It is worth noting that in Case 11 the slow pulse was first noticed after an attack of pneumonia.

2. *Neurotic group*.—(1) With coarse lesions of the nervous system, as pressure on the medulla following injury (Holberton), narrowing of the vertebral canal (Lépine, Boffard), tumour pressing on the vagus, and degeneration of the trunks of the vagi. There has been no observation showing degeneration of the nuclei of the medulla. Charcot and Huchard have laid great stress on the bulbar features of the disease, but in the cases above referred to, particularly those of Holberton, Lépine, and Boffard, in which the symptoms were most characteristic, the lesions were extrinsic. A remarkable case is reported by Neuburger and Edinger in which a neurasthenic man, aged 46 years, with obstinate constipation, had vertigo and fainting attacks when at stool. For nine days before his death the attacks were associated with deviation of the head and eyes and a pulse-rate of 18 to the minute. The necropsy showed absence of the right lobe of the cerebellum and a varix close to the accessorius nuclei, with beginning hæmorrhagic infarction. (2) Without recognisable lesions. Typical attacks of Stokes-Adams disease of maximum severity are on record in which the most careful examination has failed to find any changes in the heart, the arteries, or the nervous system. Dr. Edes's first case, that of a woman, aged 50 years, with a very neurotic history, had for seven or eight months recurring seizures, with loss of consciousness, &c., in which the pulse fell to 20 to the minute. She died in an attack; the necropsy made by Dr. Councilman was negative.

3. *Arterio-sclerotic group*.—In this group there are obvious changes in the circulatory system. So large is the majority of the cases in this division that Huchard's dictum is justified, "L'étiologie est celle de la sénilité artérielle." My experience is confined almost entirely to this form. The histories, which I have condensed as much as possible, give a fair picture of the phases and forms of this remarkable condition.

#### CLINICAL HISTORIES.

All my cases, 12 in number, were in males; three of the patients were above 76 years of age and six were between 50 and 70 years of age. The youngest was 35 years old, the case following a streptococcus infection. Excluding this patient, my cases fall into three categories—a group of five

cases with very severe and acute symptoms; a senile group of four cases; and a milder form in younger men, two cases.

#### I.—SEVERE CASES.

The patients in the severe cases are men as a rule in the pre-senile stage and they present well-marked cardiovascular lesions. In Case 2 there was extensive calcification of the coronary arteries and of the arch of the aorta, with hypertrophy of the heart and chronic myocarditis. Some of the attacks are very much like the syncope anginosa of the older writers. In Cases 3 and 4 the symptoms were those of myocardial disease associated with dilatation of the heart. Case 5, the most characteristic instance of the group, presented an extraordinary series of vascular and cerebral manifestations.

CASE 2. *Unusual sensations in the chest; constantly recurring vertigo with slow pulse; subsequent attacks with complete loss of consciousness; pulse-rate usually as low as 23, sometimes sinking to 20; arterio-sclerosis; duration of the symptoms for about six years; sudden death; calcification of the coronary arteries and the root of the aorta, with hypertrophy of the left ventricle.*—The case is given in full in my lectures on angina pectoris (1895). Of the subsequent history Dr. Houston of Troy, New York, writes (Jan. 5th, 1897): "Mr. V.'s pulse continues at about 30 to the minute with an occasional intermittence. He has now very marked vertigo, perhaps 25 attacks each day, each time nearly but not quite losing consciousness. He has no headache, sleeps well, and says he is very comfortable except for these sinking 'spells' and weakness." Jan. 25th, 1898: "Mr. V. has had some very bad attacks of late. In the present month he has twice fallen to the sidewalk while conversing with friends, loss of consciousness being absolute." March 13th, 1898: "The attacks of vertigo with unconsciousness have occurred at shorter intervals through January and February. After a period of complete rest he improved somewhat; pulse-rate 27 to the minute." On March 2nd, 1899, the patient died suddenly. On the 8th Dr. Houston wrote: "The day before Mr. V. died he had an attack of syncope on the street. In the evening he felt unusually well and played checkers with his son. He retired early and slept well. In the morning he got up and had his tub and went back to bed in order to have his breakfast. Just as the tray came he fell back suddenly and in a few moments died." The necropsy showed extensive calcification of the coronary arteries and the root of the aorta, with hypertrophy of the left ventricle. Dr. Houston states that at times his pulse fell to as low as 20 to the minute. The usual rate was 23.

This very remarkable case illustrates the long duration of the affection, fully six years, the syncopal type, without apoplectiform symptoms or convulsions, and the coronary artery changes.

CASE 3. *Attack of aintness, with a slow pulse; great cardiac weakness with pallor and syncopal attack; gradual recovery.*—The patient, a man, aged 57 years, was referred to me by Dr. J. Newton on April 4th, 1900. The patient had been a hard-working man who had lived carefully and indulged in no excesses. He had not used tobacco and alcohol. He had typhoid fever 20 years previously. His mother died from heart trouble at the age of 63 years. Two brothers had died from heart trouble at the ages of 30 and 40 years respectively. Two weeks before the onset of the present illness he had had a great deal of extra work and worry. On Nov. 14th, 1899, while walking to his place of business he felt faint, continued to walk, though slowly, and had no pain. He went to his office, walked upstairs, chatted with his foreman, then started home quietly. He felt very faint and excessively weak and was breathing very slowly. When he got home he was very pale, the left foot was particularly cold, and the left hand was very pale. He had no pain. His pulse became exceedingly slow—down to 38 and even lower. From this time on he was in bed for two months and had constantly recurring attacks of great pallor and coldness with cardiac weakness and slow pulse. During this time he had two fainting attacks in which he got very pale and cold. The heart's action gradually strengthened and he was able to get up and to move about the room. He had since then gradually improved but had had to be very careful and to go very slowly. When last seen he complained of a remarkable tickling and feeling of numbness in the left hand and the left foot, with a sensation of pulsation in the fingers. He was a very healthy-looking man, of good colour, with a good complexion. The eyes were clear; there was slight arcus in the left. The pulse was 72 and regular; the tension was plus; the artery was distinctly sclerotic. The apex beat was not visible; there was no increase in the area of transverse cardiac dullness. At the apex both sounds were clear, the first being loud and ringing. The aortic second sound was not accentuated. Altogether he seemed remarkably well and it was difficult to believe that he had had such a serious cardiac attack only a few months before.

CASE 4. *Attacks of transient vertigo with permanent slow pulse; syncopal attacks; cardiac dilatation with pulmonary adema and enlargement of the liver; gradual improvement; persistence of the bradycardia; sudden death.*—The patient was a robust, healthy-looking man, aged 61 years, of good habits and good family history. Except mental overwork and the stress and strain associated there were none of the factors leading to arterio-sclerosis. When about 35

years of age he had severe burns of both hands and the face which had been long in healing. Many members of his family had a pulse-rate of about 60. In the spring of 1899 I saw him during convalescence from an attack of bronchitis and was then impressed with the feebleness of the heart sounds; the pulse was firm and full, not specially slow. In the autumn of the same year he had an attack of syncope and it was then noticed that the pulse was slow. He had had transient attacks of vertigo. Early in the spring of 1900 he had another very severe attack of syncope in Philadelphia with prolonged collapse and great feebleness of the heart. He recovered rapidly, but the pulse remained at about 45. In the summer he became very neurasthenic and was unable to stand slight noises and had a distressing feeling of tension in the head. In July, August, and September there were much flatulency and gastro-intestinal disturbance and on exertion a tendency to fainting. There were râles at the bases of the lungs, slight cough, swelling of the liver, and signs of cardiac insufficiency. It was impossible to feel the apex beat, the area of transverse dulness was increased, the sounds were muffled, and there was a soft apex bruit. He was under the care of Dr. Holford Walker of Toronto who had the advantage of the counsel of Dr. McPheacian and of Dr. Musser of Philadelphia. I also saw the patient early in August. Gradually the heart grew stronger but without any change in the pulse-rate, which was constantly between 30 and 40. On no occasion did I find a "coupled rhythm." From October, 1900, to January, 1902, he improved steadily and was able to take long walks and to get back much of his accustomed vigour. On the morning of Feb. 5th, while getting out of bed, he complained of not feeling very well, was nauseated, and fell back in the bed and died in a few moments.

CASE 5. *Fainting "spells" with slow pulse; slight arteriosclerosis; epileptiform attacks; remarkable discrepancy between the heart and pulse rate; death in an attack.*—A man, aged 56 years, a farmer, was admitted to hospital on May 15th, 1900. He complained of dyspepsia and a nervous affection. There was nothing of any moment in his family history. When eight years old he had typhoid fever; as a youth he had malaria and at the age of 21 years he had measles. Twenty-five years before he had an attack of gravel. He had never had any venereal disease. His habits had been good. He used neither alcohol nor tobacco. He had been a large cater. Until five years previously he was a shoemaker. In August, 1899, he had two fainting "spells" which lasted for about 10 or 15 minutes. In November he began to notice that after exertion there was a feeling of suffocation. He had had to be extremely careful in his diet; if he took too much food or very indigestible articles he would feel sick at the stomach or everything would grow dim and misty before his eyes. He had had in



all four severe fainting attacks, in each of which he was unconscious for at least ten minutes. He had had many of the mild, slight attacks. The patient was a fairly well-nourished, well-built man; the mucous membranes were a little anæmic. The tongue was coated. There were no tophi. Dorsal decubitus; there were no cyanosis and no arcus; the pupils were equal and normal. The pulse was of good volume, of about normal tension, regular, and 28 to the minute; the vessel wall was distinctly felt but was not greatly sclerosed. He had a moderate grade of funnel breast; the expansion of the chest was good; the lungs were clear throughout. The point of the maximum impulse of the heart was seen and felt in the fourth interspace, 10 centimetres from the middle line and one centimetre inside the nipple line; there was no thrill. Absolute dulness began on the fourth rib and extended from the right sternal border to the point of maximum impulse in the fourth interspace. There was a loud well-marked first sound, with which there was a soft systolic bruit, traceable as far out as the anterior axillary line. The second sound was well heard and clear. Between the clearly heard heart beats at times there was a faint systolic sound heard after the first and separated from the next by a long interval. This abortive character of the alternate heart beat, "coupled rhythm," was noted on admission. At the aortic area the heart sounds were enfeebled and there was a soft systolic murmur. The second sound was not accentuated. The abdomen looked natural and there was no tenderness on palpation. The border of the liver was not palpable; the spleen was not enlarged. There was no œdema of the legs or feet.

The case is of sufficient interest to give in some detail. On May 16th the patient felt dizzy and at 4 P.M. he suddenly became very pale and fainted, remaining unconscious for ten minutes. The pulse fell to 15 beats per minute. Between 4 and 8 P.M. he had four such attacks, the pulse varying from 15 to 20 beats per minute. There was sweating with each attack. After the last attack of syncope he vomited. The night nurse reported that on several occasions the pulse was as low as 15 beats. He slept comfortably and in the morning seemed all right. On the 17th, at the visit at 9 A.M., I found the patient with a pulse-rate of 18. Both sounds had a very normal character at the apex. The systolic bruit had the greatest intensity over the body of the heart. The percussion note was clear over the manubrium. There was no tracheal tugging. On the 19th, while making the morning visit, I saw the patient in two attacks, each of which lasted about half a minute. The eyes were turned to the left and became fixed; the muscles of the face twitched and the hands twitched slightly. It resembled a slight epileptic attack. The pulse at the wrist was 12, and the cardiac impulses corresponding to them were strong and easily seen. In the jugular veins there were fluttering systolic impulses, quite well defined, but difficult to count,

about 120 to the minute. On careful inspection of the cardiac area there were seen in the fourth and fifth interspaces small, regular, systolic impulses, exactly 100 to the minute. Corresponding to these there could be heard faint systolic sounds at the same rate. During the night the patient had a severe attack of vomiting and had frequent syncopal attacks. Dr. Futcher noted that while the pulse was beating at 12 to the minute auscultation over the heart gave 143 feeble beats to the minute, each eleventh or twelfth beat being forcible, with a loud first sound, and corresponding to the one recorded in the radials. On the 20th the patient had some hiccough and at midnight there was typical Cheyne-Stokes breathing. The heart could be seen beating at 95 to the minute but the pulse was only 19 at the wrist. On the 23rd the patient had been better for the past two or three days. The pulse had been at about 20 at the wrist and 84 at the heart. On the 26th the patient had a persistent pallor, the pupils were small and equal, the pulse was full, 19 to the minute at the wrist and 74 at the heart. On the 29th at the time of the visit the pulse was 28 at the wrist. The small beats were not visible at the point of maximum cardiac impulse, where the impulses corresponded with the pulse at the wrist; but on auscultation, between each of the forcible impulses, which shook the whole front of the chest, there was heard a little, soft, faint, systolic sound, which was not expressed at the apex as a visible or palpable impulse and was not felt at the wrist. The pulsations in the jugular vein were very evident but it could not be determined if they corresponded with the total number of ventricular beats. At 9.30 p.m. the patient had an attack of unconsciousness, lasting for several minutes, followed by dyspnoea and afterwards Cheyne-Stokes breathing. On the 30th, at 10 A.M., while the nurse was giving him his bed bath, he suddenly vomited and immediately afterwards became perfectly rigid and unconscious and cyanosed. Before chloroform could be administered the muscles relaxed, the patient gave a few gasps at rather long intervals, and died without regaining consciousness. During the attack the pulse was not perceptible at the wrist. Artificial respiration was performed without any result. There was a slight trace of albumin in the urine and there were a few hyaline and granular casts. There was no necropsy.

Another case of the same intensity may be referred to. On May 13th, 1902, I saw in the afternoon at the Union Protestant Infirmary, with Dr. Hamburger, a man, aged 45 years, who illustrated all the symptoms of this severe type of the Stokes-Adams disease. He was a stout, healthy-looking man. He shook hands with me as I went in and then gradually closed his eyes in an apathetic way. The face and general surface of the skin were a little suffused. The pulse was 20 to the minute; there was slight sclerosis of the artery; no special increase in tension was present. There

were no intermediate beats of the radial pulse. He was rather stout and the apex beat was not easily visible, but the slow heart beats were palpable. Intermediate small beats could neither be seen nor felt. There was considerable increase in the transverse area of cardiac flatness. In the neck the visible pulsation of the carotids was very plain, 20 to the minute, and there were in the suprasternal notch and just along the sterno-cleido muscles on either side two or three tremulous venous impulses not so localised as in Cases 5 and 8. On auscultation at the apex both the first and second sounds were well heard. With the first there was a rather rough grating murmur. There were no intermediate sounds audible. Above the fourth costal cartilage, particularly at the mid-sternum, Dr. Hamburger had noted between the sounds one or two distant soft sounds. These I, too, could catch with distinctness. Just after we had finished the examination the patient had in succession two epileptiform paroxysms. The onset could be told at once as the beat of the heart stopped and could not be felt at the wrist or heard at the heart for from 15 to 20 and even as long as 35 seconds. The convulsion was a general tremulousness, the face became slightly cyanotic, the breath was held, the eyes twitched and rolled up, and the muscles of the face twitched. The paroxysms lasted for a few seconds only. He came out of them very quickly and the face flushed with great rapidity and he seemed a little dazed. He had as many as 150 of such attacks in the 24 hours. The patient recovered from the serious condition and returned to his home in Washington. A few months later he died during an attack.

CASE 6. *Typical pseudo-apoplectic attacks as described by Stokes; slow pulse; in some attacks convulsions; duration more than ten years.*—While attending the meeting of the British Medical Association at Montreal in 1897 I saw at a club an old friend, a man aged about 60 years, who consulted me casually about distressing attacks of transient vertigo and others of a more severe nature in which he lost consciousness completely. During the attacks he said that his pulse sank to 20 or even lower. He said to me, "It is not at all improbable that I may have an attack at some time while you are in the club and I will tell the head waiter to notify you." On the following day, while I was at dinner, I was called hurriedly to the secretary's office and there I found my friend in an attack. He had fallen unconscious, was breathing very heavily, almost stertorously, and had a very flushed face. I thought at once that it was really an apoplectic stroke. The pulse was very slow and very full, about 20 to the minute. The arteries were very sclerotic. The heart's action was very forcible and I could not hear with the unaided ear any intermediate beats or a murmur. So alarming did I think his condition that I said to his servant that I thought it might be well to send for his physician and to have him bled, to which he

replied that this was an ordinary attack, that he had seen him in many quite as severe, and that he rallied in the course of from 15 or 30 minutes. I returned in the course of half an hour and found him up, feeling a little dazed and heavy in the head but quite himself. In some of the attacks he stated that he had convulsions. On March 3rd of the following year he wrote to me that he had been very much better. He stated that he had had the fainting attacks and the slow pulse for many years. Dr. James Stewart, under whose care he was, told me that his attacks were often of the character of *petit mal* and were sometimes followed by motor aphasia, mainly of nouns. The lowest pulse-rate he had ever found was 21, but it had been as low as 18. He died during an attack. The trouble had lasted for fully ten years. He had painful neuromata along the extensor surface of the left arm and two in the left shoulder. There was a curious relationship between the pain in these and the pulse-rate, the slower the pulse the greater was the pain.

## II.—SENILE CASES.

Not infrequently old men have bradycardia with attacks of vertigo, or of fainting, or even of prolonged unconsciousness. There may be in addition cardiac dyspnoea and Cheyne-Stokes breathing. The cases are more common, I think, than any description in the literature would lead one to suppose, particularly the incomplete forms, *forme fruste*, with vertigo.

CASE 7. *Slow pulse; syncopal attacks; arthritis; possibly gout; pericarditis; death.*—On Jan. 16th, 1899, I saw, with Dr. Hemmeter, a man, aged 72 years. The patient, a very healthy man, had lived an active life, had been a hearty eater, and had been "fond of a glass of beer." He had had several attacks of arthritis, once or twice in his big toe. During the past three years it had been noticed that his pulse was very slow, down to between 50 and 60, and he had had three syncopal attacks with pronounced bradycardia. In one of these he had fallen when at stool and was unconscious for some time, with a pulse-rate of 40. When I saw him he had slight arthritis, a temperature of 102°F., and a pulse of 56, full in volume. The vessel wall was moderately sclerosed. The heart sounds were clear. On the 18th I saw him again. There was then a very loud to-and-fro pericardial friction murmur. His temperature had kept up, the joint symptoms were better, but he evidently was not so well. The amount of urine was reduced and there were much albumin and numerous tube casts. He became very much worse during the next three days, became unconscious, Cheyne-Stokes breathing developed, and he died on the morning of the 23rd. There was no post-mortem examination.

**CASE 8. Attacks of vertigo and sudden weakness; slow pulse; arterio-sclerosis; sudden death.**—The patient, a medical man, aged 70 years, was seen in March, 1900. He had always been a strong, robust man; he had never been ill in his life and was unusually well and strong. He had been a devoted cigarette smoker for 40 years. He was not a heavy eater; he had drunk during and after the War of Secession, but had been a temperate man for 25 years. He had been gouty at times. He was a fairly hard worker. On Feb. 10th he had a "giddy spell" and felt a sudden weakness as though he wanted to lie down but did not faint. The attack lasted for an hour or two. He then noticed that his pulse was slow, only 40 to the minute. It did not reach the normal for a couple of days. His usual pulse had been from 72 to 76. He did not feel well for two days. Ten days later he had a second attack, felt giddy, and noticed that his pulse was again low and that it had remained low, once being as low as 38, occasionally rising to 42 and 44. When quiet he was comfortable. He staggered a little when he first got up. He had no pain about the heart. The pulse in the sitting posture after rest and quiet was just 40. There was moderate sclerosis of the arteries. The apex beat was diffusely visible just below the nipple. The beats at the apex were 40; there were no abortive heart systoles. There was an apex systolic bruit, not obliterating the first sound, and very faint at the aortic cartilage. No flatness was manifest over the manubrium. In the right side of the neck there was a pulse in the jugular vein which occurred in groups of three and which was twice as rapid as the pulse in the temporals. It looked just like a wavy venous impulse and was 80 to the minute. I saw this patient again twice. He improved for a time after the use of tobacco and the pulse-rate rose to 55. He had a return of the "sinking" attacks with bradycardia and I heard of his death during an attack in April, 1903.

It is remarkable for how long bradycardia and occasional fainting attacks may persist. In the following case the patient claimed that he had had a slow pulse for 30 years and that he had occasional fainting attacks.

**CASE 9. Stokes-Adams disease; slow pulse; syncope with anginal attack; cardiac dyspnoea; sudden death.**—The patient, a man, aged 74 years, was seen with Dr. McDowell, complaining of debility, with attacks of shortness of breath and palpitation. He was a thin, spare man and had a good colour. He had had a very healthy life without serious illnesses. Thirty years previously his son, at the time aged 12 years, had a fall and after feeling his pulse he felt his own and found that it was only 50 per minute. He consulted a physician who told him that his condition was serious and that he would not live long. He thought that he had had a slow pulse ever since until lately. For many years he had been subject to fainting attacks on extra exertion or on great mental emotion, but they had never been serious.

Five years before, on the occasion of the fiftieth anniversary of his ordination, he preached and at the conclusion of his sermon he was seized with a pain of terrible severity in the region of the heart and down both arms. In the arms the pain was as intense and severe as the sharpest toothache. He was very faint and lost consciousness. He broke out into a profuse perspiration and the attack ended with severe diarrhoea. His pulse was very slow and three days after the attack the medical attendant said that his pulse was 38. Since that date he had not had any fainting attacks. He had felt on many occasions palpitation of the heart and irregularity and he had known that his pulse had been below 50. At night he would sometimes be aroused if he lay on the left side by a sudden sharp pain, as if something had grasped the heart. Within the past year he had had certain additional features. His pulse had become more rapid, having risen to above 70. He had had attacks of cardiac dyspnoea at night and was short of breath on exertion. That summer at the seaside he preached, took a great deal of interest in church matters, and seemed to have overtaxed his strength. He had become much more feeble. The patient's colour was good; there was no swelling of the feet; no arcus was present. The radials were stiff, with no calcification. The apex beat was in and just outside the nipple line. There was a soft systolic murmur and along the left sternal border a soft aortic diastolic which was heard only when the breath was held. Both sounds were rather feeble at the base. There was no tenderness over the course of the aorta. I saw this patient again with Dr. McDowell on Oct. 13th. He had been steadily failing, had much less ability to get about, and much shortness of breath, particularly at night. For the past two or three days he had been worse. On the previous evening he had an unusually severe attack of cardiac asthma and one attack was associated with a good deal of pain. I saw him at 5.30 in the afternoon. He was resting quietly, breathing easily. His pulse was 90 and of very good volume; there was no special tension. There was a soft apex systolic murmur, as at the previous examination. There was no gallop rhythm. His cardio-vascular condition seemed to be extremely good. He was rather dull, did not care to be disturbed, and complained of feelings of great prostration and weakness. At 12.30 that night he died suddenly without awaking.

CASE 10. *Attacks of dyspnoea; slow pulse; two attacks of loss of consciousness; arterio-sclerosis; hypertrophy of the left ventricle.*—The patient, a man, aged 65 years, was seen on Dec. 14th, 1896, complaining of dyspnoea. On entering the room the patient was so short of breath that he had to wait several minutes before he could say what was the matter. With the exception of dyspepsia, which he had had at intervals for 30 years, he had been a very healthy man. He had not used alcohol or tobacco and had not had syphilis.

He had diphtheria 10 or 12 years ago; he had not had rheumatic fever or gout. He had worked hard and recently had had business troubles and cares. For the past two or three months he had been getting short of breath, particularly on exertion. After proceeding thus far in the history I felt his pulse and was surprised to find it very slow, 40 to the minute. I then asked him about attacks of unconsciousness, of which he had made no mention, and got a history of two very remarkable seizures. In June, 1895, in Washington, after a couple of days of anxious business, he returned home one Thursday and just after dinner had a fainting attack. He did not know how long it lasted, but his family was very much alarmed and sent for a medical man; he was "off his head" for some time after the attack and talked foolishly. He was not able to leave the house for ten days. He had a second attack in June of this year. He was in the Custom House attending to some business and fell in a faint. He was unconscious for more than 20 minutes and was a good deal dazed after coming to. These were the only two attacks he had had. The patient was a tall man, with iron-grey hair and beard; he talked very deliberately and the expression was rather heavy and dull. The pulse when first counted was 40 per minute, full, slow, incompressible, anastomatic; the vessel wall was considerably thickened. The apex beat was in the fifth interspace, just below and a little outside the nipple line, forcible and punctuate. There was no thrill. On palpation in the second right interspace and second right costal cartilage there was to be felt an unusually loud diastolic snap. The limit of cardiac flatness was on the fourth rib at the right sternal margin and just at the apex beat. At the apex both sounds were heard, with the first a soft systolic murmur. At the second right interspace there were a soft systolic murmur and a second sound of most unusual and remarkable intensity, without any amphoric quality, sometimes single, sometimes distinctly reduplicated. I saw the patient again on June 27th, 1897. He had been much better; the slow pulse was not permanent but at times it was as low as 40.

### III.—CASES OF SLOW PULSE WITH OCCASIONAL SYNCOPAL ATTACKS IN YOUNGER, HEALTHY MEN.

CASE 11. *Attacks of fainting for five years; slow pulse; arterio-sclerosis; good general health; appendicitis; operation; recovery.*—The patient, a man, aged 40 years, was seen on May 20th, 1901, complaining of attacks in which he fell and lost consciousness. The patient had been a healthy man, very active and vigorous. For many years he had had at times rheumatic pains. After an attack of pneumonia, nearly 20 years previously, it was noticed that he had a slow pulse but he did not remember the rate. Five years previously he had his first attack of fainting. He felt nauseated and faint

but recovered very rapidly. A few days later he had a second attack. During that summer he had a good many and he had had them at intervals ever since. He felt in them as though everything stopped and then he would fall. There were no movements in the attacks. He was more apt to have them when he was tired or after any special excitement. In the attacks he either fainted away completely or could with difficulty keep himself from fainting by rubbing his wrists violently. The attacks rarely lasted more than a few minutes. They were accompanied with a very slow pulse, usually below 40. His apex beat was in the normal position. The heart was not enlarged. The sounds were clear; the aortic second sound was a little accentuated. The radials were distinctly sclerotic. The patient was admitted to the hospital, where he had an attack of appendicitis, of which he had had several previously, and he was transferred to the surgical side for operation. Very many observations were made upon his pulse and heart. The rate was usually about 50. The day before operation it was 40; just after the operation it rose to 90. There was no "coupled rhythm." He remained in hospital until June 3rd, during which time the range of the pulse was from 40 to 65. There was no hemi-systole. On the occasion of his visit to me I made him go out and walk briskly and when he came in his pulse rose to 110. He was a very healthy, active man and said that he had got accustomed to the fainting attacks.

CASE 12. *Syphilis at 23 years of age; for six months recurring attacks of vertigo; two attacks of great severity; permanent slow pulse of 28.*—A robust, healthy-looking man, aged 45 years, of good habits, had consulted me on March 15th, 1902, for what he called fainting attacks. They had begun six months before without any cause and were of two varieties. The first was a slight transient giddiness, in which he felt for a moment or two as though he was about to fall, but quickly gained control without struggling or swaying; while he was undressing he flushed a moment and said, "There, that was a slight one." He had many of these, often three or four in the day, and any excitement was apt to induce them. Twice he had had more serious attacks in which he had become faint and had had to hold on to something to keep from falling. He did not lose consciousness but felt a sensation of "utter gone-ness," as he expressed it, and then broke out into a profuse sweat. There were a sensation, too, of stuffiness in the throat and a wheezing in the tubes. Shortly after his attack of faintness the medical attendant noticed that his pulse was very slow and it had ranged ever since from 28 to 36. He had no abnormal sensations about the heart itself. He felt well and was vigorous but he had become much alarmed since the onset of the severer attacks. He had been a vigorous, muscular man; he had used much tobacco and alcohol in moderation. He had had syphilis but was thoroughly treated for two years. I dictated the following note:—



"Healthy-looking man of good colour. Pulse 28, full; radials easily felt. Visible pulsation in cardials and a fluttering venous impulse difficult to count but about double the rate in the carotid. Apex beat not visible, not palpable; no increase in the area of transverse cardiac flatness. Both sounds audible at apex; no intervening beat to be heard at apex or base. Aortic second sound accentuated. After exertion the pulse-rate rose to 40. Examination of the other organs was negative."

I have permission to quote the following remarkable description of his own case by an army officer who has consulted me by letter on several occasions and who has been under the care of Dr. R. H. Babcock and Dr. E. F. Wells of Chicago:—

January 5th, 1903.

DEAR SIR,—While in Germany in the summer and fall of 1900, taking a course of the Schott bath treatment for an affection of the heart, I took advantage of the opportunity thus afforded to consult several German professors regarding my malady. Among these men was Professor Dr. Rosenbach of Berlin, an author of a work on "Diseases of the Circulatory System." The professor, although he spent an hour or more in his examination of me, was very non-committal in his diagnosis as well as prognosis, but stated that he hoped the condition then found would readjust itself and that improvement of my health would result, in which case I was to inform him of the fact, as he would distinctly remember my very unusual case. He stated further that upon my return to this country I should make it a point to consult you. This I was unable to do owing to the illness of the person accompanying me to Europe upon our landing in New York. Since my return to the West I have been continuously under the care of physicians, and until July last under the observation and care of Dr. Robert H. Babcock of Chicago. It was he who in April of 1902 first informed me that mine was a case of Stokes-Adams disease, although the original examination of me by Dr. Babcock had been made as early as October, 1899. Dr. Babcock informed me that he was inclined to make that diagnosis after mature consideration of an article by Dr. August Hoffmann appearing in the *Zeitschrift für Klinische Medicin*, vol. xli, 1900. Later the article on the Stokes-Adams Disease by Professor A. Jaquet in *Deutsches Archiv für Klinische Medicin*, Band II., confirmed him in his opinion.

Personally I have made a thorough study of my case, so far as a lay-man can, and although I have had most divergent views and diagnoses given me by the various physicians who have examined and treated me I am convinced that mine is a case of Stokes-Adams disease. If there are any methods of treatment or medication that you may have used, with even moderate success, in your practice I should very much like to try them; in that case I would be able to give you a complete medical history of my case which might enable you to treat me at a distance. I would only say at this point that, so far as I know, no specific cause can be pointed out as having produced the condition which now exists. I am now 29 years of age. At 18 I was supposed to be entirely well, for I was examined at that time for life insurance and reported entirely sound by the examining physician, who yet maintains that that report was correct, and the policy was issued. At 20 I was first informed by a physician whom I consulted as to whether or not I was physically sound, contemplating as I did entering the Military Academy at West Point, that I had heart disease. I was nevertheless admitted to the Military Academy and graduated and commissioned an officer in the army four years later. One year after entrance "aortic stenosis" was diagnosed and subsequently at each annual physical examination. At these examinations such additional notes as "heart slow and strong" were also reported. When I was graduated (or at any rate not more than six months afterwards) my radial pulse was 38, regular, and I was apparently well. It is now, and has been since May, 1899, 26 per minute. Frequently stops entirely,

causing me great distress and lack of consciousness. At times there is delirium cordis. Occasionally the pulse goes up to from 40 to 70 or 75 and has been at practically a normal rate for a period of three weeks on one occasion. I cannot say whether the heart took up this higher rhythm of its own accord or not since I have been using medicine almost continuously.

I am now compelled to use morphine in moderately large quantities, it being the only thing that seems to steady my heart; eserine, too, has been tried; this just before and during the time my pulse was at a normal rate for three weeks. The use of oxygen, too, seemed to cause my pulse to become normal but would not sustain it for more than one week. The sphygmographic tracing which I send is a fair indication of the usual heart activity. My skin is almost bloodless and I suffer from the cold very severely. Since February, 1902, I have been confined to my bed almost continuously and since July absolutely. This has reduced my weight, which ordinarily is 140 pounds, to about 115 pounds. But I have begun to gain since I resumed a general diet about four weeks ago. There is a marked systolic murmur over the aortic and mitral areas, both of which murmurs become very much less marked when heart action is normal. Careful auscultation reveals usually two small heart contractions of which the latter produces the radial pulse. The former (imperfect) contraction does not produce a pulse-wave either in carotids or in the radials. None of the ordinary secondary symptoms of valvular disease of the heart, such as dyspnoea, dropsy, cyanosis, &c., are present in my case.

Yours, &c.,

#### DIAGNOSIS.

The severe form (Cases 2 to 6) presents such a clear-cut picture that there is no question as to the nature of the trouble. The senile form is also very well marked. The post-febrile variety may be very severe but is as a rule more hopeful and recovery, as in Schuster's case, may follow after weeks of recurring attacks. The toxic forms of bradycardia are sometimes associated with vertigo but rarely with syncope or epilepsy. The tobacco bradycardia may sometimes cause alarm. I was consulted on Jan. 7th, 1896, by a man, aged 48 years, who said that he had had heart disease for three years. He had smoked and chewed from boyhood. He complained of irregular action of the heart and a dull aching sensation in the chest. He then had attacks in which the pulse fell to 45 and 48 and which caused him great alarm. He had transient vertigo but never syncope. There were no signs of heart disease. I urged him to stop using tobacco. Within three months the pulse-rate was above 70. I have seen him on several occasions since and he has remained quite well.

A difficulty may arise in the diagnosis of the neurotic cases in women or in young men. Dr. Edes's first case illustrates the intensity of this form. Aggravated neurasthenia may be associated with bradycardia and vertigo of which the following cases may be given in illustration.

CASE 13.—A man, aged 44 years, was admitted to the Johns Hopkins Hospital on Oct. 29th, 1899, complaining of pain in the epigastrium, headache, and of swaying of the body while walking. He had used tobacco to excess, both



Pulse-tracing of the patient whose description of his own case is given on pages 19 and 20. Pulse-rate at 40.

smoking and chewing. He used whisky in moderation. He had not had syphilis but had had gonorrhoea twice. He had led a very active athletic life. Six months before, after severe exertion and exposure, he had "queer sensations" rising upwards from the thighs which made the act of breathing uncomfortable. He worried over this and had in a short time so much difficulty in getting his breath that he thought he had heart disease and was going to die. He stopped work for a few days but on resuming he had a similar attack and complained of a peculiar swaying of the body which he could not control. The patient worked for two months but the swaying and pains in the crown of the head and in the epigastrium compelled him to give up. He was very nervous and complained of flushing, cold feet, and insomnia. He had lived a life of continued "high tension." He was a stout well-built man; the lips and the mucous membranes were of good colour; the tongue was slightly furred. The pupils were equal but not contracted; they reacted well to light and to accommodation. Well-marked dermatographia was present. There was some swaying on standing with the eyes closed and feet together. The pulse was of good volume and normal tension, regular in force and rhythm, but slow, being only 48 to the minute. The point of maximum cardiac impulse was neither visible nor palpable. The sounds were best heard in the fourth interspace nine and a half centimetres from the mid-sternal line; there was no thrill. The sounds were rather enfeebled at the apex and were clear and of normal relative intensity; they were clear at the base; the aortic second sound was slightly accentuated. There were no abortive beats. According to the patient's wife he had since childhood had an aversion to water, the drinking of which would cause him to have a "smothering" feeling at night. At the onset of the present illness the patient went to bed feeling perfectly well; he woke up in the night with a feeling of being smothered, so he got up and went outside. He was convinced that he was dying and after a time could not walk and had to crawl home. He was put to bed; he went to work as usual on the next morning. One week later he had a similar attack. His wife said that since the onset of the attacks he would often get up at night wringing his hands and in great fear of death, but was usually easily quieted. The patient improved very much after a short stay in the hospital, but the pulse was still slow, from 48 to 50 to the minute.

The following is a still more remarkable instance of a very slow pulse with nervous attacks.

CASE 14 —The patient, a man, aged 26 years, was seen on Oct. 4th, 1901, with Dr. Harry Thomas, complaining of attacks of nervous weakness. The family history was excellent. He had good health as a young man. In January, 1895, he fell about 20 feet, hit his back, and was severely

hurt in the muscles of the back; no paralysis followed. He was in bed for three months on account of the pain in the back. This was his first year at college. He got well, except that on cold damp days his back would hurt him. His present trouble came on before the fall, in March, 1894. He had been feeling well and went to bed. In the morning he found that he was "giddy-headed" and everything in the room seemed to be turning round; he felt a little sick at the stomach. When he tried to get up he was very unsteady and if he moved suddenly he would fall; he had to support himself by chairs, &c. There were no ringing in the ears and no vomiting. He became nervous and went back to bed. The pulse sank to 42; there was no fever. The bowels were in good condition; he had a good appetite. He was in bed for three or four weeks. Every time he tried to stand he found that he was so weak that he had to go back to bed. If he did get up his heart would go from 80 to 100. He could not read on account of the headache that it caused. When he did get about he was weak. He improved slowly and in about six weeks was as usual. At the time of the first attack he was working on a farm and had had nothing to disturb him. The second attack was in about a year after his fall. Since then these attacks had recurred from eight to 12 months apart. They had all been of the same character, except that some were longer and some shorter. The shortest one was about three and a half weeks. This was in 1898. The last attack began on the afternoon of August 5th. He was taken with giddiness and vomiting and had to be taken home in a carriage and practically carried upstairs and put to bed. It was not weakness at first that kept him from walking but giddiness. The temperature was normal and remained so. On the next afternoon the pulse was 48. He was in bed for eight days and then went to his home 28 miles away with assistance. He had stayed more or less in bed every day since. The giddiness had lasted much longer in this attack than usual. He tried to go back to work a week before but was not strong enough. In going about the pulse increased to 93. The pulse when he was well was about 74 when he was going about. He was a healthy, robust-looking fellow. The pupils were active. The radials were soft; there was no sclerosis. The pulse was 80. The chest was rather long and narrow. The apex bent was in the fifth interspace, well inside the nipple line. There was no increase in the area of cardiac flatness. The aorta was not palpable in the sternal notch. The sounds at the apex and base were loud and clear; the aortic second sound was a little accentuated. In the carotids and the subclavians there was visible, possibly neurotic, throbbing. Marked and quick vaso-motor reaction was present.

These are certainly very remarkable attacks. They rather suggest a form of migraine and yet the ears were normal and the patient had no ringing in the ears with the attacks.

He gave one the impression of being an excessively nervous man. On a course of hydrotherapy he had improved very much. Dehio suggests the use of atropia to determine in a given case whether the bradycardia is due to changes in the heart itself or in the nervous centres. In normal persons small doses paralyse the peripheral ends of the vagi and the action of the heart is hastened. In old people, in chronic myocarditis, and in one case of Stokes-Adams disease Dehio states that this effect did not follow. I do not know if this observation has been confirmed.

#### CARDIO-VASCULAR FEATURES.

All of the patients except Case 1 with an acute post-febrile attack presented arterio-sclerosis; in Cases 5, 11, and 12 it was of moderate grade. In no case was the heart greatly enlarged. In Cases 2, 4, 5, and 10 there was a soft mitral systolic murmur; in Case 9 an aortic diastolic murmur was present. In Cases 4 and 5 the sounds were weak and muffled. In the only necropsy of the series (Case 2) the arteries were found to be sclerotic, the root of the aorta and the coronary arteries were calcified, and the left ventricle was hypertrophied. The condition is not associated with the ordinary forms of valvular lesions, as in a majority of the cases the valves are normal, the heart is not enlarged, and the sounds are clear. In Dr. Edes's series collected from the literature in 31 of the 35 cases in which a necropsy was held there was a definite statement as to the heart and arteries and in 26 there were sclerotic and myocardial changes. Certain special features may be considered.

*True bradycardia.*—One of the first lessons a student has to learn in the wards is that infrequent slow pulse and bradycardia are not the same and that with an infrequent pulse there may be a normal or an increased number of heart beats. In lesions of the mitral valve, in chronic myocarditis, and as a result of the action of digitalis, the radial pulse may be 50 or even 40 and the heart beats exactly double, the intervening small beat (often visible at the apex in thin-chested persons and audible as a faint systolic sound) not reaching the finger at the wrist. True bradycardia with heart beats and pulse beats of equal number occurred in most of the cases, only in Cases 5, 8, and 12 did it alternate with false bradycardia. In eight cases the bradycardia was a permanent condition; in one case the beats fell to 12 per minute; in Case 9 the slow pulse had been observed for 30 years, in Case 2 for six years, and in Case 6 for at least ten years. In Cases 1 and 2 the slow pulse was not permanent but only occurred during the attacks. In Dr. Hamburger's case with a heart-rate at 20 prior to a convulsive attack I counted intervals of 20, 30, and once 35 seconds in which there was no heart beat to be seen, heard, or felt. The pulse in true bradycardia is usually full, strong, and regular. This last feature is marked and is apt to

deceive the inexperienced as it may be present with intervening abortive systoles—the “coupled rhythm.” There may be a very strong pulse with an indistinct cardiac impulse and feeble sounds, or just the opposite. The infrequency in true bradycardia seems to be due to prolongation of the diastole; the systole as a rule is sharp and quick. The tracing which is here presented shows this very clearly. By far the best sphygmogram I have seen is the one here given which was taken by Dr. Wells of Chicago. It is a normal tracing, except in the extraordinary prolongation of the line of descent, the period of diastole.

*False bradycardia.*—Stokes noted in his patient that the pulse-rate and the heart-rate were not the same and that there were semi-beats of the heart. In three of my series these abortive beats were present. They may not be evident at the radials or in the carotids where the pulsations may be in orderly sequence and of exactly equal size—so that at the wrist there is no indication whatever of arrhythmia; even the sphygmographic tracing may not show the interpolated beats. They may sometimes be seen and felt at the apex as in Case 5; more often they may be heard with distinctness. The number of abortive systoles varies; usually they are alternate and in orderly sequence, so that with a pulse of 40 at the wrist 80 heart beats may be seen and 80 first sounds may be heard—the “coupled rhythm.” In the severe attacks with very infrequent pulse there may be a number of abortive beats. In Case 5 in which this feature was studied with great care there were remarkable variations. On one occasion, with a pulse-rate at the wrist of 12, the heart beats were 100; on another they were 143. On May 26th the pulse was 19 to the minute at the wrist, with 74 palpable, visible, and audible cardiac beats. On the 29th the pulse-rate and heart-rate were the same (23), no intervening beats could be seen, but on auscultation there were feeble, only just audible, systolic sounds intervening between the forcible thumping pulsations which shook the whole chest.

The question has been raised whether in all cases there are not these abortive beats, too feeble to be seen, felt, or heard. Case 5 was a very favourable one in which to study this problem. All the abortive systoles were usually visible on the thin chest wall and palpable. One day with the pulse at 23 and the same apparently at the heart and the wrist and without any visible or palpable abortive systoles such as were usually present, on auscultation one could hear distinctly soft systolic sounds intervening between the loud booming shocks. In other cases I have listened with the greatest care but in vain for these abortive sounds.

*The “heart-block,” or independent auricular systole, without corresponding ventricular contractions.*—Stokes noted on the readmission of his patient a new symptom—a remarkable pulsation in the right jugular vein, more than double

the rate of the ventricular contractions. This feature has been studied by Chauveau, by Quincke, by His, jun., and others, who are of opinion that the jugular pulsations correspond to independent auricular contractions which are not propagated to the ventricles—a state of "heart-block," as Gaskell terms it. In Case 5 the jugular pulsations never corresponded in number with the carotid pulsations or with the total number of ventricular beats. Cardiac, radial, and jugular tracings were taken simultaneously, from which, unfortunately, nothing very definite could be determined.

Jacquet has recently called in question the existence of these independent auricular contractions,\* the existence of which his tracings do not support. It is quite possible that there are ventricular contractions too feeble to be heard and too feeble to open the sigmoid valves, yet which might in a dilated heart cause a pulse-wave in the right jugular vein. In Case 5 as a rule the interpolated beats were palpable, visible, and audible, but they continued to be *heard* after they had ceased to be felt or seen, and still feebler contractions might cause no sound and yet transmit a wave to the veins through an insufficient tricuspid valve. We cannot dismiss the question of independent auricular contractions as settled. In Dr. Hamburger's case slight but definite jugular pulsations were visible in the prolonged periods of systole with complete silence over the cardiac area.

*Cardiac arrest.*—This phenomenon is one of the most remarkable witnessed at the bedside. In the case just referred to the apparent stoppage always preceded the slight convulsive attack. The eyes were set, the face was flushed at first, then pale, and the patient appeared to be in the article of death. In such circumstances to wait 35 seconds, watch in hand, without a heart beat seems like the final "count-out"; but this man, after scores of such attacks, recovered sufficiently to go to his home. A precisely similar condition is met with in some cases of angina pectoris. It always suggests to me the heart state of fibrillary contraction produced experimentally by the Kronecker puncture.

*Vaso-motor changes.*—As in angina pectoris the vaso-motor system is profoundly involved in the severe attacks, as shown by the pallor, the sweating, and the vomiting, and in some cases by the marked paresthesia, the numbness, and the tingling.

#### NERVOUS FEATURES.

It is for these the patient seeks relief, naturally much alarmed. Four forms of attack occur:—

*Vertigo.*—While walking in the streets or engaged in con-

\* Deutsches Archiv für Klinische Medizin, Band lxxii.



versation the patient feels giddy and staggers or may fall unless he catches hold of something. As in Case 2, the attack may be of great severity and very distressing, incapacitating the patient. The attacks may precede for years the onset of severer forms. In very old men with a permanent slow pulse this may be the only manifestation. It is a well-recognised and common symptom of arteriosclerosis.

*Syncope.*—Much more alarming are the fainting attacks with complete loss of consciousness. Without warning the patient becomes pale and may fall instantly in a deep faint, with feeble, imperceptible pulse and the general features of cardio-vascular collapse. The respirations are shallow, a clammy sweat breaks out, and in severe attacks death may seem imminent; indeed, the patient may pass away without recovering consciousness. As a rule the attack does not last more than a few minutes. Many attacks may occur in a day and, as in Case 2, they may alternate with vertigo. They may resemble in character *petit mal*. Syncope is the most frequent of the severe nervous symptoms and occurred in eight of my cases.

*Pseudo-apoplexy.*—The patient falls in a deep coma, with loud stertorous breathing, deeply congested face, and all the features of an apoplectic stroke. Both Adams and Stokes describe the condition most accurately and the latter comments on the remarkable circumstance that there is no consecutive paralysis, as after an ordinary stroke. There are rarely convulsive movements and in four or five minutes consciousness is restored and the patient may get up and go about his work (Case 6). An extraordinary feature is the frequency of the attacks as noted by Adams and Stokes. In Case 6 they had recurred for many years and had been associated with transient attacks of motor aphasia, such as are met with not infrequently in advanced arteriosclerosis.

*Epileptic seizures.*—As mentioned, the transient vertigo and syncope may resemble *petit mal*. The convulsive attacks are either slight spasms of the muscles of the face and hands with the loss of consciousness, as in Case 5, or more rarely they may be more general, resembling true epilepsy. In Case 5 and in Dr. Hamburger's case the convulsive attacks were very frequent. In the latter we could tell at once when the attack was coming on. The pulse would stop for 20 or more seconds, the face flushed, the breath was held, the eyes rolled up, and twitching of the face and hands began. Sometimes the attacks may not last for more than a few seconds and the patient may go on with a conversation; even a 100 or more of such attacks may occur in a day.

## PULMONARY FEATURES.

The cases present the respiratory symptoms so often met with in chronic myocarditis. Attacks of cardiac asthma are common, occurring chiefly at night (Case 9). These may be the features of angina sine dolore, the distress, the pallor, the sweating, the shortness of breath, or the state called by Goodhart acute emphysema, with universal wheezing, the *Lungenstarheit* and *Lungenschwellung* of von Basch—which, I take it, is nothing more than acute oedema of the lungs. Cheyne-Stokes breathing is more common and was met with in four cases of my series. In the pseudo-apoplectic attacks the stertor, with deep laboured respiration and expiratory puffing of the cheeks, may have all the intensity of the genuine stroke. Prior to the attacks of epilepsy there may be transient arrest of respiration with flushing of the face.

## PATHOLOGY.

It is by no means easy to discuss intelligently the pathology of these remarkable attacks. We have two great groups of bradycardia—the one associated with lesions in the heart itself, the other with disturbances in the nervous system, organic (as in many well-known cases) or functional, without any obvious changes. It is not the infrequent pulse, transient or permanent, which is so difficult to understand but the phenomena of the attacks of Stokes-Adams disease. What has happened so to disturb the rhythm of the heart that to one perfect there are four or five abortive systoles, or that the rate is reduced to 40, 30, or even 20 to the minute, or that the auricular wave should not be propagated to the ventricles, or that there should be prolonged periods of 15, 20, or even 35 seconds in which the heart actually stops? Is the essential factor central in the medulla, or in the ganglia of the heart, or in the automatic mechanism of the muscle itself, or in the auriculo-ventricular bundle of His, jun., or in Kronecker's coordination centre? I do not think that we know. The key to an explanation of the cerebral features of the attack is the well-known Kussmaul and Tenner experiment. Consciousness and control of the muscles depend upon a uniform blood-supply in the nerve centres. Even transient pressure upon the carotids, in a suitable subject, may cause syncope, a knowledge of which Kussmaul in<sup>2</sup> describing his original work attributes to Galen.<sup>3</sup> More

<sup>2</sup> Aus meiner Docentzeit in Heidelberg, 1903, p. 28. Kussmaul describes one of his experiments on a friend who had boasted of his strength. "His carotids were most favourably placed. Scarcely had I compressed them with my fingers when he turned pale and collapsed off the stool. I had just time to catch him. He recovered consciousness immediately and said 'Where am I?'" This is an exact counterpart of some of the transient Stokes-Adams attacks.

prolonged pressure may be followed by convulsions. Transient anemia of the nerve centres is sufficient to explain the vertigo and syncope, and it may be of cardiac origin or in many cases, as Huchard insists, it may be due to local changes in the vessels of the medulla. In any case these cerebral features may be brought into line with recurring attacks of transient aphasia, with or without loss of consciousness, of monoplegia, and of hemiplegia which are not uncommon in advanced arterio-sclerosis.

#### PROGNOSIS.

In all cases and in all forms the outlook is bad. In a few instances in young persons recovery has taken place. The disease may last for many years. I could see no reason to doubt the statement of the patient in Case 9 that he had had a permanently slow pulse for 30 years, and there are undoubtedly cases of true bradycardia in which good health has been maintained for years. Once the severer nervous symptoms have begun there is very little prospect of complete relief, though, as in Case 2, the patient may live for six years. Even after the most aggravated seizures temporary improvement may follow. The extreme gravity of the condition may be gathered from the cases here reported—seven are dead. Sudden death is the most common and occurred in six cases of the series.

#### TREATMENT.

In younger patients with arterio-sclerosis it may be worth while to try the remedies which some think may have an influence on the sclerosis; certainly, if there is a history of syphilis, iodide of potassium should be used. With high tension nitrites are indicated. In the senile form with vertigo I doubt if it is expedient to do more than to keep the bowels open and to see that too much food is not taken. The nitrites seem to be helpful in some instances when given freely, in others they are useless. The histories of cases in the literature and of those which I have given speak only too plainly of a condition not much within the scope of our art. So far as I know we have no remedy at our command which will accelerate a permanently slow pulse. Atropine may be tried, as Dehio suggests. A quiet, well-regulated life helps to ward off the attacks of vertigo and syncope as in angina pectoris. Emotional disturbances and over-exertion are to be avoided. In spite of the utmost care and most persistent treatment a patient's life (Case 2) may become a burden with the recurring seizures. For the syncope nitrite of amyl and strong ammonia may be used. When there is a warning, as sometimes is the case, their use may prevent an attack. Brandy, ether and the strong cardiac stimulants may be necessary to

revive a patient in a protracted attack. The epileptiform and pseudo-apoplectic attacks may sometimes be prevented by posture. Stokes's patient could ward them off by hanging down the head and in Case 9 rubbing the wrists violently would ward off an attack. Nothing seems to control the recurring attempts at death as in Case 5 and in Dr. Hamburger's patient oxygen inhalations are said to have given relief. With signs of dilatation of the heart and many abortive systoles and infiltration of the bases of the lungs digitalis may be cautiously tried.

Baltimore.

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*Chronic Cyanosis, with Polycythæmia and  
Enlarged Spleen: A New  
Clinical Entity.*

BY

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## CHRONIC CYANOSIS, WITH POLYCYTHEMIA AND ENLARGED SPLEEN: A NEW CLINICAL ENTITY.

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THE group of cases here reported, with those collected from the literature, are worthy of careful study, as we have here in all probability "a definite clinical entity and one which is new to medical science," to use the words of Saundby and Russell in describing their case. The condition is characterized by chronic cyanosis, polycythemia, and moderate enlargement of the spleen. The chief symptoms have been weakness, prostration, constipation, headache, and vertigo. A further analysis will be reserved until after the consideration of the cases:

*CASE I. Cyanosis for years, of unknown origin; albuminurie; rapid pulse; polycythemia; high vascular tension.*—Dr. K., aged forty-four years, consulted me October 28, 1901, complaining of a rapid pulse and diffuse cyanosis. He has been a very healthy man, active and vigorous, of good habits; has had no serious illnesses. He has been uneasy about himself, as he had detected a trace of albumin in the urine. For several years his wife has noticed that he has had a very congested appearance, and the eyes would often be deeply suffused. I have seen him at intervals for the past five years and have known him to be a very blue-faced man. He has been of a constipated habit. His eyes are somewhat prominent, but his wife says this is natural to him. He has constantly a feeling of fulness in the head, sometimes a sensation of vertigo, and for these symptoms he consulted me.

He was a well-built, well-nourished man; the face much suffused; the ears looked a little blue; the conjunctivæ were injected, and the lips distinctly cyanotic. The tongue also looked cyanotic. The general surface of the skin looked suffused and the anæmia left after pressure of the hand on the skin was very marked and very slowly obliterated. The feet and hands were quite cyanosed. The radials and temporals were moderately sclerotic. Pulse 120, regular. Apex beat in fifth, just inside the nipple line; sounds clear; aortic second a little accentuated. There was no enlargement of the thyroid. No enlargement of the liver; moderate enlargement of the spleen, the edge of which was palpable. The chest was well formed, not barrel-shaped; the cervical muscles not prominent. Expansion of the chest good. No sign of emphysema. Expiration not prolonged. Once or

twice he called on cold days to show the extreme cyanosis, and twice he came in with cough, which troubled him chiefly at night.

Several careful analyses of the urine were made by Dr. Futeher. The specific gravity ranged from 1012 to 1017; albumin was constantly present, as a rule only a trace; no sugar. On centrifugalizing there were a few hyaline and finely granular casts.

I was very much puzzled as to the nature of this case, and thought that he had some chronic degeneration of the kidneys, with slight arterio-sclerosis, but I did not think it could be advanced, as there was no marked hypertrophy of the heart, and the aortic second was not specially ringing. I could not account for the cyanosis.

*Blood.* The examinations were made by Dr. Futeher. Drop from ear almost black in color; flows sluggishly. A striking feature is the slowness with which the drop spreads under the cover. With the usual-sized drop the field is found almost filled with red cells; they look natural. Another striking feature is the relative scarcity of leucocytes. Red blood corpuscles, 9,952,000; leucocytes, 4000; hæmoglobin, 120 per cent. (Fleischl). No measurements of the red cells were made. Several counts were made, as it was thought that there might have been a mistake.

Two observations of the blood pressure, taken on the right arm when he had been in the sitting posture for about ten minutes, gave maximum pressure, 203 mm. Hg.; minimum pressure, 175 mm. Hg. Five minutes later the maximum pressure, 200 mm. Hg.; minimum pressure, 172 mm. Hg.

I saw this patient repeatedly during 1902. There was very little change in the condition. The cyanosis was always marked. He was able to attend to his practice. There was no shortness of breath; the heart's action became slower. I once counted it at 72, but he said that it was often at 120 per minute. The last examination of the urine, November 14th, showed only a trace of albumin and a few hyaline casts. The spleen never became much enlarged, but it was always easily palpable. He went to California and has since been under the observation of Dr. McBride.

*CASE II. Recurring attacks of nausea and vomiting; remarkable cyanosis, of some years' duration; pain in side; polycythæmia; albuminuria.*—M. C. (General Hospital Nos. 31202, 34970, 38753, 40820, 42041), aged thirty-five years, a Russian Jew; tailor by occupation; admitted for the first time on July 11, 1900, complaining of constipation.

The family history was unimportant.

*Personal History.* The patient has always been well. Since coming to this country, six years ago, he has been pressing in a tailor-shop, and has had to work standing. He denies gonorrhœa and syphilis. He uses alcohol moderately. Ever since coming to the United States the patient has been troubled with constipation, the bowels never moving more frequently than every second day. This is worse in the summer. Three years ago, during the summer, the bowels on one occasion were constipated for fourteen days. There is no pain during these attacks. For a long time he has been dark in color; he does not know for how long, but his friends have noticed it.

The patient's bowels moved eight days before admission after taking licorice powder. He had been constipated for four days previous to

that. Seven days ago the patient began to vomit after each meal. He has vomited daily since. Castor oil, Epsom salts, and licorice powder have been ineffectual. There have been no other symptoms save that of drowsiness. The patient has voided very little urine during these eight days.

On examination the patient was a well-nourished man, with marked cyanosis of the face, hands, and mucous membrane; the tongue was heavily coated.

The physical examination proved entirely negative, except for the cyanosis already noted. The temperature reached  $102^{\circ}$  shortly after admission, and fell to normal by midnight and remained so. On this day the blood count was: red blood corpuscles, 7,172,000; leucocytes, 21,800; hæmoglobin, 120 per cent.; no malarial parasites found; Widal reaction negative.

On July 16th the blood count was: red blood corpuscles, 6,520,000; leucocytes, 14,400; hæmoglobin, 102 per cent. The patient is feeling very much better and the bowels are moving regularly.

The patient was admitted for the second time on May 27, 1901, complaining of vomiting, which came on five days before admission. The patient admitted excessive indulgence in soda-water on the day of the illness. He states that he has vomited "every moment" since the onset, and that there has been some blood in the vomitus, which is very foul-smelling. The bowels have been constipated since the onset. He has eaten nothing for several days. There is no abdominal pain.

*May 29th.* Dr. Fletcher noted that the cyanosis was still very marked, especially in the buccal mucosa, and that there was a marked pyorrhœa alveolaris. Slight tenderness in the right iliac fossa. The spleen and liver were not enlarged.

*27th.* The blood count gave red blood corpuscles, 8,900,000; leucocytes, 23,000; hæmoglobin, 125 per cent.

*28th.* Vomiting continues unabated. Calomel, cerium oxalate, and lavage have been ineffectual in stopping it. Analysis of the vomitus: total acidity, 85; free HCl, 37; no lactic acid.

*29th.* Red blood corpuscles, 10,200,000; hæmoglobin, 112 per cent.

*30th.* Lips very livid; the general surface of the skin, including face, trunk, and extremities suffused. The imprint of the hand disappears very slowly, and the nails are a little cyanosed.

*June 1st.* Patient's bowels were finally moved by a high enema. The blood count was as follows: Red blood corpuscles, 7,576,000; leucocytes, 30,000; hæmoglobin, 115 per cent.; specific gravity (chloroform and benzol method), 1068.

*4th.* The patient was discharged feeling greatly improved, the bowels having commenced to move somewhat more freely.

The patient was admitted for the third time on April 29, 1902, complaining of an attack of vomiting, hiccupping, and constipation, which began seven weeks previously. He had vomited bile several times. The attacks of vomiting have lasted for ten or twelve days at a time and recurred repeatedly. The blood count on admission was as follows: Red blood corpuscles, 7,144,000; leucocytes, 8,600; hæmoglobin, 110 per cent.

On April 30th Dr. McCrea noted that the area of stomach tympany



was slightly increased; cyanosis still present; considerable pigmentation of the skin. Differential count of the leucocytes: Polymorphonuclear, 79.4 per cent.; small mononuclear, 14 per cent.; large mononuclear, 2.4 per cent.; eosinophiles, 1.8 per cent.; transitionals, 2 per cent. A test-meal showed free HCl present; no lactic acid. On two successive days after a long fast the stomach-contents were removed and revealed a fair amount of free HCl. The blood count on May 12th was little changed.

On May 22d the patient was discharged improved, the bowels moving regularly.

The urine had a specific gravity of 1010 to 1020, with a trace of albumin and a few casts, usually hyaline, but on one admission granular.

The fourth admission was on November 7, 1902, the patient stating that he was awakened at 4 A.M., three days before admission, with a pain in the left side, followed by vomiting, which has been continuous since. No blood in the vomitus. Constipation for five days. The patient has not eaten anything since the onset and has taken very little water. There has been some hiccoughing. Blood count: Red blood corpuscles, 7,316,000; leucocytes, 12,300; hemoglobin, 112 per cent. The cyanosis is still very marked. There is some dyspnoea, vomiting, and hiccoughing. A differential count of the leucocytes shows a slight increase in the polymorphonuclears and a diminution in the small mononuclears since the previous record. The specific gravity of the blood is 1083.

*November 12th.* Red blood corpuscles, 8,300,000.

*15th.* Red blood corpuscles, 6,700,000. Coagulation time, one and a half minutes. Specific gravity, 1072.

*19th.* The vomiting persisted until two days ago and the vomitus showed at all times free HCl; no lactic acid; slight starch digestion. The constipation was also very obstinate until yesterday. Discharged improved.

Patient admitted for the fifth time on January 23, 1903, and for the sixth time March 11th. On both of these occasions the chief symptoms were pain in the left side and the obstinate constipation. He says that the pain brings on the vomiting. The vomitus is at first frothy and white, later greenish in color. The pain is deep below the tenth and eleventh ribs on the left side, and extends toward the posterior axillary fold. On his last admission the cyanosis was extreme, the face was almost black, and the expression very anxious. There was no albumin in the urine, but on March 30th there were a few granular casts. The blood pressure was 125; the specific gravity of the blood 1081. The bowels were freely moved, and this always gives him relief. On the last admission there was very little vomiting, yet the cyanosis was never more marked.

*May 25th.* Patient has been keeping very well and is at work. He complains of pain in the left side, under the ribs, and says that as he walks he keeps his hand over the sore spot. The cyanosis is marked, quite as much as at any time in the hospital. The impression of the hand on the skin of the trunk remains a long time. The spleen is not palpable; the vertical flatness is about four inches in extent. He thinks that the skin has become darker.

CASE III. (Dr. Lowman.) *Chronic cyanosis; enlarged spleen; polycythæmia; headache; increased tension; albuminuria.*—While making a visit at the Lakeside Hospital, Cleveland, with Dr. Lowman, my attention was directed to a patient who was unusually cyanosed and who had an enlarged spleen. On further examination the case was found to belong to the group under consideration. I am indebted to Dr. Darby, Dr. Lowman's first assistant, for the notes of the case.

Female, aged forty-four years, married, of English descent, admitted to the ophthalmological division of the hospital for double pterygium, failing vision, and headache; for the latter she was transferred to the medical service. The condition of the fundi was negative, with the exception of tortuosity of the vessels.

The family history was negative.

She had had the usual infectious diseases. She had been a very healthy woman of good habits. There was no history of syphilis. She had not had winter cough or attacks of asthma. She has two children living and well. For many years, she does not know how long, she has been blue. She has had no cough, no special shortness of breath on exertion. For four years she has had headaches, which have become more intense during the past four months. They begin over the left eye and extend backward and down the neck.

On examination the patient is well nourished; the skin is dark in color, and there is a general cyanosis, particularly marked on the face, arms, and upper part of the trunk; the feet and toes are blue. Everywhere the impression made with the finger disappears slowly. The conjunctivæ are suffused. The eyes are not specially prominent. There is well-marked pterygium. Looking more closely at the face there are some distended venules about the nose and cheeks. The lips are quite cyanosed, and the tongue and buccal mucous membranes have a dusky blue color. The radials are moderately sclerotic; the vessels seem full and the tension high. The apex beat of the heart cannot be felt; there is no visible shock; no enlargement upward or to the right. The sounds are clear; the second pulmonary is accentuated. The chest is not barrel-shaped. Percussion note is clear everywhere, and there are no bronchitic râles; no prolongation of expiration.

The abdomen looks normal. On palpation the spleen is enlarged, extending 7.5 cm. below the costal margin; the anterior margin and the notch are easily felt. The upper limit of flatness is on the eighth rib. The liver is not enlarged.

*Blood.* April 13, 1903, red blood corpuscles, 11,616,000; leucocytes, 5100. Differential count: Polynuclears, 59 per cent.; lymphocytes, 32 per cent.; large mononuclears, 8 per cent.; eosinophiles, 0.5 per cent. Haemoglobin, 120 per cent. Specific gravity, 1067. A subsequent examination made on May 8th gave the red blood corpuscles 10,692,000.

*Urine.* No excess of the daily amount; clear in color; specific gravity ranged from 1010 to 1016; reaction acid; a trace of albumin and a moderate number of hyaline and granular casts.

At my suggestion the patient was put upon sodium nitrite, and Dr. Darby writes, under date of May 8th, that the headaches have entirely disappeared.

CASE IV. (Dr. Stockton.) *Chronic cyanosis; general weakness; headache, and general pains, with attacks of weakness and shortness of breath; pigmentation of skin; death; autopsy.*—When speaking of the condition with Dr. Lyon, of Buffalo, he mentioned a remarkable case of chronic cyanosis in the Buffalo Hospital under the care of Dr. Stockton, and on his return he found that there was polycythæmia. To the former I am indebted for the following notes, and to the latter for permission to use them:

J. T., a Turkish Jew, aged forty-six years, married, a shoemaker, had been admitted to various Buffalo hospitals (General, Erie County, German, etc.) for several years on different occasions, and died in the German Hospital, Friday, May 1, 1903.

His chief complaint was general weakness, chronic headache; pain in the feet and legs, made worse by walking; general diffuse pains in the abdomen, pains also over the region of the heart, moderate chronic constipation, a slight cough, and occasional attacks of shortness of breath.

For about twenty years he has had a slight cough, off and on, worse in the winter and at night. Headache has troubled him for the same period (twenty years), and indefinite pain in the chest has been felt more or less during the past twenty years. His general strength had been of exceptional vigor until about six years ago, when it began to fail. About four years ago he began to grow much darker and bluer in his skin—cyanosed. Then he began also to have pains in different parts of his body, pain and a prickling sensation in the legs and feet, pain in the right chest and right shoulder; pain in the abdomen, not localized, but diffuse and general; headache continuing. The pain in different parts of the body was not constant, but shifted from time to time.

However, the headache and the pain in the legs and abdomen were present with tolerable constancy and have continued so up to his death. The pain was described as dull and aching. In addition to the pains, he had marked weakness during the last six years of life.

Constipation was never a marked feature of the case, though the bowels were generally sluggish. The appetite was poor and capricious. He had nausea occasionally, but never vomited.

During the past four years he had been going from hospital to hospital, spending a few months at a time in each, until he felt better, then returning to his home and trying to work, but soon being required to return to a hospital because of his weakness, headache, body pains, and sometimes shortness of breath. In the hospital he would remain in bed most of the time, or sit quietly in a chair, occasionally walking slowly around the ward or going to the dining-room for his meals.

*Cyanosis.* The most striking feature of the case during the past four years has been a high-grade, extreme, general cyanosis, making the patient an object of general interest and curiosity in the various hospitals where he sojourned. His entire skin was dusky and bluish and his mucous membranes livid, resembling the appearance of a "blue baby" with congenital heart disease; in fact, he was jocularly called the "blue baby." This cyanosis was constant, though at times after rest in bed it improved somewhat, and again at other times was much intensified.

*Pigmentation.* The skin was generally dark and showed fine punctiform mottling or pigmentation, suggesting capillary extravasation as a cause, though no definite history of subcutaneous hemorrhages could be obtained. The naturally pigmented parts of the body were much more deeply pigmented than normal. The mucous membranes showed no appreciable areas of pigmentation.

*Dyspnoea.* During the last three years of life he had occasional attacks of increased weakness, cyanosis, and dyspnoea, his body becoming cold, so that his wife had often thought him dying. In the hospital, however, dyspnoea was seldom marked, though the respirations were generally moderately increased.

*Physical Examination.* A short, stocky, well-built, and well-muscled man. Cyanosis as already noted. Pigmentation as already noted.

*Heart.* The heart sounds were always clear and without murmur at any time, but were generally rather weak, except the second pulmonic sound, which was somewhat accentuated. The heart's area by deep percussion was slightly enlarged to the left and right. In the sixth interspace, about one and a half inches to the left of the nipple line, could be seen an area of pulsation, the chest wall dimpling inward with each systole—*i. e.*, systolic retraction. This sign required a careful inspection to be seen.

*Vessels.* The arteries were soft and compressible. The veins were everywhere full and visible. There was slight throbbing of the vessels of the neck, above the clavicles, thought to be arterial.

*Thorax.* The lungs were everywhere hyperresonant on percussion, and the area of resonance extended downward at the bases behind somewhat, and in front on the right side the area of liver dullness did not begin until the seventh space was reached in the parasternal line. The area of resonance above the clavicles was not appreciably increased. On auscultation the breath sounds were soft and expiration was not prolonged. Occasional wheezes and sibilant râles could be heard over both lungs on different occasions during the last few months of life. (Dr. Thayer, who saw this case with Dr. Lyon, tells me that the state of the chest did not suggest to him emphysema.)

*Liver.* Flatness began in seventh space in parasternal line and extended vertically downward to about two inches below costal margin, where the edge could be felt.

*Spleen.* Never palpable, and its area on percussion was less than normal (perhaps explained by the emphysema of the lungs).

*Abdomen* normal.

*Glands* normal.

*Legs.* Occasionally very trifling œdema was observed over the ankles, more distinct on the left side. No œdema elsewhere was ever observed.

*Eye Examination,* February, 1903. Both disks hyperæmic. Retina surrounding disks thickened. Vessels, particularly veins, engorged and tortuous.

*Urine.* An occasional trace of albumin; otherwise negative.

*X-ray Examination of Thorax.* Nothing abnormal except slightly enlarged heart.

*Blood.* The blood from the ear or finger-tip was on many occasions during the last few months of life examined and found extremely dark in color, and so thick that it would adhere to one side of thin filter

paper without penetrating it. The depth of color and darkness of the blood was far beyond the range of estimation for hemoglobin by the color scales of the various hemoglobinometers. The red corpuscles were never counted until the day of death, when they were counted at 8,250,000. Differential leucocyte count normal. Leucocytes were generally about 8300, never showing a hyperleucocytosis.

*Pulse.* The pulse was generally about normal, occasionally after exertion rising temporarily as high as 120 to the minute.

*Temperature* always normal.

*Respirations.* The general respiratory rate was from 22 to 25 per minute, once reaching 50 after severe exertion, with symptoms of collapse. On the afternoon of death the respirations were 38 per minute.

Death occurred on May 1, 1903, at 7 P.M., at the German Hospital in Buffalo, after three days' residence in the hospital. The patient died, without any special symptoms or discoverable complications, in collapse and after a few hours of drowsiness deepening into semiconsciousness.

The full report of the autopsy is not yet available, but Dr. Lyon writes that the heart was about normal; the lungs showed moderate emphysema, with cyanosis and œdema; the spleen was moderately enlarged. Nothing definite was found to account for the condition.

#### *Cases from the Literature.*

CASE V. (Vaquez, *Bulletin Médical*, Paris, 1892, vi., 849.)—Male, aged forty years. For ten years extremities cyanosed; veins distended. Then palpitations, dyspepsia, bronchial catarrh. Three years ago vertigo (Ménière type); buzzing and whistling in ears; staggering and eddying of objects; vomiting; no unconsciousness. Gums swollen, bleeding on irritation.

On examination, chronic cyanosis; no œdema. Heart: No definite auscultatory phenomenon. Blood: Red blood corpuscles, 8,900,000; leucocytes, normal.

Second admission: Paroxysmal vertigo. Attack of pain in lumbar region, ended by discharge of red blood corpuscles in urine, lasting four to six days. Liver enlarged, 20 cm. in right mammary line. Spleen 24 cm. in extent. Urine, three litres daily; same amount of fluid as ingested. Blood: Finger, 8,450,000; elbow, 8,200,000, once 9,130,000; specific gravity, 1080; hemoglobin, 165 per cent.; hyperalkalinity of blood.

*Pathology.* Probable hyperactivity of hematopoietic organs, for of two cases of congenital cyanosis, one, with red blood corpuscles, 7,000,000, had a large spleen; the other, with 4,500,000, had no palpable spleen.

CASE VI. (Cabot, *Boston Medical and Surgical Journal*, December 7, 1899.)—Female, aged forty-six years, widow, masseuse. Six years before admission she had sudden loss of consciousness, with settling of blood on one side of face and thick speech, which lasted several days. Four years later, after a period of hard work, she began to have periods of collapse, mental and muscular; face became purple, eyes injected; she was once thought to be drunk; vasomotor phenomena often present. Sciatica two weeks before admission; ecchymoses on thigh.

On examination, cyanosis of the face and tongue. Heart: No murmurs. Urine: Trace of albumin; a few hyaline casts. Blood: Red blood corpuscles, 10,460,000; leucocytes, 20,000; hæmoglobin, 150 per cent. Heart apparently normal; pulse 90. No note on the spleen.

*Course.* Rested well in summer, but still cyanotic. Thyroid treatment had no effect. Later on, after tooth extraction, bleeding lasted half a day; made her better. Soon afterward she had attacks in which her legs began to move spontaneously, the feet moving around each other. A second attack on the train in two weeks. Soon weakness of left arm and leg, headache, vomiting. She died comatose.

*Autopsy.* Hemorrhage, middle meningeal; passive congestion of all the viscera.

CASE VII. (Cabot, *Boston Medical and Surgical Journal*, March 15, 1900.)—Female, aged forty-nine years, spinster. Complaint, vertigo, weakness, bad taste, constipation. Blue line noted. Given potassium iodide and cascara.

One year later, trace of albumin and hyaline casts in the urine. Lead detected in the blood. Blood: Hæmoglobin, 120 per cent.

Father died of "consumption of blood."

Otitis media at eighteen years; several attacks of rheumatism. Menopause at forty-six years. Since then vertigo, palpitation, and headache; dizzy most of time. No tinnitus or nausea or eye symptoms. Cyanosis of lips for six months. Constipation. Four months ago three teeth drawn; then stomatitis set in. Itching at night. Polyuria.

On examination, cyanosis of face and mouth, hands and feet. Heart: Slight systolic murmur at pulmonary area. Spleen enlarged up and down. Hæmoglobin, 120 per cent. In one week vertigo and cyanosis diminished. Hæmoglobin, however, remained at 120 per cent. Four years later, red blood corpuscles, 12,000,000; spongy, bleeding gums; vertigo and staggering; skin bronzed. Lost twenty pounds in six years. Spleen a hand's breadth below ribs. Red blood corpuscles, 9,252,000; leucocytes, 10,600; hæmoglobin, 110 per cent. After venesection, red blood corpuscles, 10,032,000; normoblasts, 5. Later spleen reached to navel; red blood corpuscles, 11,352,000. Examination of gastric contents: No free HCl.

CASE VIII. (McKeen, *Boston Medical and Surgical Journal*, 1901, cxliv., 610.)—Male, aged fifty-three years, German, packer in iron foundry.

Family history unimportant.

*Personal History.* Dyspnoea twenty years ago, eight days; recurred at intervals of six months to two years. Alcohol, beer, and whiskey used moderately.

*Present Illness.* One and a half years ago cyanosis of face and hands following an attack of dyspnoea. The cyanosis has persisted since, with exacerbations. Works right along; exertion causes no dyspnoea or cyanosis. Every second or third day blurring of vision, sweating, vertigo, staggering; no headache or tinnitus. When blue the hands are cold and numb. For two years frequent attacks of diarrhoea, sometimes with prolapsus recti.

On examination, no dyspnoea; respirations 18 to the minute. Cyanosis of face, hands, and feet. Fingers clubbed. Erythema on

shoulders and chest. Eyes congested. Tongue cyanotic. Gums swollen and bleeding. Many of the teeth loose. Arteries slightly thick. Heart, no murmurs. Lungs hyperresonant. Spleen one inch below rib, descending to two and a half inches on deep inspiration. X-ray showed emphysema. Urine: A trace of albumin, granular casts, red blood corpuscles, and leucocytes. Blood: Red blood corpuscles, 9,380,000 to 9,840,000; leucocytes, 9000; hæmoglobin, 120 per cent.

CASE IX. (Saundby and Russell, *Lancet*, 1902, i., 515.)—Male, aged forty-three years, an electroplater. First visit on April 13, 1891, complaining of pains in body, especially abdomen; headache for three or four months. Spleen enlarged. Urine: Specific gravity, 1010; a trace of albumin; no casts.

Second visit on January 29, 1898, complaining of cyanosis.

*Family History.* Mother died of phthisis.

*Personal History.* Syphilis at nineteen years, gastric fever at twenty-four years, later jaundice.

*Present Illness.* Eight months ago pains, gnawing, in abdomen, worse in morning; no vomiting; constipation. For six weeks loss of flesh and weakness.

On examination, dull, speech thick, memory and attention poor. Cyanosis of face. Fingers clubbed. Teeth bad. Bronzing of legs. Spleen extends to middle line and navel; hard, slightly tender. Heart: No murmurs. Red blood corpuscles, 9,000,000; hæmoglobin, 120 per cent. Once a few hyaline casts. He grew drowsy, jaundiced, and cyanotic. Later, red blood corpuscles, 7,360,000.

*Autopsy.* Hypertrophy of left ventricle. Spleen, 1440 grammes; consistency normal. Brain congested. Suprarenal small, dark, soft. Thymus not noted.

Weil (*La Semaine Médicale*, June 29, 1901) has a brief note on two cases of hyperglobulism, with cyanosis, lasting from birth, in two children, one aged two years, the other four years. The blood count is not given. In one the spleen was enlarged, in the other normal. No heart disease.

#### *Analysis of the Cases.*

Six of the patients were males and three females. All were in the middle period of life, the youngest thirty-five years and the oldest fifty-three years. There was nothing in the occupation or in the station of life of any moment. The features may be considered in detail.

CYANOSIS. Naturally this attracts most attention and has been the feature which has led to further investigation. As is usual in all forms of cyanosis, it is most marked about the face and hands, but in Dr. Lowman's case and in both of my patients the skin of the entire body was of a dusky blue. When first seen the suffusion of the conjunctivæ and the prominence of the eyes, as in Case I., may add to the startling appearance of the patient. The cyanosis is more intense in cold weather, and is aggravated by any existing bronchial catarrh. On bright, clear days, with but little moisture in the air, it may lessen

greatly, as in Case I. The period over which the cyanosis has been noticed varies from ten years (Case V.) to three or four years (Case I.). While constant, as a rule, it may vary greatly in intensity. In Case II. the patient usually came in very deeply cyanosed, the condition aggravated, no doubt, by the vomiting and the loss of liquids, but after a few days, when the bowels were moved, the color became less intense; but I saw this patient only the other day, some six weeks after his last attack of nausea and vomiting, and he was intensely cyanosed. There is no respiratory distress with the cyanosis. While the skin looks full and tense and the face and hands bloated, yet marked dilatation of the larger superficial veins is not noted. On close examination of the skin, many fine, dilated venules are seen.

**BLOOD.** The viscosity is greatly increased. All observers have remarked not only upon the unusually dark, but upon the thick and sticky character of the blood drop. An extraordinary polycythemia is a special feature of the affection. The maximum blood count was 12,000,000 per c.mm. in Cabot's second case. In eight of the cases the count was above 9,000,000 per c.mm., and in the ninth (Case IV.) it was 8,250,000 per c.mm. There have been no measurements of the red blood corpuscles. The statement is made that in the polycythemia of congenital heart disease the red blood corpuscles are smaller than in that of high altitudes. The percentage of hæmoglobin has been high, ranging to (in Case V.) 165. Usually the range has been from 120 to 150. In Case IV. it is stated to have been above the scale. The specific gravity of the blood in Case V. was 1080, and in Case II. it ranged from 1067 to 1083. In eight of the cases the leucocyte count ranged from 4000 in Case I. to 20,000 in Case VI. As a rule, in a majority of the cases it has been below 10,000 per c.mm. In Case II. on one admission the count reached 30,000 per c.mm.

**SPLEEN.** In seven of the nine cases the spleen was enlarged. In four of these the enlargement may be termed great, reaching nearly to the navel. In Case VI. there was no note. In Case II. it was not enlarged.

The liver was enlarged in Case V.

**URINE.** In seven of the cases a trace of albumin was noticed, with hyaline, sometimes granular, casts. In Cases V. and VII. there was no note on the urine. The specific gravity was usually low.

**PIGMENTATION OF THE SKIN.** As might be expected from the prolonged existence of the cyanosis, the skin was noted to be pigmented in several of the cases (II., III., IV., VII., IX.).

**SYMPTOMS.** The symptoms have been very varied. Most of the patients have complained of headache, weakness, and prostration. Headache was a prominent symptom in four cases, vertigo in four, constipation in four, pains in back and abdomen in three cases.



Attacks of nausea and vomiting were a special feature in Case II., and are mentioned as present in Case V. Cough and shortness of breath were each present in one case. Fever was not noticed in any of the cases. The pulse was noticed to be of high tension and the vessels sclerotic. There was no œdema of the skin. The torpor, mental and physical; the sensation of fulness in the head, with headache, vertigo, and in some cases nausea and vomiting, remind us of the symptoms to which mountain climbers and aeronauts are subject. Three of the cases were fatal. In Case IV. the patient died in collapse after a few hours of drowsiness. In Case VI. the patient died comatose, with cerebral hemorrhage. In Case IX. the patient became drowsy and died in coma. The autopsy in Case IV. showed the heart to be about normal, moderate emphysema of the lungs, with cyanosis and œdema and moderately enlarged spleen. In Case VI. there was passive congestion of all the viscera and hemorrhage from the middle meningeal artery. In Case IX. there was hypertrophy of the left ventricle, with congestion of the brain.

REMARKS. *Chronic cyanosis*, a common enough feature in clinical work, is met with :

1. In organic disease of the heart, particularly in congenital malformation, in chronic myocardial and tricuspid lesions in children and adults, and in cases of adherent pericardium.
2. In certain diseases of the lungs, particularly emphysema, and in long-standing pulmonary tuberculosis of the fibroid type. Practically there are only two conditions in which patients walk into the hospital or into our consulting-rooms with extreme cyanosis, congenital heart disease, and emphysema.
3. In the methæmoglobinæmia of chronic poisoning with coal-tar products, as antipyrin and acetanilid, etc. In this condition, too, the patient may startle one by the markedly cyanotic appearance.<sup>1</sup>

There are a good many people whose normal condition is one of great fulness of the bloodvessels of the skin, so that in cold weather there may be marked cyanosis of the ears and of the face. We all know the stout, hearty, full-blooded man with rubicund face—the type which has been well described by Clifford Allbutt in his *Lane Lectures*—a common one among draymen and in men of that class, who live much in the open air and who drink freely. In them cyanosis, though not necessarily present, may be very marked in the face and hands when the temperature is low. As a rule, the peripheral circulation is

<sup>1</sup> I am sorry I have not got a blood count in a case of this sort. As a rule, there is anæmia; in a remarkable case which I saw with Dr. T. R. Brown, the hæmoglobin was only 50 per cent. Unfortunately no count was made of the red blood corpuscles. In the case of a physician with extreme cyanosis from long-continued use of antipyrin, a blood count was made, and I remember that the red corpuscles were not above normal, but I have not the actual figures.

active and the normal condition is a vivid hyperemia of the skin associated with dilatation of numerous small venules.

Cyanosis, local or general, indicates one fact—diminished oxygenation of the blood corpuscles. In the deepest cyanosis of the ear or of the finger-tip the blood count may not be above 5,000,000 per c.mm. Only recently Dr. Fitcher examined for me the blood of a red-faced, short-breathed Englishman, whose skin seemed fairly bursting with blood and whose fingers and ears were quite cyanosed. The red blood corpuscles were only just above 5,000,000 per c.mm. In the local cyanosis of Raynaud's disease the blood count may be very little above the normal. I have a patient at present in the wards in whom the blood count from the cyanosed foot ranges from 4,500,000 to 6,500,000; the count from the ears about 5,500,000 (Dr. Briggs). A few weeks ago, in Dr. Brayton Ball's wards of the New York Hospital, I saw an interesting case of coma (which turned out to be due to a fracture of the skull) with the most intense localized cyanosis in the fingers of one hand, active, vivid red hyperemia of the fingers of the other hand, and normal-looking blood distribution in the ears. The count, very kindly made for me by Dr. N. B. Foster, was practically normal and the same in all three situations. Contrariwise, the anomaly may be present (though I must say it is rare) of a red face and general superficial hyperemia with a very low blood count. During this session there has been under my care in Ward E a patient with what we have termed *anemia rubra*. With a blood count of about 2,000,000 per c.mm. from ear-tip or finger-tip, he was as red as a beet, and it was not until his blood had fallen to nearly 1,200,000 that he began to present a typical picture of pernicious anemia. On admission, with his blood at a little above 2,000,000, and looking the healthiest patient in the ward, he had nucleated red blood corpuscles. In the cyanosis of emphysema and the ordinary forms of heart disease, the number of red blood corpuscles per cubic millimetre is not, as a rule, much increased, and rarely reaches the limit of polycythemia, which, as suggested by Cabot, may well be placed at 7,000,000. Occasionally most extraordinary cyanosis occurs in adherent pericardium, as in a case reported by me (*Archives of Pediatrics*, 1896) and in the case reported by Lorrain Smith and McKisack (*Transactions Pathological Society, London*, 1902). In the latter the blood count was 6,000,000.

*Polycythemia*. There are two classes of polyglobulism—*relative*, in which the condition is due to a diminution in the quantity of the plasma of the blood, and *true*, in which there is an actual increase in the number of blood corpuscles. Much work has been done of late years on the subject. Relative polycythemia is very common. It may be caused by a deficient amount of fluids ingested, which possibly may be the cause of polycythemia of the newborn; more frequently

it is caused by loss of liquids, either by (a) sweat; (b) diarrhœa (by far the most common); (c) increased diuresis. (d) In another group of cases there is loss of liquids by secretion or transudation, as in narrowing of the pylorus with dilatation of the stomach, and in the constant loss of liquids from the blood in recurring ascites. It is interesting to note that in some of these cases the polycythæmia is of a high grade and may persist for months or even for years. It is not necessarily associated with cyanosis, as in cases of dilated stomach and in diarrhœa. There is also a toxic polycythæmia described in poisoning by phosphorus and carbon monoxide, which, too, is probably relative. The polycythæmia of vasomotor disturbances, such as has been determined by Becker, Thayer, and others after the cold bath and after violent exercise, also comes in this class. Where the much-discussed polycythæmia of high altitudes should be placed is by no means certain. While a number of observers hold that there is new-formation, the lack of oxygen acting as a stimulus, others believe that it is relative, and due to increased elimination of fluids from the body, or that it is entirely due to a large number of corpuscles in the peripheral circulation. Others, again, think it is entirely due to the effects of decreased atmospheric pressure. The microcytes, poikilocytes, and nucleated red blood corpuscles point to new-formation, but the question is still under discussion.

*True Polycythæmia.* Vaquez and his pupil, Quiserne (*Thèse*, Paris, 1902), limit to this class the condition in which with an increased formation there is a continued increase in the number of red blood corpuscles in the circulating blood. It is met with where there is difficulty in proper aëration of the blood, as in high altitudes, or in heart disease, congenital and otherwise; and also in the obscure cases of the form here under consideration. The polyglobulism is regarded as a mode of adaptation to the new conditions and a sort of functional reaction of the organism. Belonging to this group is the polycythæmia so readily studied in congenital heart disease, and described by Krehl, Gibson, and others. The figures often reach as high as 8,000,000 or 9,000,000, rarely so high as in the form discussed in this paper.

It is by no means easy to offer a satisfactory explanation of the polycythæmia with cyanosis here under consideration. It does not seem possible to connect it in any way with the moderate grade of enlargement of the spleen, and yet there are one or two observations in the literature which are of great interest in this connection. Rendu and Widal (*Bull. et mém. Soc. méd. des hôpitaux*, 1899, 3 s., xvi. 528) report the case of a policeman who had an attack of vomiting without apparent cause, with dyspnœa. The temperature was normal. Red blood corpuscles, 6,200,000; leucocytes, 6000. This count gradually

diminished. On examination, skin subicteric; cyanosis of face and hands marked, to a less degree all over the body. A tumor, evidently the spleen, reaching from diaphragm to iliac crest. Eventually ulcers developed on tongue and the liver became enlarged. Autopsy: Spleen adherent to diaphragm, fibrous on section, and filled with caseous masses.

Moutard-Martin and Lefas (*Société des hôpitaux*, 1899) have also reported a case of a woman, aged forty-nine years, with pain in the left hypochondriac region, emaciation, no ascites, no cyanosis, with enlarged spleen, slight albuminuria. The red blood corpuscles were 8,200,000, the leucocytes 31,428. At the autopsy the spleen weighed 750 grammes and contained large caseating nodules.

With our imperfect knowledge of the physiology of polycythæmia it would be premature to discuss at any length the pathology of this remarkable group of cases. We need:

1. A careful study of all forms of chronic cyanosis with polycythæmia, particularly those associated with heart disease and emphysema. (It is to be noted that the cases here reported have the highest blood count on record, much higher than the average in congenital heart disease or in dwellers at great altitudes.)

2. A more accurate study of the blood in this class of cases—the volume, the viscosity, the state of the plasma and the serum, the amount of hæmoglobin, the specific gravity, and the diameter of the corpuscles. As increased viscosity of the blood, with resulting difficulty of flow, seems the most plausible explanation of cyanosis, it is especially important to test the viscosity by accurate physical methods and to determine the relation of the number of corpuscles to the viscosity of the blood.

3. The relation of the splenomegaly to the cyanosis and polyglobulism should be carefully observed. It may not be anything more than the effect of the chronic passive congestion.

Future investigation will determine whether we have here in reality a new disease. The clinical picture is certainly very distinctive; the symptoms, however, are somewhat indefinite, and the pathology quite obscure.

CCXLVIII

248

# The Master-Word in Medicine

BY

William Osler

# THE MASTER-WORD IN MEDICINE

AN ADDRESS TO MEDICAL STUDENTS ON THE OCCASION OF  
THE OPENING OF THE NEW BUILDINGS OF THE  
MEDICAL FACULTY OF THE UNIVERSITY  
OF TORONTO, OCT. 1, 1903

BY

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"And perfect the day shall be, when it is of all men understood that the beauty of Holiness must be in labour as well as in rest. Nay! *more*, if it may be, in labour; in our strength, rather than in our weakness; and in the choice of what we shall work for through the six days, and may know to be good at their evening time, than in the choice of what we pray for on the seventh, of reward or repose."

—*Ruskin.*



## THE MASTER-WORD IN MEDICINE

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### I.

**B**EFORE proceeding to the pleasing duty of addressing the undergraduates, as a native of this province and as an old student of this school, I must say a few words on the momentous changes inaugurated with this session, the most important, perhaps, which have taken place in the history of the profession in Ontario. The splendid laboratories, which we saw opened this afternoon, a witness to the appreciation by the authorities of the needs of science in medicine, makes possible the highest standards of education in the subjects upon which our Art is based. They may do more. A liberal policy, with a due regard to the truth that the greatness of a school lies in brains not bricks, should build up a great scientific centre which will bring renown to this city and to our country. The men



*THE MASTER-WORD IN MEDICINE*

in charge of the departments are of the right stamp. See to it that you treat them in the right way by giving skilled assistance enough to ensure that the vitality of men who could work for the world is not sapped by the routine of teaching. One regret will, I know, be in the minds of many of my younger hearers. The removal of the departments of anatomy and physiology from the biological laboratory of the university breaks a connection which has had an important influence on medicine in this city. To Professor Ramsay Wright is due much of the inspiration which has made possible these fine new laboratories. For years he has encouraged in every way the cultivation of the scientific branches of medicine and has unselfishly devoted much time to promoting the best interests of the Medical Faculty. And in passing let me pay a tribute to the ability and zeal with which Dr. A. B. Macallum has won for himself a world-wide reputation by intricate studies which have carried the name of this University to every nook and corner of the globe where the science of physiology is cultivated. How much you owe to him in connection with the new buildings I need scarcely mention in this audience.

But the other event which we celebrate is of much greater importance. When the money is forthcoming it is an easy matter to join stone

*THE MASTER-WORD IN MEDICINE*

to stone in a stately edifice, but it is hard to find the market in which to buy the precious cement which can unite into an harmonious body the professors of medicine of two rival medical schools in the same city. That this has been accomplished so satisfactorily is a tribute to the good sense of the leaders of the two faculties, and tells of their recognition of the needs of the profession in the province. Is it too much to look forward to the absorption or affiliation of the Kingston and London schools into the Provincial University? The day has passed in which the small school without full endowment can live a life beneficial to the students, to the profession or to the public. I know well of the sacrifice of time and money which is freely made by the teachers of those schools; and they will not misunderstand my motives when I urge them to commit suicide, at least so far as to change their organizations into clinical schools in affiliation with the central university, as part, perhaps, of a widespread affiliation of the hospitals of the province. A school of the first rank in the world, such as this must become, should have ample clinical facilities under its own control. It is as much a necessity that the professors of medicine and surgery, etc., should have large hospital services under their control throughout the year, as it is that professors of pathology and physi-

ology should have laboratories such as those in which we here meet. It should be an easy matter to arrange between the provincial authorities and the trustees of the Toronto General Hospital to replace the present antiquated system of multiple small services by modern well equipped clinics—three in medicine and three in surgery to begin with. The increased efficiency of the service would be a substantial *quid pro quo*, but there would have to be a self-denying ordinance on the part of many of the attending physicians. With the large number of students in the combined school no one Hospital can furnish in practical medicine, surgery and the specialties a training in the art an equivalent of that which the student will have in the sciences in the new laboratories. An affiliation should be sought with every other hospital in the city and province of fifty beds and over, in each of which two or three extra-mural teachers could be recognized, who would receive for three or more months a number of students proportionate to the beds in the hospital. I need not mention names. We all know men in Ottawa, Kingston, London, Hamilton, Guelph and Chatham, who could take charge of small groups of the senior students and make of them good practical doctors. I merely throw out the suggestion. There are difficulties in the way; but is there anything in

this life worth struggling for which does not bristle with them?

Students of Medicine: May this day be to each one of you, as it was to me when I entered this school thirty-five years ago, the beginning of a happy life in a happy calling. Not one of you has come here with such a feeling of relief as that which I experienced at an escape from conic sections and logarithms and from Hooker and Pearson. The dry bones became clothed with interest, and I felt that I had at last got to work. Of the greater advantages with which you start I shall not speak. Why waste words on what you cannot understand. Only to those of us who taught and studied in the dingy old building which stood near here is it given to feel to the full the change which the years have wrought, a change which my old teachers, whom I see here today—Dr. Richardson, Dr. Ogden, Dr. Thorburn and Dr. Oldright—must find hard to realize. One looks about in vain for some accustomed object on which to rest the eye in its backward glance—all, all are gone, the old familiar places. Even the landscape has altered, and the sense of loneliness and regret, the sort of homesickness one experiences on such occasions, is relieved by a feeling of thankfulness that at least some of the old familiar faces have been spared to see this day. To me at least the memory of those happy days is a perpetual benediction, and I look

*THE MASTER-WORD IN MEDICINE*

back upon the the two years I spent at this school with the greatest delight. There were many things that might have been improved—and we can say the same of every medical school at that period—but I seem to have got much more out of it than our distinguished philosopher friend, J. Beattie Crozier, whose picture of the period seems rather hardly drawn. But after all, as someone has remarked instruction is often the least part of an education, and, as I recall them, our teachers in their life and doctrine set forth a true and lively word to the great enlightenment of our darkness. They stand out in the background of my memory as a group of men whose influence and example were most helpful. In William R. Beaumont and Edward Mulberry Hodder, we had before us the highest type of the cultivated English surgeon. In Henry H. Wright we saw the incarnation of faithful devotion to duty—too faithful, we thought, as we trudged up to the eight o'clock lecture in the morning. In W. T. Aikens a practical surgeon of remarkable skill and an ideal teacher for the general practitioner. How we wondered and delighted in the anatomical demonstrations of Dr. Richardson, whose infective enthusiasm did much to make anatomy the favorite subject among the students. I had the double advantage of attending the last course of Dr. Ogden and the first of Dr. Thorburn on *materia medica* and therapeutics.

And Dr. Oldright had just begun his career of unselfish devotion to the cause of hygiene.

To one of my teachers I must pay in passing the tribute of filial affection. There are men here to-day who feel as I do about Dr. James Bovell—that he was one of those finer spirits, not uncommon in life, touched to finer issues only in a suitable environment. Would the Paul of evolution have been Thomas Henry Huxley had the Senate elected the young naturalist to a chair in this university in 1851? Only men of a certain metal rise superior to their surroundings, and while Dr. Bovell had that all important combination of boundless ambition with energy and industry, he had that fatal fault of diffuseness, in which even genius is strangled. With a quadrilateral mind, which he kept spinning like a teetotum, one side was never kept uppermost for long at a time. Caught in the storm which shook the scientific world with the publication of the *Origin of Species*, instead of sailing before the wind, even were it with bare poles, he put about and sought a harbor of refuge in writing a work on Natural Theology, which you will find on the shelves of second-hand book shops in a company made respectable at least by the presence of Paley. He was an omnivorous reader and transmutor, he could talk pleasantly, even at times transcendently, upon anything in the

science of the day, from protoplasm to evolution; but he lacked concentration and that scientific accuracy which only comes with a long training (sometimes indeed never comes), and which is the ballast of the boat. But the bent of his mind was devotional, and early swept into the Tractarian movement, he became an advanced Churchman, a good Anglican Catholic. As he chaffingly remarked one day to his friend, the Reverend Mr. Darling, he was like the waterman in Pilgrim's Progress, rowing one way, towards Rome, but looking steadfastly in the other direction, towards Lambeth. His "Steps to the Altar" and his "Lectures on the Advent" attest the earnestness of his convictions; and later in life, following the example of Linacre, he took orders and became another illustration of what Cotton Mather calls the angelical conjunction of medicine with divinity. Then, how well I recall the keen love with which he would engage in metaphysical discussions, and the ardor with which he studied Kant, Hamilton, Reed and Mill. At that day to the Rev. Prof. Bevan was intrusted the rare privilege of directing the minds of the thinking youths at the Provincial University into proper philosophical channels. It was rumored that the hungry sheep looked up and were not fed. I thought so at least, for certain of them, led by T. Wesley Mills, came over daily

*THE MASTER-WORD IN MEDICINE*

after Dr. Bovell's four o'clock lecture to reason high and long with him

“On Providence, Foreknowledge, Will and Fate,  
Fixed Fate, Freewill, Foreknowledge absolute.”

Yet withal his main business in life was as a physician, much sought after for his skill in diagnosis, and much beloved for his loving heart. He had been brought up in the very best practical schools. A pupil of Bright and of Addison, a warm personal friend of Stokes and of Graves, he maintained loyally the traditions of Guy's and taught us to reverence his great masters. As a teacher he had grasped the fundamental truth announced by John Hunter of the unity of physiological and pathological processes, and, as became the occupant of the chair of the Institutes of Medicine, he would discourse on pathological processes in lectures on physiology, and illustrate the physiology of bioplasm in lectures on the pathology of tumors to the bewilderment of the students. When in September, 1870, he wrote to me that he did not intend to return from the West Indies I felt that I had lost a father and a friend; but in Robert Palmer Howard, of Montreal, I found a noble step-father, and to these two men and to my first teacher, the Rev. W. A. Johnson, of Weston, I owe my success in life,—if success means getting what you want and being satisfied with it.



II.

Of the value of an introductory lecture I am not altogether certain. I do not remember to have derived any enduring benefit from the many that I have been called upon to hear, or from the not a few that I have inflicted in my day. On the whole I am in favor of abolishing the old custom, but as this is a very special occasion, with special addresses, I consider myself most happy to have been selected for this part of the programme. To the audience at large I fear that much of what I have to say will appear trite and commonplace, but bear with me, since, indeed, to most of you how good so ever the word, the season is long past in which it could be spoken to your edification. As I glance from face to face the most striking single peculiarity is the extraordinary diversity that exists among you. Alike in that you are men and white, you are unlike in your features, very unlike in your minds and in your mental training, and your teachers will mourn the singular inequalities in your capacities. And so it is sad to think will be your careers; for one success, for another failure; one will tread the primrose path to the great bonfire, another the straight and narrow way to renown; some of the best of you will be stricken early on the road, and will join that noble band of

*THE MASTER-WORD IN MEDICINE*

youthful martyrs who loved not their lives to the death; others, perhaps the most brilliant among you, like my old friend and comrade, Dick Zimmerman (how he would have rejoiced to see this day!), the Fates will overtake and whirl to destruction just as success seems assured. When the iniquity of oblivion has blindly scattered her poppy over us, some of you will be the trusted counsellors of this community, and the heads of departments in this Faculty; while for the large majority of you, let us hope, is reserved the happiest and most useful lot given to man—to become vigorous, whole-souled, intelligent general practitioners.

It seems a bounden duty on such an occasion to be honest and frank, so I propose to tell you the secret of life as I have seen the game played, and as I have tried to play it myself. You remember in one of the *Jungle Stories* that when Mowgli wished to be avenged on the villagers he could only get the help of Hathi and his sons by sending them the master-word. This I propose to give you in the hope, yes, in the full assurance, that some of you at least will lay hold upon it to your profit. Though a little one, the master-word looms large in meaning. It is the open sesame to every portal, the great equalizer in the world, the true philosopher's stone which transmutes all the base metal of humanity into gold. The stupid man among you it will make bright, the bright man brilliant and

THE MASTER-WORD IN MEDICINE

the brilliant student steady. With the magic word in your heart all things are possible, and without it all study is vanity and vexation. The miracles of life are with it; the blind see by touch, the deaf hear with eyes, the dumb speak with fingers. To the youth it brings hope, to the middle-aged confidence, to the aged repose. True balm of hurt minds, in its presence the heart of the sorrowful is lightened and consoled. It is directly responsible for all advances in medicine during the past twenty-five centuries. Laying hold upon it Hippocrates made observation and science the warp and woof of our art. Galen so read its meaning that fifteen centuries stopped thinking and slept until awakened by the *De Fabrica* of Vesalius, which is the very incarnation of the master-word. With its inspiration Harvey gave an impulse to a larger circulation than he wot of, an impulse which we feel to-day. Hunter sounded all its heights and depths, and stands out in our history as one of the great exemplars of its virtues. With it Virchow smote the rock and the waters of progress gushed out; while in the hands of Pasteur it proved a very talisman to open to us a new heaven in medicine and a new earth in surgery. Not only has it been the touchstone of progress, but it is the measure of success in every day-life. Not a man before you but is beholden to it for his position here, while he who addresses you has that honor directly in con-

sequence of having had it graven on his heart when he was as you are to-day. And the Master-Word is *Work*, a little one, as I have said, but fraught with momentous sequences if you can but write it on the tables of your heart, and bind it upon your foreheads. But there is a serious difficulty in getting you to understand the paramount importance of the work-habit as part of your organization. You are not far from the Tom Sawyer stage with its philosophy "that work consists of whatever a body is obliged to do and that play consists of whatever a body is not obliged to do."

A great many hard things may be said of the work-habit. For most of us it means a hard battle; the few take to it naturally; the many prefer idleness and never learn to love to labor. Listen to this: "Look at one of your industrious fellows for a moment, I beseech you," says Robert Louis Stevenson. "He sows hurry and reaps indigestion; he puts a vast deal of activity out to interest, and receives a large measure of nervous derangement in return. Either he absents himself entirely from all fellowship, and lives a recluse in a garret, with carpet slippers and a leaden inkpot; or he comes among people swiftly and bitterly, in a contraction of his whole nervous system, to discharge some temper before he returns to work. I do not care how much or how well he works, this fellow is an evil feature in other people's lives." These are

*THE MASTER-WORD IN MEDICINE*

the sentiments of an overworked, dejected man; let me quote the motto of his saner moments: "To travel hopefully is better than to arrive, and the true success is in labor." If you wish to learn of the miseries of scholars in order to avoid them, read Part I, Section 2, Member 3, Subsection XV of that immortal work, the Anatomy of Melancholy; but I am here to warn you against these evils, and to entreat you to form good habits in your student days.

At the outset appreciate clearly the aims and objects each one of you should have in view—a knowledge of disease and its cure, and a knowledge of yourselves. The one, a special education, will make you a practitioner of medicine; the other, an inner education, may make you a truly good man, four square and without a flaw. The one is extrinsic and is largely accomplished by teacher and tutor, by text and by tongue; the other is intrinsic and is the mental salvation to be wrought out by each one for himself. The first may be had without the second; any one of you may become an active practitioner, without ever having had sense enough to realize that through life you have been a fool; or you may have the second without the first, and, without knowing much of the art, you may have endowments of head and heart that make the little you do possess go very far in the

*THE MASTER-WORD IN MEDICINE*

community. With what I hope to infect you is a desire to have a due proportion of each.

So far as your professional education is concerned, what I shall say may make for each one of you an easy path easier. The multiplicity of the subjects to be studied is a difficulty, and it is hard for teacher and student to get a due sense of proportion in the work. We are in a transition stage in our methods of teachings, and have not everywhere got away from the idea of the examination as the 'be-all and the end-all;' so that the student has constantly before his eyes the magical letters of the degree he seeks. And this is well, perhaps, if you will remember that having, in the old phrase, commenced Bachelor of Medicine, you have only reached a point from which you can begin a life-long process of education.

So many and varied are the aspects presented by this theme that I can only lay stress upon a few of the more essential. The very first step towards success in any occupation is to become interested in it. Locke put this in a very happy way when he said, give a pupil 'a relish of knowledge' and you put life into his work. And there is nothing more certain than that you cannot study well if you are not interested in your profession. Your presence here is a warrant that in some way you have become attracted to the study of medicine, but the speculative possibilities so warmly

*THE MASTER-WORD IN MEDICINE*

cherished at the outset are apt to cool when in contact with the stern realities of the class-room. Most of you have already experienced the all-absorbing attraction of the scientific branches, and nowadays the practical method of presentation has given a zest which was usually lacking in the old theoretical teaching. The life has become more serious in consequence, and medical students have put away many of the childish tricks with which we used to keep up their bad name. Compare the picture of the 'sawbones' of 1842, as given in the recent biography of Sir Henry Acland, with their representatives to-day, and it is evident a great revolution has been effected, and very largely by the salutary influences of improved methods of education. It is possible now to fill out a day with practical work, varied enough to prevent monotony, and so arranged that the knowledge is picked out by the student himself, not thrust into him, willy-nilly, at the point of the tongue. He exercises his wits, and is no longer a passive Strassbourg goose, tied up and stuffed to repletion.

How can you take the greatest possible advantage of your capacities with the least possible strain? By cultivating system. I say cultivating advisedly, since some of you will find the acquisition of systematic habits very hard. There are minds congenitally systematic; others have a life-long fight against an inherited tendency to diffuse-

ness and carelessness in work. A few brilliant fellows try to dispense with it altogether, but they are a burden to their brethren and a sore trial to their intimates. I have heard it remarked that order is the badge of an ordinary mind. So it may be, but as practitioners of medicine we have to be thankful to get into this useful class. Let me entreat those of you who are here for the first time to lay to heart what I say on this matter. Forget all else, but take away this counsel of a man who has had to fight a hard battle, and not always a successful one, for the little order he has had in his life—take away with you a profound conviction of the value of system in your work. I appeal to the freshmen especially, because you to-day make a beginning, and your future career depends very much upon the habits you will form during this session. To follow the routine of the classes is easy enough, but to take routine into every part of your daily life is a hard task. Some of you will start out joyfully as did Christian and Hopeful, and for many days will journey safely towards the Delectable Mountains, dreaming of them and not thinking of disaster until you find yourselves in the strong captivity of Doubt and under the grinding tyranny of Despair. You have been over-confident. Begin again and more cautiously. No student escapes wholly from these perils and trials; be not disheartened, expect them. Let each hour



*THE MASTER-WORD IN MEDICINE*

of the day have its allotted duty, and cultivate that power of concentration which grows with its exercise, so that the attention neither flags nor wavers, but settles with a bull-dog tenacity on the subject before you. Constant repetition makes a good habit fit easily in your mind, and by the end of the session you may have gained that most precious of all knowledge—the power to work. Do not underestimate the difficulty you will have in wringing from your reluctant selves the stern determination to exact the uttermost minute on your schedule. Do not get too interested in one study at the expense of another, but so map out your day that due allowance is given to each. Only in this way can the average student get the best that he can out of his capacities. And it is worth all the pains and trouble he can possibly take for the ultimate gain—if he can reach his doctorate with system so ingrained that it has become an integral part of his being. The artistic sense of perfection in work is another much to be desired quality to be cultivated. No matter how trifling the matter on hand, do it with a feeling that it demands the best that is in you, and when done look it over with a critical eye, not sparing a strict judgment of yourself. This it is that makes anatomy a student's touch-stone. Take the man who does his 'part' to perfection, who has got out all there is in it, who labors over the tags of con-

nective tissue and who demonstrates Meckel's ganglion in his part—this is the fellow in after years who is apt in emergencies, who saves a leg badly smashed in a railway accident, or fights out to the finish, never knowing when he is beaten, in a case of typhoid fever.

Learn to love the freedom of the student life, only too quickly to pass away; the absence of the coarser cares of after days, the joy in comradeship, the delight in new work, the happiness in knowing that you are making progress. Once only can you enjoy these pleasures. The seclusion of the student life is not always good for a man, particularly for those of you who will afterwards engage in general practice, since you will miss that facility of intercourse upon which often the doctor's success depends. On the other hand sequestration is essential for those of you with high ambitions proportionate to your capacity. It was for such that St. Chrysostom gave his famous counsel, "Depart from the highways and transplant thyself into some enclosed ground, for it is hard for a tree that stands by the wayside to keep its fruit till it be ripe."

Has work no dangers connected with it? What of this bogie of overwork of which we hear so much? There are dangers, but they may readily be avoided with a little care. I can only mention two, one physical, one mental. The very best

students are often not the strongest. Ill-health, the bridle of Theages, as Plato called it in the case of one of his friends whose mind had thriven at the expense of his body, may have been the diverting influence towards books or the profession. Among the good men who have studied with me there stand out in my remembrance many a young Lycidas, 'dead ere his prime,' sacrificed to carelessness in habits of living and neglect of ordinary sanitary laws. Medical students are much exposed to infection of all sorts, to combat which the body must be kept in first class condition. Grossteste, the great Bishop of Lincoln, remarked that there were three things necessary for temporal salvation—food, sleep and a cheerful disposition. Add to these suitable exercise and you have the means by which good health may be maintained. Not that health is to be a matter of perpetual solicitation, but habits which favor the *corpus sanum* foster the *mens sana*, in which the joy of living and the joy of working are blended in one harmony. Let me read you a quotation from old Burton, the great authority on *morbi eruditorum*. There are "many reasons why students dote more often than others. The first is their negligence; other men look to their tools, a painter will wash his pencils, a smith will look to his hammer, anvil, forge; a husbandman will mend his plough-irons, and grind his hatchet, if it be

dull; a falconer or huntsman will have an especial care of his hawks, hounds, horses, dogs, &c.; a musician will string and unstring his lute, &c.; only scholars neglect that instrument, their brain and spirits (I mean) which they daily use."\*

Much study is not only believed to be a weariness of the flesh, but also an active cause of ill-health of mind, in all grades and phases. I deny that work, legitimate work, has anything to do with this. It is that foul fiend Worry who is responsible for a large majority of the cases. The more carefully one looks into the causes of nervous breakdown in students, the less important is work *per se* as a factor. There are a few cases of genuine overwork, but they are not common. Of the causes of worry in the student life there are three of prime importance to which I may briefly refer.

An anticipatory attitude of mind, a perpetual forecasting, disturbs the even tenor of his way and leads to disaster. Years ago a sentence in one of Carlyle's essays made a lasting impression on me: "Our duty is not to *see* what lies dimly at a distance, but to *do* what lies clearly at hand." I have long maintained that the best motto for a student is, "Take no thought for the morrow." Let the day's work suffice; live for it, regardless

\* Quotation mainly from Marsilius Ficinus.

of what the future has in store, believing that to-morrow should take thought for the things of itself. There is no such safeguard against the morbid apprehensions about the future, the dread of examinations and the doubt of ultimate success. Nor is there any risk that such an attitude may breed carelessness. On the contrary, the absorption in the duty of the hour is in itself the best guarantee of ultimate success. "He that regardeth the wind shall not sow, and he that observeth the clouds shall not reap," which means you cannot work profitably with your mind set upon the future.

Another potent cause of worry is an idolatry by which many of you will be sore let and hindered. The mistress of your studies should be the heavenly Aphrodite, the motherless daughter of Uranus. Give her your whole heart, and she will be your protectress and friend. A jealous creature, brooking no second, if she finds you trifling and coquetting with her rival, the younger, earthly Aphrodite, daughter of Zeus and Dione, she will whistle you off and let you down the wind to be a prey, perhaps to the examiners, certainly to the worm regret. In plainer language, put your affections in cold storage for a few years, and you will take them out ripened, perhaps a bit mellow, but certainly less subject to those frequent changes which perplex so many

young men. Only a grand passion, an all-absorbing devotion to the elder goddess can save the man with a congenital tendency to philandering, the flighty Lydgate who sports with Celia and Dorothea, and upon whom the judgment ultimately falls in a basil-plant of a wife like Rosamond.

And thirdly, one and all of you will have to face the ordeal of every student in this generation who sooner or later tries to mix the waters of science with the oil of faith. You can have a great deal of both if you only keep them separate. The worry comes from the attempt at mixture. As general practitioners you will need all the faith you can carry, and while it may not always be of the conventional pattern, when expressed in your lives rather than on your lips, the variety is not a bad one from the standpoint of St. James; and may help to counteract the common scandal alluded to in the celebrated diary of that gossipy old parson-doctor, the Rev. John Ward: "One told the Bishop of Gloucester that he imagined physitians of all other men the most competent judges of all others affairs of religion—and his reason was because they were wholly unconcerned with it."

III.

Professional work of any sort tends to narrow the mind, to limit the point of view and to put a hall-mark on a man of a most unmistakable kind. On the one hand are the intense, ardent natures, absorbed in their studies and quickly losing interest in everything but their profession, while other faculties and interests 'rust' unused. On the other hand are the bovine brethren, who think of nothing but the treadmill and the corn. From very different causes, the one from concentration, the other from apathy, both are apt to neglect those outside studies that widen the sympathies and help a man to get the best there is out of life. Like art, medicine is an exacting mistress, and in the pursuit of one of the scientific branches, sometimes, too, in practice, not a portion of a man's spirit may be left free for other distractions, but this does not often happen. On account of the intimate personal nature of his work, the medical man, perhaps more than any other man, needs that higher education of which Plato speaks,—“that education in virtue from youth upwards, which enables a man eagerly to pursue the ideal perfection.” It is not for all, nor can all attain to it, but there is comfort and help in the pursuit, even though the end is never reached. For a large majority the daily round

and the common task furnish more than enough to satisfy their heart's desire, and there seems no room left for anything else. Like the good, easy man whom Milton scores in the *Areopagitica*, whose religion was a "traffic so entangled that of all mysteries he could not skill to keep a stock going upon that trade" and handed it over with all the locks and keys to "a divine of note and estimation," so is it with many of us in the matter of this higher education. No longer intrinsic, wrought in us and ingrained, it has become, in Milton phrase, a 'dividual movable,' handed over nowadays to the daily press or to the hap-hazard instruction of the pulpit, the platform or the magazines. Like a good many other things, it comes in a better and more enduring form if not too consciously sought. The all-important thing is to get a relish for the good company of the race in a daily intercourse with some of the great minds of all ages. Now, in the spring-time of life, pick your intimates among them, and begin a systematic cultivation of their works. Many of you will need a strong leaven to raise you above the level of the dough in which it will be your lot to labor. Uncongenial surroundings, an ever-present dissonance between the aspirations within and the actualities without, the oppressive discords of human society, the bitter tragedies of life, the *lacrymae rerum*, beside the hidden springs of which we sit in sad despair—



THE MASTER-WORD IN MEDICINE

all these tend to foster in some natures a cynicism quite foreign to our vocation, and to which this inner education offers the best antidote. Personal contact with men of high purpose and character will help a man to make a start—to have the desire, at least, but in its fulness this culture—for that word best expresses it—has to be wrought out by each one for himself. Start at once a bed-side library and spend the last half hour of the day in communion with the saints of humanity. There are great lessons to be learned from Job and from David, from Isaiah and St. Paul. Taught by Shakespeare you may take your intellectual and moral measure with singular precision. Learn to love Epictetus and Marcus Aurelius. Should you be so fortunate as to be born a Platonist, Jowett will introduce you to the great master through whom alone we can think in certain levels, and whose perpetual modernness startles and delights. Montaigne will teach you moderation in all things, and to be “sealed of his tribe” is a special privilege. We have in the profession only a few great literary heroes of the first rank, the friendship and counsel of two of whom you cannot too earnestly seek. Sir Thomas Browne’s *Religio Medici* should be your pocket companion, while from the Breakfast Table Series of Oliver Wendell Holmes you can glean a philosophy of life peculiarly suited to the needs of a

physician. There are at least a dozen or more works which would be helpful in getting that wisdom in life which only comes to those who earnestly seek it.

A conscientious pursuit of Plato's ideal perfection may teach you the three great lessons of life. You may learn to consume your own smoke. The atmosphere of life is darkened by the murmurings and whimperings of men and women over the non-essentials, the trifles that are inevitably incident to the hurly burly of the day's routine. Things cannot always go your way. Learn to accept in silence the minor aggravations, cultivate the gift of taciturnity and consume your own smoke with an extra draught of hard work, so that those about you may not be annoyed with the dust and soot of your complaints. More than any other the practitioner of medicine may illustrate the second great lesson, that we are here not to get all we can out of life for ourselves, but to try to make the lives of others happier. This is the essence of that oft-repeated admonition of Christ, "He that findeth his life shall lose it, and he that loseth his life for my sake shall find it," on which hard saying if the children of this generation would only lay hold, there would be less misery and discontent in the world. It is not possible for any one to have better opportunities to live this lesson than you will enjoy. The practice

of medicine is an art, not a trade, a calling, not a business, a calling in which your heart will be exercised equally with your head. Often the best part of your work will have nothing to do with potions and powders, but with the exercise of an influence of the strong upon the weak, of the righteous upon the wicked, of the wise upon the foolish. To you as the trusted family counsellor the father will come with his anxieties, the mother with her hidden grief, the daughter with her trials and the son with his follies. Fully one-third of the work you do will be entered in other books than yours. Courage and cheerfulness will not only carry you over the rough places of life, but will enable you to bring comfort and help to the weak-hearted and will console you in the sad hours when, like Uncle Toby, you have "to whistle that you may not weep."

And the third great lesson you may learn is the hardest of all—that the law of the higher life is only fulfilled by love or charity. Many a physician whose daily work is a daily round of beneficence will say hard things and will think hard thoughts of a colleague. No sin will so easily beset you as uncharitableness towards your brother practitioner. So strong is the personal element in the practice of medicine, and so many are the wagging tongues in every parish, that evil speaking, lying and slandering find a shining mark in

*THE MASTER-WORD IN MEDICINE*

the lapses and mistakes which are inevitable in our work. There is no reason for discord and disagreement, and the only way to avoid trouble is to have two plain rules. From the day you begin practice never under any circumstances listen to a tale told to the detriment of a brother practitioner. And when any dispute or trouble does arise, go frankly, ere sunset, and talk the matter over, in which way you may gain a brother and a friend. Very easy to carry out, you may think! Far from it; there is no harder battle to fight. Theoretically there seems to be no difficulty, but when the concrete wound is rankling and after Mrs. Jones has rubbed in the cayenne pepper by declaring that Dr. J. told her in confidence of your shocking bungling, your attitude of mind is that you would rather see him in purgatory than make advances towards reconciliation. Wait until the day of your trial comes and then remember my words.

And in closing may I say a few words to the younger practitioners in the audience whose activities will wax not wane with the growing years of the century which opens so auspiciously for this school, for this city and for our country. You enter a noble heritage, made so by no efforts of your own, but by the generations of men who have unselfishly sought to do the best they could for suffering mankind. Much has been done, much remains

to do; a way has been opened, and to the possibilities in the scientific development of medicine there seems to be no limit. Except in its application, as general practitioners you will not have much to do with this. Yours is a higher and a more sacred duty. Think not to light a light to shine before men that they may see your good works; contrariwise, you will join the great army of quiet workers, physicians and priests, sisters and nurses, all over the world, the members of which strive not neither do they cry, nor are their voices heard in the streets, but to them is given the ministry of consolation in sorrow, need and sickness. Like the ideal wife of whom Plutarch speaks, the best doctor is often the one of whom the public hears least; but nowadays in the fierce light that beats upon the hearth it is increasingly difficult to live the secluded life in which our best work is done. To you the silent workers of the ranks, in villages and country districts, in the slums of our large cities, in the mining camps and factory towns, in the homes of the rich and in the hovels of the poor—to you is given the harder task of illustrating in your lives the old Hippocratic standards of Learning, of Sagacity, of Humanity and of Probity. Of Learning that you may apply in your practice the best that is known in our art, and that with the increase in your knowledge there may be an increase in that priceless endowment of Sagacity, so

*THE MASTER-WORD IN MEDICINE*

that to all everywhere skilled succor may come in the hour of urgent need. Of a Humanity that will show in your daily life tenderness and consideration to the weak, infinite pity to the suffering and a broad charity to all. Of a Probity that will make you under all circumstances true to yourselves, true to your high calling and true to your fellow men.

CCXLIX  
249

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## TYPHOID FEVER AND TUBERCULOSIS.<sup>1</sup>

BY

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Two patients in the wards of the Johns Hopkins Hospital illustrate the important relations which may exist between typhoid fever and tuberculosis.

1. The diseases may be concurrent. A person with chronic tuberculosis may contract the fever. Of 80 autopsies in typhoid fever, 4 presented marked tuberculous lesions. Less frequently miliary tuberculosis and typhoid fever may occur together.

2. Enteric fever may be mistaken for tuberculosis. This, I think, is rare. You will find on page 464 of Series III of "Studies in Typhoid Fever,"<sup>2</sup> a case in which for nearly 2 weeks we suspected a tuberculous pneumonia and looked for tubercle bacilli. The disease began with a slight fever, headache, cough, and on examination there was impaired resonance in the right infrascapular region with tubular breathing and moist rales. Ten days after admission to the ward the left lower lobe was involved. The patient had a bad family history, one sister having died of tuberculosis, and for the first 2 weeks we were very anxious indeed. Then the picture changed entirely. She had a continuously high temperature, rose spots appeared, the spleen enlarged, and the symptoms of typhoid fever became well marked. The Widal reaction was not positive until the end of the third week. Such cases are not common.

3. Very much more frequently tuberculosis is mistaken for typhoid fever, a point which these cases illustrate. There are 5 types of tuberculous infection which may simulate typhoid fever—the acute miliary form, tuberculous meningitis, tuberculous peritonitis, the acute toxemia of certain local lesions, and forms of pulmonary tuberculosis. You will find much in the literature on

<sup>1</sup> Clinical Remarks, Johns Hopkins Hospital, October 24, 1903.

<sup>2</sup> Johns Hopkins Hospital Reports, Vol. viii.

the question of the diagnosis in the first three of these groups, but not on the last two, and, judging from my personal experience, the profession is not fully alive to the importance of the subject.

The patient, H. L. D., a man aged 30 (Hosp. No. 44,014) was admitted on September 13, 1903, complaining of shortness of breath, pleuritic pains, and cough. His habits had been fairly good. He had worked hard. His present illness had begun 2 weeks before admission with pain in the left chest and back. He did not feel very ill, and continued at work until September 13, the day before admission. He thought he had had some fever at times. On September 12, he had epistaxis and 2 chills in quick succession. On the night of September 11 and ever since he has had fever. There had been no cough and no diarrhea. Altogether the features of onset resembled very much those of typhoid, and on admission he had a temperature of 102°, pulse 108, respirations 24. The leukocytes were 5,500 per centimeter. He looked ill; had a heavy drowsy expression. The abdomen looked natural. The spleen was not felt. There were no rose spots. On examining the lungs, there was impaired resonance in the left infrascapular region with distant tubular breathing, distinctly blowing on expiration, and on coughing a shower of fine, crepitant rales. The patient coughed a little every day, but there was at first no sputum. On September 17, Dr. Fitcher noticed that he was a little cyanosed, and there was on the left side of the chest a leathery friction. The sputum on this day was examined for tubercle bacilli, but was negative. His general condition remained good. The temperature ranged between 102° and 103°, and was very steady. There were no sweats. In the next few days there was no special change in the character of the pulmonary signs. The involvement of the left lower lobe was marked, and the tubular breathing became more distinct. There were no rose spots, and the nature of the case was doubtful. The leukocytes were not increased. The Widal reaction was negative. The absence of more positive signs of typhoid fever and the absence of rose spots and the Widal reaction, made the marked pulmonary features more significant, and the sputum was examined with great care. On September 25, a few bacilli were noticed, which were regarded as suspicious, and on September 26, well-characterized tubercle bacilli were present. Elastic tissue was not found. The local signs persisted at the left base, but the fever gradually subsided, the respirations were not above 24, and on September 27, the temperature became normal. The chart is very suggestive of a mild typhoid subsiding in the third week, and had not the pulmonary symptoms been pronounced and the tubercle bacilli so definite, I think we should have had much difficulty in making a positive diagnosis. At present there is impairment of resonance at the left base with distant tubular breathing. The cough has lessened, he has had no sputum, and he looks as though he were going to do very well.

The issue in these cases is not always so satisfactory. We had a sad lesson 5 or 6 years ago.

A medical student, Edward S. O., aged 26, was admitted to Ward C on June 13, 1898, complaining of fever and headache and cough. His father had died 18 years before of tuberculosis, and two uncles on the mother's side had died of tuberculosis. He



had been very healthy and well. He had just finished his examination and had naturally been somewhat "used up." On Saturday, June 4, he had slept in a draught, and on the following morning he was very heavy and drowsy. On Monday morning he took a long walk, began to feel feverish and had creepy, chilly sensations. He felt very badly on Tuesday and started for Baltimore. He had a little diarrhea that week, headache and fever persisted, and on Sunday morning, June 12, he began to cough. He had loss of appetite; no diarrhea.

On admission the temperature was  $101.3^{\circ}$ ; pulse 96. Leukocytes 8,200. He felt very much prostrated, but on coughing he felt no pain; he had no expectoration. No rose spots were seen. The Widal reaction was not present. He was dull and drowsy, complained of severe headache, and was easily excited. The lungs were very carefully examined on June 13 and June 14, and there were no special signs detected. Throughout the month of June the fever persisted, once reaching  $103^{\circ}$ , usually about  $102^{\circ}$  in the evening. The Widal reaction was not present, there were no rose spots, and the spleen was not enlarged. The tongue was slightly coated and the bowels were constipated. There was no diazo reaction in the urine, no albumin, no tube casts. When I left town about the middle of the month my impression was that he had typhoid fever. Throughout July the condition remained practically the same. There were repeated notes of the physical examination. The temperature range was perhaps a little lower, particularly the evening record, and after July 15 it rarely rose in the evening above  $101^{\circ}$ , and in the morning was usually normal. The spleen was not palpable. After the middle of July the tongue was clean. The only suspicious points at all were a little pain on deep inspiration, and there were a few fine rales heard at both bases. There was no cough. On July 26 it had become evident that there was trouble in the right lung. There was a tympanitic note at the right apex; there was flatness in the lower interscapular region and in the infrascapular area, with tubular breathing and fine moist rales. He seemed, however, to be doing very well. The appetite was good and he had no cough and no expectoration. By this time the possibility of tuberculosis was entertained, but it was not possible to say definitely. On July 28, the red blood-corpuscles were about 4,000,000; there was no leukocytosis. Early in August he improved a great deal. The temperature was rarely above  $100.5^{\circ}$  and the respirations were only 20. He had little or no cough, and he seemed very much better. He left the hospital on August 10. There was still an area of consolidation at the right base. Subsequently he grew very much worse, the tuberculosis became quite manifest and he went to the Adirondacks, where he was under the care of Dr. Trudeau for several years.

Dr. Thayer and I were criticised very severely by the family for having regarded this case at the outset as one of typhoid fever. In truth we never reached a definite conclusion, and the diagnosis which Dr. Thayer put down on the history sheet was "Continued Fever; Pneumonia (Tuberculous?)." Under the circumstances I do not think that we could have done anything else, but the case illustrates a serious clinical difficulty which you will find very hard to meet.

There is in the private ward at present another case which illustrates the readiness with which this mistake may be made.

A young married woman, aged 26 (Hosp. No. 44,466); with a good family history, noticed in May of this year that she had some "bubbling feelings" on the left side. She was pregnant at the time; her child was born June 13, shortly after which time she began to have a cough, with pain in the left shoulder. Ten days after delivery she got up, but she felt weak and feeble and she had cough and night-sweats. She was sent to the country and in the fourth week in July she was confined to bed with fever. The temperature rose to between  $102^{\circ}$  and  $103^{\circ}$ , and the diagnosis of typhoid fever was made. She was placed on a liquid diet. She continued in bed, supposed to have typhoid or typhomalarial fever, until the middle of September, when she was allowed to get up. Shortly afterward the fever reappeared, of a remittent type. She had a great deal of cough and mucopurulent expectoration. She lost in weight, the fever persisted and she applied at the hospital on October 22, believing that she had some sequel of typhoid fever.

The chest showed marked asymmetry, owing to shrinkage of the left side. The muscles of the left shoulder girdle were wasted, and there were signs of extensive disease in the left lung. The sputum was profuse, mucopurulent, and contained very many tubercle bacilli. Her temperature-range while she was in the hospital was from  $99.5^{\circ}$  to  $103^{\circ}$ .

Here the pulmonary tuberculosis was latent in onset, probably before the birth of her baby. As is so often the case, rapid progress was made during lactation, and the fever was mistaken for typhoid. Apparently, no suspicion had been entertained of tuberculosis.

4. In rare cases pulmonary consumption follows typhoid fever.

You not infrequently see the statement made that patients convalescent from this disease are particularly prone to tuberculosis. I do not think the facts warrant this, and I believe very many of these cases are tuberculous from the outset. The original attack, as in the case of the young man you have just seen, simulates typhoid fever so closely that the physician is deceived. Then pulmonary symptoms supervene, and it is thought that the tuberculosis has come on after typhoid fever. Every year I see one or two cases of this sort, and I am glad to have had this opportunity of bringing the subject before you, as one of great importance which has scarcely received the attention it deserves.

THE HOME IN ITS RELATION TO THE  
TUBERCULOSIS PROBLEM.

BY

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# THE HOME IN ITS RELATION TO THE TUBERCULOSIS PROBLEM.

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[A lecture delivered under the auspices of the Phipps Institute, Philadelphia, December 3, 1903.]

## I.

IN its most important aspects the problem of tuberculosis is a home problem. In an immense proportion of all cases the scene of the drama is the home; on its stage the acts are played, whether to the happy issue of a recovery, or to the dark ending of a tragedy, so commonplace as to have dulled our appreciation of its magnitude. In more than 400 homes of this country there are lamentations and woe to-night: husbands for their wives, wives for their husbands, parents for their children, children for their parents. A mere repetition of yesterday's calamities! and if the ears of your hearts are opened you can hear, as I speak, the beating of the wings of the angels of death hastening to the 400, appointed for to-morrow. That this appalling sacrifice of life is in large part unnecessary, that it can be diminished, that there is hope even for the poor consumptive—this represents a revolution of feeling from an attitude of oriental fatalism which is a triumph of modern medicine. Our French brethren have made the present position of the question possible. Laennec, the father of modern clinical medicine, gave us the pathology of the disease—and much more. While Galen, Frascatorius, Morton and others believed strongly in the contagiousness of phthisis, it remained for Villemain to demonstrate its infectiveness by a series of brilliant experiments which made Koch's work inevitable; while to Verneuil, Chauveau, Nocard, Brouardel and others we owe the initiation of those local and international congresses which have done so much to rend the veil of familiarity, and to educate the public and the profession to a point at which scientific knowledge has become effective. It seems a law that all great truths have to pass through a definite evolution before they reach a stage of practical utility. First the pioneers, seeing as through a glass darkly groped blindly for the truth, but worked so effectually that by the seventh decade of the nineteenth century we had a clear pathology of tuberculosis and an accurate symptomatology; while in each generation a man had not been wanting, who, like Sydenham, or George Bodington, appreciated the essentials of treatment, as we recognize them to-day. Then Villemain and Koch demonstrated the truth of the infectivity of the disease and the presence of a specific germ. Watchers on the towers, like the late Austin Flint, a lifelong student of the disease, welcomed the announcement as the much-wished-for fulfilment of a prophecy; but, as Plato

shrewdly remarks, we are not all awake when the dawn appears, and many in this audience, like myself, had to see the truth grow to acceptance with the generation in which it was announced. It is a horrible thought, but very true, that we reach a stage in life, some earlier, some later, in which a new truth, a perfectly obvious truth, cannot be accepted; and the work of Villemain and of Koch fared no whit better with the seniles and the pre-seniles of the seventh and eighth decades of the last century than did Harvey's immortal discovery in his day, or for the matter of that, did Lister's great work. And now we are in the third or final stage, in which the truth is becoming an effective weapon in the hands of the profession and of the public. The present crusade against tuberculosis, which is destined to achieve results we little dream of, has three specific objects; first, educational—the instruction of the profession and the instruction of the people; second, preventive—the promotion of measures which will check the progress of the disease in the community; third, curative—the study of methods by which the progress of the disease in individuals may be arrested or healed. The three are of equal importance, and the first and the second closely related and interdependent. The educational aspects of the problem are fundamental. Nothing can be done without the intelligent cooperation of the general practitioners and of the community, and it is a wise action on the part of the Phipps Institute to take up actively this part of the work, and to spread a sound knowledge by lecture courses and by publications. It is not too much to say that could we get on the part of the doctors throughout the country an early recognition of the cases, with a practical conviction of the necessity of certain urgent and obvious measures, and on the part of the public attention to hygienic laws of the most elementary sort—could we in this way get the truth we know into the stage of practical efficiency, the problem would be in sight of solution.

Of late years there have been done in this country three pieces of work relating to tuberculosis of the first rank—that of Trudeau in the Adirondacks, enforcing on our minds the importance of the sanitarium treatment of early cases; that of Biggs and his associates in the New York Board of Health in demonstrating how much can be done by an efficient organization; and, thirdly, the work of Lawrence F. Flick, the Director of the Phipps Institute, in demonstrating by a long and laborious research the dangers of the house

in the propagation of the disease. In casting about for a subject it seemed to me most appropriate to discuss those aspects of the problem which concern the home in its relations to the disease, since after all the battlefield of tuberculosis is not in the hospitals or in the sanatoria, but in the homes, where practically the disease is born and bred.

II.

The germ of tuberculosis is ubiquitous; few reach maturity without infection; none reach old age without a focus somewhere. This is no new opinion. Gideor Harvey, in his *Morbus Anglicus* (1672, 2d Ed.) says: "It's a great chance we find, to arrive to one's grave in this English climate, without a smack of a consumption, Death's direct door to most hard students, divines, physicians, philosophers, deep lovers, zealots in religion," which is the English equivalent of the German popular saying, "Jedermann hat am Ende ein bischen Tuberculose." This may seem an exaggerated statement, but the records of Naegeli demonstrate its truth. After all, it is only from the post-mortem table that we can get a true statement of the frequency of tuberculosis in the community. It has long been known that a very considerable percentage of persons not dying from consumption have the lesions of tuberculosis. The records have ranged in different series from 7.5 per cent. (Osler), to 38.8 per cent. (Harris). But these studies were not made directly with a view of determining the presence of tuberculosis. They were the ordinary, everyday observation of the post-mortem room. The only series which we have dealing with this question in a satisfactory way is the study of 500 post mortems in Prof. Ribbert's Institute in Zurich, by Naegeli. It is to be borne in mind that in his work special examination was made of every organ of the body; sections were made of all parts with the greatest care, and the individual lymph glands particularly inspected. Tuberculous lesions were found in 97 per cent. of the bodies of adults.\* He gives a very interesting curve showing the incidence at different ages. Up to the fifteenth year there was only 50 per cent., then there was a sudden rise in the eighteenth year to 96 per cent., with a slow rise, so that by the fortieth year a tuberculous focus was found in everybody. This careful research demonstrates the extraordinary susceptibility in man to tuberculous infection, and an equally extraordinary degree of resistance. In the tuberculin experiments of Franz on healthy Austrian soldiers a reaction was shown in over 60 per cent., so that we must accept the conclusion that tuberculous infection, latent tuberculosis, is much more extensive than is the manifest disease.

One interesting point is that we are never left long in peaceful possession of a satisfactory belief about the modes of infection in tuberculosis. No sooner had the pool got quiet and we had set-

tled into a comfortable conviction of the unity of human and bovine tuberculosis, than Koch stepped in and troubled the waters with his views on their dual nature; and now, just as the commotion was subsiding, von Behring stirs the waters by referring all tuberculosis to the milk-jug. But none of these investigations have diminished the importance of the home as the chief source of infection, the place in which the conditions favoring contamination are most common, particularly among the poor. Nor do I think that we can give up the view of aerial convection and of primary inhalation infection in a large proportion of the cases. Figures are, of course, tricky playthings, but it does seem that the overwhelming evidence of the prevalence of bronchial and pulmonary tuberculosis in children is in favor of the older views. After all, how rare is intestinal tuberculosis as a primary lesion, and if, as von Behring supposes, there is a special vulnerability of the bowels in childhood, we should expect a much larger number of cases. It is quite possible, as he has shown, and as Ravenel has demonstrated, that the bronchial and cervical lymph glands may be the first attacked in an animal infected through the intestines; yet the incidence in childhood of respiratory disease is so large, and the incidence of intestinal lesions is so small, that it counts strongly against von Behring's new views. In fact, primary intestinal tuberculosis is extraordinarily rare. Koch states that there have only been ten cases in ten years at the Charité Hospital, Berlin, and of 3,104 instances of tuberculosis in children there were, according to Biedert, only 16 cases, while in adults primary intestinal tuberculosis occurred in but one instance in 1,000 autopsies at the Munich Pathological Institute. In this country the studies of Bovaïrd in New York and of Hand in Philadelphia speak strongly in favor of air-borne infection in the large majority of cases in children. There is a special liability of the milk to become contaminated by the dust in uncleanly streets and in dirty houses, and upon this mode of infection von Behring lays great stress, and in infancy, either in this way or from the milk of tuberculous cows, he thinks the majority of persons become infected. Apparently he does not adopt Baumgarten's view of the latency of the germ itself, but of the latency of small foci of disease acquired in childhood, which only develop into active tuberculosis under favorable circumstances. It may be well to quote his own words in this connection, as his views are of importance: "I am well acquainted with the statistical arguments based on the higher returns of infection and mortality from consumption amongst attendants on the sick residents in houses occupied by people known to be phthisical, and inmates of prisons, which are intended to demonstrate the origin of pulmonary phthisis from the inhalation of particles of dust, or moisture containing tubercle bacilli. But in view of the extensive dissemination of tuberculosis above described amongst the human race, there is ample justifi-

\* Virchow's Archiv, 900, Bd. CLX, page 426.

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cation for the objection that in cases of this kind, where persons succumb to pulmonary phthisis, tuberculous foci pre-exist in their lungs, and that these pulmonary lesions already present developed into active consumption, owing to the adoption by those persons of a mode of life favoring tuberculosis." (*British Medical Journal*, Translation Oct. 17, 1903.)

We need a systematic inspection, according to Naegeli's method, of the bodies of children dead of acute diseases, so as to get, if possible, the true incidence of infection in them. Councilman and others have shown how frequently tuberculosis is present in the bodies of young children dead of diphtheria, but the statistics at our disposal certainly do not bear out this view of von Behring, which would lead us to suppose that infection was largely a matter of childhood. Naegeli's figures on this point are interesting, though he only had 88 autopsies on children. Still his results are of value, as the inspections were made with such very special care. Of these 88 children there were only 15 with tuberculous lesions. In 10 of these the tuberculosis ran a fatal course; in 4 there were advanced lesions which did not cause death, and in only 1 was there a definitely healed lesion.

Sown broadcast as they are in our modern life, it is evident that few people reach maturity without harboring the seeds of tuberculosis. That we do not all die of the disease is owing to the resistance of the tissues, in other words, to an unfavorable, *i. e.*, the rocky soil on which the seeds have fallen. The parable of the sower sets forth in an admirable way the story of the disease. Since I used it in 1892, the illustration has become hackneyed, but in a semi-popular lecture I may be permitted to employ it again. The seed that falls by the wayside are the bacilli that reach our great highways, the air passages and intestines, in which they are picked up by the phagocytes, representing the birds of the air, or they are trodden under foot by the swarms of contending organisms. The seed that falls on stony places is that which reaches the lymph-nodes of the bronchi and mesentery, and though it springs up and flourishes for a while, there is no depth of earth, and, lacking moisture, it withers away into cretaceous healing. And that which falls among thorns represents the bacilli which effect a lodgment in the lungs, the kidneys or elsewhere, where they thrive and grow and produce extensive changes, but the thorns—the equivalent of the cares of this world and the deceitfulness of riches, in the parable—grow up also, and in the form of delimiting inflammatory processes and of contracting fibrosis, choke the seed, and recovery ultimately takes place. But falling on good ground, the seed springs up, increases and brings forth fruit some thirty, some sixty and some a hundredfold, which may be taken to represent the cases of chronic, subacute and acute tuberculosis. We are beginning to appreciate that the care of the soil is quite as important as the care of the seed. We cannot re-

peat Trudeau's remarkable environment experiment in our cities, but we learn a practical lesson of the influence of fresh air, open spaces and sunlight upon infected individuals. Much has already been done in this direction, and the reduction of the mortality from tuberculosis which has been going on for the past twenty-five years has been in great part due to improved sanitation. We have only made a beginning, but to know the enemy in this case, to know that his strength lies in the homes of the poor, is more than half the battle.

Let us look at the conditions confronting us in one of the large eastern cities. Like Philadelphia, Baltimore is fortunate in the absence of big tenement houses, but, like it, too, it has the disadvantage of a large number of very narrow streets and alleys. There is no drainage system, the sewerage is collected into cesspools, while the surface water and the water from the kitchens runs off on surface drains. There is a very large foreign population and a large number of colored people. While tuberculosis is a very common disease, I do not think the mortality in Baltimore is specially high. In the report of the Board of Health for the year 1901, there were 1,274 deaths from the disease in a total mortality of 10,479, about 12 per cent.

Four years ago two ladies, interested in the disease, gave me a sum of money to use in connection with our work at the Johns Hopkins Hospital. We do not take many cases of tuberculosis into the wards. Last year there were only 53. They come chiefly for the purpose of diagnosis, and we often admit patients from outside the city on purpose to teach them for a period of a week or ten days, just how to regulate their lives. It seemed best to try to do something for our consumptive out-patients, of whom we have an average of about 200 new cases in the year. It seemed to me that a good and useful work could be done by the personal visits of an intelligent woman to the houses of these patients, that she might show them exactly how to carry out the directions of the physician and give them instructions as to the care of the sputum, the preparation of food, and when necessary to report to the Charity Organization as to the need of special diet, or to the Health Board when the surroundings were specially unsanitary. In connection with this an inspection has been made of the condition under which these people live. Of the 726 cases, 545 were whites, and 181 blacks. Among the whites were 53 Russian Jews. There were 492 males, 234 females. The analysis of the reports of Miss Dutcher, Miss Blauvelt and Miss Rosencrantz during the past four years is briefly as follows:

	Russian	Colored	White
Bad sanitary location.....	62%	53%	36%
Insufficient light and ventilation.....	71%	68%	39%
Overcrowding.....	61%	41%	25%
Personal and household uncleanness.....	70%	56%	30%

The white population in a large majority of the cases was distributed irregularly throughout the city, but a large proportion live in good loca-

tions, many even on new streets in the suburbs. A small percentage, about 20, live in a bad neighborhood, where the houses are close together and hemmed in by narrow alleys and courts. This region lies chiefly to the south and west of the hospital toward the harbor. In about a third of these people the personal and household cleanliness is fairly good. The colored people make up about a fourth of the cases. They live in much more unfavorable localities, chiefly in narrow, thickly populated and dirty alleys in small, two-story houses, usually old, and the windows often limited to the front—houses in which proper lighting and ventilation are impossible. One important feature in the colored population is the desire always to occupy their own houses, so that there is a comparatively little overcrowding. The Russian Jews form about one-fourteenth of the total number of patients. They live in a neighborhood that was at one time inhabited by the wealthier classes and the houses have now been converted into tenements. The streets are in many cases wide and clean and sunny. The percentage of overcrowding in the rooms is high. Very often a family of seven or eight is found in two rooms. The contrast in the matter of personal and household cleanliness between the Russians and the other whites is most striking. It is exceptional to find the former in a condition, either in person or house, that could be termed in any way cleanly. A very serious thing is the frequency with which the patients move from one place to another. The 726 patients had during their illnesses occupied 935 houses. Last year the percentage of removals was still higher. The 183 patients had occupied 379 houses. Another important point brought out was the fact that fully 66 per cent. of the patients visited did not sleep alone.

Amid such sanitary surroundings the patient can scarcely avoid contaminating the house in which he lives, while perhaps more important still, the environment, combined with insufficient food, etc., lowers the resistance of the other members of the family and renders them more liable to active disease.

How are we to combat these conditions? *First*, by an educational health campaign in the homes. The young women who have been engaged in this work in Baltimore have frequently reported to me the readiness with which their suggestions have been accepted, particularly in regard to the care of the sputum. To be successful such a campaign must be carried out by the Board of Health, and a staff of trained visitors, women preferably, should do the work. To carry this out effectually there should be, *secondly*, in all cities a compulsory notification of cases. The plan has worked most successfully in New York, and it should be everywhere followed. There are no difficulties which cannot be readily surmounted, and there need be no hardships. *Thirdly*, in most cities the powers of the Health Boards should be greatly enlarged, so as to deal efficiently with the question of proper disinfection of

the houses occupied by tuberculous patients. *Fourthly*, the question of the housing of the poor needs attention, particularly in the matter of proper control of tenements, and the regulation, by law, of the number of persons in each house. *Fifthly*, by placing upon the landlord the responsibility of providing, under the control of the Board of Health, a clean, wholesome house for a new tenant. *Sixthly*, the wholesale condemnation of unsanitary streets and blocks, and the rebuilding by the municipality, as has been done in Glasgow and elsewhere. We cannot make people cleanly or virtuous by act of the legislature, at the same time we cannot leave important sanitary details in the hands of irresponsible persons whose view of life is limited to returns and rentals. The extraordinary reduction in the mortality from consumption in the large cities is due directly to an improvement in environment. That much more remains to be done in the way of betterment the facts I have presented fully show.

### III.

And then we have to face the all-important fact that at present an immense majority of all tuberculous patients have to be treated at home. Probably not 2 per cent. of the cases can take advantage of sanitarium or climatic treatment. What has the new knowledge to say to the 98 per cent., which is debarred from the enjoyment of these two great *adjutores vite*? Very much! Read aright, a message of hope to many. Just as we have learned that climate in itself is not the prime essential, but a method of life in any climate, so we have found that even under the most unfavorable surroundings many cases recover in town and country, if rigid system and routine are enforced. But "Hope, that comes to all," as the poet sings, comes not to the large proportion of the unhappy victims in our overgrown and crowded cities. What but feelings of despair can fill the mind in the contemplation of facts such as I have laid before you in the analysis of our inspection in Baltimore? So numerous are the patients that private beneficence shrinks at a task, which the city and State authorities have not yet mustered courage to attack, except in one or two places. Hospital care for advanced cases, sanitarium treatment for incipient cases can only be provided by an enormous expenditure, but we must not be discouraged, and the good work begun in Massachusetts, New York and in this State will grow and prosper. After all, the campaign in which we are engaged is one of education; only let us not forget that teaching has not all been on the side of the profession. We have all been at school during the past quarter of a century, and at school we must remain, at once teachers and pupils, if we are to make the knowledge we possess effective. We are not living in Utopia, and in the matter of sanitation the man on the street is a blundering, helpless creature whose lessons are put bodily into him at a heavy cost of life and health. You know this story only too well in Philadelphia. To provide accommo-

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dition for all consumptives is impossible, but it is not unreasonable to look forward to the day when every large city will have a sanitarium for the treatment of the early cases, situated not far from its outskirts, with all the equipment for open-air treatment. Let there be some place at least where a poor workman or working woman may have a chance for life. Now, as we doctors know only too well, hundreds are sacrificed in whom the disease could have been arrested. The hospital care of the very sick should be provided for in special wards of the city hospitals. To give the best of care to these unhappy victims is a true charity to them; to place them where they cease to be a danger to the general health is a true charity to others.

In the warfare against tuberculosis the man behind the gun is the general practitioner. The battle cannot be won unless he takes an active, aggressive, accurate part. That he is not always alert must be attributed in part to the carelessness which a routine life readily engenders, and partly to a failure to grasp the situation in individual cases. The two points to be impressed upon him are first, that *early recognition of the disease can only come from better methods of practice and greater attention to the art of diagnosis*. The insidiousness of the onset, the protean modes of advance, and the masked features of even serious cases should never be forgotten. As Garth so well puts it in his *Dispensary* (1699):

"Whilst meagre *Phthisis* gives a silent blow;  
Her *strokes* are sure; but her advances slow.  
No loud alarms, nor fierce assaults are shown,  
She starves the *fortress* first, then takes the *town*."

Too often precious time is wasted and the golden opportunity is lost by the failure of the physician to make a thorough examination of the chest. I am every day impressed with the necessity of more rigid, routine examination, even of the "ordinary case." In illustration of the carelessness which is so readily acquiesced in, let me mention a patient who was brought to me only a few weeks ago, supposed to have a protracted fever after typhoid. Her father, a physician, her husband a physician, and it is scarcely credible that neither of them had the faintest idea that the poor soul had advanced consumption, though it had reached a stage in which there was shrinkage of one side of the chest, and the diagnosis could almost be made by inspection alone. The carelessness is a sort of mental inadvertence, to which even the best of us at times seem liable. A very distinguished and careful physician brought his daughter to me a few years ago to have her blood examined, as he felt sure she had a chronic malaria. She had little or no cough, but an afternoon rise of temperature, and it turned out to be the usual story—quite pronounced local disease at her left apex. There had not been a suspicion on the part of her father or of the family.

On the other hand, we must be careful not to diagnose tuberculosis too readily. The physicians

of our sanitarium have a good many tales to tell in this matter.

The second point is the *necessity for a more masterful management of the early cases*. Here comes in that personal equation so important in practice, and which has such a vital bearing in the prognosis of the disease. The dead hand of the Arabian still presses sore upon our practice, and precious weeks are too often lost in trusting to a polypharmacy which in some instances would make the heart of Avicenna or Averroes to rejoice. It may seem hard to say so, but my firm conviction is that more tuberculous patients are injured than helped by drugs. We have not yet come to the belief—to the practical belief, at any rate—that the disease is not to be treated by them. After so much has been written and spoken, one would suppose that the essential features of the treatment of the disease were generally recognized, but the practical experience of any man who sees a great deal of tuberculosis is directly to the contrary. It is not so much that the drugs do harm *per se*, but that weeks of priceless value are lost in trying to check a cough and quiet a fever in a patient who is allowed to continue his work and is up and about. I cannot agree with a recent writer who says that the tendency at present is rather to make too little than too much of medicinal treatment. Perhaps in advanced cases we are more sparing, but in early stages I know that we are still leaning on the Egyptian reed in which our fathers trusted and trusted in vain. Year by year I see only too many instances in which the mental attitude of the physician toward the disease clearly indicates that the idea of an efficient home treatment by fresh air had never been entertained. What I would like to plead for most earnestly is this home treatment of early cases by modern methods. I am not addressing myself now to city physicians. But I would appeal to the practitioners in the country and in the smaller towns and in the suburbs, where the conditions are so much more favorable. I have been much interested for several years past in a group of cases scattered all over the country, usually in the farmer or mechanic class, in which I have supervised with the physician a home treatment, often with striking success. The remarkable case which I reported in 1900 gave me great encouragement, as the complete arrest of the disease was accomplished under the most primitive surroundings by the persistence and devotion of the patient herself, who richly deserves the good health she enjoys to-day. There have been disappointments; all cases are not suitable, all cases are not curable, and it is not easy to say which ones are likely to do well. The most favorable looking patient with a small patch at one apex may have a progressive disease and die in the best of surroundings, while a case with high fever, sweats and an extensive lesion may improve rapidly. On November 24, a fine, stalwart fellow came to see me, in whom I did not recognize the *poitrinaire*, of September 28, carrying his diagnosis in his



face. The sunshine and open air of a Maryland village had been enough; enough, at any rate, to put him on the high road.

Let me mention in a few words the essentials in this home treatment of consumption in the small towns, country places and the suburbs of our large cities. *First*, the confidence of the patient, since confidence breeds hope; *secondly*, a masterful management on the part of the doctor; *thirdly*, persistence—*benefit is usually a matter of months, complete arrest a matter of years, absolute cure a matter of many years*; *fourthly*, sunshine by day; fresh air night and day; *fifthly*, rest while there is fever; *sixthly*, breadstuffs and milk, meat and eggs.

Let us not forget that it was a country practitioner, George Bodington, of the little town of Sutton Coldfields, in Warwickshire, who, in 1840, revived the open air treatment of tuberculosis. "To live in and breathe freely the open air, without being deterred by the wind or weather, is one important and essential remedy in arresting its progress—one about which there appears to have generally prevailed a groundless alarm lest the consumptive should take cold." And he gives a number of cases showing the good effects of the open air treatment. He seems to have carried it out on the plan which was so strongly advocated by Sydenham, which was a combination of open air and riding or carriage exercise. There are few things more striking in the writings of Sydenham than the insistence with which he states that consumption is curable. It is worth quoting a paragraph which I take from Locke's *Anecdota Sydenhamiana*, as it is put in a more striking way than in his general work. "I am sure that if any physician had a remedy for the cure of a phthisis of equal force with this of riding he might easily get what wealth he pleased: In a word, I have put very many upon this exercise in order to the cure of consumptions, and I can truly say I have missed the cure of very few; in so much that I think how fatal soever this disease be above all others, and how common soever; (for almost two-thirds that die of chronic diseases die of a phthisis), yet it is this way more

certainly cured than most diseases of less moment: Provided always that this travelling be long persisted in according to the age of the patient, and length of the disease. . . . Women or very weak men that cannot ride on horseback may ride in a coach and yet attain the same end, as I have seen by often experience." In reality this practice of Sydenham never died out, but it was in practice in New England in the early days and throughout the eighteenth century. The late Henry I. Bowditch, who did so much to further the study of tuberculosis in this country, states that he followed it in his own case.

Let me conclude with a quotation from De Quincy, which puts in graphic language the question which so many generations have asked and asked in vain, but which we have been permitted to answer in part at any rate, and to answer in hope. "If you walk through a forest at certain seasons, you will see what is called a *blaze* of white paint upon 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 among 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 time-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?" It is one of the greatest triumphs of scientific medicine to be able to reply, Yes, the evil may be palliated and is rapidly being lessened, and for many at least, a remedy has been found.

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*On the Visceral Manifestations of the  
Erythema Group of Skin Diseases.*

BY  
WILLIAM OSLER, M.D.,  
OF BALTIMORE.

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JANUARY, 1904.

ON THE  
VISCERAL MANIFESTATIONS OF THE ERY-  
THEMA GROUP OF SKIN DISEASES.

[THIRD PAPER.]

By WILLIAM OSLER, M.D.,  
OF BALTIMORE.

ACCORDING to the classification of recent writers under the erythemas—les erythèmes of the French—are included simple erythema, erythema exudativum, herpes iris, erythema nodosum, certain of the purpuras, urticaria, and angioneurotic oedema. The essential process is a vascular change with exudate, blood, serum, alone or combined. While five or six of the affections just named are described usually as separate diseases they belong to one family, and are characterized by the similarity of the conditions under which they occur, the frequency with which the lesions are substituted the one for the other in the same patient at different times, the tendency to recurrence, often through a long period of years, and, lastly, the identity of the visceral manifestations. In the latter for some years past I have been particularly interested, and in 1895 I published a series of eleven cases,<sup>1</sup> and in 1900<sup>2</sup> a second series of seven cases. In this paper I shall give a third set of eleven cases, and shall consider the features presented by the entire group of twenty-nine cases.

Eight only of the patients were under ten years of age; thirteen were between the tenth and twentieth years. There were eleven females and eighteen males.

The seriousness of the condition is attested by the occurrence of seven deaths in my series—24.1 per cent.

<sup>1</sup> THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES.

<sup>2</sup> Jacobi Festschrift and British Journal of Dermatology, vol. xii.

CASE XIX. Onset, with erythema over cheeks and nose, in October, 1889; puffiness of one small joint; edema of one eyelid; increase in the erythema and swelling of the face; marked puffiness and stiffness of the hands; recurring attacks of erythema of the face and local infiltrations in different parts of the body; slight fever; in March very high fever, to 105° F.; much swelling and infiltration of the face and neck; acute nephritis; persistence of edema of face; death by uræmia May 13, 1900.—Miss C., Pittsburg, Pa., aged fifteen years; seen January 9, 1900. Father neurotic. No rheumatic history in the family. She has been a very healthy girl; is well grown. She began to menstruate at fourteen years. Large framed; has developed rapidly. Late in October, one Sunday returning from church, an erythematous blush of both cheeks was noticed, extending to the bridge of the nose. It was thought to be due to the sun, as it was a very hot day. As the congested condition of the face did not disappear, a dermatologist was consulted, who pronounced it eczema and gave her an application. For two weeks subsequently she showed a slight puffiness over the tendon of the left metacarpal bone of the middle finger. This disappeared quickly, then followed a puffiness of the left eyelid, and in a few days of the right eyelid, the erythema of the face changing in appearance, at times nearly fading. The eyelids were infiltrated and oedematous (not red). The urine was repeatedly examined and was negative.

Just before Christmas the face became very much more swollen and the eyes were nearly closed. The erythema became much more intense. On Christmas-day the backs of both hands over the middle metacarpal regions were very puffy and oedematous (not reddened). There had been no itching or burning of the face or hands. She had one attack of pain under the left breast—pleurodynia, the physician thought—quite severe, relieved by three days' rest and local applications.

*Present Condition.* The patient looks remarkably well.

*Face.* There is a marked erythema, with swelling of both cheeks and the nose, and to a less extent over the chin. It had a purplish-red look as she came in from the cold air. After rest in a warm room it became of a brighter red. On the cheeks it extends to within about 1½ cm. of the angle of the mouth, a little more extensive on the left than on the right. The nasolabial fold, the whole of the under lip, and the greater part of the upper lip are uninvolved. The nose is involved, about the same color as the cheeks, and a slight extension can be seen over the supraorbital ridges, a swelling and a slight blush of redness. The eyelids are at present only a little puffy; the conjunctivæ are slightly congested; on the chin the patches are discrete; individual isolated spots, slightly infiltrated and a little raised, and extend under the chin and behind the ears. There is no ecchymosis. The tonsils and pharynx look natural.

The left hand feels stiff, and to make a fist is painful. On the back of this hand, during Christmas-week, there was a large serous infiltration of a few hours' duration. There is now only a slight patch of erythema over the second metacarpal bone of the middle finger. On the back of the right hand there are a few scattered patches. On the back of the fingers of the right hand there are raised reddened patches, the largest one on the index.

Dr. Duhring, of Philadelphia, saw the patient the next day, and regarded the rash as a peculiar form of erythema.

The subsequent history of the case is as follows:

On February 6th the doctor wrote: "The lobes of the ears have desquamated, leaving a normal appearance, except a little dry, thin scale, not yet loosened; the redness and puffiness of the lobes have disappeared. The upper outer angles of the redness of the cheeks show a tendency to desquamate; a little roughness of the skin; thin, scaly epidermis. The upper lip, which was blotchy, has desquamated, the base being still red. The contour of the face is improved; the general erythema of the cheeks varies. The œdemas and infiltrations change from point to point: upper eyelids slight, one elbow from time to time, both knees or one knee, a finger or the back of the hand. On Sunday afternoon it developed beneath the tendo Achillis of left foot; previous to that both ankles on their outer aspects; last night the left ankle, the right knee, with some pain, and the right elbow was so stiff that it was difficult for her to use her knife or fork with that hand at dinner. Occasionally, when the œdema is more prominent, there may be a feeling of heat to the touch, the temperature at bedtime ranging from 99.8° to 100° F., to 100.2° F., to 100.4° F.; at other times normal, morning and evening. The œdema lasts from twenty-four to thirty-six hours, the back of the left hand week before last proving to be the most persistent. This morning in bed she had free movement of all her joints, showing that the disturbance of yesterday was passing away. As a rule, toward each evening she feels stiff, it may be in the extremities or hands, but by morning, unless the œdema is prominent, the stiffness is not noticeable. The spaces beneath the quadriceps tendon, the tendo Achillis, and beneath the malleoli of the ankles, and the metacarpals are the points now where the swellings occur. The eyelids have never been so bad as during Christmas holidays. Locally the face looks badly enough. Physically, notwithstanding the recurring œdema, I consider her better than one month ago. In animation and general good spirits she is becoming more natural, though the going out among people requires some pluck and determination."

On February 19th I saw the patient in Pittsburg. She seemed somewhat better, but she had still the swelling of the face and of the ear, and occasionally erythematous patches over the nose. For a few days she had had a little fever, up to 100° F., and the day I saw her she was not feeling so well and the temperature had risen to 103° F. The spleen was palpable. Then for a month she had a very severe attack of extensive inflammation of the skin of the face. She had high, irregular fever, ranging to 105° F., and the doctor writes: "The force of the trouble, whatever the cause, expended its power on the face and neck. No clinical picture could compare with it in my experience, except that seen in erysipelas—I mean in dimension, appearance, and parts involved. The extremities have remained perfectly free. The sub-maxillary and sublingual glands—in fact, the entire circumference of the neck was distended. The infiltration was so extensive that on March 2d she complained of pain in the left ear, and on March 5th the right ear was in the same condition, marked dulness of hearing, and on March 14th paracentesis of the drum had to be performed. The drainage relieved her." The temperature did not begin to fall until after March 20th.

On April 10th the doctor wrote: "Her condition is no worse than when you last heard. The pathological process, whatever it is, is con-

fined to the face and forehead. The rise and fall in the morning and evening temperature keeps about the same, varying from 99.8° to 100° F. The glands of the neck are not so large. There is some œdema of the parts. For several days in the late afternoon she is having a pretty severe frontal headache, which prostrates her. Her appetite is good, and she sleeps well. She sits up a little every day, but soon tires. She is taking a dessertspoonful of Basham's mixture with a sixtieth of strychnine. I have been hoping that no more serious complications might arise, but it is evident that we are not at the real cause of the trouble. The report of the urine is as follows: specific gravity, 1016; considerable amount of albumin, a few red blood corpuscles, hyaline and waxy casts.

"Since you saw her there has been but one outbreak of the œdema such as appeared at the beginning; it came on the back part of the left hand last week, and persisted for twenty-four hours."

On May 17th the doctor wrote: "During the latter part of March and the first part of April she was gaining. On Easter evening there was a rise of temperature, the albumin increased rapidly, and nausea and vomiting became very distressing. She had perforation of the drum of the right ear. The œdema of the face persisted. During the last week of life the left eye was closed entirely and the left half of the face was tense with œdema. The amount of urine diminished to two and a half ounces in the twenty-four hours. The mind kept clear. She died of uremia on Sunday, May 13, 1900."

This case and No. XXVI., which presented many points of similarity, illustrate the very grave character of some of these obscure forms of erythema. Here was a healthy young girl of good family history who had a persistent erythema of the face and hands, with areas of angioneurotic œdema; then three months later a more severe attack, with fever and intense swelling of the face and an acute nephritis, which proved fatal seven months after the first appearance of the erythema.

CASE XX. *Attack of severe colic; admission to the surgical side for suspected appendicitis; a week before a purpuric eruption on the legs, with high-colored urine; rash of exudative erythema on the legs, with here and there purpura; no involvement of the joints; acute nephritis, abundant albumin, and blood casts, and a small amount of blood in the stools; recovery.*—This case is particularly interesting on account of the fact that he was admitted to the surgical side of the hospital with abdominal symptoms, which were suspected to be due to appendicitis.

Milton R., aged fifteen years, admitted March 14, 1900. He had been a healthy boy; never had rheumatism; no rheumatism in his family. He had never had similar attacks, though his mother said he had irregular, colicky pains at times, and once of such severity that he vomited with it.

*Present Illness.* About March 7th he noticed himself that the urine was very dark. He had had, a week or so before, some colicky pains in the abdomen.

With the highly colored urine there was no pain in the back, micturition was not painful, and there was no increased frequency. About the same time it was noticed that his legs were somewhat swollen and

peppered with red spots, which continued to come out at intervals. The boy had been going to school and had seemed quite well up to this attack.

On admission he was a well-nourished, healthy-looking boy. There was no rash upon the face. Symmetrically arranged on the arms and elbows and about the wrists and hands were a few patches of a rash, chiefly discrete, consisting of papules 1 to 3 mm. in diameter, some distinctly raised, many of them capped with small vesicles, which in places were drying. About the elbows the patches were larger, more raised, and had a purplish-red color. They varied in size from a pin's head to 5 cm. in diameter. In the larger areas the centres were more yellowish in color, the periphery purplish red. The color did not entirely disappear on pressure.

On the legs there was an extensive symmetrical rash about the ankles and knees, the patches very diffuse, on the legs more discrete. On the outer sides of the legs there were patches 3 by 1.5 cm., slightly raised, and these presented three grades of color, the centre whitish, a reddish-brown staining, and then a zone of brighter red. Scattered between the larger areas were some distinct purpuric spots.

*Heart.* Apex-beat in fifth, 7 cm. from midsternal line, rather diffuse, no thrill, soft apex systolic murmur heard over the body of the heart.

The abdomen looked natural, soft to touch; liver not enlarged; spleen slightly enlarged, the edge distinctly palpable below costal margin. Slight general enlargement of lymphatic glands; reflexes normal.

The urine on admission was blood-red, specific gravity 1014; contained many granular casts, large and small, and some red blood casts; abundant albumin. I remarked to the class the first day how interesting it was to see a case of acute hemorrhagic nephritis without any diminution in the amount of urine, with no swelling of the face, and no trace of œdema. The temperature was 100.5° F.

*Blood.* Hæmoglobin, 60 per cent.; red blood corpuscles, 4,156,000; leukocytes, 6800; coagulation time, two minutes and a quarter. On March 3d blood cultures were taken, which were negative.

The rash gradually faded and no fresh spots of exudative erythema appeared, but on several days between the 18th of March and the 1st of April small purpuric spots appeared, some minute ones on the palms of the hands.

On March 18th the patient had a small stool containing clear mucus and bright-red blood.

The boy progressed very favorably. The urine on the 17th was 1720 c.c. The bright-red color persisted, and began to clear about March 22d. It remained smoky and had blood in it up to the middle of May. The albumin gradually disappeared. Red blood corpuscles, hyaline and granular casts were seen all through April.

On May 11th the condition was as follows: smoky, 1013; acid reaction, trace of albumin, granular casts, red blood corpuscles, red blood-celled casts. The patient was reported as quite well in the autumn.

*CASE XXI. Otitis; swelling of the hands and legs; extensive purpuric rash, in places papular; acute nephritis, with albumin, tube casts, and blood; cramps in the abdomen and vomiting; recovery; subsequent admission with meningitis from the otitis media; death.*—John D., aged twelve years; seen April 24, 1900. He complained of running from the left ear

and swelling of the hands. His family history was good; no similar troubles that he knows of; no rheumatism. Except summer complaint when he was two years old, he has been an exceptionally strong, healthy boy; has had no acute infectious diseases. About two weeks before he applied at the Dispensary he had a running from the left ear. Five days before application his hands and legs became very much swollen, and he could not put on his shoes. The day before application a rash came out on the legs.

*Present Condition.* Fairly well-nourished boy, but he looked anæmic. The face and eyelids were somewhat puffy. Evidence of recent epistaxis about the nostrils. The hands looked swollen and œdematous. The pulse was rapid, regular. There was no enlargement of the heart. The first sound was rather thudding, and the second pulmonic was accentuated. Temperature, 101° F. The abdomen looked full; the spleen was easily palpable. The liver was not enlarged.

Below the knees the legs were much swollen, firm, and did not pit on pressure. There was an extensive petechial rash, papular in places, but nowhere with much swelling. The urine showed albumin and coarsely granular tube casts; no red blood corpuscles. He was ordered an iron mixture.

*April 27th.* The patient came again to-day; says he feels very much better. The œdema of the legs has almost gone and the rash has faded. The urine shows abundant albumin, numerous coarsely and finely granular and hyaline casts.

*May 1st.* Since the previous note the patient has had recurring attacks of severe cramps in the abdomen, with vomiting. The mother describes the material brought up as at first bloody, then black, and later yellow. The swelling of the face and feet is almost gone.

*4th.* Patient has vomited every evening since the last note; has not vomited to-day; does not complain of any pain.

*10th.* Patient began to vomit on waking, and continued to do so at intervals during the morning.

*12th.* He has had no nausea or vomiting since the last note. The legs are not œdematous. A few stains of the purpura remain.

*14th.* The urine is light colored, cloudy, 1 per cent. of albumin by Esbach, and contains a large number of red blood corpuscles, finely granular casts, and casts of red blood cells.

On July 30th the boy was admitted to the hospital with acute meningitis from the otitis media. He was removed by his parents on August 1st, and he died a few days later.

*CASE XXII. Swelling of the legs, with purpura and pains in the knees and ankles; colic; acute nephritis, with blood, albumin, and tube casts in the urine; recurring attacks of purpura, with urticarial wheals; recovery.*—Edna C., aged six years; seen May 11, 1900, with Dr. Richardson, of Bel Air. Family history good. The child had been well and strong; never had rheumatism or chorea. Five weeks ago, about 4 p.m., the child complained of pains in the legs, and the mother noticed that they were swollen, and dark blotches came out. The legs became swollen as far as the knees, and it was difficult for her to move the knees and ankles. She has had for a year or so slight colicky pains in the stomach. On the following day Dr. Richardson found a good deal of albumin in the urine. On the day of the attack the urine contained blood. She has got pale, has had several recurrences of the



blotches on the legs, and has with it much colic. Yesterday she had a very severe attack.

She is a fairly well-grown child; looks a little pale and brown, partly sunburn. Color of the lips pretty good. No swelling of the eyelids; no puffiness of the wrists. The tongue is clean; no swelling of the joints. There is a fresh crop of blotches, which came the night before last. The original crop was more than this. At present there are large areas 2 cm. across, slightly raised, evidently fading spots of urticaria, with purpura. Then there are in addition spots of simple purpura scattered between these large areas. The purpura extends as far as the hips. The spleen is not palpable, liver not enlarged. The apex-beat is within the nipple line, no thrill; heart sounds are clear. The urine has been albuminous at times.

The urine to-day had a specific gravity of 1024, clear, acid reaction; contained neither albumin, sugar, casts, nor red blood corpuscles.

March 13, 1903, the mother writes that there has been no recurrence of the purpura.

CASE XXIII. *History of attacks of pain in the knees; colicky pains, with nausea and vomiting and diarrhoea for many years, sometimes with swelling of the feet; enlargement of the spleen; recurring attacks of purpura, with abdominal pain and vomiting; outbreaks of erythema; recovery.*—Sarah E. W., aged fourteen years, admitted September 10, 1900 (Med. No. 11859), complaining of stomach trouble. Her mother had had rheumatism. She herself has an indefinite history of rheumatism, irregular pains, and has had three or four attacks in which her knees have been painful; no swelling, no redness, no fever. She had been subject to sore throat, especially three years ago. At times she has had attacks of vomiting. The child's mother states that she was well and natural until the attack of measles at her fourth month. Ever since she has had two serious troubles: first, attacks of abdominal pain, with nausea, vomiting, and diarrhoea; and, secondly, skin rashes, which come out suddenly and then fade away. They are usually symmetrical. With these attacks there is often swelling of the feet, which comes very rapidly.

For three weeks she has been having pains in the abdomen, and for five days past there has been much nausea and vomiting, and three days ago she had diarrhoea, five or six stools a day. She felt feverish, had some sweats at night, and loss of appetite. She has had to get up at night once or twice to pass urine. Eight days ago the feet and legs began to swell, and a red rash broke out on the skin. The knees were painful, and her eyes at the same time became puffy. The swelling of the legs has disappeared and she has been a good deal better.

On admission she was a small, pale, frail-looking child, not anæmic, eyelids slightly puffy. The temperature was 100° F.; pulse 116, slightly irregular. There was a somewhat diffuse heart-beat in third, fourth, and fifth; on palpation a systolic thrill; on auscultation a blowing systolic bruit transmitted to the axilla; accentuation of the pulmonic second. The abdomen looked natural; the liver was not enlarged; the spleen was fully 2 cm. below the costal margin. There was slight œdema of the feet and ankles, and there was a fading rash on the knees, elbows, over the clavicles and ankles. Some of these spots were distinctly purpuric. One above the left external malleolus was a bluish spot, looking like a bruise.

*September 13th.* Had an attack, with great coldness of the feet and a burning sensation in the pit of the stomach, which increased so that at 10 P.M. she had a great deal of abdominal distress. A fresh, brilliant-red rash in raised patches came out on both buttocks, extending down the thighs, and on both elbows. The abdominal pain persisted that night, and at 6 A.M. she vomited, at first curds, later a greenish fluid, and about 9 o'clock mucus mixed with blood.

*14th.* There is this morning an abundant purpuric rash over both buttocks, extending down the thighs, up the back on each side, over the elbows, and the upper arms. The rash is raised, and the individual spots have distinct margins. On the right elbow there is a bluish-red discoloration, which is painful to the touch. There is no pain or swelling in the joint itself. She had to have morphine. Throughout the day she vomited several times.

*Blood.* Red blood corpuscles, 3,680,000; leukocytes, 10,000; hæmoglobin, 75 per cent.; blood coagulation time, four minutes.

*Urine.* Specific gravity, 1012; no albumin, no blood, no tube casts.

*15th.* The rash is very extensive over the back. Some of the purpuric areas are infiltrated and raised and measure 5 x 3 cm. There is a little swelling in the left elbow-joint to-day. There are red blotches on the thumbs and over the knuckles. The spot where the hypodermic needle was inserted is surrounded by a hemorrhage.

*16th.* The swelling of the left elbow has disappeared. There is a fresh erythema on both forearms. From this time the patient improved. There was a good deal of pigmentation and staining left by the hemorrhages. She was discharged, feeling quite well, on September 24th.

*CASE XXIV. Erythema and purpura; acute nephritis; general œdema; persistence of the albumin for two months; gradual recovery.*—Morris S., aged three years, Hebrew; admitted December 20, 1900, with swelling of the face, abdomen, penis, and legs. There was nothing of any moment in his family history; no rheumatism. He was healthy as a baby; had a sore navel for some time. When two years old he had diphtheria, a severe attack, not followed by any swelling of the feet. With this exception the child has been very well. He has grown and thriven, eats heartily, and drinks three large cups of coffee in the day! Three days ago the father noticed some red spots on the back of the left hand, which looked like bites of insects. At the same time there was swelling of the wrists and back of the neck. That night the swelling became worse and the spots extended and formed large blotches. The father said the wrists looked as if they had been scalded. On the following day the spots appeared on the legs and body and became darker. The penis became œdematous.

I saw the child at my out-patient clinic and made the following note: There is well-marked purpura over the legs and around the crests of the ilia, and there is a general subcutaneous œdema of a brawny character. The skin of the penis is œdematous. The swelling and œdema which had been so marked on the wrists has disappeared and has left a brownish-red stain. The abdomen is large; there is dulness in the flanks; no percussion wave. Some œdema of the lower part of the back. On the outer surface of the skin of the right arm there are stains of a purpuric rash. Examination of the urine showed a large amount of albumin, but no tube casts.

The child was taken home by its father the same afternoon, but returned three days later with general anasarca and signs of slight fluid in the abdomen. The child looked very well. The face was only slightly swollen, the eyelids a little puffy. The urine had a specific gravity of 1023, dark yellow in color, and there were a few casts and much albumin. Throughout the month the dropsy persisted to a slight extent, but gradually disappeared. A very careful daily study of the urine was made, particularly with reference to the percentage of albumin and urea. The amount of albumin varied through January from 0.1 to 0.3 per cent. On the 17th, 18th, and 19th of February the amount increased rapidly, reaching on the 20th 1 per cent. There were no tube casts. On March 5th, for the first time, the urine was free from albumin. Then again, from the 25th to the 30th, the albumin returned, and reached on the 28th 0.5 per cent. From that time on the albumin was absent, and he was discharged April 21st in good condition. I heard on March 1, 1902, that the patient has remained perfectly well.

CASE XXV. *For the first six years of life recurring attacks like nettle-rash; then to the tenth year freedom; in tenth and eleventh years recurrence of the rash in larger blotches and much swelling of the face and eyes; recurring attacks of severe spasmodic croup, having no special relation to the skin rash; twice with these attacks there has been swelling of the throat; lately marked swelling of the soft palate and uvula; swelling of the feet and of the face; no nephritis.*—N. D. D., aged fourteen years, Lafayette, Ala.; sent May 6, 1901, by Dr. Love. When three weeks old red splotches came out all over him and itched like nettle-rash; lasted three weeks. It recurred periodically until he was six years old. He never passed six months without an attack; sometimes they would occur quite frequently. He had no pain in the abdomen with the attacks, no vomiting. From the age of six to ten years he was perfectly free from the attacks. At ten years the trouble reappeared, and recurred periodically until he was eleven years old. Good health until the thirteenth year, when the disease returned. The "splotches" were larger and there was swelling of the eyelids and face. About six weeks ago the inside of the throat began to swell, chiefly the uvula and the soft palate, and there was oedema of the outside of the neck. He has had one attack also in the left auditory canal. The last attack was ten days ago. The feet began to swell and he could scarcely get his boots on. The face was a little swollen in this attack.

The family history is good. The father has a quinine idiosyncrasy, and cannot take even a few grains without having a skin rash. An uncle also has the same peculiarity.

He is a healthy-looking boy, of good color. No swelling of the face to-day. The remnant of an urticarial spot just above the right eyebrow. The only eruption at present is above the popliteal space on the left side, where there is a large spot extending across the lower third of the thigh, measuring 8 x 10 cm. It is reddened, prominent, greatly infiltrated, the margins localized and distinct; a dusky red color, in places of a more vivid red; very hot. In one or two places the margins look a little less red. The hyperæmia is extreme, and pressure fills up at once. There is nothing at present in his throat; no other spots anywhere.

The heart sounds are clear; arteries not sclerotic. Pulse is good. Hæmoglobin, 80 per cent. Urine: no albumin, blood, or tube casts.

All through his life he has been subject in the winter to attacks of severe spasmodic croup, which have not apparently had any relation to the skin rash. It has recurred at intervals all his life, twice with marked swelling of the throat. It commences with difficulty in breathing, and lasts twenty or thirty minutes. He will call and say he is about to choke. Wet cloths about the throat relieve it. No cough with it.

*May 8th.* The swelling in the patch of the day before yesterday has subsided. There is left a bluish-green stain like a bruise.

I heard from Dr. Love on February 23, 1903. The boy is very much better. He has had no attack for two months. He took calcium chloride for a long time with benefit; recently camphor in three-grain doses four times a day, which seems to have had a very satisfactory influence.

*CASE XXVI. Onset in September, 1901, with erythema of the nose and cheeks; extension to the elbows and arms, usually in the form of wheals, but some spots purpuric; chill, followed by consolidation of the lower lobe of left lung; protracted fever; enlargement of the lymphatic glands; delayed resolution of the pneumonia; urine clear in the attack; gradual recovery; in May, 1902, onset of acute nephritis; uræmia; death in a convulsion.*—L. E., aged twenty-four years; seen at Pittsburg, Pa., on February 6, 1902, with Dr. Litchfield. Her family history was good; no rheumatism; no tuberculosis. She had been a very robust girl; no serious illnesses. Toward the end of the summer, when at the Thousand Islands, a rash began on the face, chiefly on the nose and cheeks. It looked, the doctor said, like lupus erythematosus. It persisted, and troubled her a great deal. Dr. Fox, of New York, who only saw her once, writes that he thought it looked like an acute lupus erythematosus. It spread in patches to the body, particularly about the elbows and on the arms. The patches were red, sometimes raised, and would, at times, come out like wheals. Before Christmas she had a very violent outbreak, and many of the spots became purpuric, and on the arm the doctor said there were spots which looked almost like the eruption of vaccinia. On December 27th she had a chill, and on the third day consolidation of the left lower lobe was found. The temperature was 104° F. From the fifth and sixth days there was a drop in the temperature. On the twelfth day it dropped to 98° F.; then it gradually rose, and from the twelfth to the twenty-sixth day it ranged to 105° F. Then the other lung became involved. There was very little cough, particularly after antipneumococcic serum was given. There were no true chills. The mind was clear, as a rule. For the past three weeks the temperature has ranged about 101° F., with no very great drops. The pulse has been from 112 to 120; respirations 22 to 40; mind clear; no delirium. The right lung has been clearing. The left lower lobe has been solid for some weeks. About two weeks ago the left leg became swollen, and she had a thrombus in the femoral vein. For ten days the lymphatic glands throughout the body have been a little enlarged and tender.

At the time of my visit the patient looked thin and pale. There was no sign of any rash on the face, but there was erythema of the skin of the thighs, mottled and patchy, and in places a little raised. There was no purpura. The left leg was swollen, but was no longer tender. She had complete consolidation of the lower lobe of the left lung, with tubular breathing and a few râles. The fremitus was not very marked.

I put in a needle in two places, but got nothing. The Widal reaction was negative. The sputum was a little rusty, and I had some examined. There were pneumococci, but no tubercle bacilli.

The urine was examined repeatedly, and there was occasionally a faint trace of albumin, but nothing special. She was anæmic, and on January 29th blood count showed: red blood corpuscles, 3,310,000; hæmoglobin, 46 per cent.; leukocytes, 6000. The patient gradually improved through March and April, and seemed to be getting quite well. In May she went to Atlantic City, where she improved rapidly. Toward the end of the month an acute nephritis came on, without any special exposure; the urine was scanty, high colored, contained blood and tube casts and much albumin. There was fever, 101° to 102° F.; no skin rash. I saw her with Dr. Marvel shortly after she had had a uremic convulsion. She died within a week of the onset of the nephritis.

CASE XXVII. *From infancy recurring attacks of colic, sometimes with vomiting; recurring attacks of blotches (erythema) on the skin of face and arms; at the time of examination a spot of erythema capped with blister.*—Dorothy B., aged thirteen years, referred to me by Dr. Charlton, of Savannah, Ga., June 18, 1902, for a peculiar trouble in her stomach. She was healthy when born, was a healthy child, and has grown and developed well. The family history is good; no special peculiarities. Since infancy she has had a peculiar stomach trouble, recurring attacks of nausea, and colic-like pain. The attacks recur at irregular intervals, a week or two apart, sometimes a number in succession, and then she will be free for several weeks. She will appear perfectly well, will eat a good meal, and an hour or so afterward will say: "May I go and lie down? I have a pain in my stomach." The attacks are chiefly in the morning. The abdomen seems tender and the colic at times has been severe enough to make her cry out. It has been a source of constant worry, and nothing has ever seemed to do her any good. At times she has had very obstinate vomiting with the attacks. Her mother says the pain is always in the pit of the stomach. When four or five years of age she had a very bad attack of "ivy poisoning." This spring some red spots came out on the neck, and she has had them recurring ever since. They occur on the face and arms as red blotches, and then become capped with little blisters.

The patient is a healthy-looking girl; color good; tongue clean. The abdomen is soft, natural looking; spleen not enlarged; stomach not dilated; no enlargement of the liver. No sensitiveness anywhere on pressure. The heart is not enlarged; the first and second sounds are loud. There is a soft systolic murmur at the base. The skin seems everywhere clear, except on the left foot, just above the middle toe. Here there is a raised, infiltrated, reddened spot about 5 x 5 mm., capped with a small, clear blister. This, her mother says, is the typical appearance of the rash. When the attacks are bad a number of these appear on the face and neck, and they come out on the extremities, looking at first like hives, and then are capped by the little blisters. The urine is clear; no blood.

A letter from her mother, March 22, 1903, states that the child has improved very greatly, and has been very free from that colic, and has had no return of the skin trouble.

CASE XXVIII. *For two years recurring attacks of purpura, chiefly on the legs; severe attack three months before admission, with colicky*

*pains, vomiting, diarrhœa, and arthritis; in the last attack diarrhœa was a marked feature, with the passage of blood from the bowel.*—A. S. A., aged twenty-six years, white, single, lawyer, Montgomery, W. Va.; admitted February 12, 1902, complaining of skin disease and stomach trouble. No similar trouble in family; no purpura. Patient's father has chronic diarrhœa. Usual diseases of childhood. Typhoid fever in 1898, slight attack, but followed by a gastric (enteric?) trouble lasting about four months. Patient was in bed altogether about six months. He has had occasionally swollen and tender joints. One attack of swelling and pain about tendo Achillis. Appetite and digestion good prior to present illness. Tendency to constipation. Denies lues and gonorrhœa. Habits good. Average weight, 160 pounds. Present weight, 140 pounds. Patient first noticed the purpuric eruption on his legs in the spring of 1901, two years ago. At this time the spots were very small and situated only below the knees, especially about the ankles. At this time the patient had no nausea, vomiting, or diarrhœa; no arthritis. During the summer of 1901 the patient had indigestion and constant recurrences of purpura; no arthritis; some nausea, vomiting, and pain. At no time was he confined to his bed or compelled to give up his work.

In December, 1901, the patient had his first severe attack, which kept him in bed for about a week, and was soon followed by another of about the same severity and duration.

For eleven months, until November, 1902, the patient was well; then he had very severe abdominal pain, with diarrhœa, nausea, and vomiting, followed by arthritis and a hemorrhagic eruption on his legs. He was forced to give up work and go to bed, and until New Year's there were recurring attacks. During the last month or six weeks he has been at work, but has been feeling badly, with arthritis and purpura, some "indigestion," and pain.

The attacks are all of the same character. The patient first noticed the purpura on his legs or arms (at first it was only on his legs below knees, but is now on thighs above the knees, and on hands and arms, particularly on extensor surfaces), accompanied with a mild arthritis. The joints are "sore and stiff," but he can use them. This is followed by a severe pain in his left side and left half of abdomen, passing over middle line in a narrow band. The pain is fixed, not radiating, and of a cramp-like character; sometimes requiring morphine by the mouth or hypodermically for relief. The pain usually lasts about two days. Following the pain the patient has diarrhœa and usually nausea and vomiting. The vomiting is the last event in the series, and about the time it begins the purpura fades, leaving brownish-yellow stains.

The joints attacked are usually the ankles and knees. In the last outbreak the left hand (metacarpophalangeal joints) was involved, and his wrists, never his elbows, shoulders, or hips. Last November the patient passed considerable blood per rectum of a very dark color. He has never had hæmatemesis or hæmoptysis. Slight epistaxis. No hæmaturia or bleeding from gums or mucous membranes. He has grown quite pale in each attack, and loses flesh rapidly, but regains it quickly.

*Present Condition.* Well nourished, but pale. Examination of heart, lungs, and abdomen negative. There is a purpuric eruption on back of hands and arms, more on right arm than on left, and on extensor than on flexor surfaces; same on feet and legs up to the groins. Tender-

ness and subjective feeling of stiffness in left hand (metacarpophalangeal joints) and right wrist. Blood pressure, 145 mm. of Hg. Red blood corpuscles, 4,280,000; leukocytes, 7600; hemoglobin, 65 per cent. (von Fl.). Blood coagulation time, six and a half minutes. Urine negative.

On February 13, 1902, I made the following note: Patient is pale, sweating profusely. Tongue furred. Skin of face clear. Gums not swollen; a little red line; no blue line. There is a fading purpura on the arms; spots not raised, brownish, leaving stains, chiefly on flexor surface. No purpura on trunk and back. On the legs there are numerous stains of fading purpura over feet and extensor surfaces. The spots are larger on the legs. All are now fading. Joints nowhere red or swollen.

*Circulatory System.* Slight sclerosis of arteries. Apex beat visible in fourth left interspace, just inside nipple. Soft murmur at apex with first sound and over body of heart, not propagated to axilla.

*Abdomen* looks natural; nowhere painful; a little tender in spots over colon. Spleen not enlarged. Liver not enlarged. Appendix not palpable. Superficial glands not enlarged. He was ordered calcium chloride.

*February 14th.* Blood coagulation time, six and a half minutes.

*16th.* Purpura has almost disappeared. Patient has improved very rapidly. On his discharge a few days later the patient looked very well; blood coagulation time was three minutes.

*CASE XXIX. Acute otitis; arthritis; recurring attacks of colic, with occasional vomiting; hemorrhage from the bowels; purpura; acute nephritis; recovery.*—March 7, 1903, E. F., aged five years, seen with Dr. Hamburger, to whom I am indebted for the notes.

*Personal History.* He had a prolonged attack of summer diarrhœa two years ago. It followed an attack of otitis. For the past two weeks he has had pain in the ears. Last Wednesday (to-day being Saturday) there was a discharge from both ears. Fever has persisted off and on since the onset. This morning he was unable to stand on his feet because of pain. Temperature, 100.5° F. There is a purulent discharge from the right ear. Heart sounds are clear. Examination of the lungs negative. The spleen is not palpable. There is no tenderness in the abdomen. The dorsum of the right foot is swollen, not reddened, but very tender on palpation. There is some tenderness, but no swelling over the left foot.

*March 8th.* The patient had a restless night. His temperature rose to 102° F.; this morning it is 99.7° F.; pulse, 104. He has complained of pain in the wrists and in the interval between the thumbs and first fingers. He has pain in the abdomen, accompanied by vomiting of the milk. Heart sounds are clear.

*9th.* The patient was unable to retain food yesterday, and he has vomited this morning the nourishment, as well as some bile independent of taking food. Throughout the night he has cried because of intermittent pain in the abdomen, referred now to the left half and to the umbilical region. His temperature this morning is 99.6° F. The tongue is heavily coated. There is a decided fetor oris. Every few moments he cries out with pain in the abdomen, which lasts a few minutes, then disappears, only to return in from ten to twenty minutes. He rolls over in the dorsal decubitus in these paroxysms. The joints are no longer sensitive. The abdomen looks natural. The left half is sensitive on

palpation, particularly in the iliac region, while above in the upper half a fine gurgling can be detected. The abdomen is exquisitely tender during the painful period. Following an enema, a quantity of blood, sufficient to discolor the water a deep, dark red, was ejected with some fecal material. Early this morning he had a small movement (a couple of scybalæ) without blood. For the past four or five days the ears have been irrigated with 1.44 of bichloride of mercury to one quart of water three times a day.

10th. The boy had considerable pain during the night. Yesterday afternoon about 3.30 he passed about one ounce of pure blood. This morning he is comfortable. Pulse, 120; temperature, 98° F. The tongue is coated, but it is clearing at the tip and sides. There is no gurgling over the abdomen. There are no petechiæ. He is being fed on albumin water, and toward evening is given a starch and laudanum enema.

11th. The pain returned about noon yesterday. It was so intense that at 5.30 P.M. the starch and laudanum enemas were resumed. He had two stools, composed mainly of blood and in part of the enema. The night was restlessly spent in pain. Early in the morning he passed a bloody stool. The temperature this morning was 97.8° F.; pulse, 108. To-night the temperature is 98.6° F.; pulse, 93. The day was relatively comfortable and free from pain, but this afternoon about 6.30 the colic returned with such intensity that the patient cries out. There is no skin eruption. The starch and laudanum enemas are being discontinued and he is being given paregoric, half-ounce, every two hours.

12th. The colic continues this morning. He has had two stools to-day, one being composed of narrow, long casts, dark brown in color, evidently composed of changed blood. The other stool contains curded milk, blood, a little mucus and some fecal matter.

Urine acid, 1026, yellow, no albumin, no sugar.

13th. He had a great deal of pain during the night. This morning at ten he was given one-half ounce of castor oil. At 3.20 P.M. he had a stool approaching the normal. To-night another movement of blood and fecal matter. The day was quite comfortable, but beginning at about 8.30 the colic returned. Paregoric, twenty drops, and deodorized tincture of opium every two hours.

14th. The boy was very restless until 3 A.M.; from that time on he has been comfortable. He had a normal movement this morning and another this afternoon without blood. This afternoon he had very slight pain.

19th. Last night a slight eruption was noted. To-day, scattered over the legs, feet, and buttocks, are fine petechiæ, and on the calf of the left leg there is a bluish ecchymosis about 2.5 x 1 cm. in diameter. On both elbows there is an eruption formed by the coalescence of rose-colored, slightly raised papules. He has lost his appetite. The tongue is again lightly coated.

20th. The little fellow had an uncomfortable night, being restless and complaining of pain in the abdomen. This morning his appetite is poor. Temperature, 98.8° F. The petechiæ persist, and in addition he has a subcuticular steel-blue ecchymosis over the right hypothenar region. It is here that he complains of pain. The eruption on the right elbow has almost disappeared, leaving little brownish discoloration. On the left it still persists, although less evident. On pressure it is



not entirely effaced, still leaving a brownish color. The urine is yellow and looks a little smoky; acid, 1009; moderate flocculent sediment, containing a few hyaline casts and red blood corpuscles; albumin is present. His diet is now again limited to soft food. Castor oil is administered, and calcium chloride, 10 grains, three times a day is being given.

24th. The boy is again comfortable. He is very hungry; he looks pale. The eruption has disappeared, with the exception of a bluish discoloration on the calf of the left leg, representing the old ecchymosis. The colicky pain during the foregoing illness occurred in paroxysms at intervals varying from five minutes to an hour. On the 12th the pain was almost continuous. Between the attacks the little fellow would fall asleep, only to be awakened by pain, which caused him to roll about in great discomfort. So severe was it that he would cry out. The left lateral decubitus and lying on his face were the favorite positions during the painful periods. The abdomen was exquisitely tender during the colic. Throughout the illness the abdomen was slightly distended. The spleen was not palpable. The constant feature was a fine gurgling detected by palpation of the left half of the abdomen, particularly in the upper quadrant. The days were relatively comfortable, with the exception of the 12th, when the pain was almost continuous. The colic appeared toward evening, increased in severity through the night, reaching its maximum between midnight and three o'clock; then a decrease in its intensity and a more comfortable morning.

April 7th. A specimen of the urine sent from Atlantic City, where the patient went March 28th, is pale yellow, with a moderate flocculent, grayish sediment, containing many red corpuscles, some round granular cells, and an occasional hyalogramular cast, 1008; albumin present, 0.5 per cent.

11th. The patient returned from Atlantic City, having gained weight and looking very well. Although the complexion is good, the conjunctivæ look a little pale. While in Atlantic City he once suffered from a little pain in his abdomen, and his mother noticed a few "spots" on his legs. The urine of to-night is pale yellow, acid, 1008; small flocculent sediment, containing many red blood corpuscles, a few hyaline casts. Albumin is present.

15th. The patient has been in bed and on strict milk diet, in spite of his dislike for this food. To-day he was much nauseated and vomited directly after taking food.

16th. The urine is brown and smoky and deposits a reddish-brown sediment containing blood, some round granular cells, and granular casts, 1024; contains much albumin. Very little fluid has been taken during the last twenty-four hours.

From the time he improved the albumin lessened. There were very few tube casts, and at the date of the last report, May 10th, he was doing well, though still kept in bed and on a milk diet as precautionary measures.

A criticism has been made on my previous papers that I had jumbled together a motley group of cases, some of purpura, some of angioneurotic œdema, others of peliosis rheumatica; others, again, of exudative erythema. I did so on purpose, for I was seeking similarities, not

diversities, and I refrained as much as possible from the use of specific terms, often, indeed, not knowing what to call a case watched for a long period. What, for instance, shall we call Case II., which I studied at intervals for six years—purpura, erythema, angioneurotic œdema, or urticaria? The lesions varied from time to time, but there could be no question that all of them, with the extraordinary visceral symptoms, were manifestations of one and the same cause. Or Case XXVI., beginning with simple erythema, then crops of urticaria, and an exudative erythema with purpura and vesiculation? In Cases XIX. and XXVI. the most expert dermatologists were in doubt as to the nature of the lesions, and could only say that it was a peculiar type of erythema. On the other hand, the members of the erythema group have not all the same etiology, and, indeed, as is well known, the individual members have a very diverse etiology. For example, the urticaria of cholelithiasis, of an ague paroxysm, that caused by eating shell-fish or strawberries, the urticaria of hydatids, and an asthma attack has the same clinical and anatomical features, though caused by a variety of poisons—bacterial, protozoal, vegetable, and metabolic. It is not unlikely that the poison in itself, of whatever kind, is of less intrinsic importance than certain transient aspects of cell metabolism. In the first place, there is no constancy of action of the same poison in different persons, or even in the same person at different times. This is notoriously the case with the animal and vegetable substances causing urticaria. In the second place, the chronic forms of urticaria probably illustrate a morbid and persistent sensitiveness of the cutaneous vessels to poisons of either intestinal or tissue origin. And, thirdly, the importance of the local status is shown in that remarkable form of urticaria which comes on after exposure to cold. So long as the face is at a temperature above 60° F. the patient is all right; exposure at 40° F. is followed at once by an outbreak of urticaria. And, lastly, a peculiarity that may be transmitted through several generations, as in angioneurotic œdema, which is only urticaria "writ large," must either be a morbid susceptibility of tissue or an inherited peculiarity of metabolism, or both combined.

The relation of the erythemas to infective processes is interesting. Certain types of exudative erythema behave like an acute febrile disease, and Dühring, of Constantinople, has described an epidemic form. In many of the fevers—typhoid, pneumonia, rheumatic fever, etc.—there may be symptomatic erythemas. The severer forms of purpura urticans with arthritis and colic (Hench's purpura and the peliosis rheumatica) may run an acute febrile course with heart complications. Many of the graver cases of purpura have followed an acute infection, puerperal fever, gonorrhœa, etc., and in No. V. of my series the patient had recently had gonorrhœa, and in Nos. XXI. and XXIX. there had been

otitis media. The rheumatic poison is probably responsible for very many cases. But in a very large group the condition persists for so many years, as in Cases II., XIV., XV., and XXVII., that an infective process is out of the question.

The visceral lesions are most diverse in situations and form, and vary a good deal with the character of the eruptions. It has to be borne in mind that certain skin lesions are associated secondarily with diseases of the internal organs. Purpura of a severe type is very common in Bright's disease; urticaria and purpura in cirrhosis of the liver and cholelithiasis; urticaria in asthma, and all forms of erythema with the chronic valvular lesions of the heart in children. It may not always be easy to say, particularly in asthma, which is the primary, whether the urticaria has preceded the asthma, or *vice versa*.

The complications form two great groups—the angioneurotic and the inflammatory. To the former belong the swellings of the fauces, the œdema of the glottis, the changes in the bronchial mucosa, causing asthma, and the colic, which is probably due to localized œdema of the gastrointestinal walls; to the latter the more serious complications, endocarditis, pericarditis, pleurisy, pneumonia, and nephritis, but, as it is not easy to make a sharp distinction in all instances, it will be better to discuss the complications according to the organs attacked.

*Cerebral.* In two cases there were brain symptoms, active delirium in Case I. at the time of recurring attacks, while in Case XV. there were five or six attacks of aphasia and hemiplegia, and the cerebral and cutaneous manifestations lasted for thirteen or fourteen years! It seems not improbable that these transient attacks were due to vascular changes in the brain, the counterpart of those occurring in the skin. An analogous condition is met with in Raynaud's disease, of which I have reported a remarkable instance,<sup>1</sup> with repeated attacks of monoplegia, aphasia, and hemiplegia, alternating or occurring at the same time with the local syncope or asphyxia of the fingers and toes.

*Respiratory.* Swelling of the fauces and larynx may cause severe dyspnoea and attacks like croup. In the family I described with angioneurotic œdema two members died of œdema of the glottis. In Case XXV. of the series the lad had much swelling of the fauces and croup-like attack, twice accompanied with swelling of the throat and neck, evidently due to œdema.

The association of asthma with urticaria and other skin diseases of the erythema group has long been known, and one of the last papers of our lamented friend Dr. F. A. Packard dealt with this subject.<sup>2</sup> It seems to be most frequent with urticaria. There was no instance in my series, though in Case II. there was a persistent catarrh of the smaller tubes leading to emphysema.

<sup>1</sup> THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1891.

<sup>2</sup> *Ibid.*, 1896.

Three of the patients had severe pneumonia. In Case II. it occurred toward the close of the remarkable illness of five years' duration. In Case XI. the child died of croupous pneumonia a month after the onset of the third attack of purpura. It was impossible to say whether there was any connection between the two diseases. In Case XXVI. there was a protracted pneumonia following directly upon a severe outbreak of exudative erythema. It is likely that the recurring skin lesions, the pleuropneumonia, the phlebitis, the general glandular enlargement, and the fatal nephritis were due to one and the same poison.

*Cardiac.* Acute endocarditis seems a rare complication. I saw an instance in Philadelphia, and there are a good many cases in the literature, usually in the intense arthritic purpura (*peliosis rheumatica*). Only three cases in my series had heart murmurs, and in none of the patients was it likely that endocarditis existed. Pericarditis occurred as a terminal event in Case II.

*Gastrointestinal Symptoms.* One of the most constant features in this whole group, occurring in twenty-five of the cases, is the recurring attacks of colic, sometimes with vomiting, sometimes with diarrhœa, occasionally with the passage of blood. The association of attacks of colic with outbreaks of urticaria has long been known. Analyzing the series here reported there were eight cases in which the colic occurred alone with the outbreak of the skin lesions; in fifteen there were in addition gastric attacks, nausea and vomiting, and in five diarrhœa, and in eight blood occurred with the colic. The colic is severe, and the attacks may persist for an hour or more and may require morphine for relief. The diagnosis of renal colic was made in one case (II.), and in Case XX. the patient was admitted to the surgical ward for appendicitis. Two interesting associations of the colic may be referred to here. In certain cases of angioneurotic œdema, a malady which belongs to this erythema group, colic is a special feature, and in the family I reported almost all of the cases throughout the five generations had colic with the outbreaks of the œdema. Still more interesting is the relationship which this condition bears to those obscure cases of recurring colic and gastrointestinal crises in children, many of which I believe belong to this group. Take, for example, the following case:

Charles E. D., aged thirteen years, referred to me by Dr. Dick, of Salisbury, Md., on February 8, 1903, complaining of attacks of severe cramps in the abdomen, which have recurred at intervals for nine years. At first they occurred every month or two, and were associated with vomiting of green bile. Now he does not vomit. Of late years they have recurred with much greater frequency, so that now he never passes a week without an attack. So far as I can make out there is nothing in the diet which ever makes any difference. He is better in

warm weather, and more often has the attacks in damp weather, in winter, and after prolonged exertion. He never has any diarrhoea. He has had swelling of the joints, occasionally has had growing pains and pains about the knees. The attacks begin abruptly. Occasionally he has a little premonition in the way of uneasy sensations. The doctor states that he writhes about the floor in the attack and doubles himself into a knot and squirms about the floor like a snake. As the father expresses it, the contortions are awful. Last week he had an attack every day, but not of great severity, and this is the rule. Attacks at long intervals are always more severe. The examination of the child was negative. The urine was negative, except that the morning specimen showed a slight trace of albumin. The child was not very well grown, and looked pale and delicate. The spleen was not enlarged.

Naturally I asked particularly about the occurrence of hives or of any other skin rash, or the occurrence of arthritis, but the history was entirely negative. What is particularly interesting about the case is the fact that his mother had similar attacks during her early life, which lasted until she reached puberty. The boy has three sisters, each one of whom suffered in early life severely with hives, but had no abdominal pains.

Cases XVIII. and XXVII. show the connection of this type of colic in children with the condition under discussion. For years there were attacks of colic of great obscurity. In the former case the child was admitted with a typical outbreak of purpura and erythema; in the latter the skin lesions have lately given a clue to the nature of the protracted abdominal attacks. In angioneurotic oedema the patients may have colic alone without the giant urticaria. In children recurring colic with nausea and vomiting may be sometimes a gastrointestinal counterpart or equivalent of a cutaneous attack, as they certainly are in angioneurotic oedema, and, as I think, we may take it for granted they were in Cases XVIII. and XXVII.

*Renal.* In fourteen of the cases there was acute nephritis, indicated by albumin and numerous tube casts, and in seven cases blood. In Case VII. there was albumin without any blood or tube casts. In two cases the picture was that of an acute nephritis with dropsy. The seriousness of the nephritis is shown by the fact that of the seven deaths among the twenty-nine patients five died of uremia. The importance of the poisons causing the skin lesions of the erythema group is not sufficiently recognized as a cause of acute nephritis. Dickinson makes no mention of it in his article in Allbutt's *System*, and in most of the other systematic writers there is a corresponding silence on the subject. The nephritis, as a rule, comes on at the height of the skin lesion, or it may follow within a week or ten days, or even, as in Case XXVI., a couple of months after the subsidence of the skin lesion. There may

be no dropsy even with an intense nephritis (Case II.). The œdema of the skin lesion may simulate the puffiness of the face in renal dropsy. This was very marked in Case XXV. The photograph sent by Dr. Love showed a typical renal facies, but in this boy the urine had never been albuminous. Five of the fourteen cases of nephritis died with uræmic symptoms. With reference to the skin lesions in the renal cases, in four purpura alone was present; in three, purpura and urticaria; in two, purpura, urticaria, and erythema; in one, purpura, erythema, and œdema; in one, at various times purpura, simple erythema, urticaria, and localized œdema were present; in one, œdema and erythema, and in two, purpura and erythema. Purpura was the most constant lesion, occurring in thirteen of the fourteen cases with nephritis. It is interesting to note that there was not an instance of nephritis with œdema alone, and I have never met with it in pure cases of angioneurotic œdema.

The morbid anatomy of this type of nephritis has not been very carefully studied, and I have no post-mortems on any of the fatal cases in my series. Dr. W. T. Watson,<sup>1</sup> of Baltimore, has reported a remarkable case in a girl, aged ten years, who had had for two or three months transient pains in the abdomen. On the evening of January 28th she had a chill, followed by vomiting and fever; on the 31st, patches of erythema and maculæ; on February 1st, arthritis; on February 2d, purpuric spots; on February 3d, acute nephritis. On March 1st there was an aggravation of the condition with blood in the urine. On March 5th there was almost complete anuria, followed by general anasarca and death on the 12th. There was no endocarditis. The spleen was enlarged and firm. The kidneys were immensely enlarged, measuring each 12 x 7 cm. The cortices were pale, the striations distinct, the glomeruli prominent as gray, translucent nodules, almost like miliary tubercles. There were some small hemorrhages. Dr. W. McCallum, who made the autopsy, reports that microscopically the kidney shows extensive degeneration in the renal epithelium. Many tubules are partly filled with desquamated and degenerated epithelial cells, while the lining of others is ragged and shows fatty change. The tubules contain, besides the desquamated cells, many hyaline casts, or are sometimes filled with red blood corpuscles. The glomeruli form the most striking feature in the section. The Malpighian tuft is in almost everyone much compressed by the new growth of a mass of cells in the area of the capsular space which forms a crescentic mass. These cells lie in a connective-tissue network, which is continuous with the connective tissue outside the capsule. They have often small, subdivided, capsular spaces lined by capsular epithelium, suggesting that

<sup>1</sup> Maryland Medical Journal, 1903.

the original capsular space was merely invaded by this new growth. Dr. McCallum tells me that the case belongs to a group which has been lately described under the name of adhesive glomerulonephritis, in which there is not only a proliferation of the epithelial cells, but also a new-growth of connective tissue in the capsules.

*Arthritis* or arthritic pains were present in seventeen cases. The joint lesions were slight, as a rule; in no case was there severe poly-arthritis. The relation of the rheumatic poison to the arthritis and the other lesions is clear enough in some cases, but we cannot say that the arthritis is a hall-mark by which we can always recognize the rheumatic poison. A great many of the cases of arthritic purpura or the peliosis rheumatica have, I believe, nothing to do with the poison of rheumatism. On the other hand, erythema, with or without purpura and arthritis, may be in children, as are endocarditis, tonsillitis, and subcutaneous fibroid nodules, manifestations of the rheumatic poison—links in the rheumatic chain.

*Hemorrhages from the Mucous Membranes.* There may be recurring severe attacks of epistaxis, as in Case X.; more frequently they are slight. With the colic blood may be passed, usually in small amounts; it occurred in seven cases. Blood was passed with the urine in eight cases, in all in association with nephritis. In Case XIV., after outbreaks of urticaria for years, the final symptoms were those of a severe purpura hemorrhagica.

Lastly, it is of interest to tabulate the cases according to current nomenclature of skin diseases. In five purpura was the only lesion; in four, with arthritis; four, with fever. In seven there was the common combination of purpura with raised wheals—*purpura urticans*—which is the usual lesion of peliosis rheumatica. In five cases there was angioneurotic œdema, sometimes occurring alone, more frequently with other erythematous lesions, or alternating with them. Erythematous lesions occurred in fourteen cases, in only two alone, with swelling in the form of erythematous blotches, usually with purpura or urticaria, once only with vesiculation of an extensive character.

A word as to treatment. The very chronic cases with recurring colic for years may resist all measures. Alterative courses of gray powder, with careful dieting, may be helpful. With angioneurotic œdema nitroglycerin in full doses may be tried. Dr. Love writes that in his remarkable case (No. XXV.) camphor has done good. In such severe types as Case XIX. nothing seems to arrest the progress. The chief danger is from the kidneys, and in so frequently presenting this subject I have hoped to impress upon my colleagues the importance of recognizing this form of nephritis, and of taking early precautions to prevent its progress, against which I think protracted rest in bed and a milk diet are the best means at our disposal.

LIST OF CASES WITH VISCERAL LESIONS OF THE ERYTHEMA GROUP.

No.	Name.	Age and sex.	Skin lesions.				Fever.	Colic.	Vomiting.	Diarrhea.	Hemorrhages.	Nephritis.	Albumin.	Arthritis or arthritic pains.	Endocarditis.	Enlarged spleen.	Other complications.	Mode of death.	Duration.	Remarks.
			Purpura.	Urticaria.	Edema.	Erythema.														
1	R. L.	M. 27	...	...	...	1	1	1	1	...	...	...	...	...	1	1	...	6 yrs.	Psittidium in attacks.	
2	W. E. B.	M. 11	1	1	1	1	1	...	...	Nose.	...	...	1	...	1	Bronchitis, cough, emphysema, pneumonia.	Petrol-ditis.	5 yrs.		
3	L. W.	M. 6	1	1	...	...	1	1	1	Bowels.	1	1	1	...	...	Propry & ursemia.	10 wks.			
4	B. H.	M. 4	1	1	...	...	1	1	1	...	1	1	1	...	...	Gonorrhoea.	...	2 mos.	Came on after gonorrhoea.	
5	J. D.	M. 18	1	1	...	1	1	1	1	Urine.	1	1	1	...	...	Pneumonia.	...	Third attack.	Death from pneumonia a month after onset of third attack.	
6	W. L.	M. 9	1	...	...	...	1	1	1	Bowels.	1	1	1	...	...	...	...	About 3 wks.		
7	W. R.	F. 4	1	1	1	...	1	1	...	...	...	1	1	...	...	...	...	...	General anasarca.	
8	O. L.	F. 5	1	...	...	...	1	1	1	Urine.	1	1	1	...	...	...	...	...	Remarkable case; symptoms like purpura hemorrhagica.	
9	L. J.	M. 12	1	1	...	...	1	1	1	...	...	...	1	...	...	...	...	...		
10	B. W.	M. 20	1	1	...	...	1	1	1	...	...	...	...	...	...	Noe, re-arthritis, gums.	...	...		
11	A. B.	F. 18	1	1	...	...	1	1	1	Stomach, bowels, lungs.	...	...	1	...	...	Stomach, bowels, lungs.	...	4 yrs.	Recurring attacks of great severity.	
12	B. L.	F. 28	...	1	...	1	1	1	1	...	...	...	...	...	...	...	...	...		
13	R. B.	F. 46	...	...	...	1	1	1	1	...	...	...	1	...	...	...	...	...		
14	A. D.	M. 57	1	1	...	...	1	1	1	Stomach, bowels, urine.	1	1	...	...	1	Bronchitis.	Tremula.	27 yrs.	Extraordinary case; hemorrhages in final attack.	



15	C. A. R.	M. 29	1	1	1	...	...	1	...	Urine.	1	1	...	...	Aphasia and hemiplegia, 5 or 6 attacks.	13 to 14 years.	Remarkable case.
16	H. L.	M. 11	1	...	...	...	...	1	1	...	...	...	1	...	...	...	...
17	G. K.	M. 18	...	1	...	1	...	1	...	...	...	...	1	Apex mur.	...	...	...
18	B. P.	F. 7	1	...	...	1	1	1	1	Bowels.	...	...	1	...	1	...	Remarkable case; recurring colic for five years; case like No. 26.
19	E. C.	F. 15	...	...	1	1	1	...	...	...	1	1	...	1	Gitis, enl. lymph glands.	Uræmia.	7 mos.
20	M. R.	M. 15	1	1	...	1	...	1	...	Bowels, urine.	1	1	...	1	...	...	Admitted for appendicitis.
21	J. D.	M. 12	1	...	...	...	1	1	1	Urine.	1	1	...	...	Otitis.	...	...
22	E. C.	F. 6	1	1	...	...	...	1	...	Urine.	1	1	1	...	...	...	...
23	S. E. W.	F. 14	1	1	...	1	1	1	1	...	...	...	1	1	1	1	1
24	M. S.	M. 3	1	...	...	1	...	...	...	...	1	1	...	...	...	...	...
25	N. D.	M. 14	...	1	1	1	...	...	...	...	...	...	...	...	Swelling of throat, edema of face, spasmodic croup.	...	Remarkable case.
26	L. E.	F. 24	1	...	...	1	1	...	...	...	1	1	...	...	Pneumonia, thrombosis left femoral vein, enlargement lymphatic glands.	Uræmia.	8 mos.
27	D. B.	F. 13	...	1	...	1	1	1	1	...	...	...	...	Syst. mur.	...	...	Colic from infancy.
28	A. S. A.	M. 26	1	...	...	...	1	1	1	Bowels.	...	...	1	...	...	...	...
29	E. F.	M. 5	1	...	...	...	1	1	1	Bowels.	1	1	1	...	Otitis media.	...	...

THE "PHTHISIOLOGIA" OF RICHARD MORTON, M.D.\*

By WILLIAM OSLER, M.D.,  
Baltimore, Md.

August 22, 1662—Black Bartholomew's Day, as it has been called—brought sadness and sorrow to many English homes. The enforcement of the Act of Uniformity called for subscription to the Thirty-nine Articles, and enforced the use by all clergymen of the Book of Common Prayer. Among those ejected for refusal to subscribe—2,000 in number, it is said—was a young man, aged twenty-five, the Vicar of Kinver, in Staffordshire, Richard Morton by name. The son of a physician, born in 1637, he had been educated at Oxford, where he took the B.A. in 1656-57, became chaplain to his College and took the M.A. in 1659, and in the same year was appointed to the vicarage of Kinver. From the days of St. Luke there have been many instances of what has been called the angelical conjunction of physic and divinity. In the seventeenth century many men could sign after their names, as did Robert Lovell in his *History of Animals and Minerals* (1661), *Φιλοθεολογιατρῆσις*. Following Linacre's example, clerical orders have been taken as a rule by the physician late in life, but Morton, ejected from his living, turned his attention to medicine at a comparatively early age. From Baxter's account, he evidently was a loss to the church. He speaks of him as "a man of great gravity, calmness, sound principles, of no faction, an excellent preacher, of an upright life."

It is not known where Morton studied medicine. On the nomination of the Prince of Orange he was created an M.D. of Oxford in 1670. He settled in London, became a Candidate of the Royal College of Physicians in 1675, and a Fellow in 1679. He prac-

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\*Read before the Johns Hopkins Hospital Historical Club, January, 1900.

tised in Grey Friar's Court, Newgate Street, and had an unusual measure of success. He became physician-in-ordinary to the King, and enjoyed the confidence both of the profession and of the public. He seems to have been an intimate friend of Sydenham and a strong supporter of his new way in physic. He died in 1698.

His most important work is the *Phthisiologia*, 1689, of which there were six or seven subsequent editions in the succeeding century. Two English translations appeared, one in 1694, and the other in 1720.

His *Pyretologia* appeared in 1692, and is chiefly of value to-day as giving one of the most systematic and thorough accounts of the malarial fevers of that date.

The *Phthisiologia* is one of the first systematic treatises on pulmonary consumption. The writers of that date had, however, not got beyond the classification of phthisis given by Celsus and which embraced the forms of disease with which wasting and atrophy were associated, *i.e.*, atrophica, cachexia and phthisis proper, or consumption.

Morton's title-page of his English edition gives very well his classification: *Phthisiologia: or a Treatise of Consumptions. Wherein the Difference, Nature, Causes, Signs, and Cure of all sorts of Consumptions are explained. Containing Three Books, I. Of Original Consumptions from the whole Habit of the Body; II. Of on Original Consumption of the Lungs. III. Of Symptomatical Consumptions, or such as are the Effects of some other Distempers. Illustrated by particular Cases, and Observations added to every Book. With a Compleat Table of the most Remarkable Things.* Of these, Book II alone concerns us at present. Book I deals with the wasting associated with discharges of all sorts, suppurations, diabetes, dropsies, sweats, etc. Two points may be mentioned in passing. Under what he terms nervous consumption, I think we may recognize Gull's anorexia nervosa, particularly in the history of the two cases which he narrates. Under the section "De Tabè à Diabete," which he calls "Hydrops ad Matulam" (dropsy of the chamber-pot), he describes, for the first time, I believe, the family form in children and notes one case of recovery in childhood.

Morton was one of the first to give a clear account of tubercles in the lungs. Celsus had used the word tubercle and was stated to have introduced it into the language of medicine, but by it he really meant any small round tumor of whatever nature. Mor-



RICHARDUS MORTON M.D.

Colleg. Med. Lond. Soc.

ton's description of tubercle is as follows: "A crude Tubercle or Swelling is bred from the Obstruction of some Glandulous part of the Lungs; to wit, when a greater quantity of *Serum*, or Water is separated from the Blood, than is thrown out by the Duct of the Glandule: From whence it comes to pass, that as the Part affected being too much distended by the Humour that is imprisoned in it, is deprived of its natural Tone, and thereupon is no longer able to spew or throw out the *Serum*, or Water that flows into it, or is separated; so likewise the Humour, that is so shut up, not being any more renewed by an influx of fresh Humour, does by degrees grow dry and hard from the Natural heat of the Part: From whence arises a hardness, that resists a pressure, or a Tubercle (of which we are now speaking) which in progress of time, after the natural Tone of the Part is in this manner destroyed, is wont to be inflamed, and to turn to an Aposteme sooner or later, according to the Nature of the *Lympha*, or included Humour, and of the Blood, from which it is separated, which indeed is the whole immediate cause of a Consumption of the Lungs, and of the dry cough which attends it."

A very interesting point is that he had a strong belief in the very great prevalence of tuberculosis of the lungs, and he says: "Yea, when I consider with my self, how often in one Year there is cause enough ministered for producing these Swellings, even to those that are wont to observe the strictest Rules of Living, I cannot sufficiently admire that any one, at least after he comes to the Flower of his Youth, can dye without a touch of a Consumption. And without doubt the breeding of these Swellings is so frequent and common, that a Consumption of the Lungs would necessarily be the common Plague of Mankind, if those Swellings did not vanish, or were not removed by Art as easily as they are bred at first: And indeed I have been used to think, not without Reason, that as the more Benign Tubercles are wont to go off of their own accord, and that quickly, so none of them lay the Foundation of this great Disease, of which I am now treating, but only those which are in some degree Malignant, and ill-natur'd, and that are wont to putrefie sooner or later from some peculiar quality in their Nature, from what part soever of the Body they have their Original."

Among the procatartic or predisposing causes he mentions want of exercise, night studies and watchings, a hereditary disposition, an ill-formation of the breast, whether natural or accidental, and infection. The more immediate cause was the taking

of cold and the production of hard swellings, which he takes to be the crude tubercles mentioned by Galen, arising in the glandulous parts of the lungs.

The important point in the prevention of the disease is to be careful in the six non-naturals, in eating and drinking, in sleep, exercise, evacuations, passions of the mind, and the use of "open, fresh, kindly air and such as is free from the smoke of coals." He remarks in conclusion about the prophylaxis of consumption: "But alas! Physicians have very seldom an occasion to give their Advice about preventing this Distemper (when in the beginning perhaps it may be cured as well as other Diseases, although for the most part by neglect it proves fatal) the sick Persons seldom employing Æsculapius help before the Distemper has run on so far as to be a fatal case, and then they in vain expect Miracles from the Art of Physick, when it is more convenient for them to have the good Counsel of a Minister about the future Salvation of their Souls, and the Advice of a Lawyer about making their last Will."

The diagnostic and pathognomonic signs of the beginning of a pulmonary consumption are three: cough, fever and loss of weight. He gives a very full account of the cough of tuberculosis, and describes the form which has been known by his name, in which the patient coughs until he vomits. The fever of tuberculosis is of two kinds: the inflammatory, which has its beginning from an inflammation of the tubercles in the lungs, and which is similar to other forms of inflammatory fever, and is to be treated in the same way; and the putrid, intermitting fever of tuberculosis, which begins with a chilliness and coldness, proceeding with great heat, and at last ends in profuse and colliquative night sweats. This form accompanies a consumption to the patient's dying day, and is not to be cured with Peruvian bark or any other specific medicine. I do not know that any author previously had given such a good description of the two types of fever which we now recognize.

His description of the marasmus with the Hippocratic face is excellent. The account of the night-sweats is worth reading: "For the Sweats always come on, when the Putrid Fever is going off, to wit, after Midnight. For this Fever (whether it be a Tertian or Quotidian) comes like other Intermitting Fevers at a certain hour (which is about Noon, or a little after) with a manifest chilliness, but then proceeding for some hours with a burning Heat, Drought, Restlessness, Vomiting, shortness of Breath, a continual,

fierce and violent Cough, want of Sleep, yes, sometimes also Light-headedness, and a very red color in the Cheeks, proceeding from the Oppression of the Lungs, and those parts that are seated under the Short Ribs: But at length, to wit, about Midnight, it ends in vast and colliquative Sweats. At which time the Patient sleeps quietly, breathes not so short as before, and plentifully coughs up concocted Phlegm without any difficulty or pains, having the Symptoms of the Fever all gone off altogether of their own accord. For at this time the stream of the colliquated Humour is turned from the Lungs, and carried to the Pores of the Skin. And by that means the Patient seems all the morning to be free from a Fever, his Heat is moderate, and his Pulse low, until at length another new fit seizes him, and breaks the Treacherous Peace. And from these remissions of their Fits it often happens that these kind of Consumptive People, even when they are lookt upon as deplorable by others, flatter themselves extremely with the hopes of their Recovery; so that the same Persons that at Night use used to think themselves irrecoverable, and tell those about them they should certainly dye, yet the next Morning they always pluck up their Courage, and in vain entertain the hopes of living long."

The description of the diarrhea and of the throat symptoms, with observations on the condition of the urine and pulse, are those of a skilful, well-trained observer.

Of the varieties of consumption of the lungs he describes an acute and a chronic. He mentions a number of cases, his father's (a very skilful physician) among them, who had cough and fever for many years. He was a strong believer in the cure of consumption in its early stages—"the consumption does admit of a cure as well as other distempers." He confesses that a confirmed consumptive is rarely cured, but "if it be but a small part of the lungs that is ulcerated and the matter be benign . . . the life of the patient may be preserved many years by the careful management of himself." The hereditary consumption, and that got by infection, he says, and those occurring in the young are hardest to cure. "Every consumption, though it be cured, is apt to return, and he that has once been in a consumption, unless he governs himself very regularly, falls back into the same condition."

His section on treatment is far inferior to that on symptomatology. He advises bleeding at the outset, the use of the chalybeate waters, a milk diet, the plentiful use of shell-fish, and testaceous

medicines, that is, prepared coral, crab's eyes, powder of crab's claws, and cray-fish broth. There was a strong opinion prevalent that these hard remedies were very helpful to a cure of consumption. For the cough he used van Helmont's liquid laudanum, but warned against the sudden death that sometimes followed too much opium in the third stage of the disease. The Peruvian bark was his mainstay in the fever, and opiates and milk wherein steel had been quenched several times, for the diarrhoea.

One misses the strong statements found in Sydenham as to the value of fresh air in the treatment of the disease. Sydenham states, upon fresh air and horse-back riding, "I am sure that if any physician had a remedy for the curing of a phthisis of equal force with this of riding, he might easily get what wealth he pleased."

In the third book of the treatise are considered the symptomatic consumptions of the lung, such as are the effects of some other distempers. In the section on scrofulous consumptions, by which he means tuberculous adenitis, it would appear that he appreciated the identity of the affection in the glands with that in the lungs. He says, "and what happens in the other glandulous parts happens also in the lungs themselves." "Those who have the King's evil, who are frequently subject to glandulous swellings in other parts, are likewise many times affected with such kind of tubercles even in the lungs themselves." He states that "a scrofulous consumption," by which remember he means a tuberculous adenitis, "is curable when the tubercles are crude."

One of the most interesting sections is that upon a consumption caused by the spitting of blood (the phthisis ab haemoptoe) which he regards as one of the most fatal and incurable of the forms of consumption.

Another interesting form of consumption very fully described by Morton is that caused by stones "bred in the lungs," which he describes as smooth and chalky and without the least tubercle, or sometimes sharp and angular, causing a tearing of the lungs, with pain and the spitting of blood. He gives three cases of the spitting of lung stones associated with consumption.

A very interesting section is one on the consumption caused by peripneumonia and pleurisy, which pass into apostemes of a great bigness, and which may rupture, either internally into the windpipe, in which case the patient may be suddenly strangled or choked, or externally. He advises, if the patient can bear it, paracentesis when fluctuation is present.



Morton fully appreciated the contagious nature of tuberculosis, as the following passages indicate. I have already mentioned that he placed contagion as one of the causes. In several of his histories he recognizes it. Under scorbutical consumption he gives the history of a Mr. Hunt, who had been from his youth to the seventieth year of his age in a consumptive state. His three sons after the thirtieth year, one after another, "by the right of inheritance" were seized with a consumption, which "carried them off before the emaciated old man died." "The widow of one of them, as well from her grief for the death of her husband as from other causes, and from the taking of cold in often watching with him, and perhaps by infection too (because she lay with him to his dying day) took the disease, but gradually recovered by the use of the Islington waters." Under the phthisis ab haemoptoë, he mentions a young man, having married a virgin that was a consumptive and who died within a year after marriage, who, a few months after her death, fell into a consumption "by contagion."

# OCHRONOSIS

THE PIGMENTATION OF CARTILAGES,  
SCLEROTICS, AND SKIN IN  
ALKAPTONURIA

BY

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## OCHRONOSIS :

### THE PIGMENTATION OF CARTILAGES, SCLEROTICS, AND SKIN IN ALKAPTONURIA.

HERETOFORE ochronosis has been a pathological curiosity ; the two cases here reported in alkaptonuria show that it may have interesting clinical features.

In 1866 Virchow<sup>1</sup> described a remarkable blackening of the cartilages in the body of a man, aged 67 years, who had died from aneurysm. The colour was coal black (as shown in his figures), not ochre-coloured or yellow ; but it was not ordinary melanosis, and recognising the unique character of the condition Virchow called it ochronosis. Years passed before a second case was described by Boström,<sup>2</sup> that of a woman, aged 44 years, who had died from strangulated umbilical hernia. The same ebony-black discolouration of the cartilages was present. Then in 1892 Hansemann<sup>3</sup> described a third case, the patient being a male, aged 41 years, with general œdema and aneurysm of the left ventricle. He had had melanuria for 18 years. In a recently issued number of the *Deutsches Archiv für Klinische Medizin* Langstein and Meyer state that the examination of long-kept urine shows that this was not a case of alkaptonuria. There was no reduction of copper and no homogentisic acid could be found. Heile<sup>4</sup>

<sup>1</sup> Virchow's Archiv, 1866, Band xxxvii., p. 212.

<sup>2</sup> Virchow's Festschrift, Band ii., 1891, p. 177.

<sup>3</sup> Berliner Klinische Wochenschrift, 1892, Band xxix., p. 660.

<sup>4</sup> Virchow's Archiv, 1900, Band clx., p. 148.

recorded the fourth and fifth cases, one being that of a woman, aged 36 years, who had died from peritonitis after ruptured tubal pregnancy, and the other that of a woman, aged 52 years, with chronic leg ulcer and mitral valve disease. The sixth case was reported by Hecker and Wolf.<sup>5</sup> The patient was a man, aged 73 years, with long-standing melanuria and chronic endocarditis. In the eyes on each side some three or four millimetres from the corneal border there were black spots on the sclerotics. The urine was sometimes normal in colour when passed and sometimes brownish. It became black on standing for a day or two. The darkening was present for 11 years but was not constant. Blood, bile-pigment, indican, pyrocatechin, and drug pigments were excluded. It is distinctly stated that the urine did not reduce copper. Hecker and Wolf came to the conclusion that the reactions were those of melanuria. Post mortem there was the ordinary ochronotic blackening of the cartilages, arteries, &c. I am indebted to Dr. A. Garrod for this abstract from the *Festschrift* of the Dresden Hospital and he states that it is pretty certain this was not a case of alkaptonuria. The seventh case is recorded by H. Albrecht,<sup>6</sup> to whom is due the credit of suggesting the association of the condition with alkaptonuria. In a man, aged 47 years, who had died from pulmonary tuberculosis, the urine was dark-coloured and reduced the sulphate of copper, but the presence of alkaptonuria was not proved, for no homogentisic acid was obtained from it. After a week in the hospital he died and the necropsy showed a general ochronosis. A point of special interest was the grey-blue colour of the inner part of the ears, as if due to dilated veins.

I am able to report two cases of ochronosis in alkaptonuria in which the condition could be recognised clinically by the deep pigmentation of the cartilages of the ears and of the sclerotics, and in one by a remarkable ebony-black discolouration of the skin of the nose and cheeks.

<sup>5</sup> *Festschrift*, Dresden Hospital, 1899, p. 325.

<sup>6</sup> *Zeitschrift für Heilkunde*, 1902, Band xxiii., p. 366.

CASE 1.—A man, aged 57 years, consulted me on Jan. 16th, 1895, for diabetes and rapid action of the heart. He had been an active business man and a successful politician. I did not question the existence of diabetes, as during a prolonged residence in Europe he had been under the care of several eminent colleagues in Berlin, Paris, and London, one of whom had referred him to me. After repeated examinations Dr. Fletcher determined that the copper-reducing substance was not glucose and the case formed the basis of his paper on alkaptonuria in the *New York Medical Journal* in 1896. I need not refer in any detail to the condition of the urine in this case other than to state that it is never black when passed but darkens after a few hours. At my first examination I was impressed by a remarkable appearance of the sclerotics which showed small V-shaped areas of deep pigmentation near the cornea. I thought it might be the result of old hæmorrhages, but the patient said that the condition had gradually come on and that it had annoyed him at first but that he now thought nothing of it. There was also a slight pigmentation of the nose and on the cheeks which looked like very thickly set comedones. As he left the room my attention was directed to the deep blue colour of the inner surface of the ears. I have seen the patient at intervals during the past eight years and have taken an increased interest in the deepening pigmentation of his face, eyes, and ears. I searched the literature at intervals for an explanation but without avail and I consulted Dr. de Schweinitz and Dr. Harry Friedenwald with reference to the pigmentation of the sclerotics. It did not seem to conform with any of the reported cases of this rare condition. Lately the patient came under my care in the private ward of the Johns Hopkins Hospital for anemia and a weak, irregular heart. The pigmentation has extended considerably in the past six years and is now as follows.

*Sclerotics.*—The exposed V-shaped portions are of a deep black colour, not in the entire extent, as there are areas of normal colour. The staining is in the sclerotic coat, not in

the conjunctiva, and it does not extend to the covered parts of the eyeballs. Of late years it has become much darker; there was a brownish tinge in places which has now almost disappeared. There is nothing special to be noticed about the other parts of the eyes. The tarsal cartilages are not affected.

*Ears.*—From behind and along the free border of the helix the skin looks normal but when looked at from inside there is a remarkable blue-black discolouration, exactly like that produced by dilated veins, as Albrecht remarked. It is deepest in the concha and extends along the antihelix but not to the helix. I did not recognise at first that the pigmentation was in the cartilage. In certain positions and when the light falls into the ears the colour at once attracts attention. It has extended and deepened in the past five years.

*Face.*—Over the nose and the cheeks, in very much the butterfly distribution of lupus erythematosus, the skin is of a coal-black colour. At his first visit I thought that it was an unusual distribution of very black comedones. The line over the nose is narrow but widens and passes to the cheeks and extends over the malar bones and along the zygomata. There is no thickening of the skin, which can be picked up easily. The colour is remarkable, quite unlike anything seen in the skin in the ordinary pigmentary changes, but at first glance rather suggesting powder marks. Where present it is uniform, not patchy. It is nowhere else on the skin but Dr. Fitcher tells me that small black spots have begun to appear on the back of the hands. One of this patient's sons has alkaptonuria.

CASE 2.—The patient is a brother of the patient in Case 1, his age being 49 years. This was one of the first cases of alkaptonuria described in the United States of America. He had applied for life insurance and had been rejected repeatedly. Dr. Marshall, of the University of Pennsylvania, studied the urine carefully and called the new copper-reduc-

ing substance glycosuric acid. The man remained quite well after he had got over his fright about diabetes. When the first patient was in the hospital this brother visited him frequently, and what was my surprise to find that he too had pigmented sclerotics and ears. The patches in the eyes were small, two vertically placed bands about five millimetres from the corneo-sclerotic junction. They resembled in size and appearance those in his brother's eyes when I first saw him in 1895. The blue-black colour in the ears, not nearly so marked as in Case 1, was confined to the fossæ and could not be seen from behind. The skin was normal, but through it appeared this remarkable leaden colour as though there was a diffuse nævus. The patient had noticed the pigmentation for several years. He was morbidly sensitive about it and it was with the greatest difficulty that I could induce him to come to the clinical laboratory where Dr. Emerson determined the persistence of the alkaptonuria. This patient died in April, 1903, from pneumonia after an illness of a few days. There was no post-mortem examination.

These brothers presented a singularity in gait, walking with a slight bend or incline at the hips. At first I thought the elder brother had had spinal disease but the spine was straight and the motion of the hip-joints was perfect. He had had rheumatic pains in many joints and there were several Heberden's nodes.

Dr. Ogden of Milwaukee writes with reference to his alkaptonuria patient, whose condition was described in the *Zeitschrift für Physiologische Chemie*, 1895, that "the colour of the inside of each concha is a pearly, light-greyish lead-blue, much the colour of the inside of some of our common mussel shells." This is evidently staining of the cartilages similar to that which exists in the two patients here described and in Albrecht's case.

There is no question that these are cases of ochronosis in long-standing alkaptonuria and they support Albrecht's suggestion that the pigmentation of the cartilaginous tissues is associated with the remarkable disturbance of metabolism



which we have heretofore only recognised by the changes in the urine. The condition is thus brought within the range of the clinical physician. Fortunately it is not of much moment, so far as we know, and in the recorded cases there have been no symptoms directly due to the alkaptonuria. Dr. Garrod informs me that there are only two recorded post-mortem examinations in alkaptonuria cases. In Fürbringer's case<sup>7</sup> the patient, a male, aged 29 years, died from phthisis. There is no mention of the duration of the alkaptonuria. The necropsy was made by Thoma and the description is complete. Blackening with alkalies was looked for in the body fluids, but there is no mention of blackening of the cartilages. In von Moraczewski's case (a woman, aged 43 years) the alkaptonuria was supposed to be of late development. There is no mention of the cartilages in the protocol of the post-mortem examination. Some of the cases of ochronosis have not been in alkaptonuria and, as Dr. Garrod writes, it looks as if possibly even the very few cases described may belong to two distinct classes. Of the three cases in which black urine is mentioned two at any rate seem not to have been in alkaptonuria, and in Albrecht's patient Zdarek could not find in the fresh urine either homogentisic or uroleucic acid.

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<sup>7</sup> Berliner Klinische Wochenschrift, 1875, Band xii.

ON THE SURGICAL IMPORTANCE OF THE VISCERAL  
CRISES IN THE ERYTHEMA GROUP OF  
SKIN DISEASES.

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THE possibility of mistaking these visceral crises for appendicitis or intussusception or obstruction of the bowel, and handing the patient over to the surgeon for operation, is by no means remote. In Case II. of my series<sup>1</sup> one attack was unilateral, and of such severity that the physician who was called in, knowing nothing of the previous history of the case, diagnosed renal colic. In Case XX. the child was admitted to the surgical wards supposed to have appendicitis. Fortunately the skin rash was noticed, the pain subsided, and he was transferred to the medical wards. The association of the colic with the passage of blood *per rectum* may, of course, lead to the diagnosis of intussusception. In the January number of the *British Journal of Children's Diseases*, vol. i., No. 1, Dr. G. A. Sutherland reports the case of a boy, aged five years, who, eight days before admission, had been seized with severe abdominal pain and vomiting. After continuing intermittently for four days the attack passed off, but recurred two days later in a more persistent manner. The day before admission the motions were blood-stained. The boy looked very ill; the abdomen was distended, and he had recurring attacks of severe colic. The temperature was normal. The next day the abdomen was more distended and palpation was impossible. It was decided that the symptoms indicated obstruction from intussusception. The abdomen was opened and the sigmoid flexure was found much distended; "on going over the small intestine a part of the bowel about five inches long was found, which was dark in color, evidently from extravasated blood, and with thickened walls." There were no other hemorrhages visible. The boy reacted well from the operation, and for the next five days he had only occasional pains. He then for the first time had a skin eruption, with albumin in the urine, and the diagnosis was cleared up.

In a second case reported by Dr. Sutherland, a girl, aged seven years, was admitted to hospital with Henoch's purpura. She had

<sup>1</sup> THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, JANUARY, 1901.

a prolonged illness with the usual attacks of abdominal pain, vomiting of blood, melena, albuminuria, and haematuria. She gradually recovered, and three months later was readmitted with a recurrence of all the symptoms. The pain was more severe, referred to the umbilicus, spasmodic and colicky in character. There were hemorrhages similar to the previous attack. She died in a general convulsive seizure. The temperature was 104° F. There was acute general peritonitis and intussusception of the caecum and part of the ileum into the colon. The involved portions of the intestine were black and hemorrhagic and gangrenous. As Dr. Sutherland rightly surmises, the fatal attack was induced by hemorrhage into the wall of the colon, leading to paralysis of the affected part and to increased muscular contraction, with colic, in the adjoining part of the bowel. As a result of these strong muscular contractions the sound part of the intestine became invaginated into the paralyzed and hemorrhagic portion.

In the same journal there is reported by Mr. Harold Burrows a case in which laparotomy was performed. A boy, aged eleven years, was admitted to the Bolingbroke Hospital July 6th with a diagnosis of obstruction from intussusception. After feeling out-of-sorts for ten days, on the morning of the sixth he was seized with violent pain in the abdomen and vomiting, and shortly afterward passed blood, the vomitus being dark brown, with a fecal odor. There was general tenderness of the abdomen; no distention; no lump. The abdominal muscles were held rigid. The patient was examined under an anæsthetic, and it was decided to operate. A few inches from the ileocaecal valve the ileum showed small petechial hemorrhages and some irregular patches of congestion. The peritoneum over these parts was sticky and had lost its gloss. On the following day the patient was free from pain, but it was then noticed that there was a skin eruption. From the history the boy had had on June 26th, eleven days before admission, some arthritis and a skin rash.

The following case, at present in my wards, is a further illustration of the surgical importance of this group of cases.

Lena F., aged seventeen years, admitted for the first time December 1, 1903. The patient was seen by Dr. McCrae in consultation with her attending physician. She was in bed, rolling about with the pain, and at times assumed very curious positions, getting in the knee-elbow position and crouching and bending, very rarely staying very long in any one place. The pain was evidently of great severity, paroxysmal in character. Examination of the abdomen was negative. There was no tenderness anywhere on pressure; no resistance. The knee-joints were slightly swollen and quite tender. There was no skin eruption; no fever. She had had large doses of morphine hypodermically, which only relieved the pain for a short time. The association of the arthritis made Dr. McCrae

suspicious of the form of abdominal colic associated with skin lesions and nephritis. She was removed to the hospital with some difficulty.

The history obtained was as follows:

She had been a healthy girl. The family history was excellent except that the mother was very neurotic. There was no rheumatism in the family. She had been very well as a child and had grown and thriven. Six months before admission she had her first attack of pain in the abdomen, which every week or two had recurred and had been very severe. The attack was usually associated with vomiting. It had no relation to food, never associated with jaundice; no chills. The bowels were obstinately constipated. The attacks recurred with great severity, and on August 3d an exploratory operation was made at the City Hospital—an incision in the upper part of the abdomen. The gall-bladder was found to be clear and there was no sign of gastric ulcer; no appendicitis. Three weeks after the operation the attacks recurred, and she has had a number of very severe paroxysms. On admission she was a healthy-looking, well-nourished girl. The abdomen was not distended; no special tension; palpation could be made readily in all regions and was negative. Examination of the thoracic organs was negative. The knee-joints were a little swollen and tender, not red. Examination of the gastric juice on two occasions showed nothing special. The stools were searched carefully without finding anything abnormal. For the first few days after admission she had attacks of pain lasting from one and a half to two minutes, colic-like in character, readily controlled with codeine. She vomited on December 1st. There was no special change in the leukocytes. The count on admission was normal; coagulation time three minutes. On December 5th she had slight bleeding from the nose. On the 6th there was a trace of albumin in the urine, which persisted, and toward the close of her stay in the hospital there were a few hyaline casts. There was no skin rash. The knee condition rapidly disappeared. She was discharged December 15th, very much improved.

She was readmitted January 28, 1904. She had been very much better, but she had had slight attacks. On January 25th the colic became very severe and she had much nausea. She had had recurring attacks of bleeding from the nose, and once, she said, bleeding from the gums. There had been no skin eruption. The knee-joints became swollen and painful shortly after admission. The leukocytes were 12,500. The urine on the 29th (catheterized specimen) was smoky, and contained albumin in small amount, a few red corpuscles, and numerous hyaline casts. She remained in the hospital for nine days; the pains lessened, and she improved in her general condition.

The practical lessons to be drawn from these three cases in which laparotomy was performed are: first, that in children with colic the

greatest care should be taken to get a full history, which may bring out the fact of previous attacks, either of skin lesions, of arthritis, or of intestinal crises; and secondly, to make the most careful inspection of the skin for angioneurotic œdema, purpura, or erythema. It is also to be borne in mind that recurring colic may be for many years the sole feature of this remarkable disease, as in Cases XVII. and XXVII. of my series, in which the obscurity of the attacks of colic was not cleared up until the final appearance of skin lesions. In the case here reported the intestinal crises, in combination with arthritis and the renal features, leave no doubt as to the diagnosis. In her next attack there may be purpura or angioneurotic œdema, or an acute nephritis may occur alone. The colic is the most constant of the visceral manifestations, occurring in twenty-five of the twenty-nine cases in my series. So far as I know, it is never dangerous. In no case recorded has death resulted, I believe, from intestinal causes. The examination in the cases of Dr. Sutherland and Mr. Barrows confirms the view that the colic is due to infiltration of the intestinal wall with blood and serum.

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255

*Unity, Peace, and Concord*

A FAREWELL ADDRESS TO THE  
MEDICAL PROFESSION OF THE UNITED STATES

BY

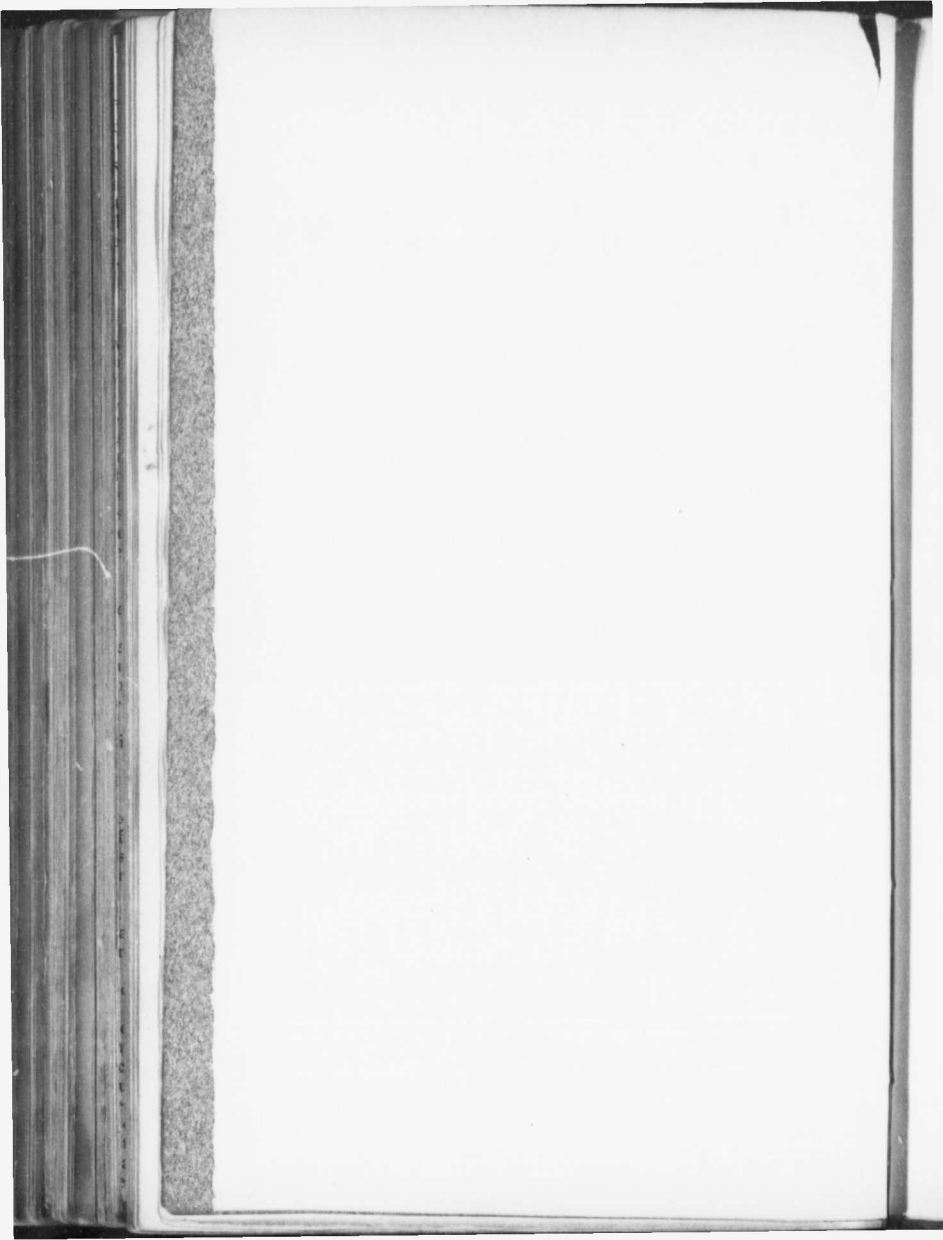
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OXFORD

HORACE HART, PRINTER TO THE UNIVERSITY

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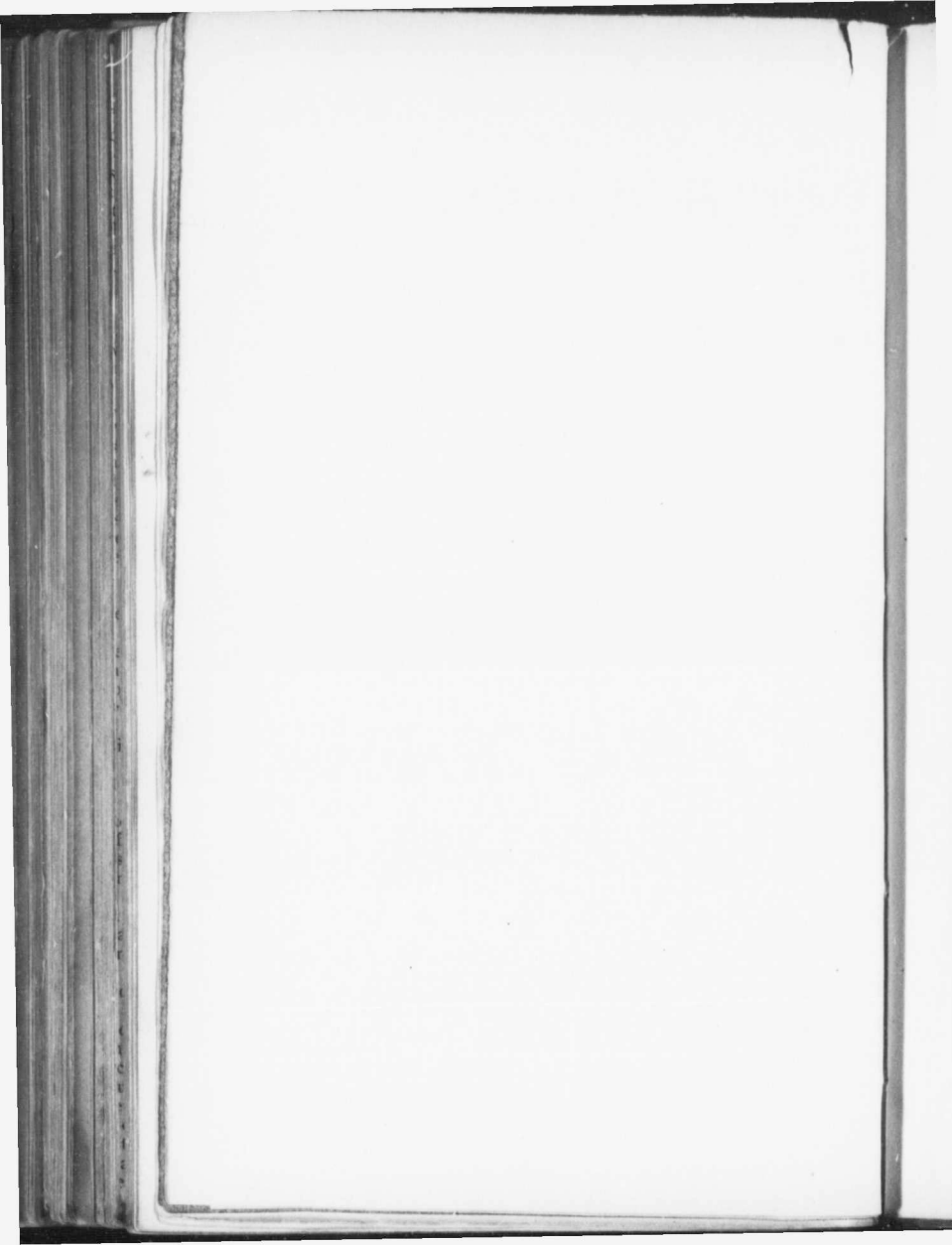
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## UNITY, PEACE, AND CONCORD

ON this occasion I have had no difficulty in selecting a subject on which to address you. Surely the hour is not for the head but for the heart, out of the abundance of which I may be able to express, however feebly, my gratitude for the many kindnesses I have received from the profession of this country during the past twenty-one years, and from you, my dear colleagues of this state and city, during the sixteen years I have dwelt among you. Truly I can say that I have lived my life in our beloved profession—perhaps too much! but whatever success I have had has come directly through it, and my devotion is only natural. Few men have had more from their colleagues than has fallen to my lot. As an untried young man my appointment at McGill College came directly through friends in the faculty who had confidence in me as a student. In the ten happy years I lived in Montreal I saw few but physicians and students, among whom I was satisfied to work—and to play. In Philadelphia the hospitals and the societies absorbed the greater part of my time, and I lived the peaceful life of a student with students. An ever-widening circle of friends in the profession brought me into closer contact with the public, but I have never departed from my ambition to be first of all a servant of my brethren, willing and anxious to do anything in my power to help them. Of my life here you all know I have studied to be quiet and to do my own business and to walk honestly toward them that are without; and one of my chief pleasures has been to work

## 6 UNITY, PEACE, AND CONCORD

among you as a friend, sharing actively in your manifold labours. But when to the sessions of sweet, silent thought I summon up the past, not what I have done, but the many things I have left undone, the opportunities I have neglected, the battles I have shirked, the precious hours I have wasted—these rise up in judgment.

A notable period it has been in our history through which we have lived, a period of reconstruction and renovation, a true renaissance, not only an extraordinary revival of learning, but a complete transformation in our educational methods; and I take pride in the thought that, in Philadelphia and in Baltimore, I have had the good fortune to be closely associated with men who have been zealous in the promotion of great reforms, the full value of which we are too close to the events to appreciate. On the far-reaching influence of these changes time will not permit us to dwell. I propose to consider another aspect of our work of equal importance, neither scientific nor educational, but what may be called humanistic, as it deals with our mutual relations and with the public.

Nothing in life is more glaring than the contrast between possibilities and actualities, between the ideal and the real. By the ordinary mortal, idealists are regarded as vague dreamers, striving after the impossible; but in the history of the world how often have they gradually moulded to their will conditions the most adverse and hopeless! They alone furnish the *Geist* that finally animates the entire body and makes possible reforms and even resolutions. Imponderable, impalpable, more often part of the moral than of the intellectual equipment, are the subtle qualities so hard to define, yet so potent in everyday life, by which these fervent

souls keep alive in us the reality of the ideal. Even in a lost cause, with aspirations utterly futile, they refuse to acknowledge defeat, and, still nursing an unconquerable hope, send up the prayer of faith in face of a scoffing world. Most characteristic of aspirations of this class is the petition of the Litany in which we pray that to the nations may be given 'unity, peace, and concord.' Century after century from the altars of Christendom this most beautiful of all prayers has risen from lips of men and women, from the loyal souls who have refused to recognize its hopelessness, with the war-drums ever sounding in their ears. The desire for unity, the wish for peace, the longing for concord, deeply implanted in the human heart, have stirred the most powerful emotions of the race, and have been responsible for some of its noblest actions. It is but a sentiment, you may say : but is not the world ruled by feeling and by passion? What but a strong sentiment baptized this nation in blood; and what but sentiment, the deep-rooted affection for country which is so firmly implanted in the hearts of all Americans, gives to these states to-day unity, peace, and concord? As with the nations at large, so with the nation in particular; as with people, so with individuals; and as with our profession, so with its members, this fine old prayer for unity, peace, and concord, if in our hearts as well as on our lips, may help us to realize its aspirations. What some of its lessons may be to us will be the subject of my address.

## UNITY

Medicine is the only world-wide profession, following everywhere the same methods, actuated by the same ambitions, and pursuing the same ends. This homo-

genity, its most characteristic feature, is not shared by the law, and not by the Church, certainly not in the same degree. While in antiquity the law rivals medicine, there is not in it that extraordinary solidarity which makes the physician at home in any country, in any place where two or three sons of men are gathered together. Similar in its high aims and in the devotion of its officers, the Christian Church, widespread as it is, and saturated with the humanitarian instincts of its Founder, yet lacks that catholicity—*urbi et orbi*—which enables the physician to practise the same art amid the same surroundings in every country of the earth. There is a unity, too, in its aims—the prevention of diseases by discovering their causes, and the cure and relief of sickness and suffering. In a little more than a century a united profession, working in many lands, has done more for the race than has ever before been accomplished by any other body of men. So great have been these gifts that we have almost lost our appreciation of them. Vaccination, sanitation, anaesthesia, antiseptic surgery, the new science of bacteriology, and the new art in therapeutics have effected a revolution in our civilization to which can be compared only the extraordinary progress in the mechanical arts. Over the latter there is this supreme advantage, it is domestic—a bedroom revolution, which sooner or later touches each one of us, if not in person, in those near and dear—a revolution which for the first time in the history of poor, suffering humanity brings us appreciably closer to that promised day when the former things should pass away, when there should be no more unnecessary death, when sorrow and crying should be no more, and there should not be any more pain.

One often hears as a reproach that more has been

done in the prevention than in the cure of disease. It is true ; but this second part of our labours has also made enormous progress. We recognize to-day the limitations of the art ; we know better the diseases curable by medicine, and those which yield to exercise and fresh air ; we have learned to realize the intricacy of the processes of disease, and have refused to deceive ourselves with half-knowledge, preferring to wait for the day instead of groping blindly in the dark or losing our way in the twilight. The list of diseases which we can positively cure is an ever-increasing one, the number of diseases the course of which we can modify favourably is a growing one, the number of incurable diseases (which is large, and which will probably always be large) is diminishing—so that in this second point we may feel that not only is the work already done of the greatest importance, but that we are on the right path, and year by year as we know disease better we shall be able to treat it more successfully. The united efforts of countless workers in many lands have won these greatest victories of science. Only by ceaseless co-operation and the intelligent appreciation by all of the results obtained in each department has the present remarkable position been reached. Within a week or ten days a great discovery in any part of the world is known everywhere, and, while in a certain sense we speak of German, French, English, and American medicine, the differences are trifling in comparison with the general similarity. The special workers know each other and are familiar with each other's studies in a way that is truly remarkable. And the knowledge gained by the one, or the special technic he may devise, or the instrument he may invent is at the immediate disposal of all. A new life-saving operation of the first class devised by a surgeon

in Breslau would be performed here the following week. A discovery in practical medicine is common property with the next issue of the weekly journals.]

A powerful stimulus in promoting this wide organic unity is our great international gatherings—not so much the International Congress of the profession, which has proved rather an unwieldy body, but of the special societies which are rapidly denationalizing science. In nearly every civilized country medical men have united in great associations which look after their interests and promote scientific work. It should be a source of special pride to American physicians to feel that the national association of this country—the American Medical Association—has become one of the largest and most influential bodies of the kind in the world. We cannot be too grateful to men who have controlled its course during the past ten years. The reorganization so efficiently carried out has necessitated a readjustment of the machinery of the state societies, and it is satisfactory to know that this meeting of our state society, the first held under the new conditions, has proved so satisfactory. But in the whole scheme of readjustment nothing commands our sympathy and co-operation more than the making of the country societies, the materials out of which the state and national associations are built. It is not easy at first to work out such a scheme in full detail, and I would ask of the members of this body not only their co-operation, but an expectant consideration, if the plan at first does not work as smoothly as could be desired. On the county members I would urge the support of a plan conceived on broad national lines—on you its success depends, and to you its benefits will chiefly come.

Linked together by the strong bonds of community



of interests, the profession of medicine forms a remarkable world-unit, in the progressive evolution of which there is a fuller hope for humanity than in any other direction.

Concentration, fusion, and consolidation are welding together various subunits in each nation. Much has been done, much remains to do; and to three desiderata I may refer briefly.

In this country reciprocity between the state licensing boards remains one of the most urgent local needs. Given similar requirements, and examinations practically of the same character, with evidence of good character, the state board should be given power to register a man on payment of the usual fee. It is preposterous to restrict in his own country, as is now done, a physician's liberty. Take a case in point: A few months ago a man who is registered in three states, an able, capable practitioner of twenty years' standing, a hard student in his profession, a physician who has had charge of some of the most important lives of this country, had to undergo another examination for licence. What an anomaly! What a reflection on a united profession! I would urge you all most strongly to support the movement now in progress to place reciprocity on a proper basis. International reciprocity is another question of equal importance, but surrounded with greater difficulties; and, though a long way off, it will come within this century.

The second urgent need is a consolidation of many of our medical schools. Within the past twenty-five years conditions have so changed that the tax on the men in charge of the unendowed schools has become ever more burdensome. In the old days of a faculty with seven professors, a school with 300 students was

a good property, paying large salaries, but the introduction of laboratory and practical teaching has so increased the expenses that very little is now left for distribution at the end of the year. The students' fees have not increased proportionately, and only the self-sacrifice and devotion of men who ungrudgingly give their time, and often their means, save a hopeless situation. A fusion of the schools is the natural solution of the problem. Take a concrete example: A union of three of the medical schools of this city would enable the scientific departments to be consolidated at an enormous saving of expense and with a corresponding increase in efficiency. Anatomy, physiology, pathology, physiologic chemistry, bacteriology, and pharmacology could be taught in separately organized departments which the funds of the united school could support liberally. Such a school could appeal to the public for aid to build and endow suitable laboratories. The clinical work could be carried on at the separate hospitals, which would afford unequalled facilities for the scientific study of disease. Not only in this city, but in Richmond, in Nashville, in Columbus, in Indianapolis, and in many cities a 'merger' is needed. Even the larger schools of the larger cities could 'pool' their scientific interests to the great advantage of the profession.

And the third desideratum is the recognition by our homoeopathic brethren that the door is open. It is too late in this day of scientific medicine to prattle of such antique nonsense as is indicated in the 'pathies.' We have long got past the stage when any 'system' can satisfy a rational practitioner, long past the time when a difference of belief in the action of drugs—the most uncertain element in our art!—should be allowed to separate men with the same noble traditions, the same

hopes, the same aims and ambitions. It is not as if our homoeopathic brothers are asleep; far from it, they are awake—many of them at any rate—to the importance of the scientific study of disease, and all of them must realize the anomaly of their position. It is distressing to think that so many good men live isolated, in a measure, from the great body of the profession. The original grievous mistake was ours—to quarrel with our brothers over infinitesimals was a most unwise and stupid thing to do. That we quarrel with them now is solely on account of the old Shibboleth under which they practise. Homoeopathy is as inconsistent with the new medicine as is the old-fashioned polypharmacy, to destruction of which it contributed so much. The rent in the robe of Aesculapius, wider in this country than elsewhere, could be repaired by mutual concessions—on the one hand by the abandonment of special designations, and on the other by an intelligent toleration of therapeutic vagaries which in all ages have beset the profession, but which have been mere flies on the wheels of progress.

## PEACE

Many seek peace, few pursue it actively, and among these few we, alas! are not often to be found. In one sense every one of us may be asked the question which Jehu returned to Joram: 'What hast thou to do with peace?' since our life must be a perpetual warfare, dominated by the fighting spirit. The physician, like the Christian, has three great foes—ignorance, which is sin; apathy, which is the world; and vice, which is the devil. There is a delightful Arabian proverb, two lines of which run: 'He that knows not, and knows not that

he knows not, is a fool. Shun him. He that knows not, and knows that he knows not, is simple. Teach him.' To a large extent these two classes represent the people with whom we have to deal. Teaching the simple and suffering the fools gladly, we must fight the wilful ignorance of the one and the helpless ignorance of the other, not with the sword of righteous indignation, but with the skilful weapon of the tongue. On this ignorance the charlatan and the quack live, and it is by no means an easy matter to decide how best to conduct a warfare against these wily foes, the oldest and most formidable with whom we have to deal. As the incomparable Fuller remarks: 'Well did the poets feign Aesculapius and Circe brother and sister, . . . for in all times (in the opinion of the multitude) witches, old women, and impostors have had a competition with doctors.' Education of the public of a much more systematic and active kind is needed. The congress on quackery which is announced to take place in Paris, with some twenty-five subjects for discussion, indicates one important method of dealing with the problem. The remarkable exhibit held last year in Germany of everything relating to quacks and charlatans did an immense good in calling attention to the colossal nature of the evil. A permanent museum of this sort might well be organized in Washington in connexion with the Department of Hygiene. It might be worth while to imitate our German brethren in a special national exhibit, though I dare say many of the most notorious sinners would apply for large space, not willing to miss the opportunity for a free advertisement! One effective measure is enforced in Germany: any proprietary medicine sold to the public must be submitted to a government analyst, who prepares a statement (as to its composition, the price

of its ingredients, &c.), which is published at the cost of the owner of the supposed remedy in a certain number of the daily and weekly papers.

By far the most dangerous foe we have to fight is apathy—indifference from whatever cause, not from a lack of knowledge, but from carelessness, from absorption in other pursuits, from a contempt bred of self-satisfaction. Fully 25 per cent. of the deaths in the community are due to this accursed apathy, fostering a human inefficiency, and going far to counterbalance the extraordinary achievements of the past century. Why should we take pride in the wonderful railway system with which enterprise and energy have traversed the land, when the supreme law, the public health, is neglected? What comfort in the thought of a people enjoying great material prosperity when we know that the primary elements of life (on which even the old Romans were our masters) are denied to them? What consolation does the 'little red school-house' afford when we know that a Lethean apathy allows toll to be taken of every class, from the little tots to the youths and maidens? Western civilization has been born of knowledge, of knowledge won by hard, honest sweat of body and brain, but in many of the most important relations of life we have failed to make that knowledge effective. And, strange irony of life, the lesson of human efficiency is being taught us by one of the little nations of the earth, which has so far bettered our instruction that we must again turn eastward for wisdom. Perhaps in a few years our civilization may be put on trial, and it will not be without benefit if it arouses the individual from apathy and makes him conscious of the great truth that only by earnest individual human effort can knowledge be made effective, and if it arouses com-

munities from an apathy which permits mediaeval conditions to prevail without a protest.

Against our third great foe—vice in all its forms—we have to wage an incessant warfare, which is not less vigorous because of the quiet, silent kind. Better than any one else the physician can say the word in season to the immoral, to the intemperate, to the uncharitable in word and deed. Personal impurity is the evil against which we can do most good, particularly to the young, by showing the possibility of the pure life and the dangers of immorality. Had I time, and were this the proper occasion, I would like to rouse the profession to a sense of its responsibility toward the social evil—the black plague which devastates the land. I can but call your attention to an important society, of which Dr. Prince Morrow of New York is the organizer, which has for one of its objects the education of the public on this important question. I would urge you to join in a crusade quite as important as that in which we are engaged against tuberculosis.

#### CONCORD

Unity promotes concord—community of interests, the same aims, the same objects give, if anything can, a feeling of comradeship, and the active co-operation of many men, while it favours friction, lessens the chances of misunderstanding and ill will. One of the most gratifying features of our professional life is the good feeling which prevails between the various sections of the country. I do not see how it could be otherwise. One has only to visit different parts and mingle with the men to appreciate that everywhere good work is being done, everywhere an earnest desire to elevate the

standard of education, and everywhere the same self-sacrificing devotion on the part of the general practitioner. Men will tell you that commercialism is rife, that the charlatan and the humbug were never so much in evidence, and that in our ethical standards there has been a steady declension. These are the Elijahs who are always ready to pour out their complaints, mourning that they are not better than their fathers. Few men have had more favourable opportunities than I have had to gauge the actual conditions in professional private life, in the schools, and in the medical societies, and as I have seen them in the past twenty years I am filled with thankfulness for the present and with hope for the future. The little rift within the lute is the absence in many places of that cordial professional harmony which should exist among us. In the larger cities professional jealousies are dying out. Read Charles Caldwell's *Autobiography* if you wish for spicy details of the quarrels of the doctors in the first half of the last century in this country. I am sorry to say the professors have often been the worst offenders, and the rivalry between medical schools has not always been friendly and courteous. That it still prevails to some extent must be acknowledged, but it is dying out, though not so rapidly as we could wish. It makes a very bad impression on the public, and is often a serious stumbling-block in the way of progress. Only the other day I had a letter from a most intelligent and appreciative layman who was interested in a large hospital scheme about which I had been consulted. I quote this sentence from it in sorrow, and I do so because it is written by a strong personal friend of the profession, a man who has had long and varied experience with us: 'I may say to you that one of the distressing bewilderingments of the layman

who only desires the working out of a broad plan is the extraordinary bitterness of professional jealousy between not only schoolmen and non-schoolmen, but between schoolmen themselves, and the reflections which are cast on one another as belonging to that clique, which makes it exceedingly difficult for the layman to understand what way there is out of these squabbles.'

The national and special societies, and particularly the American Medical Association, have brought men together and have taught them to know each other and to appreciate the good points which at home may have been overlooked. As Dr. Brush said yesterday in his address, it is in the smaller towns and country districts that the conditions are most favourable for mutual misunderstandings. Only those of us who have been brought up in such surroundings can appreciate how hard it is for physicians to keep on good terms with each other. The practice of medicine calls equally for the exercise of the heart and the head; and when a man has done his best, to have his motives misunderstood and his conduct of a case harshly criticized, not only by the family, but by a colleague who has been called in, small wonder, when the opportunity arises, if the old Adam prevails and he pays in kind. So far as my observation goes, there are three chief causes for the quarrels of doctors. The first is lack of proper friendly intercourse, by which alone we can know each other. It is the duty of the older man to look on the younger one who settles near him not as a rival, but as a son. He will do to you just what you did to the old practitioner, when, as a young man, you started—get a good many of your cases; but if you have the sense to realize that this is inevitable, unavoidable, and the way of the world, and if you have the sense to talk over, in a friendly way, the first delicate



situation that arises, the difficulties will disappear and recurrences may be made impossible. The young men should be tender with the sensibilities of their seniors, deferring to their judgement and taking counsel with them. If young graduates could be taken more frequently as assistants or partners, the work of the profession would be much lightened, and it would promote amity and good fellowship. A man of whom you may have heard as the incarnation of unprofessional conduct, and who has been held up as an example of all that is pernicious, may be, in reality, a very good fellow, the victim of petty jealousies, the mark of the arrows of a rival faction; and you may, on acquaintance, find that he loves his wife and is devoted to his children, and that there are people who respect and esteem him. After all, the attitude of mind is the all-important factor in the promotion of concord. When a man is praised, or when a young man has done a good bit of work in your special branch, be thankful—it is for the common good. Envy, that pain of the soul, as Plato calls it, should never for a moment afflict a man of generous instincts who has a sane outlook in life. The men of rival schools should deliberately cultivate the acquaintance of each other and encourage their students and the junior teachers to fraternize. If you hear that a young fellow just starting has made mistakes or is a little 'off colour,' go out of your way to say a good word to him, or for him. It is the only cure; any other treatment only aggravates the malady.

The second great cause is one over which we have direct control. The most widespread, the most pernicious of all vices, equal in its disastrous effects to impurity, much more disastrous often than intemperance, because destructive of all mental and moral nobility, as

are the others of bodily health, is uncharitableness—the most prevalent of modern sins, peculiarly apt to beset all of us, and the chief enemy to concord in our ranks. Oftentimes it is a thoughtless evil, a sort of tic or trick, an unconscious habit of mind and tongue which gradually takes possession of us. No sooner is a man's name mentioned than something slighting is said of him, or a story is repeated which is to his disadvantage, or the involuntary plight of a brother is ridiculed, or even his character is traduced. In chronic and malign offenders literally 'with every word a reputation dies.' The work of a school is disparaged, or the character of the work in a laboratory is belittled; or it may be only the faint praise that damns, not the generous meed from a full and thankful heart. We have lost our fine sense of the tragic element in this vice, and of its debasing influence on the character. It is interesting that Christ and the Apostles lashed it more unsparingly than any other. Who is there among us who does not require every day to lay to heart that counsel of perfection: 'Judge not according to the appearance, but judge righteous judgement'? One of the apostles of our profession, Sir Thomas Browne, has a great thought on the question:

While thou so hotly disclaimest the devil, be not guilty of diabolism. Fall not into one name with that unclean spirit, nor act his nature whom thou so much abhorrest—that is, to accuse, calumniate, backbite, whisper, detract, or sinistrously interpret others. Degenerous depravities, and narrow-minded vices! not only below St. Paul's noble Christian, but Aristotle's true gentleman. Trust not with some that the Epistle of St. James is apocryphal, and so read with less fear that stabbing truth, that in company with this vice thy religion is in vain. Moses broke the tables without breaking of the law; but where charity is broke the law itself is shattered, which cannot be whole without love, which is the fulfilling of it. Look humbly upon thy virtues; and though



Walter Savage Landor says, because none was worth the strife, but because I have had a deep conviction of the hatefulness of strife, of its uselessness, of its disastrous effects, and a still deeper conviction of the blessings that come with unity, peace, and concord. And I would give to each of you, my brothers—you who hear me now, and to you who may elsewhere read my words—to you who do our greatest work labouring incessantly for small rewards in towns and country places—to you the more favoured ones who have special fields of work—to you teachers and professors and scientific workers—to one and all, throughout the length and breadth of the land—I give a single word as my parting commandment:

'It is not hidden from thee, neither is it far off. It is not in heaven, that thou shouldest say, Who shall go up for us to heaven, and bring it unto us, that we may hear it, and do it? Neither is it beyond the sea, that thou shouldest say, Who shall go over the sea for us, and bring it unto us, that we may hear it, and do it? But the word is very nigh unto thee, in thy mouth, and in thy heart, that thou mayest do it'—CHARITY.

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256

# *The Student Life*

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CANADIAN AND AMERICAN MEDICAL STUDENTS

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## THE STUDENT LIFE

### I

EXCEPT it be a lover, no one is more interesting as an object of study than a student. Shakespeare might have made him a fourth in his immortal group. The lunatic with his fixed idea, the poet with his fine frenzy, the lover with his frantic idolatry, and the student aflame with the desire for knowledge are of 'imagination all compact.' To an absorbing passion, a whole-souled devotion, must be joined an enduring energy, if the student is to become a devotee of the grey-eyed goddess to whose law his services are bound. Like the quest of the Holy Grail, the quest of Minerva is not for all. For the one, the pure life; for the other, what Milton calls 'a strong propensity of nature.' Here again the student often resembles the poet—he is born, not made. While the resultant of two moulding forces, the accidental, external conditions, and the hidden germinal energies, which produce in each one of us national, family, and individual traits, the true student possesses in some measure a divine spark which sets at naught their laws. Like the Snark, he defies definition, but there are three unmistakable signs by which you may recognize the genuine article from a Boojum—an absorbing desire to know the truth, an unswerving steadfastness in its pursuit, and an open, honest heart, free from suspicion, guile, and jealousy.

At the outset do not be worried about this big question—Truth. It is a very simple matter if each one of you starts with the desire to get as much as possible. No human being is constituted to know the truth, the whole truth, and nothing but the truth; and

even the best of men must be content with fragments, with partial glimpses, never the full fruition. In this unsatisfied quest the attitude of mind, the desire, the thirst (a thirst that from the soul must rise), the fervent longing, are the be-all and the end-all. What is the student but a lover courting a fickle mistress who ever eludes his grasp? In this very elusiveness is brought out his second great characteristic—steadfastness of purpose. Unless from the start the limitations incident to our frail human faculties are frankly accepted, nothing but disappointment awaits you. The truth is the best you can get with your best endeavour, the best that the best men accept—with this you must learn to be satisfied, retaining at the same time a due humility and an earnest desire for an ever larger portion. Only by keeping the mind plastic and receptive does the student escape perdition. It is not, as Charles Lamb remarks, that some people do not know what to do with truth when it is offered to them, but the tragic fate is to reach, after years of patient search, a condition of mind-blindness in which the truth is not recognized, though it stares you in the face. This can never happen to a man who has followed step by step the growth of a truth, and who knows the painful phases of its evolution. It is one of the great tragedies of life that every truth has to struggle to acceptance against honest but mind-blind students. Harvey knew his contemporaries well, and for twelve successive years demonstrated the circulation of the blood before daring to publish the facts on which the truth was based<sup>1</sup>. Only steadfast-

<sup>1</sup> These views, as usual, pleased some more, others less; some chid and calumniated me and laid it to me as a crime

that I had dared to depart from the precepts and opinions of all Anatomists.—*De Motu Cordis*, chap. i.

ness of purpose and humility enable the student to shift his position to meet the new conditions in which new truths are born, or old ones modified beyond recognition. And, thirdly, the honest heart will keep him in touch with his fellow students, and furnish that sense of comradeship without which he travels an arid waste alone. I say advisedly an honest heart—the honest head is prone to be cold and stern, given to judgement, not mercy, and not always able to entertain that true charity which, while it thinketh no evil, is anxious to put the best possible interpretation upon the motives of a fellow worker. It will foster, too, an attitude of generous, friendly rivalry untinged by the green peril, jealousy, that is the best preventive of the growth of a bastard scientific spirit, loving seclusion and working in a lock-and-key laboratory, as timorous of light as is a thief.

You have all become brothers in a great society, not apprentices, since that implies a master, and nothing should be further from the attitude of the teacher than much that is meant in that word, used though it be in another sense, particularly by our French brethren in a most delightful way, signifying a bond of intellectual filiation. A fraternal attitude is not easy to cultivate—the chasm between the chair and the bench is difficult to bridge. Two things have helped to put up a cantilever across the gulf. The successful teacher is no longer on a height, pumping knowledge at high pressure into passive receptacles. The new methods have changed all this. He is no longer *Sir Oracle*, perhaps unconsciously by his very manner antagonizing minds to whose level he cannot possibly descend, but he is a senior student anxious to help his juniors. When a simple, earnest spirit animates a college, there is no

appreciable interval between the teacher and the taught—both are in the same class, the one a little more advanced than the other. So animated, the student feels that he has joined a family whose honour is his honour, whose welfare is his own, and whose interests should be his first consideration.

The hardest conviction to get into the mind of a beginner is that the education upon which he is engaged is not a college course, not a medical course, but a life course, for which the work of a few years under teachers is but a preparation. Whether you will falter and fail in the race or whether you will be faithful to the end depends on the training before the start, and on your staying powers, points upon which I need not enlarge. You can all become good students, a few may become great students, and now and again one of you will be found who does easily and well what others cannot do at all, or very badly, which is John Ferriar's excellent definition of a genius.

In the hurry and bustle of a business world, which is the life of this continent, it is not easy to train first-class students. Under present conditions it is hard to get the needful seclusion, on which account it is that our educational market is so full of wayside fruit. I have always been much impressed by the advice of St. Chrysostom: 'Depart from the highway and transplant thyself in some enclosed ground, for it is hard for a tree which stands by the wayside to keep her fruit till it be ripe.' The dilettante is abroad in the land, the man who is always venturing on tasks for which he is imperfectly equipped, a habit of mind fostered by the multiplicity of subjects in the curriculum; and while many things are studied, few are studied thoroughly. Men will not take time to get to the heart of a matter.

After all, concentration is the price the modern student pays for success. Thoroughness is the most difficult habit to acquire, but it is the pearl of great price, worth all the worry and trouble of the search. The dilettante lives an easy, butterfly life, knowing nothing of the toil and labour with which the treasures of knowledge are dug out of the past, or wrung by patient research in the laboratories. Take, for example, the early history of this country—how easy for the student of the one type to get a smattering, even a fairly full acquaintance with the events of the French and Spanish settlements. Put an original document before him, and it might as well be Arabic. What we need is the other type, the man who knows the records, who, with a broad outlook and drilled in what may be called the embryology of history, has yet a powerful vision for the minutiae of life. It is these kitchen and back-stair men who are to be encouraged, the men who know the subject in hand in all possible relationships. Concentration has its drawbacks. It is possible to become so absorbed in the problem of the 'enclitic  $\delta\epsilon$ ,' or the structure of the flagella of the *Trichomonas*, or of the toes of the prehistoric horse, that the student loses the sense of proportion in his work, and even wastes a lifetime in researches which are valueless because not in touch with current knowledge. You remember poor Casaubon, in *Middlemarch*, whose painful scholarship was lost on this account. The best preventive to this is to get denationalized early. The true student is a citizen of the world, the allegiance of whose soul, at any rate, is too precious to be restricted to a single country. The great minds, the great works transcend all limitations of time, of language, and of race, and the scholar can never feel initiated into the

company of the elect until he can approach all of life's problems from the cosmopolitan standpoint. I care not in what subject he may work, the full knowledge cannot be reached without drawing on supplies from lands other than his own—French, English, German, American, Japanese, Russian, Italian—there must be no discrimination by the loyal student, who should willingly draw from any and every source with an open mind and a stern resolve to render unto all their dues. I care not on what stream of knowledge he may embark, follow up its course, and the rivulets that feed it flow from many lands. If the work is to be effective he must keep in touch with scholars in other countries. How often has it happened that years of precious time have been given to a problem already solved or shown to be insoluble, because of the ignorance of what had been done elsewhere. And it is not only book knowledge and journal knowledge, but a knowledge of men that is needed. The student will, if possible, see the men in other lands. Travel not only widens the vision and gives certainties in place of vague surmises, but the personal contact with foreign workers enables him to appreciate better the failings or successes in his own line of work, perhaps to look with more charitable eyes on the work of some brother whose limitations and opportunities have been more restricted than his own. Or, in contact with a mastermind, he may take fire, and the glow of the enthusiasm may be the inspiration of his life. Concentration must then be associated with large views on the relation of the problem, and a knowledge of its status elsewhere; otherwise it may land him in the slough of a specialism so narrow that it has depth and no breadth, or he may be led to make what he believes to be important dis-

coveries, but which have long been current coin in other lands. It is sad to think that the day of the great polymathic student is at an end; that we may, perhaps, never again see a Scaliger, a Haller, or a Humboldt—men who took the whole field of knowledge for their domain and viewed it as from a pinnacle. And yet a great specializing generalist may arise, who can tell? Some twentieth-century Aristotle may be now tugging at his bottle, as little dreaming as are his parents or his friends of a conquest of the mind, beside which the wonderful victories of the Stagirite will look pale. The value of a really great student to the country is equal to half a dozen grain elevators or a new trans-continental railway. He is a commodity singularly fickle and variable, and not to be grown to order. So far as his advent is concerned there is no telling when or where he may arise. The conditions seem to be present even under the most unlikely externals. Some of the greatest students this country has produced have come from small villages and country places. It is impossible to predict from a study of the environment, which a 'strong propensity of nature,' to quote Milton's phrase again, will easily bend or break.

The student must be allowed full freedom in his work, undisturbed by the utilitarian spirit of the Philistine, who cries, *Cui bono?* and distrusts pure science. The present remarkable position in applied science and in industrial trades of all sorts has been made possible by men who did pioneer work in chemistry, in physics, in biology, and in physiology, without a thought in their researches of any practical application. The members of this higher group of productive students are rarely understood by the common spirits, who appreciate as little their unselfish devotion as their



unworldly neglect of the practical side of the problems.

Everywhere now the medical student is welcomed as an honoured member of the guild. There was a time, I confess, and it is within the memory of some of us, when, like Falstaff, he was given to 'taverns and sack and wine and metheglins, and to drinkings and swearings and starings, pribbles and prables'; but all that has changed with the curriculum, and the 'Meds' now roar you as gently as the 'Theologs.'

What I have said upon the general life and mental attitude of the student applies with tenfold force to you on account of the peculiar character of the subject-matter of your studies. Man, with all his mental and bodily anomalies and diseases—the machine in order, the machine in disorder, and the business yours to put it to rights. Through all the phases of its career this most complicated mechanism of this wonderful world will be the subject of your study and of your care—the naked, new-born infant, the artless child, the lad and the lassie just aware of the tree of knowledge overhead, the strong man in the pride of life, the woman with the benediction of maternity on her brow, and the aged, peaceful in the contemplation of the past. Almost everything has been renewed in the science and in the art of medicine, but all through the long centuries there has been no variableness or shadow of change in the essential features of the life which is our contemplation and our care. The sick love-child of Israel's sweet singer, the plague-stricken hopes of the great Athenian statesman, Elpenor, bereft of his beloved Artemidora, and 'Tully's daughter mourned so tenderly,' are not of any age or any race—they are

here with us to-day, with the Hamlets, the Ophelias, and the Lears. Amid an eternal heritage of sorrow and suffering our work is laid, and this eternal note of sadness would be insupportable if the daily tragedies were not relieved by the spectacle of the heroism and devotion displayed by the actors. Nothing will sustain you more potently than the power to recognize in your humdrum routine, as perhaps it may be thought, the true poetry of life—the poetry of the commonplace, of the ordinary man, of the plain, toil-worn woman, with their loves and their joys, their sorrows and their griefs. The comedy, too, of life will be spread before you, and nobody laughs more often than the doctor at the pranks Puck plays upon the Titanias and the Bottoms among his patients. The humorous side is really almost as frequently turned toward him as the tragic. Lift up one hand to heaven and thank your stars if they have given you the proper sense to enable you to appreciate the inconceivably droll situations in which we catch our fellow creatures. Unhappily, this is one of the free gifts of the gods, unevenly distributed, not bestowed on all, or on all in equal portions. In undue measure it is not without risk, and in any case in the doctor it is better appreciated by the eye than expressed on the tongue. Hilarity and good humour, a breezy cheerfulness, a nature 'sloping toward the southern side,' as Lowell has it, help enormously both in the study and in the practice of medicine. To many of a sombre and sour disposition it is hard to maintain good spirits amid the trials and tribulations of the day, and yet it is an unpardonable mistake to go about among patients with a long face.

Divide your attentions equally between books and men. The strength of the student of books is to sit

still—two or three hours at a stretch—eating the heart out of a subject with pencil and notebook in hand, determined to master the details and intricacies, focusing all your energies on its difficulties. Get accustomed to test all sorts of book problems and statements for yourself, and take as little as possible on trust. The Hunterian 'Do not think, but try' attitude of mind is the important one to cultivate. The question came up one day, when discussing the grooves left on the nails after fever, how long it took for the nail to grow out, from root to edge. A majority of the class had no further interest; a few looked it up in books; two men marked their nails at the root with nitrate of silver, and a few months later had positive knowledge on the subject. They showed the proper spirit. The little points that come up in your reading try to test for yourselves. With one fundamental difficulty many of you will have to contend from the outset—a lack of proper preparation for really hard study. No one can have watched successive groups of young men pass through the special schools without profoundly regretting the haphazard, fragmentary character of their preliminary education. It does seem too bad that we cannot have a student in his eighteenth year sufficiently grounded in the humanities and in the sciences preliminary to medicine—but this is an educational problem upon which only a Milton or a Locke could discourse with profit. With pertinacity you can overcome the preliminary defects, and once thoroughly interested, the work in books becomes a pastime.

A serious drawback in the student life is the self-consciousness, bred of too close devotion to books. A man gets shy, 'dysopic,' as old Timothy Bright

calls it, and shuns the looks of men, and blushes like a girl. The strength of a student of men is to travel—to study men, their habits, character, mode of life, their behaviour under varied conditions, their vices, virtues, and peculiarities. Begin with a careful observation of your fellow students and of your teachers; then, every patient you see is a lesson in much more than the malady from which he suffers. Mix as much as you possibly can with the outside world, and learn its ways. The student societies, the students' union, the gymnasium, and the outside social circle should be cultivated systematically, to enable you to conquer the diffidence which goes with bookishness and which will prove a very serious drawback in after-life. I cannot too strongly impress upon the earnest and attentive men among you the necessity of overcoming this unfortunate failing in your student days. It is not easy for every one to reach a happy medium, and the distinction between a proper self-confidence and 'cheek,' particularly in junior students, is not always to be made. The latter is met with chiefly among the student pilgrims who, in travelling down the Delectable Mountains, have gone astray and have passed to the left hand, where lieth the country of Conceit, the country in which you remember the brisk lad Ignorance met Christian.

I wish we could encourage on this continent among our best students the habit of wandering. I do not know that we are quite prepared for it, as there is still great diversity in the curricula, even among the leading schools, but it is undoubtedly a great advantage to study under different teachers, as the mental horizon is widened and the sympathies enlarged. The practice would do much to lessen that narrow 'I am of Paul

and I am of Apollos' spirit which is hostile to the best interests of the profession.

There is much that I would like to say on the question of work, but I can spare only a few moments for a word or two. Who will venture to settle upon so simple a matter as the best time for work? One will tell us there is no best time; all are equally good; and truly, all times are the same to a man whose soul is absorbed in some great problem. The other day I asked Edward Martin, the well-known story-writer, what time he found best for work. 'Not in the evening, and never between meals!' was his answer, which may appeal to some of my hearers. One works best at night; another, in the morning; a majority of the students of the past favour the latter. Erasmus, the great exemplar, says, 'Never work at night; it dulls the brain and hurts the health.' One day, going with George Ross through Bedlam, Dr. Savage, at that time the physician in charge, remarked upon two great groups of patients—those who were depressed in the morning and those who were cheerful, and he suggested that the spirits rose and fell with the bodily temperature—those with very low morning temperatures were depressed, and vice versa. This, I believe, expresses a truth which may explain the extraordinary difference in the habits of students in this matter of the time at which the best work can be done. Outside of the asylum there are also the two great types, the student-lark who loves to see the sun rise, who comes to breakfast with a cheerful morning face, never so 'fit' as at 6 a.m. We all know the type. What a contrast to the student-owl with his saturnine morning face, thoroughly unhappy, cheated by the wretched breakfast bell of the two best hours of the day for sleep, no appetite, and permeated with an

unspeakable hostility to his *vis-à-vis*, whose morning garrulity and good humour are equally offensive. Only gradually, as the day wears on and his temperature rises, does he become endurable to himself and to others. But see him really awake at 10 p.m.! While the plethoric lark is in hopeless coma over his books, from which it is hard to rouse him sufficiently to get his boots off for bed, our lean owl-friend, Saturn no longer in the ascendant, with bright eyes and cheery face, is ready for four hours of anything you wish—deep study, or

Heart affluence in discursive talk,

and by 2 a.m. he will undertake to unsphere the spirit of Plato. In neither a virtue, in neither a fault; we must recognize these two types of students, differently constituted owing possibly—though I have but little evidence for the belief—to thermal peculiarities.

## II

In the days of probation the student life may be lived by each one of you in its fullness and in its joys, but the difficulties arise in the break which follows departure from college and the entrance upon new duties. Much will now depend on the attitude of mind which has been encouraged. If the work has been for your degree, if the diploma has been its sole aim and object, you will rejoice in a freedom from exacting and possibly unpleasant studies, and with your books you will throw away all thoughts of further systematic work. On the other hand, with good habits of observation you may have got deep enough into the subject to feel that there is still much to be learned, and if you have had ground

into you the lesson that the collegiate period is only the beginning of the student life, there is a hope that you may enter upon the useful career of the *student-practitioner*. Five years, at least, of trial await the man after parting from his teachers, and entering upon an independent course—years upon which his future depends and from which his horoscope may be cast with certainty. It is all the same whether he settles in a country village, or goes on with hospital and laboratory work; whether he takes a prolonged trip abroad; or whether he settles down in practice, with a father or a friend—these five waiting years fix his fate so far as the student life is concerned. Without any strong natural propensity to study, he may feel such a relief after graduation that the effort to take to books is beyond his mental strength, and a weekly journal with an occasional textbook furnish pabulum enough, at least, to keep his mind hibernating. But ten years later he is dead mentally, past any possible hope of galvanizing into life as a student, fit to do a routine practice, often a capable, resourceful man, but without any deep convictions, and probably more interested in stocks or in horses than in diagnosis or therapeutics. But this is not always the fate of the student who finishes his work on Commencement Day. There are men full of zeal in practice, who give good service to their fellow creatures, who have not the capacity or the energy to keep up with the times. While they have lost interest in science, they are loyal members of the profession, and appreciate their responsibilities as such. That fateful first lustrum ruins some of our most likely material. Nothing is more trying to the soldier than inaction, to mark time while the battle is raging all about him; and waiting for practice is a

serious strain under which many yield. In the cities it is not so hard to keep up: there is work in the dispensaries and colleges, and the stimulus of the medical societies; but in smaller towns and in the country it takes a strong man to live through the years of waiting without some deterioration. I wish the custom of taking junior men as partners and assistants would grow on this continent. It has become a necessity, and no man in large general practice can do his work efficiently without skilled help. How incalculably better for the seniors; how beneficial to the patients; how helpful in every way if each one of you, for the first five or ten years, was associated with a senior practitioner, doing his night work, his laboratory work, his chores of all sorts. You would, in this way, escape the chilling and killing isolation of the early years, and amid congenial surroundings you could, in time, develop into that flower of our calling—the cultivated general practitioner. May this be the destiny of a large majority of you! Have no higher ambition! You cannot reach any better position in a community; the family doctor is the man behind the gun, who does our effective work. That his life is hard and exacting; that he is underpaid and overworked; that he has but little time for study and less for recreation—these are the blows that may give finer temper to his steel, and bring out the nobler elements in his character. What lot or portion has the general practitioner in the student life? Not, perhaps, the fruitful heritage of Judah or Benjamin, but he may make of it the goodly portion of Ephraim. A man with powers of observation, well trained in the wards, and with the strong natural propensity to which I have so often referred, may live the ideal student life,



and even reach the higher levels of scholarship. Adams, of Banchory (a little Aberdeenshire village), was not only a good practitioner and a skilful operator, but he was an excellent naturalist. This is by no means an unusual or remarkable combination, but Adams became, in addition, one of the great scholars of the profession. He had a perfect passion for the classics, and amid a very exacting practice found time to read 'almost every Greek work which has come down to us from antiquity, except the ecclesiastical writers.' He translated the works of Paulus Aegineta, the works of Hippocrates, and the works of Aretaeus, all of which are in the Sydenham Society's publications, monuments of the patient skill and erudition of a Scottish village doctor, an incentive to every one of us to make better use of our precious time.

Given the sacred hunger and proper preliminary training, the student-practitioner requires at least three things with which to stimulate and maintain his education, a notebook, a library, and a quinquennial brain-dusting. I wish I had time to speak of the value of note-taking. You can do nothing as a student in practice without it. Carry a small notebook which will fit into your waistcoat pocket, and never ask a new patient a question without notebook and pencil in hand. After the examination of a pneumonia case two minutes will suffice to record the essentials in the daily progress. Routine and system, when once made a habit, facilitate work, and the busier you are the more time you will have to make observations after examining a patient. Jot a comment at the end of the notes: 'clear case,' 'case illustrating obscurity of symptoms,' 'error in diagnosis,' &c. The making of observations may become the exercise of a jackdaw-like trick, like

the craze which so many of us have to collect articles of all sorts. The study of the cases, the relation they bear to each other and to the cases in literature—here comes in the difficulty. Begin early to make a three-fold category—clear cases, doubtful cases, mistakes. And learn to play the game fair, no self-deception, no shrinking from the truth; mercy and consideration for the other man, but none for yourself, upon whom you have to keep an incessant watch. You remember Lincoln's famous *mot* about the impossibility of fooling all of the people all of the time. It does not hold good for the individual who can fool himself to his heart's content all of the time. If necessary, be cruel; use the knife and the cautery to cure the intumescence and moral necrosis which you will feel in the posterior parietal region, in Gall and Spurzheim's centre of self-esteem, where you will find a sore spot after you have made a mistake in diagnosis. It is only by getting your cases grouped in this way that you can make any real progress in your post-collegiate education; only in this way can you gain wisdom with experience. It is a common error to think that the more a doctor sees the greater his experience and the more he knows. No one ever drew a more skilful distinction than Cowper in his oft-quoted lines, which I am never tired of repeating in a medical audience:

Knowledge and wisdom, far from being one,  
Have oft-times no connexion. 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.

What we call sense or wisdom is knowledge, ready for use, made effective, and bears the same relation to knowledge itself that bread does to wheat. The full

knowledge of the parts of a steam engine and the theory of its action may be possessed by a man who could not be trusted to pull the lever to its throttle. It is only by collecting data and using them that you can get sense. One of the most delightful sayings of antiquity is the remark of Heraclitus upon his predecessors—that they had much knowledge, but no sense—which indicates that the noble old Ephesian had a keen appreciation of their difference ; and the distinction, too, is well drawn by Tennyson in the oft-quoted line :

Knowledge comes, but Wisdom lingers.

Of the three well-stocked rooms which it should be the ambition of every young doctor to have in his house, the library, the laboratory, and the nursery—books, balances, and bairns—as he may not achieve all three, I would urge him to start at any rate with the books and the balances. A good weekly and a good monthly journal to begin with, and read them. Then, for a systematic course of study, supplement your college textbooks with the larger systems—Allbutt or Nothnagel—a system of surgery, and, as your practice increases, make a habit of buying a few special monographs every year. Read with two objects : first, to acquaint yourself with the current knowledge on a subject and the steps by which it has been reached ; and secondly, and more important, read to understand and analyse your cases. To this line of work we should direct the attention of the student before he leaves the medical school, pointing in specific cases just where the best articles are to be found, sending him to the Index Catalogue—that marvellous storehouse, every page of which is interesting and the very titles instructive. Early learn to appreciate the differences between the descriptions of disease and the manifesta-

tions of that disease in an individual—the difference between the composite portrait and one of the component pictures. By exercise of a little judgement you can collect at moderate cost a good working library. Try, in the waiting years, to get a clear idea of the history of medicine. Read Foster's *Lectures on the History of Physiology*, Baas's *History of Medicine*. Get the 'Masters of Medicine' Series, and subscribe to the *Library and Historical Journal*<sup>1</sup>.

Every day do some reading or work apart from your profession. I fully realize, no one more so, how absorbing is the profession of medicine; how applicable to it is what Michelangelo says, 'There are sciences which demand the whole of a man, without leaving the least portion of his spirit free for other distractions'; but you will be a better man and not a worse practitioner for an avocation. I care not what it may be; gardening or farming, literature or history or bibliography, any one of which will bring you into contact with books. (I wish that time permitted me to speak of the other two rooms which are really of equal importance with the library, but which are more difficult to equip, though of co-ordinate value in the education of the head, the heart, and the hand.) The third essential for the practitioner as a student is the quinquennial brain-dusting, and this will often seem to him the hardest task to carry out. Every fifth year, back to the hospital, back to the laboratory, for renovation, rehabilitation, rejuvenation, reintegration, resuscitation, &c. Do not forget to take the notebooks with you, or the sheets, in three separate bundles, to work over. From the very start begin to save for the trip. Deny yourself all luxuries for it; shut up the room you meant for the nursery,—have the

<sup>1</sup> Brooklyn. Price, \$2 per annum.

definite determination to get your education thoroughly well started; if you are successful you may, perhaps, have enough saved at the end of three years to spend six weeks in special study; or in five years you may be able to spend six months. Hearken not to the voice of old 'Dr. Hayseed,' who tells you it will ruin your prospects, and that he 'never heard of such a thing' as a young man, not yet five years in practice, taking three months' holiday. To him it seems preposterous. Watch him wince when you say it is a speculation in the only gold mine in which the physician should invest—*Grey Cortex!* What about the wife and babies, if you have them? Leave them! Heavy as are your responsibilities to those nearest and dearest, they are outweighed by the responsibilities to yourself, to the profession, and to the public. Like Isaphaena, the story of whose husband—ardent, earnest soul, peace to his ashes!—I have told in the little sketch of *An Alabama Student*, your wife will be glad to bear her share in the sacrifice you make.

With good health and good habits the end of the second lustrum should find you thoroughly established—all three rooms well furnished, a good stable, a good garden, no mining stock, but a life insurance, and, perhaps, a mortgage or two on neighbouring farms. Year by year you have dealt honestly with yourself; you have put faithfully the notes of each case into their proper places, and you will be gratified to find that, though the doubtful cases and mistakes still make a rather formidable pile, it has grown relatively smaller. You literally 'own' the country-side, as the expression is. All the serious and dubious cases come to you, and you have been so honest in the frank acknowledgement of your own mistakes, and so charitable in the contem-

plation of theirs, that neighbouring doctors, old and young, are glad to seek your advice. The work, which has been very heavy, is now lightened by a good assistant, one of your own students, who becomes in a year or so your partner. This is not an overdrawn picture, and it is one which may be seen in many places, except, I am sorry to say, in the particular as to the partner. This is the type of man we need in the country districts and the smaller towns. He is not a whit too good to look after the sick, not a whit too highly educated—impossible! And with an optimistic temperament and a good digestion he is the very best product of our profession, and may do more to stop quackery and humbuggery, inside and outside of the ranks, than could a dozen prosecuting county attorneys. Nay, more! such a doctor may be a daily benediction in the community—a strong, sensible, whole-souled man, living a life often of great self-denial, always of tender sympathy, worried neither by the vagaries of the well nor by the testy waywardness of the sick, and to him, if to any, may come (even when he knows it not) the true spiritual blessing—that ‘blessing which maketh rich and addeth no sorrow.’

The danger in such a man's life comes with prosperity. He is safe in the hard-working day, when he is climbing the hill, but once success is reached, with it come the temptations to which many succumb. Politics has been the ruin of many country doctors, and often of the very best, of just such a good fellow as he of whom I have been speaking. He is popular; he has a little money; and he, if anybody, can save the seat for the party! When the committee leaves you, take the offer under consideration, and if in the ten or twelve years you have kept on intimate terms with

those friends of your student days, Montaigne and Plutarch, you will know what answer to return. If you live in a large town, resist the temptation to open a sanatorium. It is not the work for a general practitioner, and there are risks that you may sacrifice your independence and much else besides. And, thirdly, resist the temptation to move into a larger place. In a good agricultural district, or in a small town, if you handle your resources aright, taking good care of your education, of your habits, and of your money, and devoting part of your energies to the support of the societies, &c., you may reach a position in the community of which any man may be proud. There are country practitioners among my friends with whom I would rather change places than with any in our ranks, men whose stability of character and devotion to duty make one proud of the profession.

Curiously enough, the student-practitioner may find studiousness to be a stumbling-block in his career. A bookish man may never succeed; deep-versed in books, he may not be able to use his knowledge to practical effect; or, more likely, his failure is not because he has studied books much, but because he has not studied men more. He has never got over that shyness, that diffidence, against which I have warned you. I have known instances in which this malady was incurable; in others I have known a cure effected not by the public, but by the man's professional brethren, who, appreciating his work, have insisted upon utilizing his mental treasures. It is very hard to carry student habits into a large city practice; only zeal, a fiery passion, keeps the flame alive, smothered as it is so apt to be by the dust and ashes of the daily routine. A man may be a good student who reads only the

book of nature. Such a one<sup>1</sup> I remember in the early days of my residence in Montreal—a man whose devotion to patients and whose kindness and skill quickly brought him an enormous practice. Reading in his carriage and by lamplight at Lucina's bedside, he was able to keep well informed; but he had an insatiable desire to know the true inwardness of a disease, and it was in this way I came into contact with him. Hard pushed day and night, yet he was never too busy to spend a couple of hours with me searching for data which had not been forthcoming during life, or helping to unravel the mysteries of a new disease, such as pernicious anaemia.

### III

The *student-specialist* has to walk warily, as with two advantages there are two great dangers against which he has constantly to be on guard. In the bewildering complexity of modern medicine it is a relief to limit the work of a life to a comparatively narrow field which can be thoroughly tilled. To many men there is a feeling of great satisfaction in the mastery of a small department, particularly one in which technical skill is required. How much we have benefited from this concentration of effort in dermatology, laryngology, ophthalmology, and in gynecology! Then, as a rule, the specialist is a free man, with leisure or, at any rate, with some leisure; not the slave of the public, with the incessant demands upon him of the general practitioner. He may live a more rational life, and has time to cultivate his mind, and he is able to devote himself to public interests and to the welfare of his professional

<sup>1</sup> The late John Bell.



brethren, on whose suffrages he so largely depends. How much we are indebted in the larger cities to the disinterested labours of this favoured class, the records of our libraries and medical societies bear witness. The dangers do not come to the strong man in a speciality, but to the weak brother who seeks in it an easier field in which specious garrulity and mechanical dexterity may take the place of solid knowledge. All goes well when the man is larger than his speciality and controls it, but when the speciality runs away with the man there is disaster, and a topsy-turvy condition which, in every branch, has done incalculable injury. Next to the danger from small men is the serious risk of the loss of perspective in prolonged and concentrated effort in a narrow field. Against this there is but one safeguard—the cultivation of the sciences upon which the speciality is based. The student-specialist may have a wide vision—no student wider—if he gets away from the mechanical side of the art, and keeps in touch with the physiology and pathology upon which his art depends. More than any other of us, he needs the lessons of the laboratory, and wide contact with men in other departments may serve to correct the inevitable tendency to a narrow and perverted vision, in which the life of the ant-hill is mistaken for the world at large.

Of the *student-teacher* every faculty affords examples in varying degrees. It goes without saying that no man can teach successfully who is not at the same time a student. Routine, killing routine, saps the vitality of many who start with high aims, and who, for years, strive with all their energies against the degeneration which it is so prone to entail. In the smaller schools isolation, the absence of congenial

spirits working at the same subject, favours stagnation, and after a few years the fires of early enthusiasm no longer glow in the perfunctory lectures. In many teachers the ever-increasing demands of practice leave less and less time for study, and a first-class man may lose touch with his subject through no fault of his own, but through an entanglement in outside affairs which he cannot control, yet deeply regrets. To his five natural senses the student-teacher must add two more—the sense of responsibility and the sense of proportion. Most of us start with a highly developed sense of the importance of the work, and with a desire to live up to the responsibilities entrusted to us. Punctuality, the class first, always and at all times; the best that a man has in him, nothing less; the best the profession has on the subject, nothing less; fresh energies and enthusiasm in dealing with dry details; animated, unselfish devotion to all alike; tender consideration for his assistants—these are some of the fruits of a keen sense of responsibility in a good teacher. The sense of proportion is not so easy to acquire, and much depends on the training and on the natural disposition. There are men who never possess it; to others it seems to come naturally. In the most careful ones it needs constant cultivation—*nothing over-much* should be the motto of every teacher. In my early days I came under the influence of an ideal student-teacher, the late Palmer Howard, of Montreal. If you ask what manner of man he was, read Matthew Arnold's noble tribute to his father in his well-known poem, *Rugby Chapel*. When young, Dr. Howard had chosen a path—'path to a clear-purposed goal,' and he pursued it with unswerving devotion. With him the study and the teaching of medicine were an absorbing

passion, the ardour of which neither the incessant and ever-increasing demands upon his time nor the growing years could quench. When I first, as a senior student, came into intimate contact with him in the summer of 1871, the problem of tuberculosis was under discussion, stirred up by the epoch-making work of Villemin and the radical views of Niemeyer. Every lung lesion at the Montreal General Hospital had to be shown to him, and I got my first-hand introduction to Laënnec, to Graves, and to Stokes, and became familiar with their works. No matter what the hour, and it usually was after 10 p.m., I was welcome with my bag, and if Wilks and Moxon, Virchow, or Rokitanski gave us no help, there were the Transactions of the Pathological Society and the big *Dictionnaire* of Dechambre. An ideal teacher because a student, ever alert to the new problems, an indomitable energy enabled him in the midst of an exacting practice to maintain an ardent enthusiasm, still to keep bright the fires which he had lighted in his youth. Since those days I have seen many teachers, and I have had many colleagues, but I have never known one in whom were more happily combined a stern sense of duty with the mental freshness of youth.

But as I speak, from out the memory of the past there rises before me a shadowy group, a long line of students whom I have taught and loved, and who have died prematurely—mentally, morally, or bodily. To the successful we are all willing and anxious to bring the tribute of praise, but none so poor to give recognition to the failures. From one cause or another, perhaps because, when not absorbed in the present, my thoughts are chiefly in the past, I have cherished the memory of many young men whom I have loved

and lost. *Io victis!* let us sometimes sing of the vanquished. Let us sometimes think of those who have fallen in the battle of life, who have striven and failed, who have failed even without the strife. How many have I lost from the student band by mental death, and from so many causes—some stillborn from college, others dead within the first year of infantile marasmus, while mental rickets, teething, tabes, and fits have carried off many of the most promising minds! From improper feeding within the first five fateful years scurvy and rickets head the mental mortality bills of students. To the teacher-nurse it is a sore disappointment to find at the end of ten years so few minds with the full stature, of which the early days gave promise. Still, so widespread is mental death that we scarcely comment upon it in our friends. The real tragedy is the moral death which, in different forms, overtakes so many good fellows who fall away from the pure, honourable, and righteous service of Minerva into the idolatry of Bacchus, of Venus, or of Circe. Against the background of the past these tragedies stand out, lurid and dark, and as the names and faces of my old boys recur (some of them my special pride), I shudder to think of the blighted hopes and wrecked lives, and I force my memory back to those happy days when they were as you are now, joyous and free from care, and I think of them on the benches, in the laboratories, and in the wards—and there I leave them. Less painful to dwell upon, though associated with a more poignant grief, is the fate of those whom physical death has snatched away in the bud or blossom of the student life. These are among the tender memories of the teacher's life, of which he does not often care to speak, feeling with Longfellow that the surest pledge of their remembrance

is 'the silent homage of thoughts unspoken.' As I look back it seems now as if the best of us had died, that the brightest and the keenest had been taken, and the more commonplace among us had been spared. An old mother, a devoted sister, a loving brother, in some cases a broken-hearted wife, still pay the tribute of tears for the untimely ending of their high hopes, and in loving remembrance I would mingle mine with theirs. What a loss to our profession have been the deaths of such true disciples as Zimmerman, of Toronto; of Jack Cline and of R. L. MacDonnell, of Montreal; of Fred Packard and of Kirkbride, of Philadelphia; of Livingood, of Lazear, of Oppenheimer, and of Oechsner, in Baltimore—cut off with their leaves still in the green, to the inconsolable grief of their friends!

To each one of you the practice of medicine will be very much as you make it—to one a worry, a care, a perpetual annoyance; to another, a daily joy and a life of as much happiness and usefulness as can well fall to the lot of man. In the student spirit you can best fulfil the high mission of our noble calling—in his *humility*, conscious of weakness, while seeking strength; in his *confidence*, knowing the power, while recognizing the limitations of his art; in his *pride* in the glorious heritage from which the greatest gifts to man have been derived; and in his sure and certain hope that the future holds for us still richer blessings than the past.

CCLVII

257

ANEURYSM OF THE  
ABDOMINAL AORTA

BY

WILLIAM OSLER, M.D., F.R.S.

REGIUS PROFESSOR OF MEDICINE AT THE UNIVERSITY OF OXFORD.

*Reprinted from THE LANCET, October 14, 1905.*

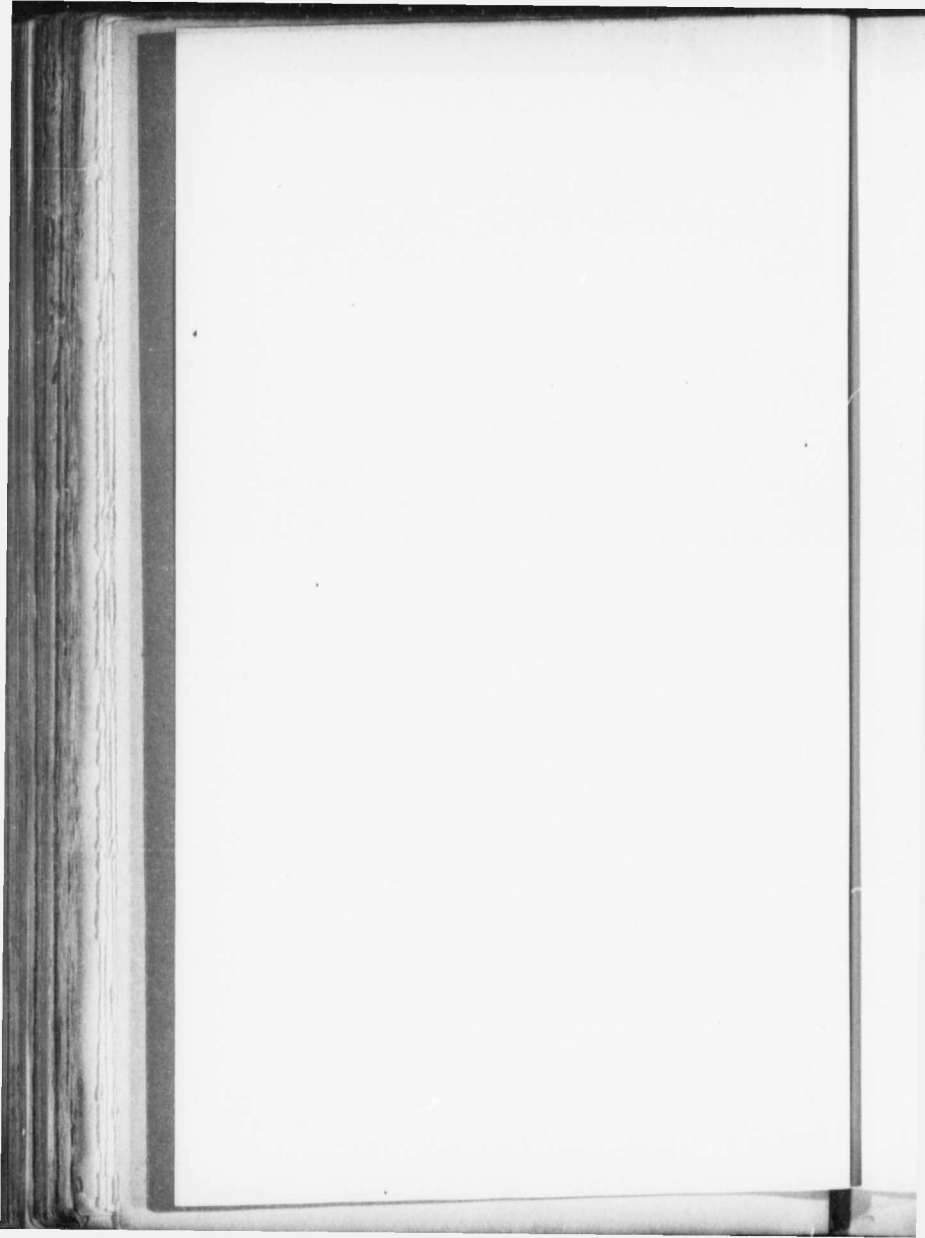
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## ANEURYSM OF THE ABDOMINAL AORTA.<sup>1</sup>

ANEURYSM of the abdominal aorta is very often diagnosed when not present, and when present the symptoms may be so obscure that the nature of the trouble is overlooked. I propose in this paper to speak of some aspects of our experience at the Johns Hopkins Hospital during the past 16 years, particularly with reference to the large abdominal tumour caused by the ruptured aneurysm. I have put in tabular form the cases, 16 in number, with the chief features. I have no intention of speaking of the history of the condition but I cannot refrain from two references. Vesalius was not only the first to recognise an aneurysm of the thoracic aorta during life but to him also we owe the first clinical description of aneurysm of the abdominal aorta. In the letter to Gasser acknowledging the receipt of the post-mortem report of a case of aneurysm of the thoracic aorta, which he had recognised two years before, he refers to an abdominal aneurysm in a woman who had had for many years a pulsating tumour below the stomach.<sup>2</sup> It is quite possible that this may have been only a throbbing aorta but it is evident that Vesalius had had his attention strongly directed to this disease, as he tells Gasser in the same letter that he had seen six cases of aneurysm since his consultation with him in Augsburg. 152 years later (1719) Valisneri (whose name is linked with the plant known to all young students of biology) made the diagnosis of aneurysm of the abdominal aorta in the case of a carman at Padua, aged about 30 years, who had had syphilis and over whose abdomen a wheel had passed. For eight months he was in bed with severe pains in the loins and back and after having been seen by several physicians Valisneri detected a pulsation and diagnosed aneurysm. The part afterwards swelled and the tumefaction extended and even raised the contiguous ribs. An unskilful surgeon opened the tumour; a copious effusion of blood followed and the man died in a quarter of an hour. Morgagni was present at the examination, when an aneurysm was found extending from the diaphragm to the pelvis, the organs were displaced to the right, and even the left kidney

<sup>1</sup> A paper read before the Medico-Chirurgical Society of Montreal.

<sup>2</sup> Roth's Vesalius.



TABLE OF CASES OF ANEURYSM OF THE ABDOMINAL AORTA AT THE JOHNS HOPKINS HOSPITAL, BALTIMORE, U.S.A.

No.	Sex.	Age (years).	Syphills.	Alcohol.	Hard work.	Chief symptoms.	Physical signs.	Operation.	Remarks.
1	M.	69	No.	No.	Yes.	Pain, nausea, and vomiting.	Tumour; thrill; no murmur.	Exploratory laparotomy.	Tumour had lasted 3 years; remarkable mobility.
2	F.	36?	?	?	No.	Pain and emaciation.	Enormous non pulsatile tumour.	Exploratory aspiration.	Huge diffuse aneurysm.
3	M.	33	?	No	..	Pain; loss of weight.	Enormous pulsating tumour in flank.	Incision; attempt to compress abdominal aorta.	Death on the table; enormous diffuse aneurysm.
4	M.	47	Yes.	Yes.	Yes.	Pain of extraordinary persistence and violence.	Pulsation in back; thrill; systolic murmur.	—	Duration 3½ years.
5	M.	27	..	..	No.	Pain.	Tumour; thrill; systolic and diastolic murmurs.	Wiring and electrolysis.	Death in 48 hours; rupture through the diaphragm.
6	M.	36	..	..	..	..	Tumour; systolic murmur; pulsation behind.	—	—
7	M.	68	..	..	Yes.	No symptoms.	Large tumour; systolic murmur.	—	—
8	M.	36	..	..	No.	Great pain.	Tumour; systolic bruit.	Wiring and electrolysis.	Death on ninth day; rupture into peritoneum.
9	F.	33	?	?	Yes.	Pain.	Large tumour; systolic and diastolic bruits.	—	—
10	M.	53	Yes.	No.	No.	No pain.	Large tumour; systolic and diastolic murmurs.	Wiring and electrolysis.	Discharged in 4 weeks. No change.
11	M.	38	..	Yes.	..	Pains.	Heaving tumour; systolic bruit.	..	Death on fourteenth day; rupture of sac.
12	M.	43	No	..	..	Pain.	Tumour; thrill; systolic murmur.	..	Pulsation much diminished; discharged in 4 weeks; no subsequent note.
13	M.	30	Yes.	No.	..	Pain; vomiting.	Tumour; thrill; systolic murmur.	..	Great improvement; lived 3½ years.
14	M.	31	..	Yes.	Yes.	No abdominal symptoms.	—	—	Dissecting aneurysm of entire abdominal aorta.
15	M.	54	No.	..	..	Latent.	Death from pneumonia.	—	Aneurysm (accumulated) of abdominal aorta; found post mortem.
16	M.	49	..	..	..	Pain.	Large pulsating tumour; rupture.	Wiring and electrolysis.	Rupture; diffuse aneurysm; death 6 months later.

usually the first indication of the trouble and throughout remains *the* feature, reaching an intensity not met with in any other disease. Five of the patients were taking large doses of morphine before admission. Associated with pressure upon, or stretching of, the nerves it is of a constant, dull, boring character, varied in some cases with paroxysms of frightful severity. Erosion of the vertebræ is usually associated with intense pain, but not always, as there may be extensive destruction without much pain but as a rule there is severe aching, boring pain which, when the nerve roots are involved, may radiate in their course. And lastly, the pain may be due to rupture of the sac and the passage of the blood into the retroperitoneal and muscular tissue. It may simulate the pain of gall-stones, of renal colic, or of appendicitis and pressure on the nerves may cause pain in the testicles and in the course of the anterior crural or sciatic nerves. The recumbent posture may be impossible during the paroxysms. Pressure usually gives slight relief. Stokes, whose description of aneurysm of the abdominal aorta remains unrivalled, recognised the remarkable characters of the pain—the dull, boring, steady form and the awful paroxysms. Beatty's classical case, which he quotes in full, first called the attention of physicians to these special features of the disease. It is interesting to note that Andral regarded Beatty's case as a rare form of intestinal neurosis.

Nausea and vomiting were early and severe symptoms in two cases. Hæmatemesis did not occur in any cases of the series. Constipation was a common feature. Intermittent claudication occurred in one case. Altogether, apart from pain and the features associated with rupture of the sac, there were not many symptoms and the patients were usually well nourished and healthy-looking. Hæmorrhage from the bowels occurred in Case 16 after operation. As the patient lived for six months, and as the necropsy showed, it could not come from erosion of the bowel. I have reported one case—a patient under the care of Dr. Palmer Howard—in which, in a robust, strong man who had had intense backache, death occurred suddenly from rupture into the duodenum. Pressure on this part may lead to great dilatation of the stomach. I saw with Dr. F. J. Shepherd an elderly lady with great distension of the abdomen, dilatation of the stomach, with severe pain and anæmia. The necropsy showed an enormously dilated stomach due to pressure of an aneurysm on the duodenum. While revising this paper Professor James Ritchie showed me an aneurysm of the aorta just as it passed through the diaphragm which had compressed the cardiac end of the stomach causing great dilatation of the œsophagus.

*Diagnosis.*—The obscurity of the symptoms in aneurysm of the abdominal aorta has been recognised by all observers. It is well illustrated in the Guy's Hospital statistics. "A

correct conclusion during life as to the nature of the disease was arrived at in 18 only out of the 54 cases on which this lecture is based, an analysis showing that an abdominal tumour was detected in 31, pulsation in 35, expansile pulsation in eight only, and a systolic murmur in 26. Incorrect diagnoses of a variety of diseases were made, including malignant tumours lying in front of the aorta, renal calculus, lead colic, spinal caries, sarcoma of the kidney, nephritis, perinephritis, pneumothorax, pleuritic effusion, epithelioma of the œsophagus, malingering, chronic intestinal obstruction, &c."<sup>5</sup>

As pulsation or throbbing, evident to the eye of the observer, or felt by the patient, is the most obvious feature of the disease, it will be well to consider briefly in what circumstances pulsation occurs in the abdomen. Normally, as one looks at the abdomen of a person in the recumbent posture, pulsation is visible between the ensiform cartilage and the navel. It may be slight, even absent, but in a majority of individuals it is present and in spare subjects in two special areas, an upper, at the ensiform cartilage or in the right costo-xiphoid angle, and a lower, just above and a little to the left of the navel. These may be separated by an area in which no pulsation is visible but they are often continuous. In favourable subjects one can see that the upper pulsation precedes the lower by an appreciable period of time. After running 100 yards quickly the chief impulse is at the ensiform cartilage, representing the throbbing of the dilated right chambers which are close to it. In over-distension of these chambers, particularly in the hypertrophy and dilatation of valvular disease, the beating in what we call the pit of the stomach is very evident and may be associated with a subjective sensation very distressing to the patient. The actual impulse itself is rarely cardiac but is due to the pushing down and out of the left lobe of the liver.

Sometimes the pulsation is actually cardiac, due to the protrusion of the abdominal wall by the right ventricle. This may occur in great dilatation, as Morgagni observed.<sup>6</sup> The diaphragm may be pushed down and at each impulse of the heart the ensiform cartilage and the skin below it are pushed out so forcibly that the condition is mistaken for aneurysm of the upper abdominal aorta. I have seen in disease of the mitral valve the dilated right ventricle cause a large pulsating tumour below the ensiform cartilage. In one patient at Mount Sinai Hospital, seen with one of the house physicians, a woman with mitral stenosis and enormous hypertrophy and dilatation of the right heart, the question was raised as to the existence of an aneurysm of the heart. In another instance in a boy, aged five years, seen on April 18th, 1895, with an extreme degree of mitral disease

<sup>5</sup> Bryant: Clinical Journal, 1903.

<sup>6</sup> Seventeenth letter, twenty-eighth article.

and great hypertrophy of the heart, the note is worth quoting: "Apex beat is in sixth and seventh interspaces, forcible, widespread, and extends laterally to the mid-axillary line. The præcordial bulging is marked, and below the left costal margin, projecting for 4 cm. and occupying the whole of the left quadrant of the epigastric region, is a prominent heaving, pulsating projection of remarkable dimensions. During coughing it becomes very much larger. In this there is a very loud systolic murmur and a rumbling murmur in diastole." It was perfectly evident that this projecting tumour was only part of an enormously distended right ventricle, not an aneurysmal tumour, as the impulse was synchronous with the apex beat and was directly continuous with the wide-spread throbbing of the heart. The cardiac epigastric tumour may be central and of a remarkable prominence. The beating of the aorta is most evident when the vessel becomes more exposed in the lower half of the epigastric and in the upper umbilical areas. In well-nourished persons the pulsation is slight and the vessel cannot be easily felt. In enteroptosis and great emaciation the vessel may be rolled under the finger as a distinct tube, feeling of about the size of the index finger, and may even be readily grasped. In rare instances the vessel is seen; even the bifurcation may be visible. In a patient with extreme anorexia nervosa the vessel with its bifurcation showed in a photograph.

Abnormal aortic pulsation is met with under the following conditions. First, in neurotic and hysterical states, chiefly in women. I suppose there is no young physician who has not diagnosed as aneurysm of the aorta the preternatural pulsation of the vessel, as Allan Burns calls it. In any suspected case it is well to be sceptical, particularly in women, in whom aneurysm is excessively rare. The subjects of this remarkable pulsation are usually neurotic, sometimes definitely hysterical. They complain of pain in the back and at the occiput and have the usual symptoms of nervous exhaustion and debility, but the special feature upon which all their feelings centre is the throbbing in the abdomen, which may be so severe as to interfere with their sleeping or even with the taking of food. In extreme cases there are pain, shortness of breath, and even remarkable attacks of hæmatemesis. It is stated that Hippocrates had noticed this pulsation, but to Morgagni we owe the first accurate description. Allan Burns<sup>7</sup> gives a very careful account of the condition and quotes from Albers, of Bremen, a remarkable instance in which, associated with the throbbing, there was passage of dark blood in the stools. The association of small hæmorrhages from the stomach and inte-tines has been described by Sidney Phillips<sup>8</sup> but I have seen no reported case more remark-

<sup>7</sup> Observations on Diseases of the Heart, Ac., 1809.

<sup>8</sup> Brit. Med. Jour., 1887, vol. ii.

able than that of Albers. The girl was excessively neurotic, had fainting fits, great palpitation in the abdomen, and an astonishing degree of violent pulsation. She had passage of blood from the bowels and the diagnosis of aneurysm was made, but a Dr. Weinhalt, who was called in, said he doubted if the pulsations proceeded from aneurysm as he had read of similar cases in Morgagni. The points to be borne in mind in these cases are: (1) That the pulsation occurs in nervous or hysterical women or in neurotic or hypochondriacal males. In mild forms it is common. (2) The subjective sensations may be pronounced—pain, abdominal distress, nausea, sickness, constipation, and, in some instances, the vomiting of small quantities of blood and the passage of blood in the stools. (3) The degree of visible and palpable pulsation may be extreme. The abdominal aorta is easily palpable and may be grasped in the fingers. It is sometimes tender. No definite tumour is felt. With much anæmia a thrill may be present. A soft systolic bruit may be heard, even without any pressure of the stethoscope. A mistake is not likely to occur if it is remembered that no pulsation, however forcible, no thrill, however intense, no bruit, however loud—singly or together—justify the diagnosis of an aneurysm of the abdominal aorta, *only the presence of a palpable, expansile tumour.*

Secondly, preternatural pulsation in the upper portion of the abdomen may be associated with tumours. In cancer of the stomach it is quite common to see a diffuse impulse in the left half of the epigastric or in the upper quadrant of the umbilical region. In the large, flat carcinoma of the stomach the impulse may be very forcible, but it is not expansile, and there is rarely any difficulty in determining that it is not aneurysmal. Cysts and solid tumours of the pancreas, cysts and tumours of the mesentery, and solid tumours of the retroperitoneal glands may be associated with a widespread impulse in the upper part of the abdomen. The greatest difficulty is encountered in comparatively small tumours directly over the course of the vessel, as in thin persons the throbbing may be so pronounced that, with a thrill and bruit, often present, the resemblance to aneurysm may be very close. As Allan Burns remarks, a tumour placed over the course of an artery and attached to it pulsates more strongly than the vessel itself. It can usually be noted in thin subjects that there is no actual expansile pulsation in the tumour itself.

Thirdly, in anæmia. In extreme anæmia there is throbbing of the arteries, both visible and palpable, and the pulse may even have the Corrigan or "water-hammer" quality. The most extreme throbbing may be seen and felt in the abdominal aorta, and it is not infrequently a source of great distress to the patient. The impulse may be bounding, striking the hand with extraordinary force, and when associated with a thrill and a bruit it may suggest aneurysm very

strongly. I have reported a case in point.<sup>9</sup> On June 13th, 1885, I saw with Dr. Whiteside a large, stout man, aged 45 years, who had had for some months dyspepsia and pains in the abdomen of exceptional severity. He was anæmic and sweating and looked as though he had had a hæmorrhage. The large and fat abdomen throbbed in a most extraordinary way. The maximum impulse was a little below the ensiform cartilage, but from this point a large wave of pulsation passed over the whole abdomen. The shock was communicated to the patient's body and one could see the jar in the head and in the feet. Standing against the foot of the bed I could feel distinctly the impulse jarring the entire bed. On palpation the throbbing was violent with each systole, but it was trifling in comparison with the extent of visible pulsation. There was no expansile movement. No tumour could be felt. A systolic murmur was audible. That evening shortly after my visit the cause of the sudden anemia became evident, as he passed a large amount of blood by the bowel and vomited blood. In the morning and for the next three or four days he vomited and passed large quantities of blood per rectum. The necropsy showed a duodenal ulcer lying directly upon the pancreas and the aorta, with thickening about it. The aorta itself was perfectly normal.

Fourthly, as pointed out by Stokes, the aorta may throb so forcibly in aortic insufficiency that aneurysm is suspected. It is a good rule never to diagnose aneurysm of any part of the aorta in young persons, particularly if anæmic, with insufficient aortic valves. Pulsation of extraordinary force, thrill, and bruit may all be present in an abdominal aorta which, post mortem, shows neither dilatation nor disease.

In old men with thin abdominal walls a very sclerotic aorta may suggest aneurysm. Among other causes of abdominal pulsation may be mentioned regurgitation of blood along the inferior vena cava. Allan Burns refers to a case of this kind, described by Senac, in which the vena cava was as large as the arm and the patient had a very violent pulsation in the epigastrium. I have not been able to find the original report.

In the diagnosis of aneurysm of the abdominal aorta perhaps the greatest difficulty arises when the sac has ruptured behind the peritoneum with the gradual formation of a large tumour, filling the upper part of the abdomen, or one or both flanks, and in which there may be little or no pulsation. While attention was called to this circumstance years ago by Stokes, that it warrants more careful consideration is shown by the frequency with which the condition is overlooked, and the extreme gravity of an operation upon what is supposed to be some form of new growth. Among the Guy's Hospital series Dr. J. H. Bryant gives cases in

<sup>9</sup> Canada Medical and Surgical Journal, March, 1887.



which the ruptured aneurysm was mistaken for renal calculus (owing to the agonising pain extending down in the left groin and to the testis), renal sarcoma (operated upon), cancer of the œsophagus, lead colic, and malignant disease of the liver.

There is perhaps no more tragic event in operative surgery than unwittingly to open an aneurysm. It has been done by past-masters of the craft. Pirogoff's comment on such a case has always appealed to me very strongly: "There are in everyone's practice moments in which his vision is hidden so that even an experienced man cannot see what is nevertheless perfectly clear. At least, I have noticed this in my own case. An overweening self-confidence, a preconceived opinion, vanity, and weariness are the causes of these astounding mistakes."

Nowadays when laparotomy is so common this form of aneurysm in the abdomen has been operated upon not infrequently. The suddenness of the onset of the pain and its great severity and the absence of pulsation in the tumour are very apt to lead one astray. In Case 2 in which there was an exploratory aspiration we had no idea that it was an aneurysm. I have not looked specially into the literature of the subject but I have had my attention called to several cases. Dr. Williams of Buffalo showed me two specimens, both from patients operated on for abdominal tumour without any idea of the presence of aneurysm. Lockett<sup>10</sup> of Jamaica operated on a large abdominal tumour supposed to be associated with the liver but he found a large non-pulsating aneurysm of the abdominal aorta. While revising this paper for the press a man was admitted to the Radcliffe Infirmary under the care of Dr. E. C. Bevers with great pain and swelling in the right iliac fossa. He had been in one of the London hospitals with renal colic. An operation for suspected appendicitis revealed the presence of a large retro-peritoneal blood tumour which followed rupture of an abdominal aneurysm.

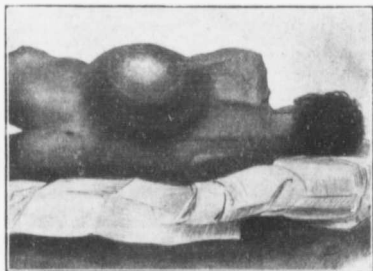
As the three cases in my series illustrate many important points in this form of the disease I shall report them in full.

*CASE 2. Pain in the back for nearly a year; admitted with an enormous abdominal tumour, projecting at the back and flank; no pulsation; thrill and rasping murmur in the epigastrium; extreme emaciation; rapidly growing sarcoma suspected; aspiration; necropsy; large diffuse aneurysm.* (Figs. 1 and 2.)—The patient, a coloured woman, aged about 36 years, was admitted on Sept. 10th, 1894. She had been married eight years, had had four children, two still-born. Her present illness began in October, 1893, with pain in the small of the back. About February, 1894, she noticed a rounded swelling like a small knob on one of the lower ribs.

<sup>10</sup> Brit. Med. Jour., 1901, vol. II.

It was immediately under the skin but she could not say whether it was on a rib or between two ribs. In April, 1894, she went to the Pennsylvania Hospital and was confined to bed until August. For the past three weeks the tumour had grown with great rapidity. The chief trouble appeared to have been pain, which at first was continuous and later had been what she called "a jumping ache." She had had to take much morphine for the pain. The patient was extremely emaciated. The most striking feature was a very large tumour on the left side of the abdomen, causing great bulging in the flank and back. The drawing made by Max Broedel (Fig. 1) illustrates better than any description the

FIG. 1.

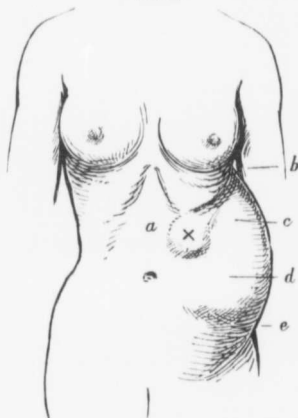


Appearance of the diffuse aneurysm in Case 2, seen from behind.

remarkable appearance presented by this mass. There was *no pulsation* but in the epigastrium there were a loud thrill and a very rasping murmur. A suggestive feature was that the heart sounds were transmitted to the large tumour just below the costal border. It seemed everywhere firm and resistant, though midway between the costal border and the crest of the ilium there were several softer spots to be felt. The skin over the mass was very glistening, not hemorrhagic. As the nature of the tumour was quite doubtful, on Sept. 15th she was given ether and Dr. Halsted made an exploratory aspiration. A thin blood-coloured fluid was drawn off and the needle seemed to enter a large cavity. A few days later oozing began from the point of puncture and there was a central spot of softening, which gradually enlarged and discharged a very offensive material. The patient died from exhaustion on Oct. 1st.

*Necropsy.*—At the post-mortem examination the body was 150 centimetres long; there was no œdema. The abdomen was swollen. On the left side, extending from the crest of the ilium to within five centimetres of the axilla and occupying the entire thickness of the lateral aspect of the body, was a tumour mass of rather soft consistence. The epidermis over the tumour was peeling off and in the centre

FIG. 2.



Front view of Case 2. *a*, Marks the site of a loud rasping systolic murmur. *b*, Level of the ninth rib. *c*, A large, rounded, glistening mass; very firm area under the ribs. *d*, Soft spots to be felt in this region. *e*, Level of crest of ilium. *x*, A small mass which appears to be separated from the larger mass.

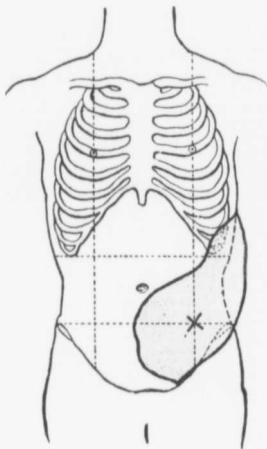
there was a slight defect from which blood-stained serum might be pressed. The orifice of this defect did not exceed two millimetres in diameter. The whole tumour bulged outwards and had a convex surface, the apex of the convexity being at the point of skin defect. The surface tapered towards the ilium on the one side and towards the axilla on the other. The subcutaneous fat was almost absent; the muscles were very thin. There was no excess of

fluid in the peritoneum. Bulging into the peritoneal cavity on the left side was a continuation of the tumour seen externally. It had displaced the left kidney and spleen, which occupied its superior surface—the kidney below, the spleen still covered by the diaphragm. The kidney could be separated and formed no essential part of the tumour mass. It was somewhat flattened on the side next the tumour. The ureter was of normal size. The spleen was bound to the diaphragm by old strong adhesions and by similar adhesions to the left lobe of the liver and less firmly to the tumour mass. The tumour mass projecting into the peritoneal cavity was as large as an adult head and reached in its upper portion nearly or quite to the median line. So far as the peritoneal cavity was concerned it was entirely behind and covered by the peritoneum. From just below the diaphragm the aorta was lifted up and ran over the anterior surface of the tumour in the median line. There was nothing of any moment in the condition of the thorax and abdominal organs except that there were numerous gall-stones with some peri-splenitis and slight peri-hepatitis. As regards the heart and aorta the heart was small; the endocardium was slightly stained with bile; all the valves were normal; the muscle was pale; the coronary arteries were normal. The right cavities were filled with coagulated blood. A large sacculated aneurysm sprang from the abdominal aorta above the renal vessels and had ruptured on the right side, forming an enormous blood tumour filled with clots.

*CASE 3. For nearly two years pain in the left side of the abdomen, constant, and in paroxysms; large tumour in the left flank, increase in size; great increase of the pain; incision of tumour with an attempt made to reach the abdominal aorta; death on the operating table. (Fig. 3.)*—A man, aged 33 years, was admitted to Ward E on April 13th, 1896, complaining of attacks of severe pain in the left side of the abdomen. He had had urethritis 12 years previously; he had never had syphilis; he was a temperate man. Two years ago he had attacks of palpitation of the heart and for nearly six months had some dizziness. His present illness he dated from 20 months previously, when he had first a sharp, stabbing pain in the left side of the abdomen. It was always in the same spot in the flank and came on about the same time in the day, and lasted from two to 12 hours. At first it was not very severe but at times for three or four days he would have attacks in which it was bad enough to cause him to double up with the pain. Evidently the pain had been of very great severity and had been the most constant feature in the case. The attacks would come on at any hour of the day or night. The pain started in the left side and radiated upwards and downwards towards the testicle. He described it as cutting in character and said that it was like the pain of a

boil. During a severe attack his legs were drawn up and he obtained relief by pressure on the left side of the abdomen. It was sometimes so bad that he had had nausea with it but never any vomiting. The pain was referred chiefly to the back rather than to the front and he said that he had always been more tender on pressure in the lumbar region than in the front part of the abdomen. He had very frequently had to take morphine for the severity of the pain and during the past year he thought that he had lost as much as 25 or 30

FIG. 3.



Outline of the tumour in Case 3.

pounds in weight. He had never had any blood in the urine nor had he passed any gravel. The patient was a well-built, well-nourished man, rather pale, but the mucous membranes were of good colour; the pulse was 30; examination of the thoracic organs was negative. The apex beat was visible in the fourth and fifth interspace, in and a little outside the nipple. The maximum impulse was inside the nipple line. The sounds were clear at both the apex and the base; there

was no accentuation of the aortic second sound. The abdomen was symmetrical, tympanitic; the skin of the left side was pigmented from the application of plasters, &c. The recti were held very tense. Pressure behind in the lumbar region caused a good deal of pain. On bimanual palpation in the left flank there was felt on deep inspiration what was thought to be the left kidney. Pressure caused a good deal of pain. There were no enlarged glands in the groin. There was marked sclerosis of the veins of the right leg. The testicles and epididymides were normal. This note was made by Dr. Harold Parsons the day after admission. The urine was amber-coloured; it was of specific gravity 1024 and contained no albumin or tube casts. On April 19th Dr. Thayer noticed that there was a resistant mass which could be taken between the hands in the left renal region, very tender on pressure. The abdominal muscles were, however, so rigid that thorough examination was not possible. Early on the morning of the 20th the patient was awakened with a very intense pain in the left side of such severity that he required morphine hypodermically. At the time of the visit the muscular resistance on the left side of the abdomen was very marked. The patient complained of great pain on pressure in front and more particularly behind. On deep inspiration nothing could be seen and on palpation nothing more definite was to be felt than was noted on the 19th. On the 22nd, at 5 P.M., the patient began to have very severe pain in the left side, similar, he said, to the pain of his ordinary attacks but much more intense than he had ever had before. At 5.30 Dr. Thayer dictated the following note: "In left side of abdomen there is now a large tumour occupying the entire flank, extending to the umbilicus and reaching almost to Poupart's ligament. It emerges from beneath the costal margin at the ninth rib. The normal depression of the flank is converted into a convexity. The greatest prominence is about midway between the anterior superior spine and the navel. On inspection it is seen that this presents a well-marked pulsation, particularly in the flank between the ribs and the crest of the ilium, and to a less extent as far over as the middle line. The tumour is uniformly dull, and there is a good deal of tenderness on pressure." (Fig. 3.) The mass had a boggy, semi-fluctuating feel—particularly at X in the figure. The patient found a good deal of relief by having the left leg drawn up, and there was some pain down the back of the leg, particularly when extended. Rectal examination was negative. The face looked blanched; the pulse was 120. The red blood corpuscles were about 3,000,000 per cubic millimetre; the leucocytes under 5000 per cubic millimetre. A needle inserted into the most prominent part of the mass obtained only a few drops of blood. On April 23rd the patient had had a fairly comfortable night. Dr. Thayer noted that the patient's complexion had become more sallow and had a slightly yellowish tinge. The tumour

on the left side was not quite so prominent. The pulsation in the upper part was, however, more marked, and at the point of maximum pulsation there was a single shock heard but no murmur. There was a very suspicious fluctuation in the mass, the outlines of which remained very much the same as the day before. When the patient turned on his right side the expansile character of the pulsation was very evident. The recurring attacks of pain, the progressive loss of weight, and the appearance of a tumour in the flank were suggestive of new growth, and it was thought possible that the pulsation might be due to extreme vascularity. The other possibility was an aneurysm of one of the branches of the abdominal aorta, or of the aorta itself, and this view was favoured by the rapid appearance of the growth and the marked impulse. The patient's condition became desperate and he urged that something should be done. Dr. Halsted determined to try to reach the abdominal aorta. Accordingly the tumour was fully exposed by median incision and was found to be an immense retroperitoneal blood cyst occupying the left half of the abdomen, with the colon passing along its right margin. A large mass could be felt high up. The aorta was exposed and an attempt was made to compress it. As the large clots turned out they were followed in a moment or two by a gush of bright arterial blood and the patient died instantly.

*CASE 16. Pain in the side; formation of a tumour; sac wired; melena, three attacks; gradual improvement; four months later severe pain with rapid increase in the size of the tumour, which filled the entire left side; death from exhaustion; necropsy, huge diffuse aneurysm (Fig. 4).*—The patient was a man, aged 49 years, by occupation a bar tender. He was first admitted on March 23rd, 1899, with acute lobar pneumonia. At that time he denied ever having had syphilis. The course was uneventful and he made a complete recovery. There was nothing to indicate an aneurysm; he complained of no pain; no mass was felt in the abdomen. The involvement was of his left lower lobe and there occurred a slight pleural effusion, straw-coloured fluid being withdrawn by the aspirating needle. The patient was readmitted on April 16th, 1904. Since the previous admission he had been a cook; he had had to lift heavy pots and kettles and had been exposed to rapid changes of temperature. He had been in the habit of drinking one bottle of beer daily but no whisky or gin. On the previous admission, however, he acknowledged having been a pretty heavy drinker as a young man. He again denied syphilis; no history was to be obtained of secondary symptoms. The onset of the present illness occurred six months previously with pain in the left flank, constant, dull, and aching in character. The pain was relieved by pressing the epigastrium against the corner of the table. Ten weeks previously he was admitted to St. Joseph's Hos-

pital where a diagnosis of aneurysm was made. At this time he had pain in the left testicle and adjacent portions of the thigh. The pain was increased by lying on the left side and also by over-eating. The appetite had been good and except for the symptoms mentioned there had been no distress; there was no loss of weight. On admission the heart was slightly enlarged; the second aortic sound was markedly accentuated and ringing. The arteries, brachials and radials, were definitely felt, but not markedly sclerosed. The temporals could not be felt. On April 19th the following note was made: "Healthy-looking, fairly robust man. Arteries are a little thickened. He looks as if he had lost a little weight. Pulsation in upper abdomen and left hypochondrium; maximum at junction. Pulsation a little more to left than to right. Cardiac pulsation corre-

FIG. 4.



Reproduced from a photograph of the tumour in Case 16. The aneurysm has lifted the left costal arch and fills the whole of the left side of the abdomen.

sponds closely with abdominal pulsation; abdominal pulsation a trifle behind cardiac pulsation. No difference between infracostal grooves. Pulsation and shock reached to, but did not lift, the ensiform. The pulsation was seen as far as navel. Lessened on deep breathing. No pulsation in back. Palpation; forcible pulsation with the hand on epigastrium; maximum about the centre. No thrill. No marked tenderness. As the fingers pass deeply in there is a very positive expansile pulsation; more marked to the left; felt 2.5 inches from median line. Tumour mass is definitely felt, particularly to left, as far as nipple line; large, rounded, cannot be felt to same extent to right; can be felt below, where there is a very definite thrill. Short, rough systolic murmur heard everywhere over the tumour; maximum just about the centre; diminishes in intensity



toward ensiform; heard at the back. Heard much more loudly to the left. Aortic second sound ringing. No tumour in flank itself; one can pass hand deeply into renal region. Femorals are both pulsating." On the 22nd the blood pressure in the dorsalis pedis arteries was—right 210 millimetres, left 200 millimetres. On the 29th the aneurysm was wired by Dr. Finney. An incision was made at the border of the left rectus; the sac was exposed with considerable difficulty. On palpation the sac was found to have a rather wide base. 11 feet of silver wire were inserted; a current of ten milliamperes was passed for 15 minutes. The incision was closed. Some pain was present after the operation, principally in the distribution of the ilio-inguinal nerve. On May 2nd the pain was more severe. On the 5th hæmorrhage from the bowels of about 100 cubic centimetres of clotted blood took place. There was no change otherwise. Some vomiting occurred during the next few days but no blood. The first dressing was done on May 9th. The wound was healed perfectly; pulsation was apparently more marked than before the operation; the tumour mass was more prominent. A well-marked thrill and bruit could be heard over it. On the 27th a second intestinal hæmorrhage took place. The patient was having much pain and at times was irrational. On the 28th there was a third hæmorrhage of 150 cubic centimetres. On June 24th it was noted that the patient was doing well; he was a good colour. The tumour seemed less prominent and felt very hard. The spleen was pushed over to the left. A systolic bruit could be heard to the right of the line of incision but not to the left. Behind there was a very marked pulsation. There was a little bulging in the lumbar region. Pulsation was visible at and beneath the eleventh rib; pulsation was also felt. On August 21st the patient had more pain than usual. He slept with morphine but on the following morning his face appeared rather blanched; there was some fulness in the left flank which was extremely tender. Pulsation of the aneurysm was less than on the previous day. On the 23rd it was noted that below the sixth inter-space in the mid-axilla, throughout the left lumbar region and extending forward to within 7.5 centimetres of the mammary line, was an area of flatness. The mass in front was not more prominent than it had been but pulsation was not quite so visible. There was considerable tenderness over the original mass. Over the mass in the flank, however, the tenderness was very marked. This whole prominent mass in the flank was pulsating but no bruit was heard over it. The bruit previously heard in the hypochondrium and epigastrium was not present. The blood count had fallen from 3,800,000 to 2,520,000. It was thought that a rupture had taken place into the retro-peritoneum. This became more evident during the next few days, the mass in the flank increasing in size and being directly continuous with the tumour previously felt in front. On the 26th it was noted that the whole

mass pulsated. The following note was made on Oct. 7th. "Large tumour filling whole flank, lifting costal margin. Pulsation remarkably diffuse, visible from lower border of sixth rib to iliac crest and as far over as navel. Tumour has lifted whole costal margin to sixth and seventh interspaces. It bulges in the flank. The pulsation is definitely felt and lifts the finger. Bimanual palpation definitely expansile. No diastolic shock. Loud murmur in middle line, heard along left costal margin, becomes feeble in flank. Second sound heard over front of tumour." Some diminution in the size of the tumour was noted during October and November. On Oct. 10th the patient began to have some fever, the temperature rising to 102° F. On Nov. 13th and 14th it was noted that the tumour was somewhat larger, extending forward farther in the epigastrium. The pain, which was always severe, became worse; the patient's general condition became more serious and he died on Nov. 16th.

*Necropsy.*—At the post-mortem examination (which was performed by Dr. MacCallum) the following condition was found: aneurysm of the abdominal aorta; encapsulated hæmatoma; erosion of the vertebrae, ribs, and ilium; destruction of the left kidney and adrenal, with obliteration of the renal artery and ureter; cavernous angiomas of the liver; chronic diffuse nephritis; and œdema of the lungs.

There are several points to which reference may be made in these cases. The enormous size of the tumour in Case 2 and the absence of pulsation, the rapid growth, the emaciation, and the anemia led to the diagnosis of a new growth. The blood obtained on aspiration did not contra-indicate this, as blood is often withdrawn from sarcomata. The irregular masses in front were also suggestive of tumour. The thrill and bruit should perhaps have aroused suspicion but the former, at least, is not infrequently heard over tumours. The absence of pulsation is probably met with when, as in this case, the hæmatoma is enormous and the patient is weak from loss of blood. The same mistake was made by Stokes (Case 80 in his book on the Heart) in a patient with enormous effusion into the mesocolon. In Case 3 the increase in size of the tumour was so rapid that the same mistake was not made. One has to bear in mind, however, that expansile pulsation, quite forcible too, is felt in large sarcomata, more particularly in the big growths from bone, as in the iliac region and the thigh. Even when the sac, as in this case, is laid open the presence of blood and transformed leathery clots is not conclusive evidence for aneurysm. There are old sarcomata among abdominal tumours in which the greater part of the growth is made up of altered reddish-grey, dry blood clot, not unlike that of an aneurysmal sac. Such a case I reported to the Philadelphia Pathological Society in 1886. In Case 16 we had an opportunity of studying the gradual formation of the

secondary tumour which reached a very large size and then shrank a little. The primary tumour has been observed to diminish in size after rupture. The attitude of the patient is sometimes very remarkable. In Case 16 the patient lay for months with the left thigh drawn up and it was impossible to extend the leg. Rapid anæmia, emaciation, and slight fever follow rupture with the formation of a large hematoma and these features, added to the presence of a large abdominal tumour, naturally suggest a new growth.

*Treatment.*—We cannot expect to do much towards the cure of internal aneurysm. Nature occasionally cures a case. I have seen at least two instances of spontaneous healing in aneurysm of the abdominal aorta. Now and again the physician is able to effect a cure. I have not been so fortunate to see such a case. In a few instances the surgeon prolongs life or even effects a complete healing. In the cases here reported the general measures were carried out which are believed to favour coagulation in the sac. We have given them a very full trial, particularly the combination of rest with low diet. Three cases received very full and thorough treatment with gelatine without much benefit. In Case 4 it seemed to do some good and relieved pain. A point of interest in this series is the large number of cases treated surgically. I have to thank my colleague, Dr. Halsted, for his kind interest, and his associate, Dr. Finney, to whom he handed over most of the cases. Dr. Hunner, also, has been helpful. In Case 1 an exploration was made to determine whether anything could be done. The tumour was so moveable that it was thought to be connected possibly with one of the branches of the abdominal aorta, but it was found to spring directly from the vessel itself. The sac seemed so solid, and the old man's condition was so good, that it seemed best to do nothing. In Case 2 a large, diffuse aneurysm was punctured for diagnostic purposes. The three special surgical measures which have been introduced are: ligation of the aorta, compression of the vessel above the sac, and the insertion of foreign material into the sac to promote coagulation with or without electrolysis. In Case 3 an attempt was made to reach the abdominal aorta and to compress it. The sac was opened freely and large clots were turned out, but before the vessel could be compressed above it there was a sudden gush of bright scarlet blood and the patient died suddenly.

There have been about a dozen cases of ligation of the aorta for aneurysm, all, I believe, fatal. Dr. Keen in reporting his case (the twelfth) gives the literature.<sup>11</sup> Compression above the sac has been more successful and in the well-known case under Dr. Murray of Newcastle, operated upon in 1863,

<sup>11</sup> Philadelphia Medical Journal, 1900, p. 470.

the aneurysm was cured and the patient remained well for six years. In 1864 Mr. Moore of the Middlesex Hospital attempted the cure of aneurysm by the insertion of a foreign body, since which time this method of procedure has been extensively practised and has been modified by Corradi who passed an electric current through the wire. The technique of the operation has been much improved, particularly by Dr. D. D. Stewart of Philadelphia and by Dr. Finney and Dr. Hunner, and in the *Johns Hopkins Bulletin* for 1900 the latter has given a description of the method which has been used in this series. In seven of the cases the sac was wired and an electric current was passed. The results have been as follows: Case 5 died 48 hours after from rupture of the sac into the pleura. Case 8 died on the ninth day from hæmorrhage into the peritoneum. Case 10 was discharged at the end of four weeks, improved; no subsequent history. Case 11 died on the fourteenth day from rupture of the sac. Case 12 was much improved; the pain had diminished, the pulsation was lessened, and he was discharged at the end of a month; no subsequent history. Case 13 was the most satisfactory in the series and may be referred to at some length. The patient was a young man under 30 years of age at the time of onset. When admitted he was suffering greatly and had severe gastric symptoms. The operation was followed by marked improvement, reduction in the size of the sac, disappearance of the pain, and complete relief of the nausea and vomiting. He returned to the hospital every year for a few weeks. At the last visit the sac had increased in size and three and a half years from the date of the operation he died from rupture of the sac. In Case 16 there were three hæmorrhages from the bowels after the operation but for two months there was improvement. Then rupture occurred into the retroperitoneal tissues with the formation of a large tumour filling the left side of the abdomen. Death occurred six and a half months after the operation.

Oxford.

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CONVULSIONS IN TYPHOID FEVER.

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## CONVULSIONS IN TYPHOID FEVER.

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ALTHOUGH nervous symptoms pointing to grave involvement of the nervous system are common enough in typhoid fever, convulsions are very rare. Murchison states that in 2,960 cases, they occurred in only 6. In one of these, the convulsions came on after much delirium on the 16th day, and the patient died comatose half an hour afterwards. The kidneys were found to be diseased. A second case, a boy of 13, died suddenly in convulsions on the 30th day. There was no post-mortem examination. In the third case, general convulsions occurred on the 11th day; recovery followed. In the fourth instance, the patient recovered after a severe fit of convulsions lasting a quarter of an hour, which occurred on the 14th day. The fifth case, a man aged 23, had on the 12th day two severe epileptiform convulsions, and recovered. The sixth case, a man aged 50, during convalescence had four epileptiform attacks. He had also thrombosis of the left femoral vein. He made a good recovery.

In our experience among between 1,500 and 1,600 cases at the Johns Hopkins Hospital, convulsions have occurred in 8. I have looked over the histories and have grouped them according to the conditions under which the convulsions happened.

First, *at the onset of the disease*.—The following remarkable case illustrates this very well, as the child was attacked in the street while apparently in perfect health, and was brought to the hospital not yet out of the attack, which was the starting-point of a severe and protracted typhoid fever.

*Case I.*—Joseph F. W., aged 7 (Hosp. No. 20,511), was admitted November 14, 1897. At 3 p.m. the patient had

dinner, consisting of bread and cheese and cucumbers. After dinner he was sent out for bread, and half an hour later was found in the street in convulsions. When brought to the hospital at 5.30 he was still having slight convulsive movements of the arms and legs. The pupils were contracted and equal; the pulse 100, of good volume. The convulsions ceased during the preliminary examination; the patient opened his eyes and regained consciousness. He was sent to the ward, and was put in a warm bath. The temperature was  $101^{\circ}$  on admission, and rose in the night to  $104^{\circ}$ . He had from this time on a steady temperature and all the characteristic features of typhoid fever. Rose spots were present on the 8th day. The case was a protracted one; the temperature was not normal until the 45th day, and he left the hospital on the 65th day. There were no other nervous symptoms.

In a second case the onset was equally abrupt, and the convulsions very severe.

*Case II.*—William V. (Med. No. 15,389), admitted March 2, 1903. White, male, aged 25. Not subject to epilepsy. The patient was unconscious when brought to the hospital. His friend stated that he had gone to bed the night before after a hard day's work apparently perfectly well. He had not been drinking, and had not been injured. About midnight the friend was awakened by a noise, and found him having "fits." The convulsions continued through the night, and he had had several on the day of admission. Between the convulsions he was comatose; they had only been able to rouse him once. The number of convulsions was not known, but apparently there had been a great many. There had been marked grinding of the teeth and foaming at the mouth. He had not bitten his tongue. He had not had "fits" before.

When seen on admission the patient was comatose; could be roused, but would not answer questions. In a few minutes he had a convulsion, affecting mainly the right side. There was more distortion of the right side of the face than of the left. The eyes and head were turned to the left. Sphincters were relaxed during the attack. After the patient was taken to the ward he had three convulsions, all preceded by a cry, affecting the right side more than the left. The patient did not bite his tongue. There was no paralysis after the

convulsions. By March 5, the mental condition had cleared, patient answered questions rationally. He had a typical attack of typhoid fever of 26 days' duration, and recovered. Positive Widal reaction.

Secondly, as a *manifestation of the toxæmia*.—The attack occurs during the course of the disease, and, though alarming, leaves no ill effects. Several of our cases have been of this character.

*Case III.*—W. T., aged 40 (Hosp. No. 1515), had a severe convulsion on the eighteenth day of his illness. It began while he was in the tub. No paralysis followed, and he seemed none the worse after it.

*Case IV.*—W. W. B., aged 27 (Hosp. No. 14,453), on the eighth day had a very severe convulsion, which lasted for fifteen minutes. He had very marked toxæmia, much muttering delirium, but no paralysis. He died from perforation on the 13th day.

There may be recurring convulsions of great severity, as in the following case:—

*Case V.*—Maggie M., aged 16 (Hosp. No. 21,695), admitted Jan. 6, 1898, on the 28th day of illness. Attack of great severity; temperature high; and she had in all 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  $104.5^{\circ}$ . 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 February 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. 9 the patient was removed to her home, where she died Feb. 17.

The following case illustrates very well this variety, due to the toxæmia, and not leaving any injurious effects:—

*Case VI.*—John H., aged 22 (Gen. No. 49,199), married, motorman on street-car line, admitted to Ward F, December 10, 1904.

Family history and personal history are negative. He has been very strong and healthy; weight 165 to 170 pounds. No source of infection discovered; typhoid fever in house across the street.

*Present Illness.*—Gradual onset with malaise for two or three weeks previous to December 1, on which day the symptoms became much more marked—weakness, loss of appetite, headache. These increased until December 5, when he stopped work. On December 1, following a purgative, he had diarrhœa and moderate pain in the abdomen. Diarrhœa stopped on admission.

On admission he was rational; temperature  $101^{\circ}$ ; pulse 72. He looked ill, but was not extremely toxic. He had slight abdominal tenderness; the spleen was palpable; no definite rose spots. Leucocytes 10,300.

On December 11 the temperature rose to  $104.5^{\circ}$ . On December 12 rose spots were seen. Some slight abdominal pain and tenderness during the next few days. The toxic features increased gradually, the tongue becoming tremulous. The fever continued high. On December 23, intestinal hæmorrhage—200 cc. of blood passed. Considerable abdominal pain. On December 26, the mental features became much more marked, low muttering delirium, muscular tremor. This continued to December 31, when the delirium became active; he attempted several times to get out of bed and required a

restraining sheet. On January 1 at 3 a.m. the patient had a tub, which he took very well, following which the temperature fell to 98°. At 4 a.m. the nurse noted that the patient's eyes were fixed; he did not respond to questions, and there were slight jerking movements all over the body. At 4.15 he had a general convulsion lasting but a few minutes. In about five minutes this was followed by another, and then at irregular intervals other convulsions, the last occurring about 4.40 a.m., this one being the most severe. The convulsions seemed to be general at onset, the arms and legs were jerked violently, the head was lifted from the pillow and jerked backward and forward. There was marked spasm of the facial muscles, drawing the corners of the mouth downward and outward. The pupils were widely dilated during the convulsion, contracted to the size of a pin-point afterwards, and equal. In the intervals the eyes were either fixed or showed a slight lateral nystagmus, they were rolled upward. The patient foamed at the mouth during the attack. The respirations were arrested throughout each spasm, the face became cyanosed, the heart rate increased, going as high as 176 per minute. Following the convulsions the patient became comatose, and could not be roused. Breathing was irregular and stertorous. For an hour afterwards there was jerking of the eyes from side to side, the eyes being rotated upward. The extremities were flaccid, no stiffness of the neck, no Kernig's sign. There was some hyperextension of the feet, the ankles being held quite rigidly. The knee jerks were diminished, equal. No ankle clonus, plantar reflexes not obtained. Reflexes of arms not present, cremasteric and abdominal cutaneous reflexes absent. Pulse 152 to the minute, heart sounds clear. At 5.30 a.m. lumbar puncture was performed, and 25 cc. of perfectly clear fluid obtained under a pressure of 230 mm. Cultures made from the fluid were negative. The coagulation time was four minutes, leucocytes 5,500. During the following day the patient was very quiet, but during the afternoon could be aroused, though he was still in a muttering delirium. There was incontinence of urine and stools. During the next few days the temperature gradually became a little lower, and, while still delirious most of the time, he was a little brighter than he had been. On January 4 he was quite rational. On

January 10 he had slight hæmorrhage. On January 10 a rather heavy ice-bag was placed on the abdomen, which remained constantly until 10.30 a.m., when, during the examination, it was found that underneath the ice-bag the surface of the abdomen showed a subcuticular mottling, apparently a beginning purpura. The ice-bag was at once removed. During the day the purpura became more marked, until the whole abdomen became covered with small purpuric spots, 2 to 4 mm. in diameter, some of which were confluent. Many of these were deep and of a dark blue colour, some were more superficial, of a reddish-blue colour. A few similar spots were seen over the lower chest, and two or three small purpuric spots were also seen on the back, no purpura elsewhere. The patient continued slightly irrational up to January 12, since which time, although he has been very irritable and nervous, there has been no delirium. Since January 12 the temperature has not been over  $102.5^{\circ}$ . He got better gradually, and made a good recovery.

Thirdly, the convulsions may be the result of *severe cerebral complications*, thrombosis of the vessels, meningitis, or acute encephalitis. One of our most remarkable and distressing cases was of this nature.

*Case VII.*—Dr. Oppenheimer, one of the house physicians, a very healthy man, aged 28, on the ninth day of a comparatively mild typhoid fever was attacked with very severe convulsions. As Dr. Thayer and I were making a ward-visit at noon on April 29th, 1895, we were sent for, and found him in some distress and with headache. 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 somewhat drawn to the left. For about an hour the convulsions were repeated at short intervals. Morphia was given hypodermically, and chloroform. 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 five p.m. the convulsions recurred with great severity, and, in spite of inhalations of chloroform, they continued 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 post-mortem showed thrombi 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. There were extensive punctiform hæmorrhages in the grey and white substance adjacent to the thrombosed vessels. Dr. Thayer tells me that a recent examination of the sections of these vessels shows most extensive arteritis.

Of the six cases of meningitis in our typhoid series only one had a convulsion.


*Case VIII.*—M. H., aged 5, admitted March 21, 1904. The day before admission at twelve midnight she was heard to scream, and she went into a convulsion in which her legs jerked, her eyes rolled, and the seizure lasted from five to ten minutes. Several such attacks recurred during the night. She was dull and heavy after admission, but no further convulsions. Naturally enough tuberculous meningitis was suspected, but three days after admission the Widal was positive. On March 26 25 cc. of clear fluid were obtained by lumbar puncture. Typhoid bacilli grew from the cultures. The case was remarkable, as the patient became emaciated, typhoid bacilli were found in the urine, yet the clinical symptoms were rather more suggestive of tuberculosis than of typhoid. The autopsy showed a widespread typhoid infection. The bacilli were isolated from the gall-bladder, the liver, the urine, and the meninges. There was swelling and deep pigmentation of Peyer's patches, but no ulceration. There was also typical fresh tuberculous meningitis, with extensive tuberculous adenitis. The case is unusual as one of combined typhoid and tuberculous infection.

And *lastly*, in a few rare instances, convulsions occur, from unknown causes, during convalescence. I have reported a case (*Typhoid Studies*, vol. 3, p. 479) which I saw with

Dr. Bolgiano, in which, on the 6th day after the temperature was normal, following a relapse, the child, aged 11, had a severe left-sided convulsion, lasting for three hours, in which she was unconscious. Five days later she had a second convulsion, also left-sided, not followed by any paralysis. Convalescence was uninterrupted, and no damage was left by the convulsion.

The prognosis is not very grave, considering the alarming nature of the complication. Of the eight cases, only three died, one of them from perforation, and one of intercurrent tuberculous meningitis; only one died directly from the cerebral condition causing the convulsion. Claytor's three cases<sup>1</sup> in young soldiers all recovered.

<sup>1</sup> *Phila. Med. Journal*, 1900.



An Address  
ON THE  
MEDICAL ASPECTS OF CARCINOMA  
OF THE BREAST.\*

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THE physician sees carcinoma of the breast at two periods. Hoping against hope, and dreading the knife, women consult him, rather than the surgeon, about a "lump" which they have noticed. But far more important are the numerous and unhappy victims of the late internal metastases. Having for some years been much interested in the subject I have collected notes of cases, one series of which I have already published.<sup>1</sup>

The cases may be considered under two divisions.

I.—THE CONDITION OF THE BREAST ITSELF.

Apart from definite tumour or cyst, the consulting physician does not often see patients with trouble in the breast. Sometimes, indeed, he overlooks the true nature of a case by omitting the examination of the breast, forgetting that extensive general lesions may be associated with a small latent carcinoma. Such an instance I have reported (in the paper referred to). A woman, aged 29, was admitted with enlargement of the right cervical and axillary glands and a pleural effusion on the same side. Naturally enough the condition was supposed to be tuberculous. She made no complaint of the breast, nor was it examined. The true nature of the trouble was only dis-

\* Delivered before the Leamington Medical Society.

covered *post mortem*, when there was found in the breast on the same side a carcinoma not much larger than a walnut.

The importance of the character of the examination is well illustrated in Case VII of my first series; a large, powerfully-built man had suffered for some months with symptoms of disease of the spinal cord, and becoming paraplegic on his way home from Florida was admitted to the Johns Hopkins Hospital. When stripped for examination, as I looked at him from the foot of the bed, my attention was at once attracted to the greater prominence of the right breast. He had not noticed it himself, nor had his physician. It was the seat of a quite large carcinoma, and his remarkable spinal cord symptoms were due to metastases.

#### *Mastitis Carcinomatosa.*

An important local condition leading to error in diagnosis is a diffuse inflammatory infiltration of the breast, extending rapidly beyond its limits, and even involving the side of the chest, the shoulder, and the arm. The cases have been described by Volkmann, Billroth, Aiken, and others. Both breasts may be involved, and the appearance may be that of a diffuse, rapidly-spreading inflammation, rather than of a new growth. Charbonnier gives a very good account of the cases in his essay, *Cancer Aigu du Sein*, Paris, 1900, and mentions instances in which the most distinguished surgeons have been in doubt; indeed, the breast has been incised for acute phlegmon. In two-thirds of the cases both breasts have been involved. The following case differs from others which I have found in the literature in the more chronic course, but it presented the same extraordinary appearance of a diffuse inflammatory condition, but widely spread beyond the breast. Shortly after I saw this patient there was a brief report of a similar case shown at one of the Paris societies, but both sides were involved, and the infiltrated areas met in front and extended behind almost to the spine.

#### *Diffuse Inflammatory Infiltration of Right Breast, Right Side of Thorax and of the Arm.*

May 11th, 1903, Dr. Friedenwald brought to see me Mrs. U., aged about 40, a very healthy-looking woman, who had had for several months swelling of the right breast and right arm. It began gradually without very much pain in June, 1902, and had progressively increased. When stripped the patient presented a very remarkable appearance. The right breast was enormously enlarged, uniformly inflamed, and a reddened infiltration extended to the clavicle, to the sternum, and below almost to the costal margin. Laterally it reached into the axilla. The right arm and hand were greatly swollen, and the skin of the upper arm was uniformly red and oedematous. The lower arm and hand were oedematous and swollen but not red. On palpation the infiltrated skin over the thorax

was brawny and hard. It pitted a little, and the erythema was rapidly replaced. Over the shoulder and biceps there was the same red, brawny infiltration. The skin of the entire arm was firm and hard; and, while it pitted on deep pressure, there was evidently an intense subcutaneous infiltration. The breast was every where uniform, tense, and brawny, but no nodules could be felt. There was a very hard, infiltrated area at the anterior axillary fold. Above the right clavicle an enlarged gland could be felt, and there was a smaller one just beneath the clavicle. The glands could not be felt in the axilla.

Altogether the patient presented an extraordinary appearance, and the question was raised as to the presence of malignant disease. I inclined strongly to the belief that it was one of those forms of diffuse carcinoma which had spread chiefly in the subcutaneous tissues. Dr. Halsted saw the case and was of the same opinion. Dr. Friedenwald tells me that throughout the summer she grew progressively weaker and thinner; before death the erythema and swelling reduced, so that the glandular enlargements could be more readily seen and the nature of the case became quite evident.

## II. METASTASES. A.—*Intrathoracic.*

Direct extension through the chest walls to the pleura with secondary involvement of the lymphatic glands, more rarely disease of the lung itself, is one of the most common of the sequelae of carcinoma of the breast. Pleurisy with effusion may come on insidiously, with the only symptom an increasing shortness of breath. In other instances there are severe pains with signs of involvement of the pleura itself by extension. The following cases illustrate the common type of pleuritic involvement.

*Carcinoma of breast, concealed or unsuspected: Marked, long-standing neurasthenia: Onset with pains in the back and legs, thought at first to be due to pleurisy.*

Nov. 20th, 1901. I saw this afternoon with Dr. Brinton Mrs. W., aged about 48, a large, stout woman, who complained of great pain in the back and legs. Dr. Brinton had known her for many years and had treated her repeatedly for nervous attacks, but she had been in other hands, and he had only seen her recently, and detected a large tumour of the left breast. Within a few weeks the pains in the back had increased, there was inability to lie down, and she had increasing difficulty in using her legs. The patient was sitting on the side of the bed, in great distress. There was a large, flat carcinoma of the left breast, with marked involvement of the axillary glands. There was pain down the spine, but no region of special swelling or tenderness. The left side of the chest was flat on percussion, the tactile fremitus was absent, and there was a very feeble distant respiratory murmur. The heart was pushed over and there were signs of pleural



effusion. She could move her legs and could stand, but only with assistance, and she had much difficulty in taking a few steps. There were no disturbances of sensation. The knee jerks were increased. The pains were chiefly in the spine and down the legs, and were evidently of a very severe character. The patient died a few months later.

It is not always easy to say how much effusion is present in the pleura. I saw with Dr. Stavely in Washington Mrs. L., aged about 60, whose right breast had been removed three years before. A local recurrence took place a year ago. For three months she had had a cough with increasing shortness of breath. The slightest exertion caused the most severe dyspnoea. She was a remarkably healthy-looking woman, propped up in bed, slight cyanosis, moderate dyspnoea. Both arms were swollen, the right a little red, not coloured. There was a large recurrence in the scar, and a flat infiltration beneath the right pectoral fold, and extending into the axilla. On percussion the manubrium was flat, and there was a wooden dullness over the whole of the front of the chest on the right side and behind from the spine of the scapula. The heart did not appear to be dislocated. The breath sounds were feeble; fremitus was absent. The extensive flatness over the manubrium and the widespread local recurrences on the chest wall made it probable that the features were in great part due to extension of the disease in the pleura and mediastinal tissues. No fluid was withdrawn on puncture.

It is not always easy to say whether the pleurisy is really of a cancerous nature or not. I saw such a case with Dr. John Philips and Dr. Cross a few months ago. The pleurisy was not extensive, and there were no signs of effusion, but it was accompanied with a great deal of pain and signs of local recurrence.

The glandular metastases within the thorax are very common and associated with all the distressing pressure symptoms of tumour. There may be no local recurrence and no physical signs, though, as a rule, the mediastinal tissues are involved and there is flatness on percussion and, not infrequently, disease of the sternum itself. The glands above the clavicle may be enlarged. The literature contains many cases of this sort, and they are among the most distressing witnessed in practice. An extraordinary circumstance is the fact that even the mediastinal growth, with penetration of the manubrium, may undergo involution, as occurred in Case v of my first series. I have seen very few instances of carcinoma of the lungs secondary to that of the breast. The organ may be involved especially when the carcinoma extends from the costal to the visceral pleura. Scattered nodules are not very rare, but I have never seen a case in which the symptoms appeared directly due to the involvement of the lungs alone.

#### B.—*Abdominal.*

The peritoneum may be involved by direct extension, and the cases are not very infrequent in which there is

a recurring carcinomatous ascites. Indeed, the breast tumour may be latent, or the patient may have concealed it and have no suspicion that the abdominal symptoms have anything whatever to do with it. This was the history of Case XII of the first series. The omentum and lymph glands may be involved, forming large, irregular tumours which may be felt only after the fluid has been withdrawn.

Metastasis to the liver is perhaps more frequent than to any other organ, but it is not always associated with symptoms, and it is more commonly of *post-mortem* than of clinical interest. It occurred in 241 of the 735 *post-mortem* examinations in cases of cancer of the breast collected by Stephen Paget.<sup>2</sup> The liver becomes enlarged, irregular, nodular, and the patient is deeply jaundiced, with all the features of secondary carcinoma. In the following remarkable case the small tumour of the breast proved to be secondary.

*Carcinoma of the Gall Bladder: Metastases in the Liver: Jaundice: Secondary Carcinoma in the Right Breast.*

Sarah H., aged 64, a stout, well-nourished woman, was admitted with deep jaundice and pain in the abdomen, symptoms which had persisted for some months. She was a very stout woman, and it was impossible to make a satisfactory examination. The cause of the jaundice was doubtful. On examination one day I noticed at the edge of the left pectoral fold attached to the breast a small, hard tumour. This was removed and proved to be an adeno-carcinoma. Under these circumstances, we naturally thought that it was the primary growth, but the *post-mortem* examination showed a primary adeno-carcinoma of the gall bladder with metastases in the liver and lung. The small tumour of the right breast was also secondary.

*C.—Cerebral.*

The symptoms may be caused either by metastasis to the bones of the skull or to the brain itself. In my first paper I referred to a number of cases in the literature, and reported an instance. The following additional cases have come under my observation. In Case XVI, seen with Dr. Keown, the right breast was removed two years previously. For three months there had been gradual anaemia, loss of weight, headache, disturbance of vision, and difficulty in walking. There were double optic neuritis and an irregular, staggering gait, very suggestive of tumour of the cerebellum. I heard subsequently that the ataxia became much more pronounced.

On June 21st, 1904, I was consulted by Dr. J. R. Jameson about a remarkable case—a woman, aged 68, who had always enjoyed good health, but who had had the left breast removed by Dr. Allen of Cleveland seven years before. About three months ago she complained of numbness in the fingers of the left hand, which persisted. One month ago, without any warning, she had a typical attack of Jacksonian epilepsy, beginning in the fingers

and extending to the forearm, the arm and shoulder, and finally to the muscles of the leg and foot on the same side, without any loss of consciousness. Gradually there was loss of power on the left side, which became complete. She gradually became comatose. When I last heard she was rapidly failing.

As in the case reported in my first paper, the symptoms of cerebral tumour may follow years after removal of the breast, or in a patient with old atrophic scirrhus. In the following case there was a remarkable scirrhous tumour of the breast which had persisted for years. The association of the hemiplegia with pains in the abdomen and swelling left, I think, but little doubt that the symptoms of the case were due to metastases.

May 12th, 1904. I saw to-day, through the kindness of Dr. J. H. Musser, Mrs. J., aged 76. The patient was in bed, looked pale, was quite conscious, and could talk, though with a little thickness. The left side of the body was paralysed. There was no disturbance of sensation. The paralysis had come on gradually within ten days without special pain in the head. The abdomen was full and large, the intestines distended with gas. The left lobe of the liver was enlarged and palpable, but no definite masses were felt. There was a great deal of pain in the upper region of the abdomen on deep pressure, and there was a distinct friction along the costal margin.

The left breast presented a very extraordinary appearance. It was smaller than the right. On the surface, extending directly across the situation of the nipple, there was a reddish scar at least 3 in. in length by about 14 in. in breadth, looking like the cicatrix of a fresh wound. It was perfectly smooth and dry. On palpation this was felt to be the surface of a large, flat carcinoma, feeling about the size of the two hands, board-like and hard, with very definite margins, and little or no infiltration of the adjacent tissues; no adherence to the ribs. The glands in the axilla and above the clavicle were not involved.

The patient had a remarkable history. Fully forty years ago she had a trouble in the left breast, which ever since has at intervals been sore, and she had always been very apprehensive of any blows or injuries. The nipple was affected and gradually became retracted. About five years ago there was a change in the breast, which gradually became smaller and harder. There has been no ulceration, but gradually of late the surface of the skin has become scar-like. She has been failing in health only for the past four or five months, and within three months has had a series of attacks of pain in the upper part of the abdomen and swelling and distension, with marked gastric features and putty-like stools, but no definite jaundice. The paralysis came on gradually about ten days ago.

A fourth case with cerebral symptoms I saw December 10th, 1902, with Dr. Kerr of Washington. The case is interesting in another respect, as Dr. Halsted thought it

one of two cases which he had seen in which the axillary glands were involved and removed before any tumour could be detected in the breast. I saw her, three months after the second operation, for an acute pneumonia, having nothing to do with the cancer. The subsequent history showed this to be the case. At the time of my visit the axilla had become inflamed and swollen, and there was evidently a recurrence. She improved, and went to Canada for the summer, but one day, at the dinner table, she had a convulsion. Not long after it was noticed that in walking the right leg was dragged. She gradually became completely paralysed on the right side and aphasic. There were intense headaches. She died in coma August 13th.

#### D.—*Spinal.*

The most common and the most serious, as entailing a maximum of suffering, are the lesions of the spine. Of the 29 cases in my series, 10 presented spinal symptoms. The anatomical lesions may be gathered from a brief statement of the autopsy in Case VIII—a man from whom the right breast was removed September 21st. For four months he had paroxysms of severe pains in the back, radiating in the course of the eighth and tenth ribs, with the gradual onset of a spastic paraplegia. Opposite the seventh dorsal body a saddle-shaped mass, 2 cm. by 1 cm., projected into the spinal canal, compressing the cord at this level. There were other small nodules projecting into the canal from the fifth to the seventh vertebrae. It is important to note the small size of the tumours which caused the paraplegia and the intense pains.

The frequency of metastases in the spine has been noted by all observers, and Billroth has somewhere remarked that they are more common in the atrophic form of scirrhus of the breast, and that the cases are frequently seen by physicians for spinal-cord disease without any suspicion of the true nature of the disease. It is rare to see kyphosis. The secondary growths may become sclerotic and shrink with the disappearance of the symptoms of pressure on the cord, as in Cases v and vi of my first series. Any part of the spine may be involved. One of my cases had for several months cervical neuralgia before the latent scirrhus of the breast was discovered. The sacrum or the sacro-iliac region of one side may be attacked. The literature is too rich in cases (as may be seen in the *Index Catalogue*, both series) to make any special references, but I may call the reader's attention to the writings of Charcot<sup>3</sup> and to the monographs of T. W. Nunn and of A. Marmaduke Sheild.

The symptoms usually occur in two stages. In the first or neuralgic stage, following removal of the breast for cancer—it may be a few months or a couple of years—the patient begins to have pains in the back and side, indefinite in character, and often ill-defined, as to the position. She gets nervous and, as she may look very well and strong, the symptoms are not infrequently put

down to neurasthenia or hysteria. There is a general hyperaesthesia, an exalted sensibility to jarring movements, or in turning in bed the pain is much aggravated. In several patients the recumbent position at once gave relief, but any movement was followed by pain. For months these symptoms may persist without the slightest sign of organic change. It is a period of distressing doubt to the physician, and of great misery to the patient, who may be allowed to suffer in the belief that she is simply nervous or hysterical. Or the question may come up for a second operation for recurrence, or for tumour of the other breast. Such a case was referred to me by Dr. Moody, of Winnipeg—a woman, aged 37, had had the right breast removed, and a second operation for recurrence. Three months after the operation the other breast was attacked, and at the same time she began to have pains in the back and legs, and occasionally in the joints. At times they had been severe enough to require a hypodermic injection of morphine. The question was as to the existence of new growths elsewhere, as operation in the other breast had been advised. The examination was negative, and she looked a very healthy woman. She had had for many years neuralgic attacks, and on several occasions lumbago, so that I could not feel at all certain that the pains were due to metastases. The operation was performed, and she was for a time much better. I have not heard of the subsequent history.

A distressing and not very rare feature in this stage is an outbreak of shingles which occurred in Case vi. Romieu has collected a series of cases from the literature.<sup>4</sup>

Gradually there is an increase in the severity of the pains, which may come in crises of the most agonizing character, requiring large doses of morphine for relief. While as a rule the pains are thoracic or lumbar, they may at first be sciatic, shooting down one or both legs. For months, or even throughout the course, there may be no disturbances of motion or of sensation. The reflexes are often exaggerated in this stage, but not more than is often seen in neurasthenia.

In a majority of the cases the second or paralytic stage is reached—a pressure paraplegia, usually of the spastic type. The onset may be rapid, and within a few days the patient may be unable to walk. More often it is a slow affair, many months elapsing before there is complete paralysis. Disturbances of sensation, other than pain, are rare. Cramps in the muscles are common, and there are painful spasms in which the legs are drawn up forcibly. Finally, there is the well-known picture of paraplegia dolorosa. In rare cases only one leg is paralysed.

I saw a few weeks ago, with Dr. Brooks, a patient who had had a breast removed for cancer four years ago, and a second operation for recurrence this summer. For more than a year she had had pains in the right leg, believed to be sciatica, and a gradual wasting, with loss of power. She was a thin, delicate-looking woman. The right leg was wasted, particularly in the gluteal and upper parts.

She could not lift it from the bed or stand upon it. The sensation was perfect. Nothing could be made out in the examination of the spine or the sacro-iliac regions. *Per rectum* some hard, nodular bodies could be felt above the fundus of the uterus, but their nature was doubtful. With such a history, and the recent recurrence of the cancer, there could be no question as to the cause of the right monoplegia.

One of the most remarkable features in the history of carcinoma is the spontaneous involution sometimes met with in the secondary tumours. Cases v and vi of my series, both with spinal symptoms, were still alive at the time of report, April, 1901. In Case v the primary tumour was removed in October, 1897. A year later the patient had a secondary growth in the right eye, pains in the back and legs, an extensive pleural effusion on the right side, and at the junction of the manubrium and the gladiolus a distinct tumour. She became greatly emaciated, was confined to bed, and had agonizing pains in the legs and the sides. For months she was in a desperate condition. Towards the autumn of 1899 the pains lessened, she was able to move her legs better. She could get out of bed and began to walk about the house and grounds. There was a distinct kyphosis of the fourth and fifth dorsal spines, and the back was stiff. The tumour of the manubrium had disappeared entirely. The vision of the right eye, which had been almost lost, improved. There was a local recurrence in the left breast, but it had not increased. In the summer of 1900 she improved still further, and was able to be out, and even drove herself. During the winter of 1900-1 she was very comfortable. She still had pains in the back and side, for which she had to take morphine. In the summer of 1901 she began to have some shortness of breath. There were a few local skin recurrences. She gradually failed, and died on November 10th, 1901, three years after the first appearance of the secondary growths.

Case vi is in some respects even more remarkable. The primary operation was in February, 1898. In August, 1899, she began to have the usual nerve-root pain, and in November she had a severe attack of herpes on the left side. After a winter of great suffering she became completely paraplegic, and for weeks was desperately ill. In July she was moved to the country, and she began to get better. The paraplegia disappeared, and she regained control of the bladder and bowels. She walked stiffly, with the back bowed; but from this time on until her death in January, 1903, she had no further paralysis. She took about 3 gr. of morphine daily. When the paraplegia existed there were nodules about the scar, and the glands in the neck were enlarged, but they progressively diminished in size. One skin nodule ulcerated and never entirely healed, but gave her no trouble. Four months before her death she had anorexia with vomiting, and stiffness of the right arm, but there was no recurrence of the paraplegia, nor did the secondary tumours increase in size. The patient lived for between three and four

years after the onset of a paraplegia, due, there can be no question, I think, to pressure of a secondary mass in the spine.

Even more remarkable cases are on record, in which multiple secondary tumours have gradually disappeared. The cases reported by Pearce Gould<sup>5</sup> and Vulpian<sup>6</sup> illustrate recovery from conditions apparently the most desperate, with a gradual subsidence of the secondary masses. In the cases the subsequent histories of which are here given, the morphine seemed to have had a very beneficial influence on the general condition, and it may have helped to keep in check the progress of the disease.

#### E.—*Bones.*

The frequency of metastasis to the bones has been noted by all writers. In a few rare instances there is widespread generalization in the bones, as in the cases reported by Brunon<sup>7</sup> and Firket.<sup>8</sup>

In many of the cases with brain and spinal cord symptoms the lesion is in the bones, causing pressure. The long bones are not so often involved. In the following remarkable case spontaneous fracture of the thigh bone occurred at the seat of the secondary growth.

On December 1st, 1901, I saw at Mount Clemens, Michigan, Mrs. M., aged about 47. The patient was an exceedingly nervous woman, but otherwise had enjoyed fairly good health. In the spring of the year she had had rheumatic pains in different regions, but there had been nothing to call attention to the condition of her breast. She went to Cuba, where she remained for three months, returning in October. The pains had rather increased, but were still somewhat indefinite in character, and were thought to be rheumatic, and as some of her friends had received great benefit at Mount Clemens, she decided to go there for a course of the baths. A few days before leaving it was accidentally discovered that she had a tumour of the left breast, about which she had known for some time, but had never spoken. She had had some pains in the legs and in the back, but she was able to get about. The pains were, I believe, more marked in the left leg. On getting into the sleeping-car to go to Mount Clemens she had stepped up two steps, but on trying to get up the third she had an agonizing pain in the left leg, and had to be helped in, and throughout the night on the car her sufferings were excruciating. This was between two and three weeks before I saw her. From that time on she was confined to bed, could scarcely move the left leg without the most agonizing pain, and it was only with the greatest difficulty that she could be carried on a sheet to take the baths.

The condition was as follows: A healthy-looking woman, very neurotic and emotional, in an agony of apprehension lest her leg should be removed. She was not at all cachectic. There was a large carcinoma of the left breast, with secondary involvement of the glands of the axilla. The left leg was strongly flexed and everted. She could

not voluntarily move it, but she could, with the other foot, straighten the leg a little from the knee. The middle and upper part of the left thigh was visibly larger than the right. On palpation the lymph glands were not enlarged. There was no special tenderness, but there was evidently swelling and enlargement of the upper part of the thigh bone. Any attempt to straighten the thigh or to move it from its everted position caused the most agonizing pain.

It was suggested that she probably had a new growth in the upper part of the thigh, possibly about the neck of the thigh bone, and that she had had a fracture with dislocation at the time of getting into the sleeping car. She was taken back to New York, where she saw Dr. W. T. Bull, who concurred in the diagnosis of secondary carcinoma of the thigh bone. Nothing could be done, and the patient gradually failed in health and died a few months later.

In the following case the scapula was involved three years after removal of the breast: Mrs. N., aged 52, seen December 30th, 1901. She had had old valvular disease of the heart, and it was for this I was asked to see her. Incidentally it was mentioned that she had had her left breast removed three years previously by Dr. Tiffany for cancer.

She had been an energetic, active woman, and since the operation had apparently been in good health. Three weeks ago, while in Washington one evening, she had a sudden severe pain in the right side, of sufficient intensity to require morphine. She had not been well since, having a great deal of pain, chiefly in the right side of the chest. Last Thursday, five days ago, it lessened on the right side and became very intense on the left.

She was a well-nourished woman, a little pale, sweating profusely. The pulse was under 90, a little collapsing. She had signs of quite an extensive operation in the left breast. There was marked mitral insufficiency, and a loud, rough systolic murmur in the aortic area. There was impaired resonance at the base of the right lung, and numerous fine râles. There were no glands enlarged above the clavicle or in the axilla. Examining from behind, one was immediately struck by the difference in appearance between the two scapulae. The left was enlarged uniformly, chiefly in the upper half. It was not specially painful. There were no secondary masses in the ribs.

The bones of the hands and feet are not often involved—in not one of the 650 autopsies analysed by Stephen Paget. I was consulted in July, 1904, by Dr. Neagle about a patient who had had two recurrences within eighteen months after a primary operation. She then began to have pain and tenderness in the thumb of the right hand, the metacarpal bone of which enlarged, forming a solid fusiform tumour. The inner end of the right clavicle gradually became enlarged and tender, and at the last report the left knee and ankle had become involved—evidently a case of widespread generalization in the bones.



In many cases of internal metastases in cancer of the breast the symptoms are obscure or there are features which make the diagnosis doubtful. Scarcely enough stress is laid in works on surgery upon the terminal stages of cancer with the tragic events of which the general practitioner is left to battle alone. Amid the sad failures of our art these cases stand out in strong relief. An early diagnosis of the condition and an early recognition of its hopelessness may lessen the terrible ordeal of the poor victim, and mitigate not only her sufferings, but those of the near relatives. Morphine, enough morphine! given freely and without fear, in doses sufficient to keep the patient comfortable, affords the only possible relief. The radical operation as now performed, if performed early, should lessen enormously the proportion of these distressing cases with internal metastases.

## NOTES AND REFERENCES.

<sup>1</sup> *American Medicine*, April, 1901. <sup>2</sup> *Lancet*, 1889, I. <sup>3</sup> *Oeuvres Complètes*, Tome II, 116. <sup>4</sup> *Leçon dans le Cancer du Sein*, Lyons, 1860. <sup>5</sup> *Clinical Society's Transactions*, vol. xxx. <sup>6</sup> *Gaz. des Hôp.*, 1885. <sup>7</sup> *Progrès Médical*, 1884. <sup>8</sup> *Bulletin Soc. Anat. de Paris*, 1885, lvi.

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# Angina Pectoris as an Early Symptom in Aneurysm of the Aorta.

BY

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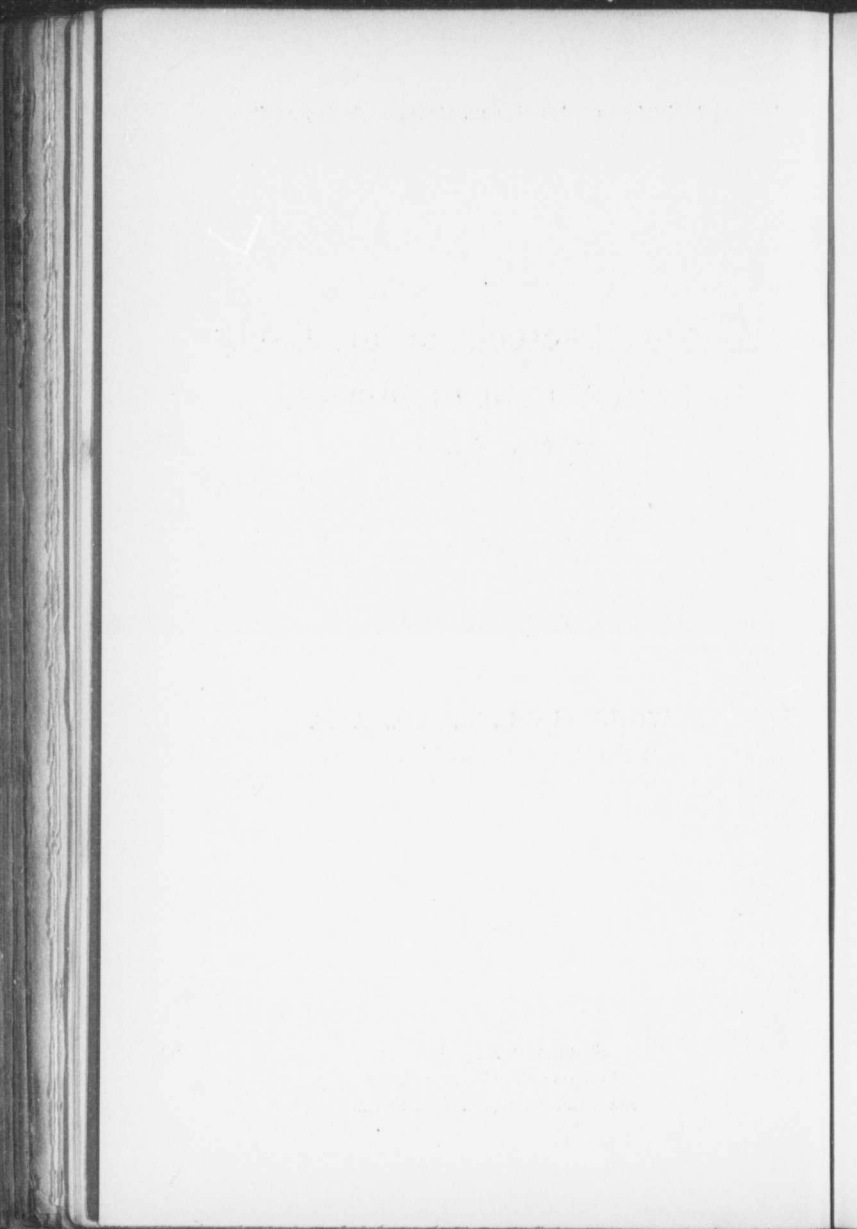
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ANGINA PECTORIS AS AN EARLY SYMPTOM IN  
ANEURISM OF THE AORTA.

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PAIN is one of the earliest and most constant of the symptoms in aneurism of the aorta. In 132 cases of thoracic aneurism under my care in the Johns Hopkins Hospital, tabulated for me by Dr. Hamman, in 63 it was the first symptom. It was present in 104 cases, being of a very severe character in 61. Its absence was noted in 25. In three cases there was no history.

That pain should ever be absent is remarkable, and yet with extreme dyspnœa, cough and cyanosis the patient may experience nothing more than distress, and, strange as it may appear, the sac may perforate the chest wall or erode the spine without causing pain—so, at least, the patients affirm! Perhaps the most common situation for the pain is in the region of the heart itself, radiating to the neck, to the shoulder, to the back and down the left arm, sometimes to both arms. There were three cases in the series in which abdominal pain was severe. In No. 13, a large aneurism of the transverse arch the patient had had for six months attacks of abdominal pain supposed to be wind colic. He had no pain in the chest.

Several different varieties of pain may be recognised in aneurism: (1). Attacks with the characters of true angina—paroxysms of pain of maximum intensity with the associated features as the radiation to the arm, etc. In a comparatively small number of the cases in this series the attacks were of a definitely anginal type—in not more than in 22. It is stated by Gibson that, “in a large proportion of cases of aneurism of the

aorta, angina pectoris in its most pronounced and unmistakable forms is present." (2). Pain due directly to pressure on the nerves, sharp and neuralgic in character, often extending along the course of the nerves, and which in aneurism of the descending thoracic aorta may be associated with herpes. This is by far the most common type and it, too, may be paroxysmal, varying very greatly in intensity. It is pain of much the same sort as one meets with in pressure from pelvic tumours and in disease of the vertebrae. (3). Pain of a dull boring character met with particularly when the sac is eroding the chest wall or the spine. It is not always easy to distinguish this from the second variety, but I have had patients tell me they could appreciate the difference very clearly, and it is this form that is the most enduring and most severe. It seems due to tension and stretching of fibrous and bony structures rather than to pressure upon nerve cords. (4). Pain referred to the nerves of the arms, or to the skin in the precordial region, or to the pectoral or to the sterno-cleido-mastoid muscles. Pain down the left arm is very common, and it was a marked symptom in 22 cases. The pain may be present in the arms alone. In Case 61, a man aged 35, there was no pain in the chest, but attacks of sharp pain in both arms and in the elbows. In the regions mentioned there may be marked cutaneous hyperæsthesia or paræsthesiæ as pointed out by Mackenzie, Gibson and others.

I wish to call attention in this paper to a group of cases often of great obscurity, in which attacks of angina pectoris precede for months or for years the appearance of the aneurism. The paroxysms may be of the most typical character, and not the slightest suspicion may be entertained of the true nature of the case. The attacks are associated with the early structural changes in the wall of the aorta. Pain is not a necessary accompaniment of sclerosis of the aorta. I have seen it in syphilitic patients, and in them the attacks are likely to be definitely anginal. As is well known with lesions of the arteries, pain of a most intense degree may be associated. We see it in embolism, in thrombosis and in the ligation of vessels. The pain in embolism may be of a most ferocious kind. I remember

once reaching the house just as embolism of the femoral artery had occurred in a case of ulcerative endocarditis. The young man was screaming in agony. A few weeks ago a remarkable instance occurred under Dr. Brooks' care at the Radcliffe Infirmary. A man with aortic insufficiency had a sudden pain in the calf of one leg. For days he was in such agony that he had to have large doses of morphia. The calf just below the popliteal space was much swollen and tender. Gradually pulsation became evident, and within ten days it was clear that he had an aneurism of the posterior tibial artery. The most interesting circumstance was the disappearance of a musical diastolic murmur noted by Dr. Mallam (who had had the man under observation for several years), and associated very probably, as he suggested, with the breaking of a calcified vegetation from the valve, and embolism of the posterior tibial artery. The aneurism resulted from a tear in the vessel, not from the more usual cause, an infective arteritis. This is a good illustration of pain of a most exceptional intensity caused by lesion of the vessel wall itself. Many other conditions could be mentioned with which vascular pain is associated, as in thrombosis, etc.

In the cases I here report the special features are the attacks of angina preceding the appearance of the aneurism, and in several of the cases the disappearance of the attacks as the aneurism became evident. Of course, the association of early anginal attacks in aneurism has not escaped the notice of many observers. Gairdner, in Allbutt's System, says that in not a few instances aneurism of the aorta leads to symptoms closely resembling typical angina pectoris, and he has recorded cases in which such attacks had preceded for several years the physical signs of aneurism. My attention was re-directed to the subject by a case which I saw a few months ago with Dr. Mallam—a stout, healthy-looking man, who had had, eighteen months before, typical attacks of angina, and throughout the year several recurrences of great severity. Lately, there were dyspnoea and signs of cardiac insufficiency, and an aneurism had appeared to the right of the sternum.

The following cases are of interest as illustrating the extreme obscurity of the symptoms in some of these cases.

CASE I. *Attacks of angina pectoris preceding for several years the appearance of an aneurism of the arch of the aorta.*

Mr. S., aged 51, seen March 11th, 1894, with Dr. Atkinson. The patient is a well-developed, muscular man, grey, but still youthful looking. He has always enjoyed excellent health; has never had syphilis (?); he served in the Army; he has been a moderate smoker and a moderate drinker. He smokes three or four pipes of tobacco in the day. He has never had rheumatic fever.

Since October, 1893, he has had attacks of pain in the chest, invariably beginning a short time after he had gone to bed. He describes the pain as of a dull burning character, situated just beneath the breast bone. Usually it passes off in a short time and he goes to sleep. Then, about four or five o'clock, he is awakened with a pain and a sense of oppression, and has to sit up in bed. With but occasional variations this has been going on throughout the winter, and he has not had relief from any of the ordinary measures. Describing the attacks more particularly, the pains never radiate to the arms or up the neck. Frequently there is an unpleasant sensation in the back; sometimes the pain will leave the front of the chest and become severe at the back. He does not sweat, nor does he think he changes colour during the attacks. There is no special anguish or sense of impending dissolution. He can move about during them, and motion gives relief. He is sometimes a little short of breath. He does not belch during the attacks, nor does he think indiscretions in diet have any special influence. The nitrite of amyl, nitro-glycerin and the iodides have been tried without any avail, and lately he has been forced to use morphia. He is a healthy-looking man; not anæmic. Pupils equal; slightly smaller than they should be (he had had a quarter of a grain of morphia at five o'clock; examination at twelve o'clock); they react to light and on accommodation; no arcus. The radial pulses are equal, vessels a little firm, tension not specially increased. The apex beat is in fifth interspace within the nipple line; somewhat difficult to palpate accurately; no tender spots; no areas of abnormal pulsation. Percussion over manubrium



is clear; no increase in the area of heart dulness. On auscultation the sounds at the apex are clear and of normal relative intensity. Towards the base the second sound is much accentuated, and to the right of the sternum is loud, ringing; well heard all over the manubrium and in the carotids. The respiratory murmur equal on both sides of the chest. There is no bruit audible along the left vertebral groove; no tracheal tugging. Examination of the abdominal organs is negative. The knee jerks are absent, and not obtained with re-inforcement. The gait is normal; he stands well with the eyes shut; has no difficulty in walking in the dark. He has no areas of anæsthesia; no lightning pains.

I made the following note after dictating the above:—"It is very difficult to determine whether this really is an instance of true angina associated with organic lesion. The attacks scarcely have the intensity of the genuine form; he has no sweating, no change of colour, no immobility. Two facts only in the case suggest that there may be some organic basis—namely, the marked accentuation of the aortic second sound, and the absence of the knee jerks. He was advised to quit smoking entirely and the bromide and iodide of potassium were to be given a thorough trial."

September 28th, 1895. I heard from this patient to-day through Dr. Simon. Though he has been better for a time, he still has attacks. Dr. Simon reports, too, that he thinks there is some increase in the area of heart dulness.

I saw the patient six years after the first note, when he was 57 years old. The severe attacks had gradually disappeared. He now has at intervals pains in the chest, but he has no longer any paroxysmal attacks. There is audible stridor; he is very short of breath; and the face becomes very much congested if he stoops. There is diffuse pulsation over the manubrium; a loud diastolic shock; no murmur; well-marked tracheal tugging. Subsequently the aneurism perforated the chest wall and became very large. He died under my care in the Johns Hopkins Hospital. The absence of the knee jerks, the Argyll-Robertson pupil which was present, and the aneurism make a luetic infection highly probable.

In the following case, of still greater interest and greater obscurity, the patient had consulted many physicians and many different opinions had been given. For nearly two years he had attacks of pain in the chest of great severity. There was no sign of aneurism, though it was suspected early by Dr. McPhedran. I examined him repeatedly without detecting anything to suggest disease of the aorta. It is quite possible that the fluroscope might have shown the tumour even at the early stage. The disappearance of the pains with the appearance of the aneurism is an interesting feature.

CASE II. *Severe paroxysms of pain in chest with inability to lie down. Marked hyperacidity of gastric juice. No physical signs. After persisting for more than a year, disappearance of attacks. Gradual onset of aneurism with pressure symptoms. Death.*

A.C., aged 49, Toronto, Canada, consulted me on January 31st, 1898, complaining of pains about the heart and in the shoulders.

*Family history.* Father died aged 85; the mother, aged 59, had been asthmatic for years, and died of kidney and heart trouble. No history of rheumatism or gout in the family.

*Personal history.* He had been married twenty-five years; no children. The patient has used alcohol freely, and for years kept a popular restaurant in Montreal. He has been temperate for twelve years. He used tobacco very freely, but of late years has only smoked two or three cigars a-day. He has had chancreids several times, but no hard sore so far as he knows; no history of any secondaries. For many years he was a "high liver." His best weight was 215 pounds. He has lost twenty or thirty pounds within the past two years. For nearly eighteen years he has had headaches at intervals, always in the occipital region, frequently associated with stomach trouble. For eighteen years at least he has had at times indigestion, eructations of gas, and a full feeling after meals.

*Present illness.* For some years he has had occasional pains in the stomach and lower thoracic region, associated, he thought, with indigestion. They were generally worse at night. The

first severe attack, in April, 1897, came on during the night, and, from his statement, must have been a very peculiar one, as the pain was more or less persistent, and he could not sit up, even to take his meals. He became nervous and sleepless. From the character of the pain and the patient's general condition, Dr. MacPhedran suspected aneurism of the aorta. The pain was in the lower part of the chest and never passed down the arm, but was often exactly over the heart, extending to the right and to the back. After remaining in bed for nearly a month he began to improve. In July, 1897, he was laid up again for two weeks with a second attack of severe pain. The next attack was on November 15th. It was not so severe. The last attack began early in January, 1898, and the pains have been quite sharp. For sixteen days he was unable to lie down and slept in a chair. In the intervals he has been pretty well, but he has not been wholly free from pain. The patient, a very intelligent man, gives a graphic account of his attacks, and says he has not really had a comfortable night's rest since April, 1897. He describes the pain as a sharp stitch directly over the heart, which passes across to the right side of the thorax, and frequently goes through to both shoulder blades. He never has any smothering feelings. At times he has sweated in the severe attacks, and has turned pale. Excitement and exercise do not aggravate it. He has always felt that his condition was due to stomach trouble, as over-eating at night, or indiscretions in diet seem to aggravate the condition.

*Examination.* The patient is a rather grey man, and looks much older than his years. The radials are a little sclerotic, tension plus. Heart: Point of maximum impulse not very evident, apparently in fifth interspace. There is no increase in the area of superficial dulness. The first sound is a little muffled, but there is no murmur. The second aortic sound is clear, without accentuation. No flatness over manubrium; no bruit in vessels of the neck or along the spine behind. There is no tracheal tugging. Breath sounds are of equal intensity on both sides. The patient was admitted to the hospital, and his condition carefully studied for three weeks. The stomach was found to be somewhat relaxed; on inflation the lower border came to

within a finger's breadth of the navel. He had lavage late at night and there was always some food present. He had often uneasy sensations during the night, particularly about two or three in the morning; no positive pain. A careful study of the gastric juice on four occasions showed a persistent superacidity. It was interesting to note that on several occasions the attacks at night were greatly relieved by hard-boiled eggs, and often by the use of large doses of bicarbonate of soda or the burnt magnesia. There were never signs of renal trouble. He left the hospital very much improved. While we suspected aneurism, there was never detected any sign of it.

The case attracted much attention, as the patient came under the care of many physicians. The pains were never referred to the stomach, always to the heart; the acute attacks must have been very severe.

I heard of him at intervals, in reports from Dr. Rowe, of Toronto, under whose care he was. He got very much better, and through the years 1899 and 1900 he was able to be about and enjoyed life. In August, 1900, he began to have a cough, and paralysis of the left vocal cord was determined by Dr. Thorburn. From this time the signs of aneurism were evident. A very remarkable feature was the disappearance of the pain. Mr. C. wrote to me, January 30th, 1900: "I would like to explain to you how strangely the pain left me about a year and a half ago. . . . Some time after I went to Europe and during my trip I gained 24 pounds in weight, and although I must say the pain did not entirely disappear, I would get a twinge now and again, nothing to speak of."

On October 7th, 1901, Dr. Lafleur, of Montreal, sent the following note: "Whatever doubts there may have been at that time concerning the nature of his illness, there could be none when I saw him, and his cough betrayed him the moment he entered my room." He had slight visible pulsation to the left of the sternum, with an increase upward of the area of cardiac flatness. The second sound was accentuated. There was no bruit. In the left infrascapular region there was a flat note and very ringing heart sounds.

Dr. Rowe writes on October 13th, 1901, that there was marked

pulsation on the front of the chest wall near the sternum, which could be seen and felt. He had a very severe paroxysmal cough. There were marked signs of pressure on the left bronchus, so that the respiratory murmur could not be heard. There was complete paralysis of the left recurrent laryngeal.

He died October 6th, 1901.

CASE III. *Angina-like pain with syncope, followed by attacks of a typical character, preceding for nearly a year the signs of aneurism of the arch of the aorta.*

H.B., aged 53, seen with Dr. Lewis Brinton, October 13th, 1903, complaining of pains in his chest.

The patient had inflammatory rheumatism at 19, but does not think that his heart was affected. As a young man he had a chancre, but no secondaries. He had sick headaches until his forty-fifth year. He has been a moderate drinker, and has smoked to excess for years. He has been a very hard worker, but not a heavy eater. He has had dyspepsia at intervals for many years.

The present illness dates from about a year ago, when he had pain in the right arm and afterwards in the chest, and he was thought to have had an attack of acute indigestion. Then he had pains in the shoulders and in both arms, coming on in paroxysms, with pains in the chest. One day after a luncheon at which he had eaten very heartily he had two attacks of great severity, in which he fainted. He lost consciousness and became quite feeble and collapsed. The attack was associated with some pain in the chest. He had another one on July 3rd of this year, severe pains in the chest and down both arms. On close questioning he says that even a year ago he had a slight fainting spell. In the severe attack the doctor says he was pale and pulseless, with profound vascular and motor collapse. Of late the pains have been very severe, chiefly in the chest, coming on in paroxysms, and associated with a fear of dying. The attacks are frequently nocturnal. He is kept awake, and in them he sweats and turns pale. The pain in the chest is chiefly sub-sternal and is relieved by nitrite of amyl.

The patient was a healthy-looking man of fairly good colour;

no cyanosis. The pupils were equal and reacted to light. The thorax was well formed. The apex beat was in 5th space.

To the right of the sternum in third and fourth interspaces there was a very definite diffuse pulsation, extending almost as far as the nipple line. Over this there is markedly impaired resonance and a diastolic shock. On auscultation there was at the apex a soft bruit, and over the area of pulsation a loud diastolic shock.

Dr. Brinton kindly sent me a note about the patient's death early in December, 1903. The *autopsy* showed an extensive dilatation of the arch of the aorta, with a large aneurism sac projecting into the right pleura and pressing on the right bronchus. There were well-organized laminated fibrous clots in the central portion of the sac. There were extensive atheromatous changes from the orifice of the coronary arteries throughout the aorta. The coronary arteries were also atheromatous.

This case illustrated the difficulty in making the diagnosis of aneurism in the early stages. For more than a year the symptoms had persisted without anything to suggest aneurism, which had been sought for by several careful physicians.

CASE IV. *For two years recurring attacks of angina of great severity; aortic insufficiency; gradual appearance of aneurism of the arch.*

A.K., aged 58, seen October 28th, 1903, complaining of pain under the breast bone at night, which "terminates in a spot in the right lung, about the size of a marble, and runs down the right arm; one night down the left." The first attack occurred two years ago, and he has had an attack nearly every night since. He does not turn pale in them; does not now sweat, though he did at first. They are very severe, and last a couple of hours if he does not take morphia to relieve them. The pain starts just below the ensiform cartilage, where there is a very tender spot on the skin.

He had pneumonia ten years ago. He has always been a temperate man. The pulse is distinctly collapsing, visible in the radials. The arteries are sclerotic. He is a healthy-looking

man; good colour; iron-gray hair. The pupils are a little unequal; the left a little larger than the right, react well to light. Marked throbbing in the carotid arteries. The apex beat is in fifth space, outside the nipple. There is a distinct slight diastolic thrill at the aortic area. On percussion the manubrium is clear to the 2nd rib. Slight diffuse general pulsation visible. At the aortic cartilage and over the whole sternum is a to and fro bruit, the diastolic the louder; the systolic does not obliterate the first sound. Both murmurs are very loud to the right of the sternum, as though there was some dilatation of the arch, and well heard as low as the upper border of the 4th rib. At the apex both murmurs are audible, distant, transmitted. No definite tracheal tugging. On careful lateral inspection there is seen a distinct throbbing in the second and third right interspaces. It extends as far out as the nipple line. There is no bulging. This is the seat of his severe pain. There is no very definite punctuate pulsation; no diastolic shock. The signs of aneurism became much more marked and the pains lessened as the tumour grew larger and eroded the ribs. He died in May of the following year.

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261

# RELIGIO MEDICI

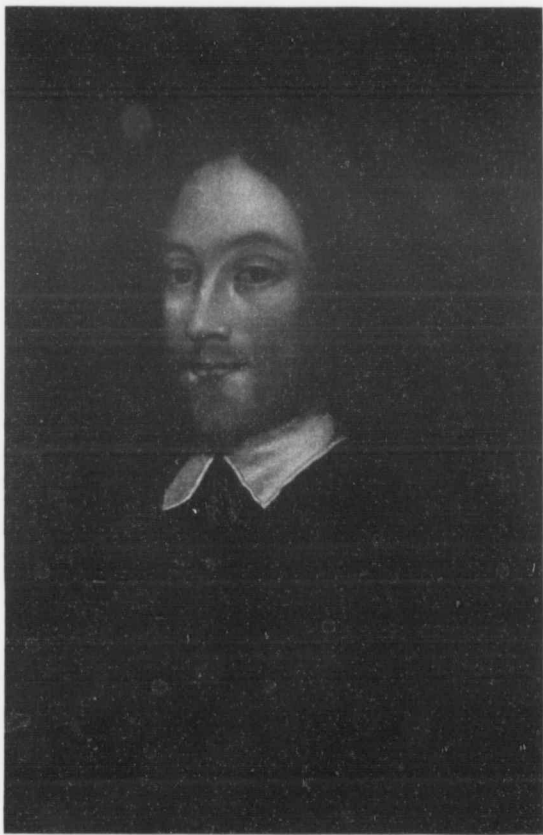
AN ADDRESS DELIVERED  
AT GUY'S HOSPITAL  
OCTOBER, 1905

BY  
WILLIAM OSLER, M.D., F.R.S.  
REGIUS PROFESSOR OF MEDICINE, OXFORD

*Reprinted from THE LIBRARY, January, 1906*

LONDON  
PRINTED AT THE CHISWICK PRESS  
1906





SIR THOMAS BROWNE

From the portrait at St. Peter's Mancroft, Norwich

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## THE 'RELIGIO MEDICI.'<sup>1</sup>



AS a boy it was my good fortune to come under the influence of a parish priest of the Gilbert White type, who followed the seasons of Nature no less ardently than those of the Church, and whose excursions into science had brought him into contact with physic and physicians. Father Johnson, as his friends loved to call him, founder and Warden of the Trinity College School near Toronto, illustrated that angelical conjunction (to use Cotton Mather's words) of medicine and divinity more common in the sixteenth and seventeenth centuries than in the nineteenth. An earnest student of Sir Thomas Browne, particularly of the 'Religio Medici,' he often read to us extracts in illustration of the beauty of the English language, or he would entertain us with some of the author's quaint conceits, such as the man without a navel (Adam), or that woman was the rib and crooked piece of man. The copy which I hold in my hand (J. T. Fields's

<sup>1</sup> An address delivered at the Physical Society, Guy's Hospital, October 12, 1905.

edition of 1862), my companion ever since my schooldays, is the most precious book in my library. I mention these circumstances in extenuation of an enthusiasm which has enabled me to make this almost complete collection of the editions of his works I show you this evening, knowing full well the compassionate feeling with which the bibliomaniac is regarded by his saner colleagues.

### I.—THE MAN.

The little Thomas was happy in his entrance upon the stage, 19th October, 1605. Among multiplied acknowledgements, he could lift up one hand to Heaven (as he says) that he was born of honest parents, 'that modesty, humility, patience, and veracity lay in the same egg, and came into the world' with him. Of his father, a London merchant, but little is known. There is at Devonshire House a family picture which shows him to have been a man of fine presence, looking not unworthy of the future philosopher, a child of three or four years, seated on his mother's knee. She married a second time, Sir Thomas Dutton, a man of wealth and position, who gave his stepson every advantage of education and travel. We lack accurate information of the early years—of the school days at Winchester, of his life at Broadgate Hall, now Pembroke College, Oxford, and of the influences which induced him to study medicine. Possibly he got his inspiration from the Regius Professor of Medicine, the elder Clayton, the Master of Broadgate Hall and afterwards of Pembroke College. That he was a dis-

tinguished undergraduate is shown in his selection at the end of the first year in residence to deliver an oration at the opening of Pembroke College. Possibly between the years 1626, when he took the B.A., and 1629, when he commenced M.A., he may have been engaged in the study of medicine; but Mr. Charles Williams, of Norwich, who is perhaps more familiar than any one living with the history of our author, does not think it likely that he began until he went abroad. In these years he could at least have 'entered upon the physic line' and could have proceeded to the M.B. He was too early to participate in the revival of science in Oxford, but even after that had occurred Sydenham flung the cruel reproach at his Alma Mater that he would as soon send a man to her to learn shoemaking as practical physic. It was possible, of course, to pick up a little knowledge of medicine from the local practitioners and from the Physic Garden, together with the lectures of the Regius Professor, who, as far as we know, had not at any rate the awkward failing of his more distinguished son, who could not look upon blood without fainting, and in consequence had to hand over his anatomy lectures to a deputy.

Clayton's studies and work would naturally be of a somewhat mixed character, and at that period even many of those whose chief business was theology were interested in natural philosophy, of which medicine formed an important part. Burton refers to an address delivered about this time by Clayton dealing with the mutual relations of mind and body. The 'Anatomy of Melancholy,' which appeared in 1621, must have proved a stimulating *bonne bouche* for

the Oxford men of the day, and I like to think of the eagerness with which so ardent a student as Browne of Pembroke would have pounced on the second and enlarged edition which appeared in 1624. He may, indeed, have been a friend of Burton, or he may have formed one of a group of undergraduates to watch Democritus Junior leaning over the bridge and laughing at the bargees as they swore at each other. It is stated, I know not with what authority, that Browne practised in Oxford for a time.

After a visit to Ireland with his stepfather he took the grand tour—France, Italy, and Holland—spending two years in study. Of his Continental trip our knowledge is very meagre. He went to Montpellier, still famous, but failing, where he probably listened to the teaching of Riviere, whose 'Praxis' was for years the leading textbook in Europe—thence to Padua, where he must have heard the celebrated Sanctorius of the *Medicina Statica*—then on to Leyden, just rising into prominence, where it is said he took his doctor's degree in 1633. Of this, however, there is no certainty. A few years ago I looked through the register of that famous University, but failed to find his name. At the end of two years' travel he may have had cobwebs in his pocket, and the Leyden degree was expensive, as that quaint old contemporary of Browne, the Rev. John Ward of Stratford-on-Avon, tells us ('Diary'): 'Mr. Burnet had a letter out of the Low Countries of the charge of a doctor's degree, which is at Leyden about £16, besides feasting the professors; at Angers in France, not above £9, and feasting not necessary neither.' No doubt the

young Englishman got of the best that there was in the teaching of the day, and from the 'Religio' one learns that he developed from it an extraordinary breadth of culture, and a charity not always granted to travellers. He pierced beneath the shell of nationalism into the heart of the people among whom he lived, feeling at home everywhere and in every clime; hence the charity, rare in a Protestant, expressed so beautifully in the lines: 'I can dispense with my hat at the sight of a cross, but scarce with the thought of my Saviour.'

He must have made good use of his exceptional opportunities as he was able to boast, in a humble way it is true, that he understood six languages.

Returning to England in 1634 he settled at Shibden Dale, close to Halifax, not, as Mr. Charles Williams has pointed out, to practice his profession, but to recruit his health, somewhat impaired by shipwreck and disease. Here, in Upper Shibden Hall, he wrote the 'Religio Medici,' the book by which to-day his memory is kept green among us. In his travels he had doubtless made many observations on men and in his reading had culled many useful memoranda. He makes it quite clear—and is anxious to do so—that the book was written while he was very young. He says: 'My life is a miracle of thirty years.' 'I have not seen one revolution of Saturn.' 'My pulse hath not beat thirty years.' Indeed, he seems to be of Plato's opinion that the pace of life slackens after this date, and there is a note of sadness in his comment, that while the radical humour may contain sufficient oil for seventy, 'in some it gives no light past thirty,' and

he adds that those dying at this age should not complain of immaturity. In the quiet Yorkshire valley, with leisable hours for his private exercise and satisfaction, the manuscript was completed, 'with,' as he says, 'such disadvantages that (I protest) from the first setting pen to paper I had not the assistance of any good book.' 'Communicated to one it became common to many,' and at last in 1642, seven years after its completion, reached the press in a depraved form.

In 1637, at the solicitation of friends, Browne moved to Norwich, with which city, so far as we know, he had had no previous connection. At that date the East Anglian capital had not become famous in the annals of medicine. True, she had given Caius to the profession, but he had only practised there for a short time and does not seem to have had any special influence on her destinies. Sir Thomas Browne may be said to be the first of the long list of worthies who have in the past two and a-half centuries made Norwich famous among the provincial towns of the kingdom. Here for forty-five years he lived the quiet, uneventful life of a student-practitioner, absorbed, like a sensible man, in his family, his friends, his studies and his patients. It is a life of singular happiness to contemplate. In 1641 he married Dorothy Mileham, 'a lady of such a symmetrical proportion to her worthy husband—that they seemed to come together by a kind of natural magnetism.' In the 'Religio' he had said some hard things of the gentle goddess and had expressed himself very strongly against Nature's method for the propagation of the race. He be-



lieved, with Milton, that the world should have been populated 'without feminine,' and in almost identical words they wish that some way less trivial and vulgar had been found to generate mankind. Dame Dorothy proved a good wife, a fruitful branch, bearing ten children. We have a pleasant picture of her in her letters to her boys and to her daughter-in-law in a spelling suggestive of Pitman's phonetics. She seems to have had in full measure the simple piety and the tender affection mentioned on her monument in St. Peter's Church. The domestic correspondence (Wilkin's edition of the 'Works') gives interesting glimpses of the family life, the lights and shadows of a cultured English home. The two boys were all that their father could have wished. Edward, the elder, had a distinguished career, following his father's footsteps in the profession and reaching the dignity of the Presidency of the Royal College of Physicians. Inheriting his father's tastes, as the letters between them prove, his wide interests in natural history and archaeology are shown in his well-known book of 'Travels,' and I am fortunate in possessing a copy of the 'Hydriotaphia' with his autograph.

Edward's son, the 'Tommy' of the letters, the delight of his grandfather, also became a physician, and practised with his father. He died in 1710 under rather unfortunate circumstances, and with him the male line of Sir Thomas ended. Of the younger son we have, in the letters, a charming picture—a brave sailor-lad with many of his father's tastes, who served with great distinction in the Dutch wars, in which he met (it is supposed) a sailor's death. The eldest

daughter married Henry Fairfax, and through their daughter, who married the Earl of Buchan, there are to-day among the Buchans and Erskines the only existing representatives of Sir Thomas.

The waves and storms of the Civil War scarcely reached the quiet Norwich home. Browne was a staunch Royalist, and his name occurs among the citizens who in 1643 refused to contribute to a fund for the recapture of the town of Newcastle. It is astonishing how few references occur in his writings to the national troubles, which must have tried his heart sorely. In the preface to the 'Religio' he gives vent to his feelings, lamenting not only the universal tyranny of the Press, but the defamation of the name of his Majesty, the degradation of Parliament, and the writings of both 'depravedly, anticipatively, counterfeitedly, imprinted.' In one of the letters he speaks of the execution of Charles I as 'horrid murder,' and in another he calls Cromwell a usurper. In civil wars physicians of all men suffer least, as the services of able men are needed by both parties, and time and again it has happened that an even-balanced soul, such as our author, has passed quietly through terrible trials, doing the day's work with closed lips. Corresponding with the most active decades of his life, in which his three important works were issued, one might have expected to find in them reference to the Civil War, or, at least, echoes of the great change wrought by the Commonwealth, but, like Fox, in whose writings the same silence has been noticed, whatever may have been his feelings, he preserved a discreet silence. His own rule of life,

no doubt, is expressed in the advice to his son: 'Times look troublesome, but you have an honest and peaceable profession which may employ you, and discretion to guide your words and actions.'

Busy with his professional work, interested in natural history, in archaeology, and in literature, with a wide circle of scientific friends and correspondents, the glimpses of Browne's life, which we have from the letters, are singularly attractive. He adopted an admirable plan in the education of his children, sending them abroad, and urging them to form early habits of independence. His younger boy, Thomas, he sent at the age of fourteen to France, alone, and he remarks in one of his letters to him: 'He that hath learnt not in France travelleth in vain.' Everywhere in the correspondence with his children there is evidence of good, practical sense. He tells one of the boys to 'cast off *puer pudor rusticus*, and to have a handsome garb of his body.' Even the daughters were taken to France. In his souvenir of Sir Thomas Browne Mr. Charles Williams has given an illustration of his house, a fine old building which was unfortunately torn down some years ago, though the handsome mantelpiece has been preserved.

An interesting contemporary account has been left by Evelyn, who paid a visit to Sir Thomas in 1673. He says: '. . . the whole house being a paradise and a cabinet of rarities, and that of the best collections, especially medails, books, plants, and natural things. Amongst other curiosities, Sir Thomas had a collection of the eggs of all the foule and birds he could procure, that country, especially

the promintory of Norfolk, being frequented, as he said, by several kinds which seldom or never go further into the land, as cranes, storkes, eagles, and a variety of other foule.'

After Dr. Edward Browne was established in London the letters show the keen interest Sir Thomas took in the scientific work of the day. Writing of his son's lecture on anatomy at the Chirurgical Hall, he warns him that he would have more spectators than auditors, and after that first day, as the lecture was in Latin, 'very many will not be earnest to come here-after.' He evidently takes the greatest interest in his son's progress, and constantly gives him suggestions with reference to new points that are coming up in the literature. Here and there are references to important medical cases, and comments upon modes of treatment. It is interesting to note the prevalence of agues, even of the severe haemorrhagic types, and his use of Peruvian bark. In one of the letters a remarkable case of pneumothorax is described: 'A young woman who had a julkung and fluctuation in her chest so that it might be heard by standers-by.' Evidently he had a large and extensive practice in the Eastern Counties, and there are numerous references to the local physicians. There is a poem extolling his skill in the despaired-of case of Mrs. E. S., three or four of the lines of which are worth quoting:

He came, saw, cur'd! Could Caesar's self do more;  
Galen, Hippocrates, London's four-score  
Of ffamous Colledge . . . had these heard him read  
His lecture on this Skeliton, half dead;

And seen his modest eye search every part,  
Judging, not seeing.

The correspondence with his son is kept up to the time of his death. Only part of the letters appears in Wilkin's 'Life,' and there are many extant worthy of publication.

In 1671 he was knighted by Charles II. In 1664 he was made an honorary Fellow of the Royal College of Physicians, with which, through his son, he had close affiliations. His name does not appear in the roll of the Royal Society, with the spirit and objects of which he must yet have had the warmest sympathy. He was in correspondence with many of the leading men of the day—Evelyn, Grew, Elias Ashmole, Dugdale, Paston, Aubrey, and others. The letters deal with a remarkable variety of subjects—natural history, botany, chemistry, magic and archaeology, etc. The 'Pseudodoxia Epidemica' (1646) extended his reputation among all classes and helped to bring him into close relationship with the virtuosi of the period. There is in the Bodleian a delightful letter from Mr. Henry Bates, a wit of the court, a few extracts from which will give you an idea of the extravagant admiration excited by his writings: 'Sir,—Amongst those great and due acknowledgements this horizon owes you for imparting your sublime solid phansie to them in that incomparable piece of invention and judgment, R. M. gives mee leave, sir, here at last to tender my share, which I wish I could make proportionable to the value I deservedly sett upon it, for truly, sir, ever since I had the happiness to know your religion I have religiously honoured

you; hug'd your Minerva in my bosome, and voted it my *vade mecum*.' . . . 'I am of that opinion still, that next the "Legenda Dei," it is the master piece of Christendome; and though I have met sometimes with some *omnes sic ego vero non sic* men prejudicating pates, who bogled at shadowes in 't, and carpt at atoms, and have so strappadoed me into impatience with their senseless censures, yet this still satisfied my zeal toward it, when I found *non intelligunt* was the nurse of their *vituperant*, and they onely stumbled for want of a lanthorne.'<sup>1</sup>

While interested actively in medicine, Browne does not seem to have been on intimate terms with his great contemporaries—Harvey, Sydenham, or Glisson—though he mentions them, and always with respect. He was a prudent, prosperous man, generous to his children and to his friends. He subscribed liberally to his old school at Winchester, to the rebuilding of the Library of Trinity College, Cambridge, and to the repairs at Christ Church, Oxford. A life placid, uneventful, and easy, without stress or strain, happy in his friends, his family, and his work, he expressed in it that harmony of the inner and of the outer man which it is the aim of all true philosophy to attain, and which he inculcated so nobly and in such noble words in the 'Religio Medici' and in the 'Christian Morals.'

A description of him given by his friend, the Rev. John Whitefoot, is worth quoting: 'He was never seen to be transported with mirth or dejected with sadness; always cheerful but rarely merry, at any sensible rate; seldom heard to break a jest, and

<sup>1</sup> Wilkin, vol. i., p. 253.

when he did he would be apt to blush at the levity of it. His gravity was natural, without affectation.'

The end came unexpectedly in his seventy-seventh year, after a sharp attack of colic, on his birthday, October 5th, 1682—a curious coincidence of which he speaks in the 'Letter to a Friend': 'But in persons who outlive many years, and when there are no less than 365 days to determine their lives every year—that the first day should make the last, that the tail of the snake should return into its mouth precisely at that time, and they should wind up upon the day of their nativity—is, indeed, a remarkable coincidence, which, though astrology hath taken witty pains to solve, yet hath it been very wary in making predictions of it.'

There are three good portraits of Sir Thomas—one in the College of Physicians, London, which is the best known and has been often reproduced, and from which is taken the frontispiece in Greenhill's edition of the 'Religio Medici'; a second is in the Bodleian, and this also has frequently been reproduced; the third is in the vestry of St. Peter's Mancroft, Norwich. Through the kindness of Mr. Charles Williams it is here reproduced as a frontispiece to this number of 'The Library.' In many ways it is the most pleasing of the three, and Browne looks in it a younger man, closer to the days of the 'Religio.' There is a fourth picture, the frontispiece to the fifth edition of the 'Pseudodoxia,' but it is so unlike the others that I doubt very much if it could have been Sir Thomas. If it was, he must have suffered from the artist, as did Milton, whose picture in the frontispiece to the

'Poems,' 1645, is a base caricature, but Browne has not had the satisfaction of Milton's joke and happy revenge.

## II.—THE BOOK.

As a book the 'Religio Medici' has had an interesting history. Written at 'leisurable hours and for his private exercise and satisfaction,' it circulated in manuscript among friends, 'and was by transcription successively corrupted, until it arrived in a most depraved copy at the press.' Two surreptitious editions were issued by Andrew Croke in 1642 (Fig. 1), both in small octavo, with an engraved frontispiece by Marshall representing a man falling from a rock (the earth) into the sea of eternity, but caught by a hand issuing from the clouds, under which is the legend 'A Coelo Salus.' Johnson suggests that the author may not have been ignorant of Croke's design, but was very willing to let a tentative edition be issued—'a stratagem by which an author panting for fame, and yet afraid of seeming to challenge it, may at once gratify his vanity and preserve the appearance of modesty.'

There are at least six manuscripts of the 'Religio' in existence, all presenting minor differences, which bear out the author's contention that by transcription they had become depraved. One in the Wilkin collection, in the Castle Museum, Norwich, is in the author's handwriting. Had Browne been party to an innocent fraud he would scarcely have allowed Croke to issue within a year a second imperfect edition—not simply a second impression, as the two differ in the size and number of the pages,





(1). FRONTISPIECE OF THE  
SURREPTITIOUS EDITION



(2). FRONTISPIECE OF THE  
AUTHORIZED EDITION

and present also minor differences in the text. The authorized edition appeared in the following year by the same publisher and with the same frontispiece, with the following words at the foot of the plate: 'A true and full copy of that which was most imperfectly and surreptitiously printed before under the name of "Religio Medici"' (Fig. 2). It was issued anonymously, with a preface, signed 'A. B.': 'To such as have or shall peruse the observations upon a former corrupt copy of this Booke.' A curious incident here links together two men, types of the intellectual movement of their generation—both students, both mystics—the one a quiet observer of nature, an antiquary and a physician; the other a restless spirit, a bold buccaneer, a politician, a philosopher, and an amateur physician. Sir Kenelm Digby, committed to Winchester House by the Parliamentarians, had heard favourably from the Earl of Dorset of the 'Religio Medici.' Though late in the day, 'the magnetic motion,' as he says, 'was impatience to have the booke in his hands,' so he sent at once to St. Paul's churchyard for it. He was in bed when it came. 'This good natur'd creature I could easily perswade to be my bedfellow and to wake me as long as I had any edge to entertain myselfe with the delights I sucked in from so noble a conversation. And truly I closed not my eyes till I had enricht myselfe with (or at least exactly surveyed) all the treasures that are lapt up in the folds of those new sheets.' Sir Kenelm holds the record for reading in bed; not only did he read the 'Religio' through, but he wrote 'Observations' upon it the same night

in the form of a letter to his friend, which extends to three-fourths of the size of the 'Religio' itself. As Johnson remarks, he 'returned his judgement of it not in the form of a letter but of a book.' He dates it at the end 'the 22nd. (I think I may say the 23rd, for I am sure it is morning and I think it is day) of December, 1642.' Johnson says that its principal claim to admiration is that it was written within twenty-four hours, of which part was spent in procuring Browne's book and part in reading it. Sir Kenelm was a remarkable man, but in connection with his statements it may be well to remember the reputation he had among his contemporaries, Stubbs calling him 'the Pliny of our age for lying.' However this may be, his criticisms of the work are exceedingly interesting and often just. This little booklet of Sir Kenelm has floated down the stream of literature, reappearing at intervals attached to editions of the 'Religio,' while his weightier tomes are deep in the ooze at the bottom.

The 'Religio Medici' became popular with remarkable rapidity. As Johnson remarks, 'It excited attention by the novelty of paradoxes, the dignity of sentiment, the quick succession of images, the multitude of abstrusive allusions, subtlety of disquisition, and the strength of language.' A Cambridge student — Merryweather — travelling in Europe, translated it into Latin, and it was published in 1644 by Hackius at Leyden in a very neat volume. A second impression appeared in the same year, and also a Paris edition—a reprint of the Leyden. The Continental scholars were a good deal puzzled and not altogether certain of the

orthodoxy of the work. Merryweather, in a very interesting letter (1649) says that he had some difficulty in getting a printer at Leyden. Salmasius, to whom Haye, a book merchant, took it for approbation, said 'that there was in it many things well said, but that it contained also many exorbitant conceptions in religion and would probably find much frowning entertainment, especially amongst the ministers.' Two other printers also refused it. The most interesting Continental criticism is by that distinguished member of the profession, Guy Patin, professor in the Paris Faculty of Medicine. In a letter to Charles Spon of Lyons, dated Paris, October 21st, 1644, he mentions having received a little book called the 'Religio Medici,' written by an Englishman, 'a very mystical book containing strange and ravishing thoughts.' In a letter, dated 1645, he says 'the book is in high credit here; the author has wit, and there are abundance of fine things in the book. He is a humorist whose thoughts are very agreeable, but who, in my opinion, is to seek for a master in religion may in the end find none.' Patin thought the author in a parlous state, and as he was still alive he might grow worse as well as better. Evidently, however, the work became a favourite one with him, as in letters of 1650-1653-1657 he refers to it again in different editions. It is remarkable that he nowhere mentions the author by name, but subsequently when Edward Browne was a student in Paris Patin sends kindly greetings to his father.

Much discussion occurred on the Continent as to the orthodoxy of the 'Religio.' It is no slight

compliment to the author that he should have been by one claimed as a Catholic, by another denounced as an Atheist, while a member of the Society of Friends saw in him a likely convert. The book was placed on the 'Index.' In England, with the exception of Digby's 'Observations,' there were no

adverse criticisms of any note. Alexander Ross, that interesting old Southampton schoolmaster, who seems always to have been ready for an intellectual tilt, wrote a criticism entitled 'Medicus Medicatus, or the Physician's Religion cured by a Lenitive or Gentle Potion.'

In England there were two reprints in 1645, and it appeared again in the years 1656, 1659, 1669, 1672, and in 1682, the year of Browne's death.

A comparison of the early

editions shows that all have the same frontispiece and are, with slight variations, reprints of that of 1643. The work also began to be reprinted with the 'Pseudodoxia Epidemica' (third edition, 1659). The Latin editions followed each other rapidly. As I mentioned, it first appeared at Leyden in 1644, and was reprinted the same year there and in Paris; then in 1650 in Leyden again, in 1652 in Strassburg, and in the same place in 1665 and 1667.

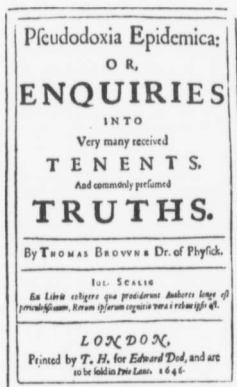


FIG. 3.—TITLE-PAGE OF THE  
'PSEUDODOXIA.'

The most important of these editions was that of Strassburg, 1652, with elaborate notes by Moltkuis, of which Guy Patin speaks as 'miserable examples of pedantry,' and indeed stigmatizes the commentator as a fool. The Dutch translation appeared in 1655 and a French in 1668, so that altogether during the author's lifetime there were at least twenty editions of the work.

In the seventeenth century there were in all twenty-two editions. In the eighteenth century there were four English editions, one Latin, and one German. Then a long interval of seventy-seven years elapsed, until in 1831 Thomas Chapman, a young Exeter College man, brought out a neat little edition, my own copy of which is made precious by many marginal notes by S. T. Coleridge, who was one of the earliest and most critical among the students of Sir Thomas. In the same year the first American edition was published, edited by the Rev. Alexander Young, of Boston. In 1838 appeared an excellent edition by J. A. St. John, 'traveller, linguist, author, and editor,' and in 1844 Longman's edition by John Peace, the librarian of the City Library, Bristol. This edition was re-published in America by the house of Lea and Blanchard,<sup>1</sup> Philadelphia, the only occasion, I believe, on which the 'Religio' has been issued by a firm of medical publishers. In 1845 appeared Pickering's beautiful edition, edited, with many original notes, by the Rev. Henry Gardiner, in many ways the most choice of nineteenth century issues. In 1862 James Ticknor

<sup>1</sup> They did not issue an edition in 1848, as mentioned by Greenhill on the authority of J. T. Fields.

Fields, the well-known Boston scholar and publisher, brought out a very handsome edition, of which, for the first time in the history of the book, an *édition de luxe* was printed on larger paper. In 1869 appeared Sampson Low and Co.'s edition by Willis Bund; and in 1878 Rivington's edition edited by W. P. Smith. Then in 1881 there came what must always remain the standard edition, edited by Dr. Greenhill for the Golden Treasury Series, and reprinted repeatedly by Macmillan and Co. To his task Dr. Greenhill brought not only a genuine love of Sir Thomas Browne, but the accuracy of an earnest, painstaking scholar. Since the year 1881 a dozen or more editions have appeared, of which I may mention the excellent one by Dr. Lloyd Roberts, of Manchester. I may finish this dry summary by noting the contrast between the little parchment-covered surreptitious edition of 1642 and the sumptuous folio of the Vale Press. In all, including those which have appeared with the collected works, there have been about fifty-five editions. Browne states that the work had also been translated into High Dutch and into Italian, but I can find no record of these editions, nor of a German translation, 1680, mentioned by Watt.

Space will allow only a brief reference to Browne's other writings. 'Pseudodoxia Epidemica: or, Inquiries into very many received Tenets and commonly presumed Truths,' appeared in 1646 in this small folio (Fig. 4). In extent this is by far the most pretentious of Browne's works. It forms an extraordinary collection of old wives' fables and popular beliefs in every department of human know-

ledge, dealt with from the standpoint of the science of that day. In a way it is a strong protest against general credulity and inexactness of statement, and a plea for greater accuracy in the observation of facts and in the recording of them. Walter Pater has drawn attention to the striking resemblance between Browne's chapter on the sources of Error and Bacon's doctrine of the Idola—shams which men fall down and worship. He discusses cleverly the use of doubts; but, as Pater remarks, 'Browne was himself a rather lively example of entertainments of the Idols of the Cave—Idola Specus—and, like Boyle, Digby, and others, he could not quite free himself from the shackles of alchemy and a hankering for the philosopher's stone.' The work was very popular, and extended the reputation of the author very widely. Indeed, in 1646 Browne was not known at large as the author of the 'Religio,' as his name had not appeared on the title-page of any edition issued at that date. The Pseudodoxia was frequently reprinted, a sixth edition being published in 1672, and it appeared in French both in France and in Holland.

Equalling in popularity among certain people the 'Religio,' certainly next to it in importance, is the remarkable essay known as 'Hydriotaphia—

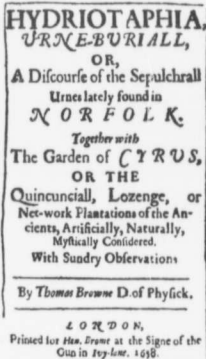


FIG. 4.—TITLE-PAGE OF  
THE 'URN-BURIAL.'



Urne-Burial: or, A Discourse of the Sepulchrale Urnes lately found in Norfolk' (1658). Printed with it is 'The Garden of Cyrus,' a learned discourse on gardens of all forms in all ages. Naturally, when an unusual number of funeral urns were found at Walsingham, they were brought to the notice of Browne, the leading antiquary of the county. Instead of writing a learned disquisition upon their date—he thought them Roman, they were in reality Saxon—with accurate measurements and a catalogue of the bones, he touches upon the whole incident very lightly, but, using it as a text, breaks out into a noble and inspiring prose poem, a meditation upon mortality and the last sad rites of all nations in all times, with learned comments on modes of sepulchre, illustrated with much antiquarian and historical lore. Running through the work is an appropriate note of melancholy at the sad fate which awaits the great majority of us, upon whom the iniquity of oblivion must blindly scatter her poppy.' 'The greater part must be content to be as though they had not been, to be found in the register of God, not in the record of man.'

Nowhere in his writings does the prose flow with a more majestic roll. Take, for example, this one thought: 'If the nearness of our last necessity brought a nearer conformity unto it, there were a happiness in hoary hairs and no calamity in half senses. But the long habit of living indisposeth us for dying, when avarice makes us the sport of death, when even David grew politically cruel, and Solomon could hardly be said to be the wisest of men. But many are too early old and before the days

of age. Adversity stretcheth our days, misery makes Alcmena's nights, and time hath no wings unto it.'

Closely connected in sentiment with the 'Urn-Burial' is the thin folio pamphlet—the rarest of all Browne's works, printed posthumously in 1698—'A Letter to a Friend on the Occasion of the Death of his Intimate Friend' (Fig. 6). It is a splendid dissertation on death and modes of dying, and is a unique study of the slow progress to the grave of a consumptive. It is written in his most picturesque and characteristic vein, with such a charm of diction that some critics have given it the place of honour among his works. Pater, in most enthusiastic terms, speaks of it with the 'Urn-Burial' as 'the best justification of Browne's literary reputation.'

The tender sympathy with the poor relics of humanity which Browne expresses so beautifully in these two meditations has not been meted to his own. 'Who knows the fate of his bones or how often he is to be buried?' he asks. In 1840, while workmen were repairing the chancel of St. Peter Mancroft, the coffin of Sir Thomas was accidentally opened, and one of the workmen took the skull, which afterwards came into the possession of Dr. Edward Lubbock, who deposited it in the

A  
L E T T E R  
T O A  
F R I E N D .  
Upon occasion of the  
D E A T H  
O F H I S  
Intimate Friend.

---

By the Learned  
Sir THOMAS BROWN, Knight,  
Doctor of Physick, late of Norwich.

---

L O N D O N :  
Printed for Charles Brown at the Gun at the West End  
of St. Paul's Church-yard. 1698.

FIG. 5.—TITLE-PAGE OF  
'A LETTER TO A FRIEND.'

Museum of the Norfolk and Norwich Infirmary. When I first saw it there in 1872 there was on it a printed slip with these lines from the 'Hydrioptaphia': 'To be knaved out of our graves, to have our skulls made drinking bowls, and our bones turned into pipes, to delight and sport our enemies, are tragical abominations escaped in burning burials.' The skull has been carefully described by Mr. Charles Williams, to whom I am indebted for the loan of photographs.

In addition to the 'Letter to a Friend,' there are three posthumous works, 'Certain Miscellany Tracts' (1684), edited by Archbishop Tenison, and 'Posthumous Works,' 1712, containing chiefly papers of antiquarian interest. In the same year, 1712, appeared the 'Christian Morals,' edited by Archdeacon Jeffrey of Norwich, from a manuscript found among Browne's papers. Probably a work of his later life, it forms a series of ethical fragments in a rich and stately prose which, in places, presents a striking parallelism to passages in the Hebrew poetry. The work is usually printed with the 'Religio,' to which in reality it forms a supplement.

Of the collected editions of Browne's works, the first, a fine folio, appeared in 1686. In 1836, Simon Wilkin, himself a Norwich man, edited the works with the devotion of an ardent lover of his old townsman, and with the critical accuracy of a scholar. All students of Sir Thomas remain under a lasting debt to Mr. Wilkin, and it is pleasant to know, that through the kindness of his daughter-in-law, Mrs. Wilkin, of Sidmouth, a Sir Thomas Browne Library has been founded in connexion

with the Castle Museum, Norwich, in which Mr. Simon Wilkin's collections have been placed. A three-volume edition of the works is in course of publication by Grant Richards, 1904-5.

### III.—APPRECIATION.

Critics from Johnson to Walter Pater have put on record their estimate of Browne and of his place in literature. Among these for keenness of appreciation Pater takes the first rank. Lamb and Coleridge dearly loved the old Norwich physician, in whom they found a kindred spirit. In America the New England writers, Ticknor, Fields, Holmes, and Lowell were ardent students of his works. Lowell in particular is fond of apt quotations from him, and in one place speaks of him as 'our most imaginative mind since Shakespeare.' But no one has put so briefly and so clearly the strong characters of our author as the French critic, Taine: 'Let us conceive a kindred spirit to Shakespeare's, a scholar and an observer instead of an actor and a poet, who in place of creating is occupied in comprehending, but who, like Shakespeare, applies himself to living things, penetrates their internal structure, puts himself in communication with their actual laws, imprints in himself fervently and scrupulously the smallest details of their figure; who at the same time extends his penetrating surmises beyond the region of observation, discerns behind visible phenomena a world obscure yet sublime, and trembles with a kind of veneration before the vast, indistinct,

but populous abyss on whose surface our little universe hangs quivering. Such a one is Sir Thomas Browne, a naturalist, a philosopher, a scholar, a physician, and a moralist, almost the last of the generation which produced Jeremy Taylor and Shakespeare. No thinker bears stronger witness to the wandering and inventive curiosity of the age. No writer has better displayed the brilliant and sombre imagination of the North. No one has spoken with a more elegant emotion of death, the vast night of forgetfulness, of the all devouring pit of human vanity which tries to create an immortality out of ephemeral glory or sculptured stones. No one has revealed in more glowing and original expressions the poetic sap which flows through all the minds of the age.'

The growing popularity of Browne's writings testifies to the assured position he holds, if not in the hearts of the many, at least in the hearts of that saving remnant which in each generation hands on the best traditions of our literature. We, who are members of his profession, may take a special pride in him. Among physicians, or teachers of physic, there is, perhaps, but one name in the very first rank. Rabelais stands apart with the kings and queens of literature. Among the princes of the blood there are differences of opinion as to their rank, but Sir Thomas Browne, Holmes, and John Brown of Edinburgh, form a group together high in the circle. Of the three, two were general practitioners; Oliver Wendell Holmes only in the early part of his life, and for forty years a teacher of anatomy; but all three have far closer ties with us

than Goldsmith, Smollett, or Keats, whose medical affiliations were titular rather than practical.

Burton, Browne, and Fuller have much in common—a rare quaintness, a love of odd conceits, and the faculty of apt illustrations drawn from out-of-the-way sources. Like Montaigne—Burton even more—Browne's bookishness is of a delightful kind, and yet, as he maintains, his best matter is not picked from the leaves of any author, but bred among the 'weeds and tares' of his own brain. In his style there is a lack of what the moderns call technique, but how pleasant it is to follow his thoughts, rippling like a burn, not the stilled formality of the technical artist in words, the cadencies of whose precise and mechanical expressions pall on the ear.

As has been remarked, the 'Religio Medici' is a *tour de force*, an attempt to combine daring scepticism with humble faith in the Christian religion. Sir Thomas confesses himself to be 'naturally inclined to that which misguided zeal terms superstition.' He 'cannot hear the Ave Maria bell without an elevation.' He has no prejudices in religion, but subscribes himself a loyal son of the Church of England. In clear language he says, 'In brief, where the Scripture is silent the Church is my text; where that speaks it is but my comment. When there is a joint silence of both, I borrow not the rules of my religion from Rome or Geneva, but from the dictates of my own reason.' He is hard on the controversialist in religion—'every man is not a proper champion for truth, nor fit to take up the gauntlet in the cause of verity,' etc. While he disclaims any 'taint or tincture' of heresy, he con-

fesses to a number of heretical hopes, such as the ultimate salvation of the race, and prayers for the dead. He freely criticizes certain seeming absurdities in the Bible narrative. His travels have made him cosmopolitan and free from all national prejudices. 'I feel not in myself those common antipathies that I can discover in others, those national repugnancies do not touch me, nor do I behold with prejudice the French, Italian, Spaniard, or Dutch; but where I find their actions in balance with my countrymen's, I honour, love, and embrace them in the same degree. I was born in the eighth climate, but seem for to be framed and constellated unto all. I am no plant that will not prosper out of a garden; all places, all airs, make unto me one country; I am in England, everywhere, and under any meridian.' Only the 'fool multitude' that chooses by show he holds up to derision as 'that numerous piece of monstrosity, which, taken asunder, seem men, and the reasonable creatures of God; but confused together, make but one great beast, and a monstrosity more prodigious than Hydra.' He has a quick sympathy with the sorrows of others, and, though a physician, his prayer is with the husbandman and for healthful seasons. No one has put more beautifully the feeling which each one of us has had at times about patients: 'Let me be sick myself, if sometimes the malady of my patient be not a disease unto me; I desire rather to cure his infirmities than my own necessities; where I do him no good, methinks it is scarce honest gain; though I confess 'tis but the worthy salary of our well-intended endeavours.'

He has seen many countries, and has studied their customs and politics. He is well versed in astronomy and botany. He has run through all systems of philosophy but has found no rest in any. As death gives every fool gratis the knowledge which is won in this life with sweat and vexation, he counts it absurd to take pride in his achievements, though he understands six languages besides the patois of several provinces.

As a scientific man Browne does not take rank with many of his contemporaries. He had a keen power of observation, and in the 'Pseudodoxia' and in his letters there is abundant evidence that he was an able naturalist. He was the first to observe and describe the peculiar substance known as adipocere, and there are in places shrewd flashes, such as the suggestion that the virus of rabies may be mitigated by transmission from one animal to another. We miss in him the clear, dry light of science as revealed in the marvellous works of his contemporary, Harvey. Busy as a practical physician, he was an observer, not an experimenter to any extent, though he urges: 'Join sense unto reason and experiment unto speculation, and so give life unto embryon truths and verities yet in their chaos.' He had the highest veneration for Harvey, whose work he recognized as epoch making—'his piece, "De Circul. Sang.," which discovery I prefer to that of Columbus.' He recognized that in the faculty of observation the old Greeks were our masters, and that we must return to their methods if progress were to be made. He had a much clearer idea than had Sydenham of the value of



anatomy, and tells his young friend, Power of Halifax, to make *Autopsia* his *fidus Achates*.

That he should have believed in witches, and that he should have given evidence in 1664 which helped to condemn two poor women, is always spoken of as a blot on his character; but a man must be judged by his times and his surroundings. While regretting his credulity, we must remember how hard it was in the sixteenth and seventeenth centuries not to believe in witches—how hard, indeed, it should be to-day for any one who believes implicitly the Old Testament!—and men of the stamp of Reginald Scot and Johannes Wierus, who looked at the question from our point of view, were really anomalies, and their strong presentation of the rational side of the problem had very little influence on their contemporaries.

For the student of medicine the writings of Sir Thomas Browne have a very positive value. The charm of high thoughts clad in beautiful language may win some readers to a love of good literature; but beyond this is a still greater advantage. Like the 'Thoughts of Marcus Aurelius' and the 'Enchiridion' of Epictetus, the 'Religio' is full of counsels of perfection which appeal to the mind of youth, still plastic and unhardened by contact with the world. Carefully studied, from such books come subtle influences which give stability to character and help to give a man a sane outlook on the complex problems of life. Sealed early of this tribe of authors, a student takes with him, as *compagnons de voyage*, life-long friends whose thoughts become his thoughts and whose ways become his

ways. Mastery of self, conscientious devotion to duty, deep human interest in human beings—these best of all lessons you must learn now or never—and these are some of the lessons which may be gleaned from the life and from the writings of Sir Thomas Browne.

WILLIAM OSLER.

CELEST

262

*The Growth of Truth*  
*As Illustrated in the Discovery of the*  
*Circulation of the Blood*

BEING THE HARVEIAN ORATION DELIVERED AT THE  
ROYAL COLLEGE OF PHYSICIANS, LONDON,  
OCTOBER 18, 1906

BY

WILLIAM OSLER, M.D., F.R.S.

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# THE GROWTH OF TRUTH

## AS ILLUSTRATED IN THE DISCOVERY OF THE CIRCULATION OF THE BLOOD

### I.

ONLY those of us, Mr. President and Fellows, who have had the good fortune to hold the distinguished position which by your kind grace, Sir, I hold to-day, only those of us who have delivered the Harveian Oration, can appreciate the extraordinary difficulties besetting a subject, every aspect of which has been considered, very often too, by men who have brought to the task a combination of learning and literary skill at once the envy and the despair of their successors. But I take it, Sir, that in this Ambarvalia or commemorative festival for blessing the fruits of our great men, ordained definitely as such by him whose memory is chiefly in our minds to-day, our presence here in due order and array, confers distinction upon an occasion of which the oration is but an incident. But, honour worthy of such a theme should be associated with full knowledge of the conditions under which these great men lived and moved; and here comes in the real difficulty, because it is rarely possible to bring the fruits of independent critical investigation into their lives and works. Particularly hard is it for those of us who have had to live the life of the arena: our best efforts bear the stamp of the student, not of the scholar. In my own case, a deep



reverence for the mighty minds of old, and a keen appreciation of the importance to our profession of a study of history, may be put in the scales against defects as to the appreciation of which I have still remaining sufficient self-detachment. The lesson of the day is the lesson of their lives. But because of the ever-increasing mental strain in this age of hurry, few of us have the leisure, fewer still, I fear, the inclination, to read it thoroughly. Only with a knowledge of the persistency with which they waged the battle for Truth, and the greatness of their victory, does the memory of the illustrious dead become duly precious to us.

History is simply the biography of the mind of man ; and our interest in history, and its educational value to us, is directly proportionate to the completeness of our study of the individuals through whom this mind has been manifested. To understand clearly our position in any science to-day, we must go back to its beginnings, and trace its gradual development, following certain laws, difficult to interpret and often obscured in the brilliancy of achievements—laws which everywhere illustrate this biography, this human endeavour, working through the long ages ; and particularly is this the case with that history of the organized experience of the race which we call science.

In the first place, like a living organism, Truth grows, and its gradual evolution may be traced from the tiny germ to the mature product. Never springing, Minerva-like, to full stature at once, Truth may suffer all the hazards incident to generation and gestation. Much of history is a record of the mishaps of truths which have struggled to the birth, only to die or else to wither in premature decay. Or the germ may be dormant for centuries, awaiting the fullness of time.

Secondly, all scientific truth is conditioned by the state of knowledge at the time of its announcement. Thus, at the beginning of the seventeenth century, the science of optics and mechanical appliances had not made possible (so far as the human mind was concerned) the existence of blood capillaries and blood corpuscles. Jenner could not have added to his *Inquiry* a discourse on immunity; Sir William Perkin and the chemists made Koch possible; Pasteur gave the conditions that produced Lister; Davy and others furnished the preliminaries necessary for anaesthesia. Everywhere we find this invariable filiation, one event following the other in orderly sequence—'Mind begets mind,' as Harvey says; 'opinion is the source of opinion. Democritus with his atoms, and Eudoxus with his chief good, which he placed in pleasure, impregnated Epicurus; the four elements of Empedocles, Aristotle; the doctrine of the ancient Thebans, Pythagoras and Plato; geometry, Euclid' (*De Generatione*).

And, thirdly, to scientific truth alone may the *homo mensura* principle be applied, since of all mental treasures of the race it alone compels general acquiescence. That this general acquiescence, this aspect of certainty, is not reached *per saltum*, but is of slow, often of difficult, growth—marked by failures and frailties, but crowned at last with an acceptance accorded to no other product of mental activity—is illustrated by every important discovery from Copernicus to Darwin.

The growth of Truth corresponds to the states of knowledge described by Plato in the *Theaetetus*—acquisition, latent possession, conscious possession. Scarcely a discovery can be named which does not present these phases in its evolution. Take, for example, one of the most recent: Long years of labour gave us a full know-

ledge of syphilis; centuries of acquisition added one fact to another, until we had a body of clinical and pathological knowledge of remarkable fullness. For the last quarter of a century we have had latent possession of the cause of the disease, as no one could doubt the legitimate inference from discoveries in other acute infections. The conscious possession has just been given to us. After scores of investigators had struggled in vain with the problem, came Schaudinn with an instinct for truth, with a capacity to pass beyond the routine of his day, and with a vision for the whole where others had seen but in part. It is one of the tragedies of science that this brilliant investigator, with capabilities for work so phenomenal, should have been cut off at the very threshold of his career. The cancer problem, still in the stage of latent possession, awaits the advent of a man of the same type. In a hundred other less important problems, acquisition has by slow stages become latent possession; and there needs but the final touch—the crystal in the saturated solution—to give us conscious possession of the truth. But when these stages are ended, there remains the final struggle for general acceptance. Locke's remark that 'Truth scarce ever yet carried it by vote anywhere at its first appearance' is borne out by the history of all discoveries of the first rank. The times, however, are changing; and it is interesting to compare the cordial welcome of the pallid spirochaete with the chilly reception of the tubercle bacillus. Villemin had done his great work, Cohnheim and Salmonson had finally solved the problem of infectivity, when Koch published his memorable studies. Others before him had seen the bacillus, but the conscious possession of the truth only came with his marvellous technique. Think of the struggle to

secure acceptance! The seniors among us who lived through that instructive period remember well that only those who were awake when the dawn appeared assented at once to the brilliant demonstration. We are better prepared to-day; and a great discovery like that of Schaudinn is immediately put to the test by experts in many lands, and a verdict is given in a few months. We may have become more plastic and receptive, but I doubt it; even our generation—that great generation of the last quarter of the nineteenth century, had a practical demonstration of the slowness of the acceptance of an obvious truth in the long fight for the aseptic treatment of wounds. There may be present some who listened, as I did in October, 1873, to an introductory lecture at one of the largest of the metropolitan schools, the burden of which was the finality of surgery. The distinguished author and teacher, dwelling on the remarkable achievements of the past, concluded that the art had all but reached its limit, little recking that within a mile from where he spoke, the truth for which he and thousands had been striving—now a conscious possession in the hands of Joseph Lister—would revolutionize it. With scores of surgeons here and there throughout the world this truth had been a latent possession. Wounds had healed *per primam* since Machaon's day; and there were men before Joseph Lister who had striven for cleanliness in surgical technique; but not until he appeared could a great truth become so manifest that it everywhere compelled acquiescence. Yet not without a battle—a long and grievous battle, as many of us well knew who had to contend in hospitals with the opposition of men who could not—not who would not—see the truth.

Sooner or later—insensibly, unconsciously—the iron

yoke of conformity is upon our necks; and in our minds, as in our bodies, the force of habit becomes irresistible. From our teachers and associates, from our reading, from the social atmosphere about us we catch the beliefs of the day, and they become ingrained—part of our nature. For most of us this happens in the haphazard process we call education, and it goes on just as long as we retain any mental receptivity. It was never better expressed than in the famous lines that occurred to Henry Sidgwick in his sleep:

We think so because all other people think so;  
Or because—or because—after all, we do think so;  
Or because we were told so, and think we must think so;  
Or because we once thought so, and think we still think so;  
Or because, having thought so, we think we will think so.

In departing from any settled opinion or belief, the variation, the change, the break with custom may come gradually; and the way is usually prepared; but the final break is made, as a rule, by some one individual, the masterless man of Kipling's splendid allegory, who sees with his own eyes, and with an instinct or genius for truth, escapes from the routine in which his fellows live. But he often pays dearly for his boldness. Walter Bagehot tells us that the pain of a new idea is one of the greatest pains to human nature. 'It is, as people say, so upsetting; it makes you think that, after all, your favourite notions may be wrong, your firmest beliefs ill-founded; it is certain that till now there was no place allotted in your mind to the new and startling inhabitant; and now that it has conquered an entrance, you do not at once see which of your old ideas it will not turn out, with which of them it can be reconciled, and with which it is at essential enmity.' It is on this account that the man who expresses a new idea is very

apt to be abused and ill-treated. All this is common among common men, but there is something much worse which has been illustrated over and over again in history. How eminent soever a man may become in science, he is very apt to carry with him errors which were in vogue when he was young—errors that darken his understanding, and make him incapable of accepting even the most obvious truths. It is a great consolation to know that even Harvey came within the range of this law—in the matter of the lymphatic system—it is the most human touch in his career.

By no single event in the history of science is the growth of truth, through the slow stages of acquisition, the briefer period of latent possession, and the for us glorious period of conscious possession, better shown than in the discovery of the circulation of the blood. You will all agree with me that a Fellow of this college must take his courage in both hands who would, in this place and before this audience, attempt to discuss any aspect of this problem. After nearly three centuries of orations the very pictures and books in this hall might be expected to cry out upon him. But I have so taken my courage, confident that in using it to illustrate certain aspects of the growth of truth I am but obeying the command of Plato, who insists that principles such as these cannot be too often or too strongly enforced. There is a younger generation, too, the members of which are never the worse for the repetition of a good story, stale though it may be in all its aspects to their elders; and then there is that larger audience to be considered to which the season is never inappropriate to speak a word.

## II.

The sixteenth century, drawing to a close, had been a period of acquisition unequalled in history. Brooding over the face of the waters of mediaevalism, the spirit of the Renaissance brought forth a science of the world and of man which practically created a new heaven and a new earth, and the truths announced by Copernicus and Galileo far transcended

the searching schoolmen's view  
And half had staggered that stout Stagyrite.

Among other things, it had given to medicine a new spirit, a new anatomy, and a new chemistry. In the latter part of the fifteenth century Hippocrates and Galen came to their own again. A wave of enthusiasm for the fathers in medicine swept over the profession; and for at least two generations the best energies of its best minds were devoted to the study of their writings. How numerous and important is that remarkable group of men, the medical humanists of the Renaissance, we may judge by a glance at Bayle's *Biographie Médicale*, in which the lives are arranged in chronological order. From Garbo of Bologna, surnamed the expositor, to Rabelais, more than 150 biographies and bibliographies are given, and at least one-half of these men had either translated or edited works of the Greek physicians. Of our founder, one of the most distinguished of the group, and of his influence in reviving the study of Galen and so indirectly of his influence upon Harvey, Dr. Payne's story still lingers in our memories. Leonicensus, Linacre, Gonthier, Monti, Koch, Camerarius, Caius, Fuchs, Zerbi, Cornarus, and men of their stamp not only swept away Arabian impurities from the medicine of

the day, but they revived Greek ideals and introduced scientific methods.

The great practical acquisition of the century was a new anatomy. Vesalius and his followers gave for the first time an accurate account of the structure of the human body, and while thus enlarging and correcting the work of Galen, contributed to weaken the almost divine authority with which he dominated the schools. Nearly another century passed before chemistry, in the hands of Boyle and others, reached its modern phase, but the work of Paracelsus, based on that of the 'pious Spagyrist', Basil Valentine, by showing its possibilities, had directed men's minds strongly to the new science. Of the three, the new spirit alone was essential, since it established the intellectual and moral freedom by which the fetters of dogma, authority, and scholasticism were for ever loosened from the minds of men.

Into this world, we may say, stepped a young Folkestone lad, when, on the last day of May, 1593, he matriculated at Cambridge. Harvey's education may be traced without difficulty, because the influences which shaped his studies were those which had for a century prevailed in the profession of this country. We do not know the reason for selection of Caius College, which, so far as I can gather, had no special connexion with the Canterbury school. Perhaps it was chosen because of the advice of the family physician, or of a friend, or of his rector; or else his father may have known Caius; or the foundation may already have become famous as a resort for those about to 'enter on the physic line'. Or, quite as likely, as we so often find in our experience, some trivial incident may have turned his thoughts towards medicine. When he came



up in 1593, there were those of middle age who could tell racy stories of Caius, the co-founder of the college, against whose iron rule they had rebelled. 'Charged not only with a show of a perverse stomach to the professors of the Gospel, but with Atheism,' the last days of Caius's noble life were embittered by strife and misunderstanding. Doubtless the generous souls among them had long since learned to realize the greatness of his character, and were content to leave 'the heat of his faith to God's sole judgement, and the light of his good works to men's imitation', with which words, half a century later, the inimitable Fuller concludes a short sketch of his life. I like to think that, perhaps, one of these very rebels, noting the studious and inquisitive nature of Harvey, had put into the lad's hand the little tractate, *De libris propriis*, from which to glean a knowledge of the life and works of their great benefactor.

The contemplation of such a career as that of Caius could not but inspire with enthusiasm any young man. No one in the profession in England had before that time reached a position which I may describe as European. An enthusiastic student and the friend of all the great scholars of the day; a learned commentator on the works of the Fathers; the first English student in clinical medicine; a successful teacher and practitioner; a keen naturalist; a liberal patron of learning and letters; a tender and sympathetic friend—Johannes Caius is one of the great figures in our history. Nor need I dwell, before this audience, on his devotion to our interests, other than to say that the memory of no Fellow on our roll should be more precious to us. Four years hence, on October 6, will occur the quatercentenary of his birth. As well in love as in gratitude, we could celebrate it in no more appropriate manner,

and in none that would touch his spirit more closely, than by the issue of a fine edition of his principal works (including the MS. annals of the College). For the preparation of this there are those among us well fitted, not less by veneration for his memory than by the possession of that critical scholarship which he valued so highly.

When Harvey set out on the grand tour, Italy was still the *mater gloriosa studiorum*; to which one hundred years earlier, so tradition says, Linacre on leaving had erected an altar. The glamour of the ideals of the Renaissance had faded somewhat since the days when John Free, an Oxford man, had made the ancient learning his own; and had so far bettered the instruction of his masters that he was welcomed as a teacher in Padua, Ferrara, and Florence. In a measure, too, the national glory had departed, dimmed amid the strife and warfare which had cost the old republics their independence. Many years earlier Fracastorius, one of our medical poets, had sung of her decadence:

To what estate, O wretched Italy,  
Has civil strife reduc'd and moulder'd Thee!  
Where now are all thy ancient glories hurl'd?  
Where is thy boasted Empire of the world?  
What nook in Thee from barbarous Rage is freed  
And has not seen thy captive children bleed?<sup>1</sup>

And matters had not improved but had grown worse. In the sixteenth century Italian influence had sunk deeply into the social, professional, and commercial life of England, more deeply, indeed, than we appreciate;<sup>2</sup> and it was not for a generation or two later that the candlesticks were removed from the Cisalpine towns to

<sup>1</sup> *Syphilis*. Englished by N. Tate, 1686.

<sup>2</sup> *Italian Renaissance in England*, Einstein. Macmillan, 1902.

Montpellier, Paris, and Leyden. In 1593 a well-to-do young Englishman who wished to study medicine thoroughly went to North Italy, and most naturally to Padua—'fair Padua, nursery of the arts'—whose close affiliations with us may be gathered from the fact that, of universities next to Oxford and Cambridge, she has given us more Presidents than any other. In the years that had passed since Vesalius had retired in disgust, the fame of its anatomical school had been well maintained by Fallopius, Columbus, and Fabricius, worthy successors of the great master. Of each may be said what Douglas says of the first named: '*In docendo maxime methodicus, in medendo felicissimus, in secundo expertissimus.*' While the story of Harvey's student life can never be told as we could wish, we know enough to enable us to understand the influences which moulded his career. In Fabricius he found a man to make his life-model. To the enthusiastic teacher and investigator were added those other qualities so attractive to the youthful mind, generous sympathies and a keen sense of the wider responsibilities of his position, as shown in building, at his own expense, a new anatomical theatre for the University. Wide as was the range of his master's studies, embracing not alone anatomy but medicine and surgery, the contributions by which he is most distinguished are upon subjects in which Harvey himself subsequently made an undying reputation. The activity of his literary life did not begin until he had been teaching nearly forty years, and it is a fact of the highest significance that, corresponding to the very period of Harvey's stay in Padua, Fabricius must have been deep in the study of embryology and of the anatomy of the vascular system. His great work on generation was the model on which Harvey based his

own, in some ways, more accurate studies—studies in which, as my colleague Professor Brooks of the Johns Hopkins University has pointed out, he has forestalled Wolf and von Baer.

The work of Fabricius which really concerns us here is the *de Venarum Ostiolis*. Others before him had seen and described the valves of the veins, Carolus one of the great Stephani, Sylvius and Paul Sarpi. But an abler hand in this work has dealt with the subject, and has left us a monograph which for completeness and for accuracy and beauty of illustration has scarcely its equal in anatomical literature. Compare Plate VII, for example, with the illustrations of the same structures in the Bidloo or the Cowper *Anatomy*, published nearly one hundred years later; and we can appreciate the advantages which Harvey must have enjoyed in working with such a master. Indeed, it is not too far-fetched to imagine him, scalpel in hand, making some of the very dissections from which these wonderful drawings were taken. But here comes in the mystery. How Fabricius, a man who did such work—how a teacher of such wide learning and such remarkable powers of observation, could have been so blinded as to overlook the truth which was tumbling out, so to speak, at his feet, is to us incomprehensible. But his eyes were sealed, and to him, as to his greater predecessors in the chair, clear vision was denied. The dead hand of the great Pergranite lay heavy on all thought, and Descartes had not yet changed the beginning of philosophy from wonder to doubt. Not without a feeling of pity do we read of the hopeless struggle of these great men to escape from slavish submission to authority. But it is not for us in these light days to gauge the depth of the sacred veneration with which they regarded the Fathers. Their

mental attitude is expressed in a well-known poem of Browning's:

those divine men of old time  
Have reached, thou sayest well, each at one point  
The outside verge that rounds our faculty,  
And where they reached who can do more than reach?

Willing to correct observations or to extend anatomy by careful dissection, it was too much to expect from them either a new interpretation of the old facts or a knowledge of the new method by which those facts could be correctly interpreted.

The ingenious explanation which Fabricius gave of the use of the valves of the veins—to serve as dams or checks to the flow of the blood, so that it would not irrigate too rapidly and overflow the peripheral vessels to the deprivation of the upper parts of the limbs—shows how the old physiology dominated the most distinguished teacher of the time in the most distinguished school of Europe. This may have been the very suggestion to his pupil of the more excellent way. Was it while listening to this ingenious explanation of his master that, in a moment of abstraction—dimly dreaming, perhaps, of an English home far away and long forsaken—that there came to Harvey a heaven-sent moment, a sudden inspiration, a passing doubt nursed for long in silence, which ultimately grew into the great truth of 1616?<sup>1</sup>

The works of Vesalius, of Fallopius, and of Fabricius effected a revolution in anatomy, but there was not at the close of the sixteenth century a new physiology. Though he had lost an anatomical throne, Galen ruled

<sup>1</sup> Boyle states that in the only conversation he ever had with him, Harvey acknowledged that a study of the valves of the veins had led him to the discovery of the circulation of the blood.

absolutely in all conceptions of the functions of the body, and in no department more serenely than in that relating to the heart, the blood and its movements. Upon his views I need not dwell further than to remind you that he regarded the liver as the source of the blood, of which there were two kinds, the one in the veins, the other in the arteries, both kinds in ceaseless ebb and flow, the only communication between these closed systems being through pores in the ventricular septum. He knew the lesser circulation, but thought it only for the nutrition of the lungs. The heart was a lamp which is furnished with oil by the blood and with air from the lungs. Practically until the middle of the seventeenth century Galen's physiology ruled the schools, and yet for years the profession had been in latent possession of a knowledge of the circulation. Indeed, a good case has been made out for Hippocrates, in whose works occur some remarkably suggestive sentences.<sup>1</sup> In the sixteenth century the lesser circulation was described with admirable fullness by Servetus and by Columbus, and both Sarpi and Caesalpinus had Hippocratic glimmerings of the greater circulation. These men, with others doubtless, were in latent possession of the truth. But every one of them saw darkly through Galenical glasses, and theirs was the hard but the common lot never to reach such conscious possession as everywhere to make men acquiesce. One must have the disinterestedness of the dead to deal with a problem about which controversy has raged, and in which national issues have been allowed to blur the brightness of an image which would be clear as day to those with eyes to see. Nor would I refer to a matter long since settled by those best competent to judge, had

<sup>1</sup> Willis's *Harvey*, pp. 21-2.

not the well-known work of Luciani, the distinguished Professor of Physiology at Rome, appeared recently in German dress, edited by Professor Verworn, and spread broadcast views to which, with a chauvinism unworthy of their history, our Italian brethren still adhere. It has been well said 'that he alone discovers who proves', and in the matter of the circulation of the blood, this was reserved for the pupil of Fabricius. Skipping many arduous years we next meet him as Lumleian Lecturer to the College.

### III.

The really notable years in the annals of medicine are not very numerous. We have a calendar filled with glorious names, but among the saints of science, if we know an era it is as much as can be expected—perhaps because such men are less identified with achievements than representative of the times in which they lived. With many of our greatest names we cannot associate any fixed dates. The Grecians who made Hippocrates possible, live in memory with some theory, or a small point in anatomy, or in regard to the place of their birth; while the 'floruit' cannot always be fixed with accuracy.

Hippocrates himself, Erasistratus, Galen, and Araetius have no days in our calendar. We keep no festival in their honour as the churches do those of St. Jerome and St. Chrysostom. It is not until after the Renaissance that certain years (*anni mirabiles*) stand out in bold relief as connected with memorable discoveries, or with the publication of revolutionary works. Nevertheless, only a few in each century; even the sixteenth, so rich in discoveries, has not more than five or six such years, and not one of them is connected with work done in

this country. As to the seventeenth century, it is hard to name four made memorable by the announcement of great discoveries or the publication of famous works; in the eighteenth century not three, while in the century just completed, though it is replete with extraordinary discoveries, one is hard pressed to name half a dozen years which flash into memory as made ever memorable by great achievements. Of the three most important, anaesthesia, sanitation, and antiseptic surgery, only of the first can the date be fixed, 1846, and that for its practical application. For the other two discoveries, who will settle upon the year in which the greatest advance was made, or one which could be selected for an anniversary in our calendar?

There is one *dies mirabilis* in the history of the College—in the history, indeed, of the medical profession of this country, and the circumstances which made it memorable are well known to us. At ten o'clock on a bright spring morning, April 17, 1616, an unusually large company was attracted to the New Anatomical Theatre of the Physicians' College, Amen Street. The second Lumleian Lecture of the annual course, given that year by a new man, had drawn a larger gathering than usual, due in part to the brilliancy of the demonstration on the previous day, but also it may be because rumours had spread abroad about strange views to be propounded by the lecturer. I do not know if at the College the same stringent rules as to compulsory attendance prevailed as at the Barber Surgeons' Hall. Doubtless not,<sup>1</sup> but the President, and Censors, and Fellows would be there in due array; and with the help

<sup>1</sup> Mr. William Fleming, the College Bedell, calls my attention to the Statutes of that period. Under penalty of a fine all Fellows and candidates were commanded to attend for at least five years.



of the picture of 'The Anatomy Lecture by Bannister', which is in the Hunterian collection, Glasgow, and a photograph of which Dr. Payne has recently put in our library, we can bring to mind this memorable occasion. We see the 'Anatomy', one of the six annually handed over to the College, on the table, the prosector standing by the skeleton near at hand, and very probably on the wall the very *Tabulae* of dissection of the arteries, veins, and nerves that hang above us to-day. But the centre of attention is the lecturer—a small dark man, wand in hand, with black piercing eyes, a quick vivacious manner, and with an ease and grace in demonstrating, which bespeaks the mastery of a subject studied for twenty years with a devotion that we can describe as Hunterian. A Fellow of nine years' standing, there was still the salt of youth in William Harvey when, not as we may suppose, without some trepidation, he faced his auditors on this second day—a not uncritical audience, including many men well versed in the knowledge of the time and many who had heard all the best lecturers of Europe.

The President, Henry Atkins, after whose name in our Register stands the mysterious word 'Corb', had already had his full share of official lectures, less burdensome three hundred years ago than now. Let us hope the lecture of the previous day had whetted his somewhat jaded appetite. The Censors of the year formed an interesting group: John Argent, a Cambridge man, a 'great prop of the college', and often President, of whom but little seems known; Richard Palmer, also of Cambridge, and remembered now only for his connexion with Prince Henry's typhoid fever, as Dr. Norman Moore has told us; Mathew Gwinne of Oxford, first Professor of Physic at Gresham College and a play-

wright of some note in his day; and Theodore Goulston of Merton College, one of our great benefactors, and for 267 years past and gone purveyor-in-chief of reputation to the younger Fellows of the College. Mayerne would be there, not yet a Fellow, but happy in his escape from the Paris Faculty; still dusty with conflict, he would scent the battle afar in the revolutionary statements which he heard. Meverell, fresh from incorporation at Cambridge, also not yet a Fellow; Moundeford, often President, whose little book *Vir Bonus* sets forth his life. Paddy, a noteworthy benefactor, a keen student, still gratefully remembered at Oxford, would have strolled in with his old friend Gwinne; Baldwin Hamey the elder, also a benefactor, would be there, and perhaps he had brought his more interesting son, then preparing to enter Leyden, whose memory should be ever green among us. Let us hope Thomas Winston, probably an old fellow-student at Padua, and later appointed Professor of Physic at Gresham College, was absent, as we can then be more charitable towards the sins of omission in his work on *Anatomy*, published after his death, which, so far as I can read, contrary to the statement of Munk (Roll of the College), contains no word of the new doctrine. As an old Paduan, and fresh from its anatomical school, the younger Craige would not be absent. Fludd, the Rosicrucian, of course, was present; attracted, perhaps, by rumours of anti-Galenical doctrines which had served to keep him out of the College; nor would he be likely to be absent at the festival of one whom he calls his 'physicall and theosophicall patron'. And certainly on such an occasion that able Aberdonian, Alexander Reid, would be there, whose *Σωματογραφία* had just appeared,<sup>1</sup> with an extraordinary full account

<sup>1</sup> Copy in Bodleian Library.

of the vascular system. Reid was a good anatomist, one of our most distinguished Medico-Chirurgical Fellows, and a liberal benefactor. If, as has been stated, he was not a convert on account of his age, it was on account of his youth, for the Harveian doctrine, if in meagre form, is to be found in the later editions (5th) of his *Manual*. But we would miss Lodge, the poet, 'cried up to the last for physic,' as he had recently started for the Continent. And we may be sure that Harvey's old fellow-students at Padua—Fortescue, Fox, Willoughby, Mounsell, and Darcy—would honour their friend and colleague with their presence; and Edward Lister, also a fellow-Paduan, the first of his name in a family which has given three other members to our profession—two distinguished and one immortal.<sup>1</sup> It was not a large gathering, as the Fellows, members, licentiates, and candidates numbered only about forty; but as the lecture was a great event in the community, there would be present many interested and intelligent laymen, of the type of Digby, and Ashmole, and Pepys—the 'curious', as they were called, for whom throughout the seventeenth century the anatomy lecture equalled in attraction the play. Delivered in Latin, and interspersed here and there with English words and illustrations, there were probably more who saw than who comprehended, as Sir Thomas Browne indicated to his son Edward when he lectured at Chirurgeons' Hall.

It is a fortunate, and perhaps a unique, circumstance in bibliography that the manuscript of this course of lectures should have been preserved, and that we should be able to follow step by step the demonstration

<sup>1</sup> I followed Munk's *Roll*, but Lord Lister tells me that he does not know of a relationship. I am sorry, as Martin Lister deserves the honour.

—a long and formidable procedure, as the whole anatomy of the thoracic organs was discussed. I dare say there was a prolonged break between the morning and the afternoon lecture 'for a fine dinner', such as Pepys described, when, on February 27, 1663, he went with Harvey's pupil, Scarborough, to Chirurgeons' Hall and was used with 'extraordinary great respect'. Towards the close, after discussing, in novel and modern terms, the structure and action of the heart, Harvey summed up in a few sentences the conclusion of the matter. They stand as follows in the *Praelectiones* (published by the College in 1886):

W. H. constat per fabricam cordis sanguinem  
per pulmone in Aortam perpetuo  
transferri, as by two clacks of a  
water bellows to rayse water  
constat per ligaturam t.ansitum sanguinis  
ab arteriis ad venas  
unde perpetuum sanguinis motum  
in circulo fieri pulsu cordis.

Probably few in the lecture hall appreciated the full meaning of these words, which to some must have seemed a blot on the whole performance; while others, perhaps, all with the feelings of the fishes after St. Anthony's well-known sermon,

Much delighted were they,  
But preferred the old way,

returned to their homes wondering what he would say on the morrow when the 'divine banquet of the brain' was to be spread before them.

One thing was certain—the lecture gave evidence of a skilled anatomist of remarkably wide experience and well versed in literature from Aristotle to Fabricius. While Harvey could agree with John Hunter, who

states in a manuscript introductory lecture in the College library—'I deliver nothing I have not seen and observed myself'—he could not add with him, 'I am not a reader of books.' Nearly one hundred references to some twenty authors occur in the manuscript of the thorax, or, as he calls it, the 'parlour' lecture.

It is a great pity that we have no contemporary account of the impression on such men as Mayerne or Reid of the new doctrines, for which we have the author's statement that they were taught annually and elaborated. So far as I know there is no reference to show that the lectures had any immediate influence in the profession, or indeed that the subject-matter ever got beyond the circle of the college. We are not without a first-hand account by the author of his reception: 'These views as usual pleased some more, others less; some chid and calumniated me, and laid it to me as a crime that I had dared to depart from the precepts and opinions of all anatomists; others desired further explanation of the novelties.'

It is difficult for us to realize the mental attitude of the men who listened year by year as the turn of the 'Parlour Lecture' came. Their opinions, no less firmly held than is our positive knowledge, did not get much beyond: 'The great dictator Hippocrates puts us in mind of it, Galen has a thousand times inculcated the same, the prince of the Arabian tribe, Avicen, has set his seal unto it.' This expresses their mental state, and such a heresy as a general circulation could scarcely be appreciated; and in a man of such good parts as Harvey would in pity be condoned, just as we overlook the mild intellectual vagaries of our friends.

Bootless to ask, impossible to answer, is the question why Harvey delayed for twelve years the publication

of his views. He seems to have belonged to that interesting type of man, not uncommon in every age, who knows too much to write. It is not a little remarkable that this reticence of learning has been a strong mental feature in some of the greatest of discoverers. Perhaps it was the motive of Copernicus, who so dreaded the prejudices of mankind that for thirty years he is said to have detained in his closet the *Treatise of Revolutions*. From what Harvey says, very much the same reasons restrained the publication of his work. To the lesser circulation, with the authority of Galen and Columbus to support it, men 'will give their adhesion', but the general circulation 'is of so novel and unheard-of character that I not only fear injury to myself from the envy of a few, but I tremble lest I have mankind at large for my enemies, so much doth wont and custom, that has become as another nature, and doctrine once sown and that hath struck deep root and rested from antiquity, influence all men'. He felt, as he says to Riolan, that it was in some sort criminal to call in question doctrines that had descended through a long succession of ages and carry the authority of the ancients; but he appealed unto Nature that bowed to no antiquity and was of still higher authority than the ancients. Men have been for years in conscious possession of some of the greatest of truths before venturing to publish them. Napier spent twenty years developing the theory of Logarithms; and Bacon kept the *Novum Organum* by him for twelve years, and year by year touched it up—indeed, Rowley states that he saw twelve copies. Two other famous discoveries by Englishmen have the same curious history—the two which can alone be said to be greater than the demonstration of the circulation of the blood. Zachariah

Wood speaks of Harvey as the surmiser of the little world, to distinguish him from another Englishman who first went about the greater world. But a greater than both—Isaac Newton—had grasped the secret of a cosmic circulation, and brooded in silence over the motion of the spheres for more than twenty years before publishing the *Principia*. Between the writing of the rough sketch in 1842 and the appearance of the *Origin of Species* seventeen years elapsed; and from the date of the journal notes, 1836, in which we have the first intimation of Darwin's theory, more than twenty years. In Harvey's case this intellectual reticence, this hesitation 'to quit the peaceful haven', as he says, has cost us dear. Only a happy accident gave us the *De Generatione*, and the College can never be too grateful to Sir George Ent for that Christmas visit, 1650, so graphically described, and to which we owe one of the masterpieces of English medicine. How many seventeenth-century treatises we could have spared to have had the *Practice of Medicine conformable to his Thesis of the Circulation of the Blood!* How instructive his prospective *Medical Observations* would have been we can gather from the remarkable series of cases scattered through the manuscript notes and his published writings. His 'treatise apart' on *Eventilation or Respiration*; the *Medical Anatomy*, or *Anatomy in its Application to Medicine*, as he says, 'I also intend putting to press'; the work 'from observations in my possession' on *Organs of Motion in Animals*—all of these, with the work on *Generation in Insects*, and others mentioned by Dr. Merrett,<sup>1</sup> the then library keeper, 1667, were probably dispersed when those sons of Belial ransacked his chambers at Whitehall.

<sup>1</sup> Munk, *Roll of the College*, vol. i, p. 132.

'Still the die is cast, and my trust is in the love of truth and the candour that inheres in cultivated minds.' With these words he consoles himself, knowing from experience that the publication of even a portion of the work, as in one place he calls the little book, would raise a tempest. Zachariah Wood in the preface to the English edition, 1673, expresses what many of his contemporaries must have felt, 'Truly a bold man indeed, O disturber of the quiet of physicians! O seditious citizen of the Physical Commonwealth! who first of all durst oppose an opinion conformed for so many ages by the consent of all.' De Bach of Amsterdam describes the dilemma in which teachers found themselves: 'This new thing I did examine, which the first entrance did seem very easily to be refuted, but being weighed in a just balance, and having added to reason my own ey-sight it was found inexpugnable, nay (the very prick of truth enforcing) to be embraced with both arms. What should I doe? Must Hippocrates be left, Galen slighted? No, if we follow the truth senced with reason and our sense, we are still Hippocrates his, we are still Galens' (English edition, 1653).

The history of the next thirty years illustrates the truth of Locke's dictum in the struggle for acceptance. Not the least interesting part of the story, it should be told at greater length and with more detail than it has yet received—more than I am able to give it. That the repeated demonstrations, aided by the strong personal influence of the man, brought the College, as a body, to the new views is witnessed rather by the esteem and affection the Fellows bore to Harvey than by any direct evidence. The appearance of the book in 1628 made no great stir; it was not a literary sensation—a not uncommon fate of epoch-making works, the authors of



which are too far ahead of their contemporaries to be appreciated. The same event happened to Newton's *Principia*; as Sir William Petty remarks, 'I have not met with one man that put an extraordinary value on the book.'

Among Englishmen, Primrose alone, brought up among the strictest sect of the Galenists, and at the time not a Fellow—wrote a criticism from the old standpoint (1632), and remained unconvinced twelve years later, as his controversy with Regius shows. And only one special treatise in favour of the circulation was written in England—that of Sir George Ent, a pupil and friend of Harvey, who wrote (1641) specially against Parisanus, a Venetian, a foeman quite unworthy of his quill. In the universities the new doctrine rapidly gained acceptance—in Cambridge through the influence of Glisson, while in part to Harvey's work and influence may be attributed that only too brief but golden renaissance of science at Oxford. A little incident mentioned in the autobiographical notes of the celebrated Wallis shows how the subject was taken up quite early in the universities: 'And I took into it the speculative part of physick and anatomy as parts of natural philosophy, and, as Dr. Glisson has since told me, I was the first of his sons who (in a public disputation) maintained the circulation of the blood, which was then a new doctrine, though I had no design of practising physick.' This was in the early 'thirties'. But the older views were very hard to displace, and as late as 1651 we find such intelligent members of the 'invisible college' as Boyle and Petty carrying out experiments together in Ireland to satisfy themselves as to the truth of the circulation of the blood.

It took much longer for the new views to reach the

textbooks of the day. From no work of the period does one get a better idea of the current anatomical and physiological teaching in London than from Crooke's *Body of Man* (1615 and 1631). Collected out of Vesalius, Plantinus, Platerius, Laurentius, Valverde, Bauchinus, and others, it is an epitome of their opinions, with the comments of the professor who read the anatomy lecture to the Company of the Barber-Surgeons. In the preface to the first edition he speaks of the contentment and profit he had received from Dr. Davies's Lumleian Lectures at the College of Physicians. There is no indication in the second edition that he had benefited by the instruction of Dr. Davies's successor. Galen is followed implicitly, with here and there minor deviations. The views of Columbus on the lesser circulation are mentioned only to be dismissed as superfluous and erroneous. The Gresham Professor of the day, Dr. Winston, makes no mention of the new doctrine in his *Anatomy Lectures* which were published after his death, 1651, and are of special interest as showing that at so late a date a work could be issued with the Galenical physiology unchanged. In Alexander Reid's *Manual*, the popular textbook of the day, the Harveian views are given in part in the fifth edition, in which, as he says in the preface, 'the book of the breast' is altogether new—an item of no little interest, since he was a man advanced in years, and, as he says, 'the hourglass hasteneth, and but a few sands remain unrun.' Highmore, the distinguished Dorsetshire anatomist, and a pupil of Harvey, in his well-known *Anatomy* published in 1651, gives the ablest exposition of his master's views that had appeared in any systematic work of the period, and he urges his readers to study the *de Motu Cordis* as 'fontem ipsum' from which to get clearer knowledge. He quotes an

appropriate motto for the period—*laudamus veteres : sed nostris utimur annis*. But even so late as 1671 the old views were maintained in the English edition of Riolan. And yet the knowledge of Harvey's views must have spread broadcast, not only in the profession, but in that large outside circle of distinguished men who felt the new spirit of science working in their veins. From converse or from the Lumleian lectures, which no doubt he often attended, Kenelm Digby must have had the information about Harvey's views on generation, as at the date of the issue of his *Two Treatises*, 1644, they had not been published anywhere. While he knew well the motion of the blood as expounded by Harvey, and having, in making his great antidote, studied the action of the viper's heart, Digby, like Descartes, could not emancipate himself from the old views, as shown in the following passage: 'But if you desire to follow the blood all along every steppe, in its progresse from the hart round about the body, till it returne back againe to its center, Doctor Harvey, who most acutely teacheth this doctrine, must be your guide. He will show you how it issueth from the hart by the arteries ; from whence it goeth on warming the flesh, untill it arrive to some of the extremities of the body : and by then it is grown so coole (by long absence from the fountaine of its heate ; and by evaporating its owne stocke of spirits, without any new supply) that it hath need of being warmed anew ; it findeth itself returned backe againe to the hart, and is there heated againe, which returne is made by the veines, as its going forwardes, is performed only by the arteries.'

Sir William Temple well expresses the attitude of mind of the intellectual Philistine of the time, who looked for immediate results. Speaking of the work of Harvey and of Copernicus he says : 'Whether either of

these be modern discoveries or derived from old foundations is disputed; nay, it is so too, whether they are true or no; for though reason may seem to favour them more than the contrary opinions, yet sense can hardly allow them, and to satisfy mankind both these must concur. But if they are true, yet these two great discoveries have made no change in the conclusions of Astronomy nor in the practice of Physic, and so have been but little use to the world, though, perhaps, of much honour to the authors.<sup>1</sup> It is pleasant to notice that our old friend, Sir Thomas Browne, with his love of paradox, declared that he preferred the circulation of the blood to the discovery of America.

Of the reception of Harvey's views in Holland and Germany there is nothing to add to the admirable account given by Willis. The early and strenuous advocacy of Descartes must have influenced the Dutch physicians; but in this, as in so many other things, the infection of his early years proved too powerful, and he could not get rid of the 'ancient spirits'. Of the discovery of the circulation he says<sup>2</sup> it is 'la plus belle et la plus utile que l'on pût faire en médecine'. 'Tout à fait contraire au sein (*sic*) touchant le mouvement du cœur,' which he held to be due to an ebullition of the spirits—a sort of ferment (*espèce de levain*) existing in it. Much more actively discussed in Holland than elsewhere, the writings of Drake, Walaeus, Regius, Plempius, Sylvius, de Bach, Conringius, T. Bartholini (the Dane), and others threshed out the whole question very thoroughly, and their views, with those of Hoffman, Slegel, and others, are referred to by Willis and given in greater detail by Riolan.<sup>3</sup>

<sup>1</sup> *Works*, 1814, vol. iii, p. 293.    <sup>2</sup> Cousins's edition, vol. ix, p. 159.

<sup>3</sup> *Opuscula Anatomica*. London, 1649.

In the oft-quoted statement that Harvey, 'conquering envy, hath established a new doctrine in his lifetime,' Hobbes was right so far as England and Holland are concerned. But it was far otherwise in France, where it met with a bitter and protracted hostility. The Medical School of the University of Paris, at the time one of the best-organized and most important in Europe, declined to accept the circulation of the blood during his lifetime and for some years after his death. The history of the period is pictured for us in vivid colours in that *journal intime* which Gui Patin kept up with his friends, Spohn and Falconet of Lyons and the Belins (*père et fils*). With all his faults, particularly his scandalous lack of charity, one cannot but feel the keenest sympathy with this dear old man. Devoted to his saints, Hippocrates and Galen, Fernel and Duret, and to his teachers, Piètre and Riolan, to him the circulation of the blood was never more than an ingenious paradox. To such a lover of books and of good literature everything can be forgiven, and in his letters we follow with deepest interest his vigorous campaign against his dear enemies, the *Cuisiniers arabesques*, who had enslaved people and physicians alike, the haemophobes, the chemists, the astrologers and the *stibiate*, or as he calls it, the *Stygiate* group. To him the Koran was less dangerous than the works of Paracelsus, the appearance of the new Geneva edition of which he deeply deploras. Reverence for Galen and friendship with Riolan, rather than any deep interest in the question, inspired his opposition. To him the new doctrine was ridiculous, and it was he who called the partisans of it *circulateurs* in allusion to the Latin word, circulator, meaning charlatan. In 1652 he writes to Spohn that the question is still open whether the blood passes through the septum

of the heart or through the lungs. In 1659 he promises to send him a work of Vinean against the circulation.<sup>1</sup> More extraordinary still is the fact that as late as 1670, twelve years after Harvey's death, the thesis of one Cordelle, a bachelor of medicine, publicly discussed the circulation of the blood, and Gui Patin, who presided, decided in the negative. The fiction of an ingenious narrator, *le doux songe* of Harvey, are the terms in which he speaks of it. The whole passage is worth quoting as possibly the last public denouncement of what seemed a rank heresy to the old Galenists: 'Supposer que le sang se meut toujours circulairement, que de la veine cave ascendante il tombe dans l'oreillette droite du cœur, que de là il aille traverser toute la substance du poumon pour retomber de là dans l'oreillette gauche en passant par la veine pulmonaire, et qu'enfin de là il soit projeté dans l'aorte et toutes les artères qui le feront passer dans les veines et dans le cœur, lui faisant par ce moyen suivre un circuit, voilà le doux songe de Harvey, la fiction d'un narrateur ingénieux, mais nullement prouvée par l'évidence. La circulation du sang, son transport circulaire par les vaisseaux, c'est l'enfantement d'un esprit oisif, un vrai nuage qu'embrassent les Ixions pour procréer les Centaurs et les monstres.'<sup>2</sup>

As I said, we can forgive a great deal to the man who has left us such a picture of seventeenth-century life, drawn, all unconsciously, with a master hand; and through the mists of prejudice and hate we can recognize the good sense which had the courage to protest against the *forfanterie arabesque et bézoardesque* in much of the therapeutics of the day.

<sup>1</sup> *Lettres*, vol. i, p. 324, édition 1694.

<sup>2</sup> Gui Patin, par Félix Larrieu. Paris, 1889.

Though a professor in the Paris Faculty and a brilliant lecturer, Patin at that time did not occupy such a distinguished position, nor was his opposition of such importance as that of Riolan—'John Riolan, the Son, the most experienced Physician in the Universitie of Paris, the Prince of Dissection of Bodies, and the King's professor, and Dean of Anatomie and of the knowledge of simples, chief physician to the queen-mother of Louis XIII'—as he is quaintly, but very truly, described by Harvey.<sup>1</sup> Brought up by his father to regard Hippocrates and Galen as the sources of all wisdom, the intensity of his zeal increased with his years until at last 'to see the physic of Galen kept in good repair' became the passion of his life. The deep pity of it all is that such mental blindness should have stricken a really great man, for he was a brilliant anatomist and teacher, the author of the best anatomical textbook of its day, a man of affairs, profoundly versed in literature, a successful practitioner, and for years the head of the profession in France.

The opposition of such a man was serious, and naturally had a profound influence. Not content with the comparatively brief statement in the *Encheiridion*, 1648, Riolan published in England the following year his *Opuscula Anatomica nova*, one very large section of which is taken up with the problem of circulation. It was this probably as much as a present of the *Encheiridion* that induced Harvey to break his long silence and to reply. After a report of a discussion upon a thesis in 1645 and a statement of objections, a most interesting discussion follows of the literature, in which the opinions of various writers are examined, particu-

<sup>1</sup> Title-page of English edition of the Letter.

larly those of Cartesius, Conringius, Walaëus, and Plempius.

It is quite possible that the second *Disquisition* of Harvey to Riolan, published with the first in duodecimo form at Cambridge in 1649, was brought out by Riolan's latter publication, though it is not directly referred to. Little did Harvey appreciate that his old friend was both blind and deaf—incapable of seeing obvious facts. It was not a question of being conversant with anatomy or of having had experience, on both of which points Harvey dwells at length. Riolan knew his anatomy as well as, or better, than any man of his generation. It was not that he would not—but he that could not—see the truth which was staring him in the face. As Reynaud<sup>1</sup> mentions, an occasional thesis (Fagon, 1663; Mattot, 1665) supporting the circulation did slip through the Faculty: but the official recognition in France did not come until 1673, when Louis XIV founded a special Chair of Anatomy at the Jardin des Plantes for the propagation of the new discoveries.

The satire of Molière and the *Arrêt Burlesque* of Boileau completed the discomfiture of the 'anticirculateurs', but it had taken nearly half a century to overcome the opposition of those who saw in the new doctrines the complete destruction of the ancient system of medicine.

#### IV.

Even when full grown in the conscious stage Truth may remain sterile without influence or progress on any aspects of human activity. One of the most remarkable

<sup>1</sup> *Les Médecins au Temps de Molière*, 1863.



of phenomena in mental biography is the failure of the Greeks to succeed after giving the world such a glorious start. They had every essential for permanent success: scientific imagination, keen powers of observation; and if in the days of Hippocrates the mathematical method of interrogating Nature prevailed rather than the experimental, Galen carried the latter to a degree of perfection never again reached until the time of Harvey. Only when placed in its true position in relation to Greek religion and philosophy, as has been done so skilfully by Gomperz,<sup>1</sup> do we realize the immensity of the debt we owe to those 'our young light-hearted masters'. And Gomperz makes clear the nature of the debt of Greek thought to the practical sense of the physicians. But alas! upon the fires they kindled were poured the dust and ashes of contending philosophies, and neither the men of the Alexandrian school nor the brilliant labours of the most encyclopaedic mind that has ever been given to medicine sufficed to replenish them. Fortunately, here and there amid the embers of the Middle Ages glowed the coals from which we have lighted the fires of modern progress. The special distinction which divides modern from ancient science is its fruitful application to human needs—not that this was unknown to the Greeks; but the practical recognition of the laws of life and matter has in the past century remade the world. In making knowledge effective we have succeeded where our masters failed. But this last and final stage, always of slow and painful

<sup>1</sup> The three volumes of his *Greek Thinkers*, now in English dress, should be studied by every young man who wishes to get at the foundations of philosophy. The picturesque style of Professor Gomperz and his strong sympathy with science add greatly to the interest of the work.

consummation, is evolved directly from truths which cannot be translated into terms intelligible to ordinary minds. Newton's great work influenced neither the morals nor the manners of his age, nor was there any immediate tangible benefit that could be explained to the edification or appreciation of the 'ordinary man' of his day; yet it set forward at a bound the human mind, as did such truths as were proclaimed by Copernicus, by Kepler, by Darwin, and others. In a less conspicuous manner Harvey's triumph was on the same high plane. There was nothing in it which could be converted immediately into practical benefit, nothing that even the Sydenhams of his day could take hold of and use. Not so much really in the demonstration of the fact of the circulation as in the demonstration of the method—the *Inventum mirabile* sought for by Descartes, the *Novum Organum* of Bacon—lies the true merit of Harvey's work. While Bacon was thinking, Harvey was acting; and before Descartes had left his happy school at La Flèche Harvey was using *la nouvelle méthode*; and it is in this way that the *de Motu Cordis* marks the break of the modern spirit with the old traditions. No longer were men to rest content with careful observation and with accurate description; no longer were men to be content with finely-spun theories and dreams, which 'serve as a common subterfuge of ignorance'; but here for the first time a great physiological problem was approached from the experimental side by a man with a modern scientific mind, who could weigh evidence and not go beyond it, and who had the sense to let the conclusions emerge naturally but firmly from the observations. To the age of the hearer, in which men had heard, and heard only, had succeeded the age of the eye, in which men had seen and had been

content only to see. But at last came the age of the hand—the thinking, devising, planning hand; the hand as an instrument of the mind, now reintroduced into the world in a modest little monograph of seventy-two pages, from which we may date the beginning of experimental medicine.

No great discovery in science is ever without a corresponding influence on medical thought, not always evident at first, and apt to be characterized by the usual vagaries associated with human effort. Very marked in each generation has been the change wrought in the conceptions of disease and in its treatment by epoch-making discoveries as to the functions of the body. We ourselves are deeply involved to-day in toxins and antitoxins, in opsonins, tulases, and extracts as a direct result of the researches in bacteriology and in internal secretion. There were sanguine souls in Harvey's day, who lamented with Floyer that the discovery had not brought great and general innovations into the whole practice of physic. But had the old Litchfield physician lived he would have seen the rise of a school based directly upon the studies of Harvey and Sanctorius, the brilliant reasonings of Descartes and the works of Bellini and Borelli. The mechanical school rose in its pride on solid foundations which appealed to practical men with singular force. Very soon that 'beatific epitome of creation', man, was 'marked out like a spot of earth or a piece of timber with rules and compasses', and the medical terminology of the day became unintelligible to the older practitioners who could make nothing of the 'wheels and pulley, wedges, levers, screws, cords, canals and cisterns, sieves and strainers', and they cracked their jokes on 'angles, cylinders, celerity, percussion, resistance, and such-like

terms which they said had no more to do with physic on the human body than a carpenter has in making Venice treacle or curing a fever'. Once accepted, men had a feeling that so important a discovery must change all the usual conceptions of disease. As has been said before, Harvey tells that he had in preparation a *Practice of Medicine conformable to his Thesis of the Circulation of the Blood*, and it soon became customary to put in the title-pages of works some reference to the new doctrine. Even Riolan's *Opuscula Anatomia* makes an allusion to it. Walaëus, a keen defender of Harvey, published in 1660 a little compendium of practice *ad circulationem sanguinis adornata*, but there is nothing in it to suggest any radical change in treatment. Rolfinck's *Dissertationes Anatomicae*, 1650, embracing the older and more recent views in medicine are *ad circulationem accommodatae*, and even as late as 1690 the well-known anatomy of Dionis was *suiwant la circulation*. With the loss of his work on the *Practice of Medicine* it is impossible to say whether Harvey's own practice was modified in any way. To part from the spirits and humours must have left his attitude of mind very sceptical, and that his 'therapeutic way' was not admired (as Aubrey tells us) speaks for a change which may have set many against him. More important than any influence upon treatment was the irresistible change in the conceptions of disease caused by destruction of the doctrine of spirits and humours, which had prevailed from the days of Hippocrates. While Harvey, as he says, had in places to use the language of physiology, that is, the language of the day, he makes it very clear, particularly in the second letter to Riolan, that he will have none of the old doctrine to which the *de Motu Cordis* dealt the death blow.

But the moving hand reminds your orator, Mr. President, of a bounden duty laid upon him by our great Dictator to commemorate on this occasion by name all of our benefactors; to urge others to follow their example; to exhort the Fellows and Members to study out the secrets of Nature by way of experiment; and, lastly, for the honour of the profession, to continue in love and affection among ourselves. No greater tribute to Harvey exists than in these simple sentences in which he established this lectureship, breathing as they do the very spirit of the man, and revealing to us his heart of hearts. Doubtless, no one more than he rejoices that our benefactors have now become so numerous as to nullify the first injunction; and the best one can do is to give a general expression of our thanks, and to mention here and there, as I have done, the more notable among them. But this is not enough. While we are praising famous men, honoured in their day and still the glory of this College, the touching words of the son of Sirach remind us: 'Some there be that have no memory, who are perished as though they had never been, and are become as though they had never been born.' Such renown as they had, time has blotted out; and on them the iniquity of oblivion has blindly scattered her poppy. A few are embalmed in the biographical dictionaries; a few are dragged to light every year at Sotheby's, or the memory is stirred to reminiscence as one takes down an old volume from our shelves. But for the immense majority on the long roll of our Fellows—names! names! names!—nothing more; a catalogue as dry and meaningless as that of the ships, or as the genealogy of David in the Book of Chronicles. Even the dignity of the Presidential chair does not suffice to float a man down the few centuries that have passed since the foundation

of the College. Who was Richard Forster? Who was Henry Atkins? Perhaps two or three among us could tell at once. And yet by these men the continuity and organic life of the College has been carried on, and in maintaining its honour, and furthering its welfare, each one in his day was a benefactor, whose memory it is our duty, as well as our pleasure, to recall. Much of the nobility of the profession depends upon this great cloud of witnesses, who pass into the silent land—pass, and leave no sign, becoming as though they had never been born. And it was the pathos of this fate, not less pathetic because common to all but a few, that wrung from the poet that sadly true comparison of the race of man to the race of leaves!

The story of Harvey's life, and a knowledge of the method of his work, should be the best stimulus to the Fellows and Members to carry out the second and third of his commands; and the final one, to continue in love and affection among ourselves, should not be difficult to realize. Sorely tried as he must have been, and naturally testy, only once in his writings, so far as I have read, does the old Adam break out. With his temperament, and with such provocation, this is an unexampled record, and one can appreciate how much was resisted in those days when tongue and pen were free. Over and over again he must have restrained himself as he did in the controversy with Riolan, of whom, for the sake of old friendship, he could not find it in his heart to say anything severe. To-day his commands are easier to follow, when the deepened courtesies of life have made us all more tolerant of those small weaknesses, inherent in our nature, which give diversity to character without necessarily marring it. To no man does the right spirit in these matters come by nature, and I would urge upon

our younger Fellows and Members, weighing well these winged words, to emulate our great exemplar, whose work shed such lustre upon British Medicine, and whom we honour in this College not less for the scientific method which he inculcated than for the admirable virtues of his character.

263

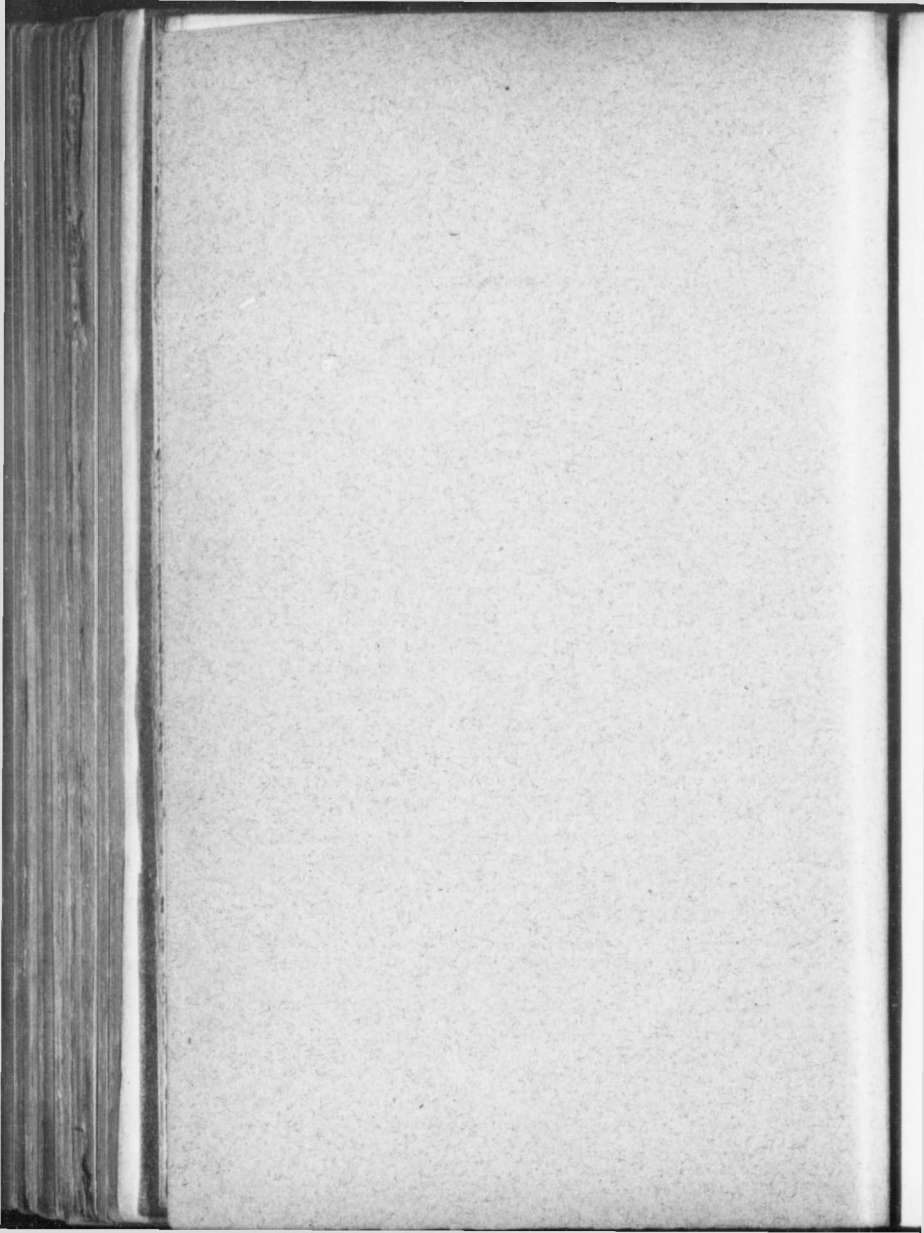
# **Fracastorius**

BY

**William Osler, M.D.**

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## Fracastorius.\*

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BY WILLIAM OSLER, M.D.

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### I

Upon few pictures in literature do we dwell with greater pleasure than that of Catullus returning to his home near Verona, wearied with the pleasures of the Capital, sick at heart after the death of his much beloved brother, and still, we may fancy, aching with the pangs of mis-prise'd love; but at the sight of "Paeninsularum Sirmio, insularumque ocella," he breaks out into joyful song and all his cares vanish.

Fifteen centuries later another "Bard of Sirmio" sang the joys of the Lago di Garda, 'mid Caphian hills,' and while we cannot claim for Fracastor a place beside his immortal townsman, he occupies a distinguished position in our annals as the author of the most successful medical poem ever written, and as the man from whom we date our first accurate knowledge of the processes of infection and contagion. The facts relating to the life of Fracastorius are to be obtained from the Venice edition of his works, 1584, and from the remarkably full and critical study by Mencken.† The best account in English is by Greswell.‡

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\* Read before the Charaka Club, December, 1904.

† De Vita, etc., Hieronymi Fracastorii. Lipsiae, MDCCXXXI.

‡ Memoirs of Angelus Politianus, etc., 2nd ed. Manchester, 1805.

Born in 1484 at Verona, of an ancient family, the Fracastoria (the name is also spelt Frastorius), there are related of his early days two marvellous stories—that he was born with his lips so united that a surgeon had to be called in to separate them; and that, while an infant in his mother's arms, she was killed by a lightning stroke while he escaped unhurt. He gave signs early of unusual ability, and was sent to Padua—at that time well deserving the encomium of Shakespeare: "Fair Padua, nursery of the arts." Here he made warm friends with many brilliant young men with whom in after life he remained on terms of close intimacy, and to some of whom his poems were dedicated. It is uncertain how long he resided at Padua, but at the outbreak of war he joined the Venetian forces under the command of his friend Livianus, at whose defeat and capture Fracastor returned to his native town. There is no information as to his teachers in medicine, but Mencken suggests that from Hieronymus Turrianus he got his most important training. He seems very quickly to have gained reputation as a physician, and his services were sought by rich and poor alike. It is stated that he practised without pecuniary reward. Poetry, astronomy, cosmography and natural philosophy shared with medicine his time and his labors. He kept up an extensive correspondence with many distinguished men in science and in letters. "He performed wonders by his exact knowledge of herbs and simples, by searching the best books of the ancients. The most excellent antidote, *Diascordium*, was of his preparing. . . . The age in which he lived saw nothing equal to his learning but his honesty." So writes the author of the *Life* pre-



*Girolamo Fracastoro.*

fixed to the English translation of the *Morbis Gallicus*. He lived for the greater part of the time in the country near Verona, amid the hills overlooking the Lago di Garda. "Here," says his biographer, "after a moderate ascent, is seen the Villa of Fracastor in the midst of a level ground, yet so elevated as to command a view of the lake. The house is plain and has little to boast from artificial ornament, but much from the natural beauty of the situation. It is of square form with an open aspect on every side except the north. On the east, on which part the Adige rolls its rapid current, hastening from the interior of Germany, and laves the foot of the mountain, it commands a view of Verona, with innumerable villas scattered here and there in the subjacent plain. . . . On the west the appearance of the Lago di Garda is no less pleasing. Here hills rising in alternate succession meet the view; here the sometimes disturbed and tumultuous billows of the lake—the charming peninsula of Catullus; vessels with extended sails; and fishing barks seen approaching from remote distances; and numerous towns and hamlets seated on the sunny promontories. . . . Here our Girolamo was accustomed to enjoy the conversation of his friends. Here he found that tranquility and rural seclusion, equally propitious to the muses and to severer studies; and here he produced many of those works which spread his celebrity throughout Europe and covered his brow with the wreath of fame." In a poem addressed to Turrianus, Fracastor has himself celebrated the beauties of his home "mid Caphian hills."

He died of apoplexy in 1553, aged 71. Monuments to his memory were erected at Padua by his

friend Rhamnusius and by his fellow citizens. "He was of low stature, but of good bulk, his shoulders broad, his hair black and long, his face round, his eyes black, his nose short and turning upwards by his continual contemplation of the stars; a lively air was spread over his countenance, that displayed the serenity and ingenuity of his mind." Mencken makes fun of this description, particularly of the snub nose, and certainly the pictures, as the one here reproduced, give a fine Roman nose of full proportions.

The important works of Fracastor are the two of which I shall speak. An astronomical work, *Homocentrica*, with a discussion of the old question of critical days, appeared in 1538. The work on *Sympathia and Antipathia*, Bk. I, appeared in 1548 in the same volume with *De Contagione*. Many fine editions of the collected works appeared after his death, and in the seventeenth century there were six or seven editions. The minor poems are to be found in all of them.

## II.

The scientific reputation of Fracastorius rests upon the work *De Contagione*, etc., the title page of which is here reproduced. It contains among other things three contributions of the first importance—a clear statement of the problems of contagion and infection, a recognition of typhus fever, and a remarkable pronouncement on the contagiousness of phthisis.

In the sixteenth century, and indeed for a much later period, following the views of Hippocrates and Galen, the fevers were thought to be due to a corruption or putridity of the humours, and no very clear ideas had been expressed as to their mode of propagation, still

HIERONYMI FRACASTORII  
VERONENSIS.

DE SYMPATHIA ET ANTIPATHIA RERVM  
LIBER VNVS

DE CONTAGIONE ET CONTAGIOSIS  
MORBIS ET CVRATIONE  
LIBRI III



VENETIIS. M D XLVI.

less of their origin. The simple classification into ephemeral, putrid and hectic forms was maintained, though the recognition by the Arabians of specific varieties, such as small-pox and measles, had stimulated greatly the study of fevers. In the course of an active professional life Fracastorius had witnessed the rapid spread of syphilis and repeated outbreaks of the plague and exanthematic typhus, so that he had had exceptional opportunities to study the problems presented by them. In answer to the question, What is contagion? he replies: "As the name indicates, contagion is an infection passing from one individual to another," and the infection is absolutely the same and the virus is the same in him who receives and in him who gives. A fire in one house destroying an adjoining one does not do so by contagion, as in the sense in which the word is used it is not a wholesale destruction, but a change in the elements of which the body is composed, brought about by particles of such minuteness that they do not come within range of our senses.

There are three fundamentally distinct classes of infections: (1) Diseases infecting by contact alone, (2) those infectious by means of an intermediate agent—fomites, as garments, etc.; and (3) those which infect at a distance through the air, as the pestilent fevers, etc.

He draws an analogy between the diseases of the first class and the putrefaction passing by contact from one grape or pear to another, the seeds of contagion—*seminaria contagionum*—passing from one to another.

The contagion through fomites is the same in reality as in the direct; the virus remains intact and is as active as in the body from which it came, and it may be preserved two or three years just as odors are kept



by small particles which retain their activity. The whole question of fomites he discusses with a clearness new to medicine; indeed I do not know that the word was used by any previous writer.

More curious and more astonishing, he thinks, are the contagions of the third class, which act at a distance, and seem indeed to be of a different nature and to act on a different principle. The germs are more powerful and more subtle, with a greater facility in penetrating bodies. They differ extraordinarily among themselves: some attack trees and grains, others animals; some attack men only, others oxen; some the old, others only the young; some males, others only females. The different germs attack different organs; some the eyes, others the deeper organs, as the lungs.

Fracastorius draws a remarkable parallel between the processes of contagion and the fermentation of wine. It is not the same as putrefaction, which differs in the absence of any new generation, and is accompanied with an abominable smell. Certain poisons resemble contagions in their action, but they differ essentially in not producing in the individual a principle or germ capable of acting on another person.

In the second book the special fevers are considered under the two divisions of non-pestilent and pestilent, the former, characterized by a milder course, embracing chiefly small-pox and measles, between which, however, he does not draw a very clear distinction. In 1505 and 1528 there appeared for the first time in Italy a disease characterized by high fever, early loss of consciousness, and a copious petechial and lenticular rash. Fracastorius gives an excellent description of it as a disease quite distinct from the other

pestilent fevers, particularly the plague, with which it had been confounded, and we have no difficulty in recognizing it as epidemic or exanthematic typhus.

The chapter *de phthisi contagiosa* is of special interest to us as one of the earliest and clearest statements on the subject. He says that previous writers have spoken of phthisis as originating in catarrh attacking the lungs, or the rupture of a blood vessel, or an abscess in the lung, or the sequence of a pleurisy or a pneumonia; but very few have spoken of contagion as an all important cause. Habitual residence with a consumptive he regards as one of the most common sources of the disease, the germs of which may remain attached to clothing and rooms for a year or more. He recognizes the similarity of the hereditary and the contagious forms.

The third book, devoted to treatment, is not very satisfactory, though there is a modern flavor in the statement that the germs, which must be first attacked, may be scattered or broken or chased away or dispelled by antipathy. In the section on the treatment of phthisis he has not progressed beyond Galen or Celsus.

By far the best chapter in the book is devoted to syphilis, an extended consideration in prose of the subject the poetical consideration of which as a younger man had made him famous.

### III.

The countless contributions on the subject of syphilis in the fifteenth and sixteenth centuries belong now to the musty volumes of forgotten lore; only two, possessing perennial interest, appear and reappear as

witnesses to the vigor and vitality of the minds which produced them. Both were written by poets, but the better poet wrote in prose, and, while not a physician, gave one of the most realistic pictures of the disease which exists in literature. Ulrich von Hutten, poet, satirist, soldier, reformer, the greatest name after Luther and Erasmus in the Reformation, suffered with the new disease for many years. The famous treatise on Guaiacum (1514) is an account of his own case and those of his friends, and of their weary sufferings until relieved by the new drug, guaiacum (*lignum sanctum*), the mode of preparation of which and the indications for use he lays down with the skill of an artist. Apart altogether from the unique interest attaching to von Hutten as a man, his little book is well worth reading, as giving a graphic first-hand account of syphilis as it appeared early in the sixteenth century. German editions are easy to procure. One, edited by Oppenheimer, was recently published by Hirschwald, Berlin, 1902.\*

The other contribution is the celebrated poem of Fracastorius, the title page of which is herewith reproduced. Next to the famous *Regimen Sanitatis* of the School of Salerno, it ranks as the most popular poem in medical literature. The original edition is a small quarto, issued from a Verona press and not a very good example of the printing of the period. To its enduring popularity the numerous editions in the Surgeon-General's Library, Washington, and in the British Museum bear witness, and every few years a new translation appears in French, German or Italian.

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\* Only two English editions have appeared, one by Thomas Paynell, 1533, the other by Daniel Turner, 1730 (Paynell's edition revised).

HIERONYMI FRACASTORII  
SYPHILIS  
SIVE MORBUS GALLICVS

Veronæ, M D X X X, mense Augusto.

*Non sine Priuilegio, multaq; pecuniaria, et exco-  
municationis pœna: pro ut in Priuilegijs continetur.*

An English translation by Nahum Tate in 1686 was published afterwards as a sort of supplement—with separate pagination—to Dryden's *Examem Poeticum*, or Miscellany Poems, 1693, third part. A little quarto, of 70 pages, in Latin verse, it brought to the author both literary and professional fame. His contemporaries exhausted the resources of the language in praise of a performance whose Virgilian beauties excelled anything that had been written since classical days. Modern commentators have been more critical and have not found the poem so full of "divine graces." A well-known scholar whose judgment I asked sent the following: "I am frankly disappointed with Fracastorius's poem. The Latin and the metrical propriety are admirable, but there seems to me to be an intolerable amount of 'gas' in it, and I think he attached more importance to the form than to the matter. I had hoped he would have been more definite about the form in which the disease showed itself in the sixteenth century, and the remedies he proposes seem to me to be used more as an opportunity of introducing a number of sounding words of trees and places in a setting of classical mythology than as a series of well considered prescriptions. But perhaps I do him injustice. Lucretius with his account of the plague at Athens would have given him a better model."

Following the example of von Hutten, who dedicated his treatise to the Archbishop of Mayence, Fracastorius inscribed his work to his friend Bembo, a Prince of the Church and Secretary to Pope Leo X. As at this time the disease was not thought to be wholly of venereal origin, such a dedication would

not be deemed inappropriate. Apart altogether from the poetical interest, which after all is subsidiary, the work is of the greatest value as a contemporary picture of the disease, embodying the opinions of an intelligent observer upon its origin. In one other point it is notable. The word syphilis, invented by Fracastor for the disease, occurs in the poem as the name of one of the characters. Nowhere in the poem does he say why the disease is called after the shepherd or why he invented it, but in his section on "le mal Français" in *de Contagione*, 1546, he says: "In my poem I gave it the name syphilis." It had been known by many names—*morbis gallicus*, *mal Français*, the French pox, the Neapolitan disease and *morbis venereus*, etc.; but from this time the new name became common and gradually came into general use.

To appreciate the rapid popularity of the poem, it is to be remembered that in the early part of the sixteenth century syphilis was regarded as a mysterious epidemic, hitherto unknown, which had struck terror into all hearts by the rapidity of its spread, the ravages it made and the apparent helplessness of the physicians to cure it.

The poem is an exposition of Fracastor's views on the origin, symptomatology and cure of the new disease which had seized astonished Europe. He accepts the usual statement that it first appeared in the French army before Naples about 1470.

"To Naples first it came  
From France, and justly took from France his name,  
Companion of the War."

He discussed the American origin, the popular one of the day:

"Say, Goddess, to what cause we shall at last  
Assign this plague, unknown to ages past ;  
If from the western climes 'twas wafted o'er,  
When daring Spaniards left their native shore ;  
Resolv'd beyond th' Atlantick to descry  
Conjectured worlds, or in the search to dye."

More probable is it, he thinks, that the malign influence of the planets, particularly the conjunction of Mars and Saturn, had brought about conditions favorable for the outbreak of the plague which had existed for ages but slumbered at intervals.

"Long since he scatter'd his infernal flame,  
And always being had, though not a name."

Our elements are slaves to the "rabble of the sky," and when a planet enters a new course some mighty work of Fate is to be expected. Two hundred years ago, when Mars and Saturn were last in conjunction, an unknown fever raged through the East, and similar plagues were predicted by the astronomers as a result of their recent position in the skies.

The description of the symptoms is very complete and there is no difficulty in recognizing the disease. There is a period of incubation—"the moon four monthly rounds shall steer"—before the appearance of convincing symptoms, and all this time the malady lurks within and grows confirmed. Gradually the victim begins to feel depressed, the roses fade from his cheeks, a leaden hue spreads over his face, and then local sores appear on the genitalia. Fracastor, with a majority of the writers of that date, thought the disease had very often an extra-genital origin. "When night's ungrateful shades arise" then begin the execrable pains in arms, shoulders and legs. Soon foul blotches spread over the skin and pustules form.

The muscles are attacked, deep ulcers form and the bones are laid bare. Instead of tuneful speech imperfect sounds result from involvement of the vocal cords. In places the humour grows fixed and "hardens to a node." He then pictures a fair and beautiful youth, full of the pride of life and the joys of health, stricken with the terrible plague and deformed out of all recognition; and it reminds him of the state of his beloved Italy, torn with strife and at the mercy of foreign foes.

" Now for our second task, and what relief  
Our age has found against this raging grief "

The patient's constitution and the temper of his blood must be considered. Get out in the open air, away from fens and lakes; take to the chase, but not too actively: the boar but not the stag may be attempted. Even the plough, the rake and the axe are not to be despised. The very house yields exercise, the hall has room for fencing and the bounding ball. Minerva, not Venus, may be sought.

Diet is all-important. Avoid fish, as they convert more to humours than to nourishment; pork may be eaten and poultry, but all coarser foods must be spurned. Milk is the best drink; wine as a rule is to be avoided; plenty of fresh vegetables are to be taken.

If strength suffices, the patient may be bled, particularly in the spring. A bitter tonic of fennel and hops is to be ordered.

" The greater part, and with success more sure,  
By mercury perform the happy cure :  
A wondrous virtue in that mineral lies."

Its healing power was revealed to one Ilceus, a hunts-



man, who was afflicted with the disease in Syria. Callirrhoe, a goddess, directed him how to get the precious metal from "the spacious voids and subterranean roads," and after bathing in the lakes of liquid silver he was healed. Full directions for inunction are given. The "lard of swine" is used for a vehicle, mixed with larch gum and turpentine. The whole body is to be smeared except the head and breast, and then the patient is to sweat profusely under thick bed-clothing. The course is to be repeated from ten days until

" The mass of humours now dissolved within,  
To purge themselves by spittle shall begin."

Victorious health is now at hand, and all that remains is to take a bath with rosemary and lavender, vervain and yarrow, to wash all the dregs away.

But the virtues of the "sacred tree" must also employ his muse to tell of blessing never seen nor sung before. The tree is first described, growing in a spacious isle, with branches ever green. So hard is the substance that it makes a saw toothless and scarcely from the axe receives a flaw. In variegated hue the wood resembles the "gaudy bow," and the natives, conscious of its use, plant it on the hills and vales. The mode of preparation and administration is as follows :

" Or break in splinters, which they steep a while  
In fountains, and when soak'd, in vessels boil,  
Regardless how too fierce a fire may make  
The juice run o'er, whose healing froth they take,  
With which they bathe their limbs where pustles breed,  
And heal the breaches where dire ulcers feed.  
Half boil'd away the remnant they retain,  
And adding hony boil the chips again :

To use no liquor when they dine,  
 Their countries law and greater priest enjoyn :  
 The first decoction with the rifting light  
 They drink, and once again at fall of night ;  
 This course they strictly hold when once begun,  
 Till Cynthia has her monthly progress run,  
 Hous'd all the while where no offensive wind,  
 Nor the least breath of air can entrance find."

It is interesting to compare the account of the cure with that given by Ulrich von Hutten. While not so full in detail, it agrees in the main, and particularly in the last injunction, to "house" the patient during it, so that no fresh air can reach him, and to restrict the diet to "just so much food as can bare life preserve." In both the cure was to last for thirty days. As Fournier remarks in a note in his translation of the *Morbis Gallicus*, the identity of the directions in these two writers, pharmacological and general, speak for a fixed and consecrated plan which was followed with scrupulous exactness.

There is told the story of the discovery of the New World by Columbus, and the joy of the sailors in its wonders. Unhappily they shot some beautiful birds, beloved of the Sun-God, and a prophecy of dire ills was uttered by one of the birds which escaped :

" Nor end your sufferings here ; a strange disease,  
 And most obscene, shall on your bodies seize."

By chance, before they left the natives held the great festival to the Sun-God, but grief was on all faces—"all languished with the same obscene disease"; but the priest in snowy robes displayed the boughs of healing guaiacum with which he purged the tainted ground. This the native prince assured the Spanish General was the disease the holy bird had predicted would

attack his men, and he told the story of the origin of the plague, and the discovery of guaiacum as a cure.

" A shepherd once (distrust not ancient fame)  
Possess these downs, and Syphilus his name."

He kept the flocks of King Alcithous, and one year the drought was so extreme that the cattle perished for want of water. So incensed was Syphilus that he blasphemed the Sun-God in good set terms and decided from henceforth to offer no sacrifices to him, but to worship King Alcithous. The shepherd won all the people to his way and the king was overjoyed and proclaimed himself "in Earth's low sphere to be the only and sufficient deity." But the Sun-God, enraged, darted forth infection on air, earth and streams, and Syphilus became the first victim of the new disease.

" He first wore buboes dreadful to the sight,  
First felt strange pains and sleepless past the night ;  
From him the malady received its name."

Becoming a general pestilence, the Sun-God was appealed to, and his priests promised a cure if a proper sacrifice was made to appease the offended deity. The lot fell on Syphilus, who was bound on the altar with his throat laid open to the uplifted knife, but at the last moment Juno interceded and commanded them to slay a heifer in his stead. An annual sacrifice in commemoration of this event was held, and a swine bound to the altar "to witness Syphilus his crime." The guaiacum was given as a cure for the disease. The afflicted sailors learned of the natives how to pre-

pare the remedy, and not forgetful of their country's good, freighted their largest ships with the rich wood.

" Iberian coasts, you first were happy made  
With this rich plant, and wonder'd at its aid ;  
Known now to France and neighboring Germany,  
Cold Scythian coasts, and temp'rate Italy,  
To Europe's bounds all bless the vital tree."

*Joseph*, the other long poem of Fracastorius, was translated into English by Josuah Sylvester, with the following remarkable title: "The Maiden's Blush: Joseph, Mirror of Modesty, Map of Pietie, Maze of Destinie, or rather Divine Providence. From the Latin of Fracastorius. Translated and dedicated to the High-Hopefull Charles Prince of Wales. London, 1620. 12mo."