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T H E

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Original Communications.

THREE CASES OF ABSCESS OF THE LUNG TREATED.*

BY

JAMES BELL, M.D.,

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It is not my intention to bring before the society to-night a paper on abscess of the lung, but to present a patient on whom I have recently operated for this condition, and incidentally to refer to two other similar cases which I have previously treated by operation.

This patient whom I bring before you to-night was a strong rugged man, a farmer in New Brunswick, with excellent family and personal history, when he contracted pleuro-pneumonia in March, 1897. He was convalescent in two weeks, and gained rapidly for a month, when a troublesome cough developed. At the end of two more weeks he was examined by a physician, who told him that the lower lobe of the right lung was consolidated. As far as he is aware this condition never cleared up; the cough continued, and in July the expectoration was slightly tinged with blood. In October the cough grew worse, and he spit up at times large quantities of foul smelling pus, as much as a pint and a half per day. For a time these evacuations of pus were more or less intermittent, but gradually became of almost daily occurrence. At this time he suffered from perspirations and other septic symptoms. He lost 45 pounds during the first six months, but did not lose flesh afterwards. He had been obliged to remain constantly in bed, lying upon his right side from December of 1897. Whenever he assumed an erect posture or turned on his back, he was seized with a violent cough which necessitated his lying down again.

On admission to the Hospital in December the right side of the chest was prominent, expansion almost nil, except in the infra-clavicular

* Read before the Montreal Medico-Chirurgical Society, February 8, 1901.

region; and the anterior two-thirds of the right chest was absolutely dull.

Punctures were made with a large aspirating needle, but no fluid was discovered.

On admission, the quantity of pus evacuated was not so large as it had been some months previously, but it was horribly foetid. The diagnosis of pulmonary abscess was made, and on the 17th of December an attempt to anaesthetise him with ether had to be abandoned on account of the evacuation of this foul smelling pus into his bronchial tubes, and violent spasmodic cough. It was utterly impossible to anaesthetise him.

On the 20th December, 1900, an inch and a half of the ninth rib just posterior to the posterior axillary line was removed under local anaesthesia, Schleich's mixture being used. The operation was carried out with difficulty, as it was impossible to turn the patient over on to the left side. He was brought beyond the edge of the table, and the operation carried on from below. When the rib was excised a large aspirating trochar was introduced and pus was found of a character similar to that which had been expectorated. The lung was found to be adherent to the pleura, and was about three-eighths of an inch thick. It was opened by the thermo-cautery and enlarged with the finger. About three-fourths of a pint of pus escaped at the time of the operation. It was horribly foul smelling, so much so that the odor was not removed from the operating room during the remainder of the day. A large rubber tube was introduced after the cavity had been explored. The cavity was found to be a large one with irregular walls.

From the moment of operation he progressed favorably, and within a few days the foetor had disappeared from his expectoration, and he was able to turn on his other side, and on his back. He has gained over 30 pounds since the operation up to the present time, and with the exception of a small sinus is now perfectly well.

Of the other cases referred to, the first was a young man aged 24, who was shot through the chest at Fish Creek on the 24th of April, 1885; the bullet entered through the second left costal cartilage and passed downwards and outwards and made its exit through the seventh rib in the mid-axillary line. This man was subjected to much hardship for some time before proper hospital accommodation was secured, and he developed pneumonia, the greater part of the right lung being consolidated. He was also wounded in the hip, and had slight fever and a troublesome diarrhoea. He did not do well and soon intermittent expectoration of foul-smelling pus occurred.

On the 23rd of May the eighth intercostal space was opened just anterior to the posterior axillary line. The lung was found adherent to the chest wall, and the collection of matter was found to be some distance from this point. The wound in the seventh rib in the mid-axillary line

was then enlarged and a cavity as large as a Florida orange was evacuated. The contents of the cavity were foul smelling pus and portions of gangrenous lung.

This patient made an uninterrupted recovery, and within a few months was perfectly well and strong. (This case has already been reported in the *Montreal Medical Journal*, in a communication entitled "Cases of Gun Shot Wounds of the Chest.")

The second case referred to was of a boy 5 years of age, who after a left-sided pneumonia in December, 1894, developed a septic condition which was followed by periodical evacuations by the mouth of foul smelling pus. A dull area was found on the axillary line, extending back in a less marked degree towards the spinal column. A portion of the sixth rib was removed; adherent fibroid lung was found. Explorations with a large-sized trochar failed to discover pus.

This was on the 2nd of March, 1895. On the 28th of March exploration by a needle over the whole dull area failed to discover pus.

On the 26th of April, 1895, the patient was anæsthetised in an erect posture (on account of the difficulty from the pus pouring into the bronchial tubes when he was in a recumbent posture); a slight dull area was found just anterior to the posterior axillary line on a level with the fourth rib. An aspirating needle was passed through a hard firm structure inside the chest wall and pus was found. An inch of the rib was removed. The fibroid lung was perforated with the thermo-cautery to a depth of half an inch or more and a pint of foul smelling pus evacuated. A rubber tube was introduced and the conditions immediately improved and the patient made an uninterrupted recovery.

On the 26th of September the following year (1896) the patient was brought back to the hospital with an acute meningitis and died. No autopsy was permitted.

Some points of interest in these cases to which I would call attention are the following:—

The abscesses in each case followed a pneumonia, and judging from the symptoms, probably began as a local gangrene of lung tissue. As one would expect, the abscess communicated with the bronchi with the result that evacuations of horribly foul smelling pus, at first more or less intermittent occurred, and continued until the cavity was drained. In each case there was considerable difficulty about the anæsthetic, and in the case exhibited to-night general anæsthesia was impossible on account of the filling of the bronchi with pus which interfered with the breathing, and produced violent spasms of coughing. In this case, the attempt to administer ether, which was only maintained for a few minutes, kept the patient in a condition of semi-asphyxia and violent coughing for most

of the afternoon. In each case the lung was firmly adherent to the chest wall, making the operation almost as simple as that for empyema, and finally the results of draining the cavities were most satisfactory. Localization of the abscesses, alone, was difficult, the aspirating needle failing to give evidence of pus even when it had undoubtedly entered the cavity. This is easily understood when one considers that such a cavity is necessarily at times more or less completely emptied by a fit of coughing, and that its contents are moreover thick and viscid, containing generally much mucus and some shreddy material (gangrenous lung tissue), especially if the case is a comparatively recent one.

CHRONIC MALIGNANT ENDOCARDITIS WITH PRESYSTOLIC MURMUR DUE TO VEGETATIONS ON THE MITRAL VALVE.*

BY

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W. G. aet. 22 was admitted to the Montreal General Hospital on Sept. 22, 1900, complaining of headache and pains in the limbs and back, and chilliness.

When 11 years of age he had typhoid fever and acute rheumatism about the same time. He had gonorrhœa at the age of 15. For the past 5 years he has done a good deal of bicycle racing, and has enjoyed excellent health.

For a week previous to the onset of the present illness he has felt tired and indisposed for work. He went to bed the day before admission to hospital and that night had a slight chill with severe headache.

Status Præsens. He is a muscular and well-developed man. The face is slightly flushed and the skin warm and moist. Temperature 101.2-5 to 103° on day of admission. The pulse is of normal volume and tension, 120, the arteries at the wrist are slightly thickened and show visible pulsation. The cardiac impulse is unduly forcible and is felt in the fifth space in the nipple line, and dullness is slightly increased to the left. The cardiac sounds are indistinct at the apex being replaced by a rumbling presystolic murmur, localised to the apex, and a loud systolic murmur, transmitted to the axilla and to the back, and heard over the heart to the pulmonary cartilage. There is a moderate pulmonary accentuation at the 3rd left space. The lungs and abdominal organs are normal. Urine S. G. 1031, alkaline, no albumen or sugar. A few triple phosphates and urates. No Ehrlich reaction.

A small patch of herpes developed at the angle of the mouth on Sept. 24th.

After being in hospital three days the temperature fell to 99.1-5 and for the next eight days ranged between 98 and 100.4-5, being higher in the evenings. The pains disappeared and he felt so well that it was with difficulty that he could be kept in bed.

The subsequent history of the case may be summarised as follows. Apart from some rheumatic pains in the joints of the lower extremities,

* Read before the Montreal Medico-Chirurgical Society, March 22, 1901.

the general condition remained good to the 23rd of October when a phlebitis of the right internal saphenous vein developed. Three days later there was an eruption on the abdomen closely resembling the rose rash of typhoid fever. A spot was excised and cultures made but with a negative result.

During the whole course of the illness the temperature was constantly above normal varying from 97 to 100 in the mornings to 101 to 103 in the evenings.

Evidences of emboli in the spleen and in the posterior tibial artery were observed. On Nov. 4th, there was acute pain in the splenic region with some tenderness and rigidity just below the costal border on the left side. A similar attack was present on the 24th. The organ never became palpable but its dullness extended to the costal border. On Nov. 9th, there was a severe pain in the right popliteal space, the foot was cold and the pulse in the posterior tibial artery was obliterated.

Dec. 5th. There was a moderate anæmia, R. B. C. 4,000,000 H. 60%. Cultures from the blood proved negative. Frequent examinations always showed an absence of the Widal reaction.

During the last two months of life the anæmia became very marked and there was great emaciation.

The cardiac signs altered somewhat during the illness. By Feb. 5th. the apex beat became displaced beyond the nipple in the 6th space, $5\frac{1}{2}$ in. from midsternum. The first sound at the apex became loud and abrupt, and a prolonged thrill, preceding the cardiac impulse, could be sometimes felt at the apex. The murmurs continued, the presystolic being heard into the axilla. Alarming attacks of cardiac weakness were present during this period. In these the pulse ran up to 160 and became extremely weak and small, and there was orthopnoea and cyanosis. In the intervals between these attacks the pulse was rather small, extremely soft and dicrotic. Profuse sweats were occasionally present and there was on one occasion a subconjunctival hæmorrhage. On Jan. 23rd, there was a hyperresonant note in front of the chest on the right side with crepitations at the base behind. Owing to the weak condition no very satisfactory examination could be subsequently made, and the small pleuritic effusion found after death was doubtless responsible for the altered note in front of the chest. Death took place from marasmus, on the 13th of February, after a stay of 141 days in hospital. The temperature fell as low as 96 during the last 48 hours.

Abstract of autopsy performed by Dr. D. D. MacTaggart.

Anatomical diagnosis. Dilatation and non-ulcerative vegetative mitral endocarditis. Tubercular pleurisy with serous effusion. Suppurative infarct of spleen. Obliteration of posterior tibial artery.

The heart is considerably dilated weighing 400 gms. The right ventricle is thin measuring about 7-8 cm., the tricuspid orifice is much dilated. The left ventricle is thinned and dilated its walls being from $\frac{2}{3}$ to $\frac{1}{2}$ cm. in the thickness. The mitral orifice is of normal size, and the auricular surfaces of the mitral cusps with the chordæ tendinæ covered with numerous adherent vegetations of which the largest project about one cm. from the valve. There is no ulceration or loss of substance of the valves.

The pleura contains 4 pints of fluid and is covered with numerous miliary tubercles. The spleen is large and contains a large suppurating infarct. The posterior tibial artery is obliterated at the lower third of the leg.

Remarks.

The diagnosis in the first few days of the patient's illness was influenza in a case of chronic valvular disease. The rather abrupt onset with a slight chill, the pains in the head, back and limbs, the eruption of herpes and the presence of other cases of influenza in the city were suggestive of this condition. The diminution in temperature on the third day of his illness seemed to be further evidence of influenza. There were however no catarrhal symptoms and Pfeiffer's bacillus could not be demonstrated.

It soon became evident that some further cause than influenza was at work in maintaining the elevation of temperature—moderate as it was.

The old history of rheumatism with a double apex murmur and fever, in the absence of any other evidence of local disease, suggested a chronic rheumatic endocarditis, with an acute endocarditis added on. The mitral valve seemed to be alone affected, and stenosis and regurgitation were both thought to be present. The subsequent prolonged course was always regarded as pointing to a vegetative rather than to an acute ulcerative process—an opinion which subsequently proved to be correct. The evidence of emboli in the spleen and in the posterior tibial artery were strongly corroborative of the diagnosis, as were also the anæmia and the emaciation of the latter stages of the disease.

At one period the presence of a phlebitis and of rose spots suggested the possibility of typhoid fever. Repeated examinations always showed the absence of the Widal reaction and an excised spot failed to show any typhoid bacilli in cultures, although they may be readily demonstrated in genuine rose spots.

The occurrence of these spots, which are referred to by Bramwell and other systematic writers, might readily lead to an erroneous diagnosis, and it is satisfactory to have reliable methods of distinguishing such

pseudo-spots. The phlebitis which subsequently developed in the other side as well was doubtless a septic manifestation.

The cardiac symptoms were pronounced particularly in the later stages of the disease. Attacks of rapid and feeble cardiac action with dyspnoea were present on a number of occasions and the patient was on several occasions on the verge of fatal collapse. The great cardiac dilatation was doubtless a powerful factor in producing these alarming attacks.

Not the least interesting feature of this case was the presence of a presystolic murmur, a thumping first sound and an occasional thrill at the apex, signs which led to the diagnosis of mitral stenosis. The murmur was more of a rumble than the typical rub of a well marked case of stenosis, yet it was of such a character as is often heard in stenosis, especially after compensation has commenced to fail. The autopsy showed an entire absence of any mitral narrowing, but rather large vegetations projecting from the auricular surface of the valve were apparently the cause of the murmur, which was set up by the blood current in its passage from the auricle to the ventricle.

Pathologically and clinically it is impossible to draw a sharp line between a mild verrucose endocarditis and a malignant ulcerative form. All gradations are met between the two extremes. Although in this case no ulceration was present yet the progressively downward course of the malady place it in the category of malignant endocarditis.

The tubercles in the pleura were all of a small miliary variety and were evidently a late infection.

SOME OBSERVATIONS ON THE WIDAL REACTION IN TYPHOID FEVER.

BY

H. M. LITTLE, B.A.,

Voluntary Assistant, Royal Victoria Hospital.

The Widal reaction, first described in a paper read on June 20th, 1896, by the man whose name it bears, has received an unusual degree of attention in medical literature, and careful investigations by many and competent observers since that date have led to an almost general recognition of its value, employed with due precaution, in the diagnosis of enteric fever. These are, however, from time to time, authoritative statements to the contrary, and doubts are not infrequently expressed of its actual diagnostic value. It would seem that depreciation of this kind, when not due to an entire ignorance of the significance of the test, may, in many cases, be attributed to faulty methods in laboratory technique. That an accurate knowledge of the requirements of the test, in its many details, is an all essential feature in estimating its true value, I can, thanks to many hours of fruitless labor in my early investigations, unfortunately, perhaps fortunately, bear witness to.

In the recent volume of Johns Hopkins Reports (Vol. VIII., p. 385), Gwyn, in a most excellent paper on the Widal Reaction, reports that in some 265 cases diagnosed clinically as Typhoid Fever, only one failed to give a reaction, and even this exceptional case proved later to be a paracolon infection. In addition, two typical cases, diagnosed conditionally as typhoid fever, failed to react. Thus:

(a) In cases certainly typhoid, 99.6% gave a positive reaction.

(b) In all cases, 98.1% gave a positive reaction.

In 151 cases in the Royal Victoria Hospital during the past twelve months, the reaction was present in all cases but one, and appeared as early as the 4th and late as the 33rd day.

In only one of the cases I have tabulated below was there any question as to the reaction, which even here has been marked "partial."

The complaint has been made, that, granting its presence, in the vast majority of cases it does not appear early enough; that other signs, such as splenic enlargement, rose spots, etc., may be present before the Widal reaction. Anyone who has noted the varying manifestations of typhoid fever, the possible absence of rose spots and splenic enlargement, as well as other signs, will not lightly refuse such valuable confirmatory evidence as is afforded by the Widal reaction, however late.

I need only refer to a case reported by Dr. Finley (See page 333),

where a young man with ulcerative endocarditis entered the Montreal General Hospital with a condition so closely simulating typhoid that it was only excluded by the absence of the Widal reaction. The early appearance of the reaction has never been especially urged in its favor. As a matter of fact recent investigations at the Royal Victoria Hospital show that often the Erlich's reaction appears first. Of Gwyn's cases, only 97, (or 37%,) gave the reaction on admission to the Hospital.

Unfortunately the proper examination of the blood is well nigh impossible outside a laboratory. The cultures require such constant care and are, even in spite of this, so prone to get out of order, that the most favorable surroundings for bacteriological work are indispensable. The importance of a proper method is evident to anyone who has given the subject a more than casual attention, and recent observers have so shown the liability to error from faulty technique, that the significance of the test can be said to depend wholly upon this factor in all its details.

The earlier reactions were all made with blood, freshly drawn, either entire, or with the corpuscles removed by clotting or centrifugation. This has been largely superseded, in public health work especially, by Wyatt Johnston's method with the dried blood. The abuse of this method may account for much dissatisfaction, as may be imagined from the pernicious habit of some practitioners who take two pieces of window glass, and, having obtained a drop of blood, compress it between the two glasses, firmly gluing them, and send the whole to the laboratory for diagnosis. In such cases an accurate dilution is an impossibility, and reaction and observer share any discredit. To favor greater accuracy, especially as regards dilution, in my own cases, the blood was collected in small Pasteur pipettes, which, with the aid of a match, were easily sealed and in which the serum soon separated and could readily be drawn off. The blood in these small serum tubes will keep for several weeks, and may be as easily carried through the post as the dried specimen on paper. When the blood was to be examined the small tube was broken in the middle and the serum drawn up into a capillary tube. By drawing out over the flame, about 8 to 10 cm. of glass tubing about 4 mm. in diameter, then carefully dividing, two tubes of the same calibre will be obtained from which the drops will be approximately equal, one of these may be used for serum the other for culture.

The proper preparation of the culture, is the greatest of all difficulties. Bouillon has for long been the generally accepted media; this should be acid, preferably exactly 1.5%; with alkaline media, the bacilli may clump spontaneously. Difficulties, which frequently arise in using bouillon, may be obviated by a most satisfactory method which I have tried at the suggestion of Dr. E. W. Archibald. The bacilli may be grown on acid agar and an emulsion made; this emulsion should not be made by mixing

bacilli with sterilized water, but by allowing sterilized water to run down over the surface of the growth and collect in the bottom of the tube.

For purpose of examination 19 drops of this emulsion culture were placed on a glass slide and then one drop of clear serum added and the whole intimately mixed. It has been recommended to use simply a drop of the mixture on a slide with a coverslip over it, but general experience is in favor of the hanging drop.

It should be remembered that, though the typical reaction demands complete cessation of movement and clumping, not one case in fifty will give this in a reasonably short time. Cabot, who has done a great deal of work on the subject, gives his idea of the reaction as "Clumping and slowing or cessation of movement." It is obvious that if only one drop be set up for examination, constant observation will be necessary; on the other hand, if a control of afebrile blood be set up at the same time, comparison of the two will early give an idea of the condition of the suspected blood. Still better, if a typhoid case is available, a second control may show how much reaction is to be expected from the culture in use. It is well to set the controls up early and examine both for abnormalities, as this may save much time and inconvenience in the way of getting new specimens for examination. In the undercited cases a double control was invariably used, and clumping with relative slowing of bacilli was taken as the standard. In all these only two gave absolutely typical reaction, *i.e.*, complete cessation of movement; one, a case of typhoid in the wards, complicated by hæmorrhage, the other a woman who had had fever three and a half years previously and whose blood reacted with a dilution of 1-50 in a comparatively short time.

During the past summer it was my privilege to examine the blood of the patients in the Royal Victoria Hospital on admission and during convalescence. Of those discharged convalescent from June 16th to August 16th, only one failed at discharge to give the Widal reaction. This was a young girl, *æt.* 8, whose attack had not been severe. This almost constant presence of the reaction was made a starting point for further observations later in convalescence. This work was by no means the first along the same lines, but that it was worth looking into may be further illustrated by two cases:

1. A case diagnosed post-mortem as Tuberculosis of the Bladder, gave on several examinations a distinctly positive Widal reaction. Was this a legacy of a previous typhoid infection?

2. A boy, *æt.* 16, in the wards with typhoid in June, was readmitted in September with a remittent fever. He gave a positive Widal reaction, but in a couple of days his temperature dropped to normal by crisis. In this latter instance the persistence of the reaction for three months might

have given rise to a false diagnosis of the second febrile attack (which was obviously not typhoid) had his past history not been given in a satisfactory manner.

Beginning with those recently discharged, I have been able to look up some 71 cases which gave reactions in the hospital in 1897, '98, '99, 1900. To avoid prejudice in the decisions of the test, the cases were examined by number, not by name, and no data was obtained till the reaction of the blood had been marked positive or negative.

Of these 71 cases, 12 were re-examined after an interval of six months. Of these, 8 gave the same reaction on both examinations, 4 were positive at first and negative later, none were negative at first and later positive. The above four have been included in the statistics given below, making in all some 75 cases. Of these:

42 were within 1 year after the fever.

13 others were within 2 years.

11 others within 3 years.

9 others within $3\frac{1}{2}$ years.

The average age of the cases examined, was $23\frac{1}{2}$ years.

Of the 42 cases during the 1st year, 24 were positive, 18 negative.

Of the 13 between 1 and 2 years, 5 positive, 8 negative.

Of 11 between 2 and 3 years, 5 positive, 6 negative.

Of 9 cases above 3 years, 3 positive, 6 negative.

There seemed in these cases to be no distinct relation between the severity of the disease and the duration of the reaction. Many severe cases lost the reaction within the year, while in another instance a girl, *æt.* 14, retained the reaction for over 2 years. It is true that of the three noted above as positive after 3 years, one had a relapse and peripheral neuritis, a second ambulatory typhoid, but the third, which of all the cases gave the best reaction, had no distinct characteristic. One notable feature of these three cases was the relatively great age. Thinking a comparison might be of interest I made averages of the ages.

42 cases under 1 year, average age, 19 yr. 10 m. Average age of those positive, 24 yr. 9 m.; of those negative, 16 yr.

13 cases under 2 years, average 25. Average age of those positive, 29; negative, 22 yr. 6 m.

11 cases under 3 years, average age, $23\frac{1}{2}$. Average age of those positive, 21 yr. 4 m.; negative, 25 yr. 6 m.

9 cases under $3\frac{1}{2}$, average age, 34. Average positive, 40 yr. 4 m.; negative, 31.

It will be noted that in all these instances, save one, the average of those positive is much higher than those negative, and that list includes the peculiar exception of the girl mentioned above.

Certainly no definite data seem obtainable whereby one can associate the duration of the reaction with the special feature of the disease. Neither the age of the patient nor the severity of the attack are unexceptionally in a definite ratio to the persistence to the Widal reaction. Nor can one believe (as many state) that its persistence after many years is due to the presence of the living typhoid bacilli, *e.g.*, cases of late bone lesions, cholecystitis, etc. (that is, where these complications appear months or years after and the blood still gives Widal). While the reaction often persists in these cases, it is not infrequently absent, and the not unusual absence of the reaction in late stages of the uncomplicated cases, when we are assured that living bacilli must still be present in the tissues, suffices to indicate the irrationality of any such theory.

NOTE ON THE TREATMENT OF THE HAIR IN TYPHOID FEVER.

BY

H. M. LITTLE, B.A.

In view of the fact, that in different institutions and in private practice, not a little variation of opinion exists as to the necessity of cutting the hair (or shaving the scalp) in typhoid fever, I have examined into the results of the treatment under different conditions—the observations being of interest, inasmuch as frequent statements have been made, that radical measures are wholly unnecessary as well as unkind to the afflicted individual. Sixty-two cases were examined some months after their affection, and the result of the various treatments noted.

Of these, 35 had their hair cut while in hospital, and in only 7 was subsequent falling out of the hair noted. Of these 7, 4 were cut late. The ultimate result in all, was a thicker growth of hair than ever before.

In 2 cases it was thought to be coarser than before.

Twenty-seven patients (15 women, 12 men) had not their hair cut, and in only 3 there was no falling out. Ten had to have their hair cut later to prevent baldness, 7 being females.

In 7 other cases not cut, 4 are very thin, 2 were still falling, and one curly before, is now thin and straight.

A SHORT REVIEW OF DRIESCH'S WORK ON THE MECHANICS OF DEVELOPMENT.

BY

CRESSWELL SHEARER.

During the last decade a remarkable change has taken place in embryological science, an entirely new field of research has been opened up whereby many new facts have been discovered and old opinions have become altered. The initial impulse was given in this direction in 1883 by the investigations of Pflüger upon the influence of gravity and mechanical pressure on the segmenting egg of the frog. Since then a remarkable series of researches have appeared, the most important being probably those conducted by Driesch,* which have for the time being thrown all other biological problems into the background. As long as the working embryologist was content to find in development nothing but phyletic relationships, and systems of classification, little heed was paid to the underlying factors and components of the developmental process itself. Until this time, beyond the discovery announced independently by Roux and Pflüger that the first plane of cleavage in the frog's egg coincides with the median plane of the adult body, little if anything was known of the determining causes of cleavage.

As most of you are aware the orthodox embryological doctrine traces the origin of the organs of the animal body back to layers, and these layers in turn back to certain of the primitive segments of the animal egg or ovum. Since in many eggs the segments destined to form these layers are distinguishable from the first by their size, contents, shape, position, etc., it was assumed that in the unimpregnated ovum there were definite areas by the growth of which particular organs of the animal were always produced. This principle, first distinctly laid down by Wilhelm His, in one of the most charming of scientific works (*Unsere Körperform*, 1874), has exerted the widest influence on embryological speculation. "The principle, according to which the germinal disk contains the preformed germs spread out over a flat surface, and conversely, that every point of the germinal disk is found again in a later organ, I call the principle of organ-forming germ-regions (*organ-bildende Keimbezirke*)."¹ It first occurred to Driesch to put this idea to the direct test of experiment. With this object in view he selected for study the egg of the sea-urchin (*Echinus*), partly on account of the

* *Entwicklungsmechanische Studien*; Zeits. f. wiss. Zool. 1892; Bd. LIII, p. 160. Id. 1890.

simple manner in which it develops, partly for the ease and abundance with which it may be procured. Perhaps, a brief account, first, of the normal development of this egg will help us better to understand his results. The eggs are laid in the sea water and are there fertilized. The conditions of their fertilization remind one strongly of the manner of pollination of some plants. You know how the pollen of pines has been recorded to have fallen on the decks of ships a thousand miles from land in such quantities as to dirty everything and half blind the sailors. So with these sea-urchins, so full with their spermatozoa is the sea, during the breeding season, it is nearly impossible to place their eggs anywhere in it and prevent their being fertilized. The egg on being fertilized divides into two, four, eight,—so far perfectly regular spheres. In the next division we get sixteen, of these four are smaller than the rest, being called micromeres, in contradistinction to the others which are larger and so called macromeres. After this the divisions become very complex and are not easily followed; they result in a hollow sphere with walls one cell thick, the most primitive larval form, the blastosphere or blastula, which in these animals is free swimming, unlike the corresponding stage in the higher animals. One-half the sphere now becomes invaginated into the other, as in making a double night cap fit the head, and we have the gastrula stage, which finally develops into the characteristic larval form of the echinoderms, the "pluteus."

Driesch took the fertilized egg and allowed it to divide into two cells, he then placed 50 to 100 of the eggs in a glass tube an inch and a half long, by half an inch wide, half filling the tube with water, he then shook the tube violently with all his strength for about five minutes. He found that he had separated by this shaking the blastomeres of his eggs, so that after shaking he had separated egg blastomeres instead of whole eggs in his tube. On letting these separated egg cells stand in fresh water for some time, he found that each cell had regenerated its missing fellow cell and formed a complete egg again, only these eggs were half the size of the normal egg. The next day these eggs went on to form perfect blastospheres one half normal size, finally developing into plutei which except for size showed no traces of irregularity. Driesch then argues thus: we start with half a sphere and we get a whole one—this can only happen in two ways. In the first case those cells which would have formed the mid-dorsal or mid-ventral parts—form the right side, or those cells which would have formed the anterior and posterior parts form the right side. When the union was only partially loosened the blastula showed an indentation which was gradually effaced. In one case, however, twin blastula enclosed in the same membrane and afterwards separating were found. In another remarkable case a pair of siamese twin plutei were found.

Driesch then carried these experiments a step further. He shook the segments of the egg apart when in the four cell stage, and found that he could get three-quarter size plutei, and also one-quarter, which were perfectly normal.

The next set of experiments that he engaged in were with the view of testing the effects of light, warmth, and pressure, on the development of the egg. The apparatus used was extremely simple. Ten minutes after impregnation a glass ring 10 mm. in diameter and 2 mm. thick is put on a slide, a drop of sea water with two eggs is put on a cover slip, and then inverted over the ring, and tapped till it falls to the bottom of the ring. The overlapping portion of the cover slip outside the ring is filled with water so as to prevent the evaporation of the water inside the ring and the necessary concentration of the salt. The effect of heat say 30° C. was very curious, sometimes two distinct heaps were formed by the cells in the 8 and 16 cell stages. When removed from the action of heat at this stage, this incipient doubleness disappears; if allowed to stay longer we get double blastulæ formed, some times a sausage shaped form with a furrow. The heat was not allowed to act longer than the sixteen cell stage. In the first division when subject to heat, the two cells do not touch one another as in the normal egg, but their adjacent surfaces are separated and have a serrated and jagged appearance as if torn; this does not occur in the four cell stage. The eight cell stage showed interesting modifications. The normal arrangement is of course where

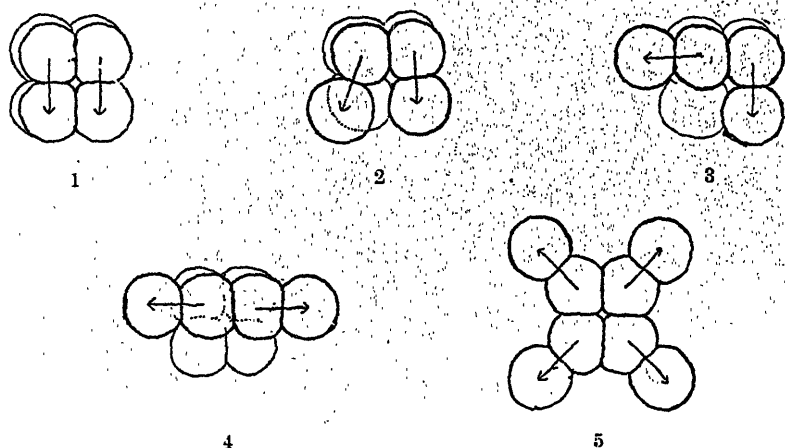


Fig. 1. The normal arrangement of the blastomeres in the egg of *Echinus* in the eight cell stage. Fig. 2. The arrangement of the blastomeres in the eight cell stage produced by the application of heat, one blastomere is at an angle of forty-five degrees. Fig. 3. Where one blastomere is at a right angle. Fig. 4. Where two blastomeres are at right angles. Fig. 5. Where four blastomeres are at right angles and all the blastomeres in the same plane.

the four spindles out of which eight nuclei have proceeded are vertical to one another. This may be modified by one spindle being placed at an angle of 45° , again this spindle may even be at right angles to the rest, and this may happen with two out of the four spindles, and finally all of them may be horizontal. Many of all these forms developed into perfectly normal plutei.

The result of experiment to test the effect of light, may be briefly stated as almost negative. Darkness delays development slightly, so does red light, green light delays it very considerably, while blue and violet hurry it.

The influence exerted by pressure was most interesting. A number of impregnated eggs were placed on a slide under a long cover slip. A bristle placed under one end of the slip relieved the pressure there, so all degrees of pressure were obtained extending from one end of the slip to the other, being least nearest the bristle and greatest at the other end of the slide. The effect of pressure is perfectly definite. Nuclear spindles which would otherwise be vertical, that is parallel to the line of pressure, become horizontal, so that in the eight cell stage and also in the sixteen cell stage the cells are radially disposed. In the sixteen cell stage we ought to have four micromeres: under pressure we have two at the most and usually none. When the pressure is less, vertical spindles appear in the sixteen cell stage. In all cases except where pressure is first applied in the four cell stage, as soon as the pressure is removed and the eggs washed in fresh sea water they recover their normal form. When, however, the egg membrane is burst by the pressure, then different effects follow. The four cell stage is mostly normal but occasionally has the form of four cells in line, when we remove the pressure this abnormal form is retained. The eight cell stage has a similar shape only consisting of two rows, of four cells in line instead of one.

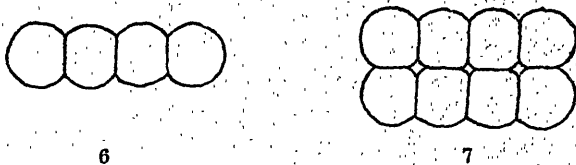


Fig. 6. The condition produced in the four cell stage of the egg of *Echinus* by the application of pressure the egg membrane being burst, the four blastomeres are arranged in line. Fig. 7. The condition produced by the application of pressure in the eight cell stage, the blastomeres being arranged in two lines.

The sixteen cell stage consists of a two layered plate, each of the eight cells dividing by a spindle perpendicular to the surface. Exam-

in for a moment the eight cell stage figured above, we see that the four cells which ought to have formed the upper pole lie now along one side or anteriorly and posteriorly. In the sixteen cell stage the four

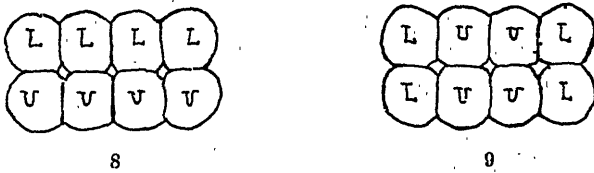


Fig. 8. The arrangement of the blastomeres in the eight cell stage of *Echinus* in which the blastomeres forming the lower and upper poles lie along side one another. Fig. 9. The arrangement of the blastomeres were they do not lie along side one another, the lower pole cells being separated and placed on the right and left of the upper pole cells.

cells which ought to have formed one pole, form upper and lower poles, the other four cells which should have formed the other pole form the sides of the blastula, since all future divisions are tangential and the blastula sausage shaped; later it becomes spherical, but this cannot alter the fact that the poles have been formed from abnormal regions. In fact it is a general rule that horizontal spindles only are formed as long as the pressure continues, so we get a plate of sixteen cells or we can get thirteen cells in one layer, and three in another at will. The two layered plate which is the result takes on the normal form of the blastula, and develops into a perfectly normal pluteus. Of course as will be readily understood, a sixteen cell plate is often broken into two pieces which give rise to two blastulæ.

The conclusions which Driesch draws from these remarkable experiments, are that the blastomeres of *Echinus* are of uniform material, which can be shaken together in any way without altering the result of their development. To quote his own words they are, "Composed of an indifferent material so that they may be thrown about at will, like balls in a pile, without the least impairment of their power of development." Hence the development which a given blastomere will undergo is a function not of its material, as both Hertwig and Weismann and their schools have assumed, but in the words of Driesch, "their prospective value (Bedeutung) is a function of their location." In no sense, therefore, in the light of these experiments can the cell be regarded as an isolated and independent unit. Again, they bring us back to the fact that, "The only real unity is that of the entire organism, and as long as its cells remain in continuity they are to be regarded, not as morphological individuals, but as specialized centres of action into which the living body resolves itself, and by means of which the physiological division of labor is effected." (E. B. Wilson.)

Let me point out the bearing of these experiments upon our existing theories of heredity and development. As some of you may be aware, we have to-day two diametrically different theories of development, the lineal descendants, in a modified form, of the issue between the schools of the Preformationists, and the Epigenesists of two hundred years ago. The first of these theories in its modified modern form, the so-called "Mosaic theory," which I may state has nothing to do with Moses or the Mosaic law, seeks the cause of development in the nature of cell division. Cell division according to this view is nothing but the sifting apart of the various hereditary germs stored in the chromosomes of the nucleus of the fertilized egg; as development goes on each cell during division receives its store of hereditary qualities, which determine the part it shall play in the entire organism. The entire ontogeny is thus compared by Roux to a veritable mosaic-work. This theory is of additional interest to us from the fact under the influence of Weismann it has been most brilliantly elaborated and charmingly presented, its proportions becoming truly colossal. These primary hereditary germs, which he calls "biophores" are according to his ideas aggregated to form "determinants," the determinants to form "ids," and the ids to form "idants," which are identified with the chromatin of the nucleus. Lately Weismann, has had to modify his theory to account for the experiments of Roux, in which he destroyed one of the blastomeres of an egg with a hot needle, and got the missing blastomere regenerated in a manner similar to the way Driesch's blastomeres after being shaken and separated, regenerated their missing halves. He supposes that in addition to the specific hereditary germs which each cell receives during division, it also receives a latent series of germs which are only called into action by some injury as the destruction of one of the blastomeres, or their mechanical separation, when they immediately become active and cause regeneration, or the repetition of the original development, during the course of normal development they remain latent and are dominated by the specific germs. It is the highly imaginary nature of Weismann's speculations that have failed to make them carry conviction, for it is unnecessary to say that these latent germs, qualitative cell division, etc., are pure assumptions on his part, and are as Wilson has remarked statements about phenomena, of which at least for the present we are quite ignorant. It is in the light of these experiments however that Weismann's theory encounters its greatest difficulties, and entirely breaks down. During the last few years Weismann's views have attracted less and less attention, and they may be said as instruments of scientific thought to have served their day.

Let us for a moment regard the second theory of development, what

Wilson has designated the "anti-mosaic conception" and see whether it contains a larger element of truth. This theory is the descendant of the theory of epigenesis so ably championed by Wolff in 1759 in his celebrated "Theoria Generationis," where by a most remarkable series of observations he tried by actual experiment to show the fallacy of the then popular theory of preformation. To Wolff all development proceeds by new formation, the germ consisting of unorganized material which little by little in the course of development becomes organized. To-day differentiation is to be sought in the interaction of the parts of the embryo, the individual cell being determined by its environment and position. "The egg," says Hertwig, "is an organism which multiplies by division to form numerous organisms equivalent to itself, and it is through the interaction of all these elementary organisms, at every stage of development, that the embryo, as a whole, undergoes progressive differentiation. The development of a living creature is in no wise a mosaic work, but, on the contrary all the individual parts develop in constant relation to one another, the development of the part is always dependent on the development of the whole."

"I would accordingly conceive," says Pflüger, "that the fertilized egg has no more essential relation to the later organization of the animal than the snow-flake has to the size and form of the avalanche which, under appropriate conditions may develop out of it."

As the essential process of the production of form is according to Driesch's experiments the same in the normal as in the abnormal condition we naturally see how he sides with this last view of development, and is now its stoutest champion. For in the light of his experiments how can the formation of the embryo be regarded as a piece of mosaic work, the unfolding of preformed hereditary qualities, when by experiment it can be so altered and even obliterated without affecting in the least the final outcome of development. Development is epigenesis. How are we to conceive the determinants of a blastosphere pre-existing as a structure of particles in the fertilized egg nucleus when we know from experiment that their shape, size, and position, are determined by the influence of gravity, their position in the egg mass, the character of their protoplasm, etc.? To quote Hertwig again, "The conditions for the origin of the blastosphere come into existence only by the process of segmentation; it is only by its capacity to divide that the egg contains the conditions of blastosphere formation. Here we have epigenesis—the appearance of a new formation, not the becoming visible of pre-existing complexity."

Let me conclude my remarks by saying that no theory of development can hope to afford us a proper explanation of development which alone

considers mere mechanical conditions, whether these be intrinsic or extrinsic. We must remember that the living substance of which the cell is formed has the quality of taking in substances from the outside and giving out substances to the outside, the metabolism, the elementary vital process, as Herbert Spencer defined it, "the continuous adjustment of internal to external relations," in short the life of the cell; it is with this that every theory of development will have first to deal. "Development is the expression of the metabolic relations between cell and medium, conditioned by growth." As Verworn has remarked this can scarcely be better expressed than in the words of Karl Ernst von Baer himself, the father of embryology, who thus states the most general result of his studies upon the embryology of animals that, "The developmental history of the individual is the history of the growing individuality in all its relations."

A SPECIMEN OF BOTHRIOCEPHALUS LATUS.*

BY

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The specimen, which is herewith presented, was found in a patient attending the out-patient department of the Royal Victoria Hospital, and was voided by him without the use of any known anthelmintic. On his second visit to the hospital he brought this parasite with him, stating that this was the second time in the past five or six months that he had found such a worm. The complaints which he had made on his former visit in no way led to the suspicion of his harboring such a parasite, but rather pointed to some neurasthenic condition.

On observing this specimen one was at once struck with the remarkable contrast which it presented to the ordinary tape-worm found in Canada. It was much darker in colour, its segments very much shorter than those of the common tape-worm, and, on closer inspection, one failed to find any evidence of a lateral genital pore. When held against the light each segment or proglottis presented a central brown rosette, in striking contrast to the general finely-divided uteri and oviducts of the common tape-worm.

The ova, as shown in the specimen under the microscope, are distinctly larger than those of the beef tape-worm, being of an oval shape, of a brown, or yellowish brown colour, and thus showing another contrast to the ova of the above mentioned and more common tape-worm.

It was thus apparent that we had to do with an unusual intestinal parasite, at least rare in this country, and, so far as the observer is able to ascertain, found only in those who have resided in certain foreign countries. On further enquiry of the young French-Canadian who harbored this parasite, it was found that he had never dwelt outside of Canada and rarely outside of the province of Quebec. It is interesting to note in connection, that his habit of life for some years from spring time to autumn has been that of a wandering sportsman, fishing and hunting and camping, and doing his own cooking for several months of the year.

Of the parasite, the total length presented was 27 feet, and although the head was not found, still it would appear that the parts examined were sufficiently characteristic to indicate that the parasite was a bothriocephalus latus. Briefly enumerated they are as follows:—The total length, although not completely represented in the amount under obser-

* Read before the Montreal Medico-Chirurgical Society, March 22, 1901.

vation; the pigmentation; the short segment with its dark brownish rosette in the centre, and its breadth greater than its length; the absence of a lateral genital pore and hence though not demonstrated a central genital pore; and the characteristic oval brown ovum.

The patient was in no degree an unhealthy individual and, judging from the colour of his skin and mucous membranes, anæmia did not exist. It would seem, then, that this is a genuine case of a Canadian harboring a *bothriocephalus latus* or fish tape-worm.

REPORT OF A CASE OF TENDON GRAFTING FOR PARALYSIS FOLLOWING ANTERIOR POLIOMYELITIS.*

BY

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The patient who is presented to you to-night suffered from what was apparently, an attack of anterior poliomyelitis, six years ago. Since then he has been unable to walk without the aid of a brace. He was brought under the writer's notice last November. At that time he walked with a very distinct limp, and was wearing on his left leg a short double upright brace probably with the object of correcting the tendency to foot-drop.

On examination it was found that the muscles of the left thigh and calf were markedly atrophied, and that the foot was held in the position of equino-valgus. By manipulation and change of position it was noted that the anterior tibial muscle was much weakened, if not entirely functionless. This resulted in eversion of the foot, especially marked on attempted flexion. The functions of the extensors longus digitorum and hallucis seemed unimpaired. Those of the tibialis posticus and other muscles arising from the posterior surfaces of the tibia and fibula were much weakened. The muscles of the thigh except the sartorius seemed atrophied and weakened.

Through the kindness of Dr. Cushing the writer is able to report that the results of an electrical examination of these muscles which was made at the Royal Victoria Hospital were similar to those made by clinical examination.⁽¹⁾

As the patient's mother contended that the deformity was increasing, in spite of the treatment received, during the past five or six years, it was considered advisable to try the result of operative interference.

The following were the operations considered, each of which aimed at the restoration of the functions of tonic flexion and inversion lost through the atrophied condition of the tibialis anticus muscle.⁽²⁾

(1) The grafting of the tendon of the extensor proprius hallucis to that of the tibialis anticus.

(2) The grafting of a slip from the tendon of the tibialis anticus muscle into that of the peroneus tertius or extensor longus digitorum, or *vice versa*.

(3) The grafting of a slip from the tendo achillis into the tendon of the tibialis anticus.

By the kindness of Drs. Perrigo and Jack, the patient was admitted, under the writer's care, as a semi-private in the Western Hospital on

* Read at the Montreal Medico-Chirurgical Society, April 12, 1901.

December 2nd last. On December 3rd, the patient being anæsthetised, the operation was begun by an incision being made from the external malleolus to the insertion of the tendon of the tibialis anticus. The tendon sheaths were then exposed. The tendons of the common extensor and proprius hallucis were found to be in fair condition and size. That of the peroneus tertius was absent.⁽³⁾ The tendon of the anterior tibial was small and weak. The further steps in the operation were: The tendon of the tibialis anticus muscle was split upwards from a point one and one-half inches from its attachment for a distance of nearly two and a-half inches. At this point the outer half was detached, at its highest point, and carried to the innermost tendon of the common extensor which had been further exposed by an incision overlying it, when the absence of the peroneus tertius was discovered. This portion of the common tendon of the tibialis anticus was freshened, carried through it, and sutured there.

Attention was then directed to the inner half of the split tendon of the tibialis anticus muscle. This was next approximated to the tendon of the extensor proprius hallucis, which having been freshened, was sutured to it. The foot had been previously placed in the varus position. The cutaneous incision was then sutured with catgut, and the foot having been retained in the varus position, the child was incased in a single plaster of paris spica extending from his left nipple to the toes of that foot. In three days the patient was removed to his house, where he remained with his foot incased in plaster for three months.

After this period the plaster was removed and a cast having been made of his foot a brace comprising a single upright which extended from his knee to a Whitman foot plate was prepared for his use. The child was then allowed to resume his ordinary habits.

Conclusions: By the improved position of the child's foot it seems probable that there has been perfect union of the tendons grafted, and although the patient's left leg is never likely to be in as good condition as that of his right, it can at least be hoped that the improvement will be progressive as the common extensor and proprius hallucis muscles become stronger and better able to do not only their own work, but that of the anterior tibial.

REFERENCES.

1. Results of an examination made by electricity by H. B. Cushing, M.D., at the Royal Victoria Hospital, Montreal, November, 1900.

Tibialis anticus, little or no power.

Tibialis posticus, little or no power.

Extensors of foot, impaired in function.

Extensor longus digitorum, normal.

Peroneus tertius, probably normal.

Extensor longus hallucis, normal.

Peroneus longus and brevis, doubtful.

2. In arranging these operations it is impossible to state definitely till an ocular examination of the tendons has been made what will be the operation of choice.

3. It will be noted that by electrical examination it was impossible to state definitely the existence or non-existence of this muscle.

IMPRESSIONS OF TEACHING IN THE EDINBURGH ROYAL INFIRMARY.

BY

CLARENCE GREY, M.D., C.M., L.R.C.P. & S.E.

The Edinburgh Royal Infirmary has well been called the "backbone" of the Edinburgh Medical School. A hospital of over eight hundred beds, with a large staff of professors, lecturers, demonstrators and tutors, all apparently devoted to their work, cannot fail to act as a stimulus to the most listless student. Not only is there an excellent opportunity of doing ward work during the day, but the clinical laboratories and wards are also open to the students from seven to half-past eight in the evening, and under the guidance of the clinical tutors, students are able to turn to good account an hour in the evening which is frequently of little value to them. It is during the evening hour also that tutorial classes are held in the clinical subjects. On the teaching staff of each subject is a tutor who acts under the superintendence of the professor, and in the wards or lecture theatre brings to the notice of the students and explains the more minute but still practical points which the professor may have failed to touch upon in the course of his systematic lectures. Before the tutor, the student does not attempt to conceal his ignorance or hesitate to ask questions which he might feel disinclined to ask of the professor. In this way the tutor frequently proves of much assistance to those who are backward in their knowledge. There is no extra fee for these classes, and attendance is not compulsory, and one may infer from the number of students who take advantage of them that they are much appreciated. Indeed the students depend upon these classes for the greater part of their practical training. The clinical tutors in surgery and gynæcology, in addition to giving instruction in the usual routine work, exhibit instruments, explain their uses, and give practical instruction on the application of splints, etc.

A course in clinical diagnosis is given by the clinical tutor in medicine: which is supplementary to a series of demonstrations with which the professor precedes his course in clinical medicine. In this subject a stranger is much impressed with Professor Wyllie's course, for besides graphically illustrating each sign, he is happily able to imitate with his voice many of the pathological sounds heard in the chest. These sounds he requires the students to repeat after him, giving them the "time rhythm" for each heart bruit, by striking his hands. A large number

of students in the act of imitating cardiac bruits by blowing with the lips, slapping the knees, etc., is a rather noisy procedure, and is apt to be disconcerting to the onlooker: but that it is of value to the student no one who has attended these classes would doubt for a moment.

Such a teaching method as this is of special value in Edinburgh, where there is a greater proportion of students to patients than obtains in Montreal. The Edinburgh student must be previously prepared so that he can grasp abnormal phenomena quickly and make the most of every case he examines, for in respect to material he is not so fortunate as his Montreal brethren.

In the operating theatre and surgical wards the students replace the nurses to a large extent. Two students sterilize and take charge of the instruments, one attends to the ligatures, while a fourth administers the anæsthetic. Chloroform is the anæsthetic in common use; ether is seldom administered. One rarely sees more than two nurses in attendance, and one of these has charge of the sponges, changing the solutions, etc.

Necessarily this work is a tax on the students' time, but the training and valuable knowledge he obtains more than compensates him for the loss. The course for the degree extends over five years of about eight months each. The student enters upon his hospital work and lectures in medicine or surgery early in his course, and in both these subjects lectures and clinical work are undertaken simultaneously but in one subject only each year.

The student must overtake a certain amount of work before he is allowed to go up for examination, but he is permitted within certain limits to plan and apportion his own time and studies. The system of extramural teaching permits him to make choice of his lectures and clinical teachers, and if he is inclined to extend his studies in any direction he is at liberty to do so. Perhaps it is this want of definite guidance which is the cause of so many studying with a "coach," who keeps his pupils steadily at work and directs their energies to the greatest advantage.

In the surgical out-patient and dispensary work the student is allowed certain positions which give him an opportunity of testing his knowledge and resources. He is also allowed to attend dispensary and obstetrical cases at their own homes.

The surgical out-patient consultations are conducted in a large lecture theatre. The cases for this clinic are selected; new cases are chosen, and "repeats" are only occasionally exhibited to show results of treatment. Many cases are sent in to this clinic by outside practitioners. This clinic is attended enthusiastically by the students, and when any specially interesting case is only able to be seen by a few at the time the clinic is going on, the patient is retained until it is over for closer examination by the other students.

The Infirmary out-patients are not supplied with medicines, but are given prescriptions which they have filled at a reduced rate by any druggist. Besides the ordinary out-patient medical clinic, Dr. Andrew Smart and Dr. Byron Bramwell hold special clinics, which are attended by the senior students. The facts in each case are deduced by questions asked by the teacher at the students' request. Suggestions as to the treatment are criticized by the teacher, who afterwards makes a few general remarks upon the disease of which the patient may be a type.

Veneral diseases are treated in a separate department; many cases both ward and out-patients are seen and contrasted, and special demonstrations given on each form of disease.

The skin clinic under Drs. Allan Jamieson and Norman Wallser is held in a lecture theatre and each case is made to go around the theatre so that the students are afforded an opportunity of more closely examining it.

A clinical course in infectious diseases is compulsory, and each student is required to take a course at the City Hospital where typhoid fever is also studied.

The course in gynæcology includes ward work and history taking. The operations are replaced once a week by a course in practical examination; at this time the patient is generally under an anæsthetic.

One should not fail to mention the excellent tutorial teaching given in this subject by Dr. Lackie.

The final examinations before the Royal College are essentially practical; more value, it is said, is placed on the oral and clinical examination than on the written. A thorough knowledge of anatomy is demanded, and on this subject the student may expect to be asked the most minute question both in the clinical and in the oral examinations in surgery, besides receiving a paper on surgical anatomy. A final year student was overheard to say that he found himself rather deficient in his surgery, but that he was devoting all his time to anatomy in the hope that the latter would enable him to pass in surgery. He was not successful, but it may serve to show the importance attached to anatomy in the surgical examination.

A rather curious feature about the Edinburgh student is that he does not seem to be worried over being occasionally "plowed," to use the local expression. This may be because on an average he is better off financially than his colonial brother, or perhaps sad experience has rendered him used to discomfiture. In the recent examinations for the triple qualification only 42 per cent., or 33 out of 78, were successful, and many of these had gone up for examination on one or more previous occasions. £10 is the amount forfeited by the unsuccessful candidate, so that the above figures are all the more remarkable. On the whole, medical edu-

cation is much more expensive in Edinburgh than in Montreal, £30 (\$150.00) being the fee paid for examination alone. In Canada, however, the medical boards of the provinces endeavour to make up for this difference, as registration costs more than twice as much as in Great Britain.

Unquestionably one must recognize many good points in the Edinburgh method of teaching, arising possibly from an effort to overcome the difficulty of handling a great number of students. No clinical material is lost to the student for the want of demonstration. Each case whether in the out-patient clinics or in the wards, besides receiving treatment, is exhibited and made the subject of a short clinical lecture. Division of labour and extramural teaching, the latter producing a friendly rivalry between the teachers, are no doubt also important stimulating factors. I may also add that in the clinical lectures pathology and treatment receive special consideration, the latter being seldom left to a few concluding remarks, and in the final examination there is both a written and oral examination in therapeutics.

RETROSPECT OF CURRENT LITERATURE.

Pharmacology and Therapeutics.

UNDER THE CHARGE OF A. D. BLACKADER.

The Suprarenal Gland.

JOKICHI TAKAMINE, M.D. "On the Blood-Pressure Raising Principle of the Suprarenal Gland." *Therapeutic Gazette*, April, 1901.

Although the active principle of this gland dissolves readily in water, an aqueous extract is apt to deteriorate rapidly and become utterly useless, sometimes dangerous. Various preservatives have been tried, but few have proved successful. Recently various attempts have been made to isolate the active principle. Dr. Abel announced in 1898 (*Bulletin of the Johns Hopkins Hospital*, Sept. and Oct.), that he had succeeded in isolating a substance which he considered to be the active principle, and named it epinephrin. But, shortly afterwards, Dr. Furth of Strassburg criticised his methods, and claimed to have attained the isolation of the true active principle by a different method. Neither Dr. Abel nor Dr. Furth, however, were able to obtain their principle in a chemically pure form. In the present paper Dr. Takamine announces that he has succeeded in isolating what he believes to be the blood-pressure raising principle of this gland in a stable and pure crystalline form, a principle which he terms adrenalin. Adrenalin is described as a light white microcrystalline substance showing itself in several different crystalline forms, the form varying according to the condition of the solution from which it is made. It has a slightly bitter taste, and leaves a numb feeling on the tongue at the spot to which it has been applied. When dry it is perfectly stable. On heating it over 200° C., it turns brown, melts, and at a still higher temperature it is decomposed. It is with difficulty soluble in cold water, more readily in hot. Adrenalin shows a slightly alkaline reaction on moistened litmus paper. The colourless aqueous solution is easily oxidized by contact with the air, its colour changing from pink to red, and eventually to brown. Adrenalin is easily soluble in acids or alkalis, and forms salts which are crystallizable with difficulty. The physiological activity of adrenalin is

well marked; an aqueous solution of the strength of 1 in 10,000 blanches the normal conjunctiva within from 30 to 60 seconds. It is a powerful astringent. Intravenous injection of it produces a powerful action upon the muscular system in general, but especially upon the muscular walls of the blood vessels, and the muscular wall of the heart, resulting in a great rise in blood pressure. A test of the comparative strength of adrenalin with that of the fresh extract of suprarenal gland shows that adrenalin is 625 times stronger than suprarenal extract.

The therapeutic applications of adrenalin are already numerous and new uses for it are constantly being found out by different experimenters. Applied locally it is the most powerful astringent and hæmostatic known. It may be of service in all forms of inflammation; it is a stimulant to the heart muscle. At the same time it greatly increases the work of the heart. It is said to be non-irritating, non-poisonous, and non-cumulative. Its employment has given satisfactory results in the treatment of the following diseases and conditions: acute conjunctivitis, some forms of deafness, laryngitis, laryngeal phthisis, asthma and hay fever, nasal hæmorrhage and in hæmophilia and exophthalmic goitre. The writer regards its therapeutic efficacy as established beyond doubt, and thinks that unquestionably it will attain to a prominent place in *materia medica*.

BATES, W. H., M.D. "A contribution concerning the efficacy of the Suprarenal Gland, both internally and locally, with report of cases." *International Medical Magazine*, December, 1900.

Dr. Bates has, for some years, employed the dried and powdered gland, by placing 5 grains on the tongue, and directing that it be gradually swallowed, without water. In this way he thinks that a portion is absorbed, before reaching the stomach. For local uses he prepares a solution by mixing one part of the dried gland with 10 parts of water. After standing a few minutes, this is filtered, and is ready for use. Fresh solutions should be prepared as required. The solution may be sterilized by heat, without destroying the active principle. A large number of preservatives have been employed, to prevent changes taking place in the solution. Dr. Bates states that he has experimented with every antiseptic which has been recommended; and all have disappointed him. The extract forms the best known hæmostatic. It controls nasal hæmorrhage, in bleeders. For operations in the nasal passages it is beyond praise. After its use, hypodermically, the normal skin may be incised, without the loss of a drop of blood. This statement, he says, may seem extravagant, but has been confirmed so often, in his experience, that he regards it as absolutely true. Secondary hæmorrhage may be expected, because the action of the remedy, like the other therapeutic

agents, is temporary; but he states that he has less secondary hæmorrhage now than before, when suprarenal was not used. Although the suprarenal is so powerful, it is not objectionable in any way. It has been employed, with much success, in patients the subject of hæmophilia. Hæmorrhage from the stomach and bladder has been controlled by the extract used locally, and its internal administration has stopped uterine hæmorrhage, in epithelioma of the cervix; it is also a most powerful astringent. It is of much value in acute inflammations of the mucous membrane of the eye, ear, nose, and throat. In stomach inflammations, the astringent property of the extract is a valuable adjunct to antiseptic or other treatment. The suprarenal extract is the only powerful remedy which can be instilled in all diseases of the eye, without producing harm, and is of much service both in iritis, conjunctivitis, and glaucoma. Dr. Bates states that the continual use of the suprarenal, in the eye, is followed by no bad effects. It is also of great value in inflammations of the ear. In affections of the nose and throat, Roe states that he can hardly find words to express his appreciation of it. There is no styptic, he says, that compares with it in the prevention or arrest of nasal hæmorrhage, and no remedy so potent in the arrest of acute rhinitis and colds in the head, in the control of hay-fever and asthma, in the reduction of inflammation about the fauces, in the control of tonsillitis and laryngitis, and in the reduction of cedematous conditions, particularly of the larynx. Combined with this direct control of local disturbances, it has not only no depressing effect upon the system, but, on the contrary, a decidedly tonic effect. Roe mentions a precaution that should be observed in applying dressings, after the employment of the suprarenal extract. The dressing should be made much lighter than would be used in controlling hæmorrhage when the extract was not employed, else, with the re-establishment of the circulation, the pressure may be too great. Its local application has given also much relief, in hay-fever. It is said also to be of service in cedema of the glottis, in bronchitis and hæmoptysis. Bates describes it as a powerful heart stimulant, safe, rapid, and efficient.

LEWIS S. SOMERS. "The Employment of the Suprarenal Gland in Hay Fever." *Philadelphia Medical Journal*, December 8, 1900.

Dr. Somers has employed the suprarenal gland both applied locally and administered internally in the treatment of hay fever in 21 patients, 19 males and 2 females, the youngest being 17, and the oldest 56 years. The time during which the patients received the adrenal exclusively varied from one to 6 weeks, 10 being obliged to discontinue the tablets, after a week's trial, on account of disagreeable symptoms. Several used them continuously, for 6 weeks, and in 4 it was administered at irregu-

lar intervals; but at least one tablet daily from 2 to 3 weeks. He regards the tablet as the best form in which to employ it, all patients beginning on one 5-grain tablet, every 2 hours; and in those in whom this amount produced unpleasant symptoms the dose was reduced by half. Doses of from 15 to 75 grains were given daily without the production of any untoward symptom, but, at the same time, without much appreciable benefit to the hay fever. In some cases, it appeared to increase the tendency to asthma. Better effects are obtained when the tablet is allowed to dissolve on the tongue. If immediately swallowed, little or no appreciable results were obtained. Its effect upon the mucosa of the upper respiratory tract is practically nil, when swallowed; but when it is allowed to dissolve in the mouth, a slight action is observed. The untoward or disagreeable effects produced were nausea, a sense of chest constriction, and the development of asthma, or the augmentation of the paroxysm which was already existing. The nausea was slight, and rapidly disappeared. A sense of chest constriction was observed only in those with pre-existing asthma, or in those who developed it while under observation.

Although Dr. Somers does not recommend a long trial of the internal use of the drug in this affection, he considers its local employment of great value. When applied to the mucosa of the nose and pharynx, he says we can depend upon restoring the nasal respiration, diminishing secretion, and practically making the patient comfortable so long as the applications are continued. In conjunction with other measures suited to the individual case, Dr. Somers regards its local employment as the most satisfactory single remedy that we at present possess.

On Cacodylate of Iron.

GILBERT AND LEREBROULET. "On Cacodylate of Iron." *Journal des Practiciens*, Sept. 1, 1900.

Cacodylate of iron may be obtained either from the interaction of cacodylic acid and the subcarbonate of iron, or by double decomposition between the soluble cacodylate of barium and sulphate of iron. Ferric cacodylate, thus obtained is an amorphous powder, gray, or brownish in colour, soluble in water, and reddening slightly litmus paper. It contains 45% of oxide of iron, and 32% of arsenic. Its toxic action is, however by no means so great as might be inferred from its chemical composition.

The writers have administered this drug, both by the mouth and hypodermically. When used hypodermically, the solution must be a weak one, as with stronger solutions indurated nodules are liable to occur, which may persist and be very painful. A three per cent. solution however is

well borne, and of such a solution from 2 to 3 cm. may be injected at one time. In one case only did general symptoms follow this mode of injection. No renal complications were observed. Hypodermic injections are not always convenient and practicable, and in such cases, the authors have administered the ferric cacodylate in water, after the two chief meals. In almost all the cases the drug gave rise to no untoward symptoms, but in a few instances, the patients complained of gastric pains. The strong garlicky odor of the breath so frequently resulting from the use of sodium cacodylate, does not appear to have been noticed; nor was there any indication of renal irritation.

The doses employed varied from 15 to 25 centigrams (2-4 grains) *per diem*, but the hypodermic method is recommended as distinctly more effective than its administration by the mouth. Very excellent results are stated to have been obtained from its employment in chlorosis. One case is mentioned by these writers, of more than 4 years' standing, which had resisted other methods of treatment, and in which the red blood corpuscles rose, in 20 days, from 1,725,000 to nearly 3,000,000, and the hæmoglobin from 35% to 60%.

On the Value of Formaline as a Disinfectant.

The value of formaline as a disinfectant is discussed in an editorial article, *British Medical Journal*, December 1st, 1900. The writer states that it has been claimed by many experimenters that the gas possesses considerable penetrating power; and time appears to have been wasted, in demonstrating that such a claim is exaggerated. As Dr. Kenwood has pointed out, the specific gravity of formic aldehyde is about the same as that of the atmosphere; and it therefore diffuses more readily than either sulphurous acid or chlorine; but to expect it to penetrate through several thicknesses of closely folded blankets, at the current temperature and pressure of the room, is to expect a physical impossibility. No gas, under these conditions, can ever effect much more than surface disinfection; and the numerous bacteriological experiments which have been performed, to ascertain if the gas possessed such powers of penetration, were unnecessary. Recently, Dr. M. J. Roseman, Director of the Hygienic Laboratories in the United States Hospital, Marine Service, in a series of carefully executed experiments, tested the value of the method of a formaline disinfection, largely practised in America; a method which consists in sprinkling formaline (a 40% solution of formic aldehyde) upon the upper layers of infected clothing, placed in trunks; or pouring some on to absorbent material placing this in the corners of a trunk. This he finds by no means invariably successful, and increasing the time of exposure beyond 24 hours

does not increase its efficiency. The evaporation of a solution in a closed container is slow and uncertain, owing to the fact that formic aldehyde is given off at ordinary temperature from its aqueous solution, in very small amounts.

Abba, (*Centralblatt für Bakteriologie*, Band XXVIII, nos. 12 and 13), as a result of experiments to test the value of formaldehyde as a disinfectant for rooms, states that it is not to be relied on, when there is much perceptible dust in the room. It does not penetrate bedding; it requires at least 10 hours, for each room, and in cases where ventilation is difficult, the rooms are not inhabitable for 24 hours. He concludes that on account of the variability and inequality of its effects, it cannot be considered as an efficient disinfectant, for general use.

The Value of Glycerine as a Medium for Antiseptics.

VON WANSCHHEIM, "The value of glycerine as a medium for antiseptics." *Wiener Klinische Wochenschrift*, July 26, 1900.

Glycerine has some definite disinfecting power, both when pure, and when moderately diluted with water. Although less than 30 per cent. glycerine has no effect on the bacterium coli, or the staphylococcus aureus, 50% to 70% glycerine kills the staphylococcus more quickly than pure glycerine. Owing to this distinct antiseptic action of its own, it would appear, theoretically, to be an excellent medium for the employment of other antiseptics. Practically however, this is not the case. With three exceptions, all the substances used in the writer's experiments, developed a much feebler antiseptic power, when diluted with glycerine than when mixed with water. This statement applies to solutions of sulphuric acid, oxalic acid, carbolic acid, creolin, lysol, tannin, and thymol. The three exceptions to this rule are glacial acetic acid, which has the same bactericidal power with glycerine as with water, and acetone and hydrochloric acid, which are more powerful bactericides, when mixed with glycerine than when diluted with water. The addition of glycerine to antiseptic soaps likewise lessens greatly their antiseptic value. Thus, a 10% solution of soft soap in pure glycerine, to which 5% of carbolic acid is added, requires 30 minutes to destroy the staphylococcus; while a solution made with soap and water, instead of water and glycerine, requires only five minutes. 2½% and 5% solutions of carbolic acid and glycerine have no antiseptic action whatever.

It is a remarkable fact that the addition of water to solutions of carbolic acid in pure glycerine increase their antiseptic power; so that 5% solution of carbolic acid in pure glycerine becomes efficient, when it is reduced to a 2½% solution, by the addition of an equal quantity of water. A 10% solution in glycerine, however, has the same value as one of an

equal strength in water. Carbolic acid, therefore, when used as an antiseptic, should not be mixed with pure glycerine in concentrations of less than 10%. If less concentrated solutions are required, the glycerine should be diluted with an equal quantity of water.

A. D. Blackader.

Jaborandi and Its Alkaloids.

JOWETT AND MARSHALL, "Jaborandi and its alkaloids." *British Medical Journal*, Oct. 13, 1900.

Jowett finds in the leaves of the *Pilocarpus pennatifolius* and the *Pilocarpus microphyllus* varying amounts of pilocarpin and isopilocarpin but no jaborin. Pilocarpidin is found only in the leaves of true jaborandi, now very rare.

Pilocarpin and, to a less extent, isopilocarpin, which is a derivative of pilocarpin, represent the physiologically active principles of the plant. The jaborin of commerce is found to consist of coloring matter with a small amount of the above mentioned alkaloids and has only a mild pilorcarpine effect.

Various specimens of Ext. Jaborandi Liquidum (B.P.) were tested physiologically and found to vary greatly in their physiological activity.

The authors consider these extracts so variable in their strength that they advise their complete abandonment by the clinician and recommend the use of the alkaloid in the form of its nitrate, a stable salt fairly soluble (1 to 7) in water.

J. T. Halsey.

Clinical Therapeutics.

On the Cause and Cure of Insomnia.

Sir James Sawyer, M.D., F.R.C.P., *British Medical Journal*, December 8, 1900, in a course of lectures on the treatment of insomnia, advises the physician to study, as far as he may be able, the particular causation of insomnia, and endeavour to remedy that rather than resort at once to the assistance of hypnotics. Such drugs are only to be given in exceptional cases. The successful treatment of a case of sleeplessness as a rule follows from the discovery of its cause. The writer groups the different varieties of intrinsic insomnia into three classes: Psychic, toxic, and senile. In the psychic group, undue cerebral activity is the primary vice, and its subjects are mostly men of the so-called nervous temperament. In the toxic variety, the cause of the sleeplessness acts primarily upon the blood-vessels of the brain, inducing an arterial hyperæmia. Tobacco, alcohol, tea and coffee are the external poisons which most frequently give rise to insomnia; the internal, or autogenetic poisons which produce this effect are the waste products of tissue metamorphosis, so apt to accumulate in the bodies of gouty persons, or those whose kidneys are inadequate. Senile insomnia is mainly, if not entirely, the result of the senile degeneration of the smaller cerebral arteries. They have lost their resilience and contractility, and are not able to adapt themselves to the conditions necessary for normal healthy sleep. This condition of lack of resiliency, however, is largely counteracted by the cardiac feebleness, which so often exists as a conservative lesion.

In the severer forms of psychic insomnia, it may often be necessary to secure sleep for a short time by the action of an efficient hypnotic. Acute insomnia, dependent upon some sudden mental shock or strain may often thus be relieved; and a few nights of sound and sufficient sleep, artificially induced, will do more than anything else to restore to the brain the power of sleeping without further aid from drugs. Great caution, however, should be used in the exhibition of hypnotics. Many human lives are yearly lost, as a consequence of overdoses of hypnotics taken by sufferers from insomnia. It is to be remembered that all drugs which produce sleep as a physiological effect, and the relief of insomnia as a therapeutic action, with the exception perhaps of the bromides, produce stupor rather than sleep in overdoses; a stupor which deepens into the sleep which knows no waking when taken in larger doses still. One important point must not be overlooked; an overworked man or woman must never

be permitted to go on with their overwork and habitually secure sleep by the use of hypnotics. In such cases we must relentlessly aim at preventing the sleeplessness by removing its cause, rather than pursue the illogical and dangerous course into which a patient would often persuade us, of permitting that cause to continue, and of trusting to medicine to counteract or suppress one of its effects. Whatever the cause of insomnia a holiday with complete change of scene, and with distinct change of activities will often do much to cure. Great, however, as is the curative influence of new surroundings and new outlets for energy, psychic insomnia will often demand the use of drugs. Potassium bromide is by far the best hypnotic in well nourished patients, and in the slighter cases generally. It is a direct and quite safe brain sedative; but it must be given properly and in full doses, 30 to 60 grains, dissolved in sufficient water, taken after getting into bed. In many cases of chronic wakefulness, arising from prolonged mental strain, the patient is distinctly anæmic. The insomnia cannot be cured, unless this condition be cured. Such a person generally feels drowsy when he is up, but becomes wakeful as soon as he lies down. Such a one requires hæmatinics, and his diet should be generous. In these cases, alcohol is often the best hypnotic, as it gives, perhaps better than any other drug, rest and sleep to the wearied brain of persons whose blood is poor. In almost all cases of chronic psychic insomnia, when the patient is worried and weakly, sorrowful, and anæmic, alcohol properly employed will be of the greatest service. We need not exaggerate our responsibility in thus prescribing of alcohol, but we should never forget it, and we should explain to our patient the reasons for employing the remedy, and direct that the remedy is to be discontinued when the conditions, which called for its exhibition, have disappeared. Among the important details to receive attention in such cases, Sawyer insists that the patient go to bed and get up at fixed and regular times. Lying in bed in the morning is not a remedy for insomnia. Daily bodily exercise in the open air always short of great fatigue must be enjoined. Among adjuvants that may occasionally be used are the various methods employed for changing the current of conscious cerebration. To try hard to go to sleep is often the surest way to keep awake. We do many things best, when we forget ourselves; and going to sleep is no exception to the rule. Binz, quoted by the late Dr. Pereira, recommends the taking of deep inspirations, a plan which may be of service in promoting the sleep of a person in bed. The bedclothes which cover the patient should be sufficient, but not excessive. He must neither feel chilly, nor must the body be overheated. In all cases the bedroom window should be open all night and all the year round, but arrangements should be made so that there be no draught over the patient. The head of the bed is better away from the wall, and the best bed on which to lie is a hair

mattress covered with a sheet and a blanket and supported upon a chain stretcher. In some cases, a little food, taken just at the time for sleeping, is an efficient soporific. Sleep may sometimes be induced by the temporary application of cold to the head or to the general surface of the body. A patient who has been lying awake will often fall asleep at once, on regaining his bed, after sousing his head, neck and hands in cold water; or after following Charles Dickens's plan of standing at his bedside until he feels chilly, then shaking up and cooling his pillows and bedclothes, and again getting into bed.

In toxic insomnia, a special endeavor must be made to act on the maxim, *causantē causa cessate et effectus*. We must stop or lessen the consumption of tobacco, alcohol, tea, etc., as the case may be. Gouty insomnia, and the sleeplessness arising in some chronic kidney diseases involves a consideration of the whole question of the therapeutics of the maladies upon which these forms of wakefulness depend.

Senile insomnia is very obstinate. Perhaps in the bromides, with full doses of hops or henbane, we have the most efficient and least harmful medicinal means of relieving such, while the promotion of sleep may be accomplished by an intelligent combination of some of the non-medicinal measures to which reference has been made.

On the Treatment of Paralysis Agitans.

DR. R. T. WILLIAMSON. "On the Treatment of Paralysis Agitans."
Medical Chronicle, Feb., 1901.

In a very excellent article on the subject of paralysis agitans, Dr. Williamson states that he has tried carefully a large number of drugs which have been recommended by various writers, and has in many cases pushed them until even toxic symptoms have appeared, but, in the majority of instances has not observed the slightest benefit. He mentions among the drugs that he has thus employed but found useless, arsenic, quinine, potassium iodide and bromide, strychnine, cannabis indica, caffeine, nitroglycerine, chloral hydrate, and chloretone. The drugs which in his hands have proved of most benefit in the palliative treatment of this affection are hyoscine hydrobromate, and its congeners, duboisine sulphate, and hyoscyamine. Hyoscine hydrobromate he has found most useful. Although recommended some years ago by Erb, of Heidelberg, little reference is made to it in recent accounts of this affection in English medical literature; a few writers indeed have stated that they have not found it of any service. Although Professor Erb recommended the drug to be used hypodermically Dr. Williamson generally ordered it in pill form in doses of from 1-200 to 1-150 of a grain to be taken three, afterwards four times a day for long periods.

In some cases the best results were only obtained when the drug was given in solution in chloroform water, and the amount increased to 1-75 and even 1-50 of a grain. Such doses of course should be given with great caution and only arrived at very gradually. Though the tremor is not arrested by these doses it is undoubtedly diminished, and the general restlessness, such a troublesome symptom of the disease, is lessened. Sleeplessness is often a troublesome symptom of paralysis agitans at an advanced stage, and one point of practical value is that the bed should not be too soft. For the troublesome pains in the limb antipyrine or phenacetin are sometimes of service.

The Value of Camphor as a Stimulant in Typhoid Fever.

DR. STENDEL. "The value of camphor as a stimulant in typhoid fever."
Therapeutic Gazette, Nov. 15, 1900.

Dr. Stengel urges the claims of camphor as a cardiac stimulant in typhoid fever, and says it is of value for the maximum stimulation which is required to combat the depression resulting from diarrhoea and tympanites. In such cases after alcohol has been pushed to the limit of safety and strychnine has been administered as freely as seems advisable, injections of camphorated oil, as advocated by Von Ziemssen, will be found to be of much value. One grain of camphor dissolved in fifteen minims of sterile olive oil, may be injected under the skin, without pain and with rarely any unpleasant after results, such as indurations or abscesses. The oil is quickly absorbed and the stimulation is prompt and continuous. As much as one or two grains every second hour may be given for several days, but as a rule the interval between the injections should be four hours. The drug commends itself particularly on account of the quieting effect on the nervous system. It is also of service in those cases in which obstinate hiccough has occurred, and several times this same symptom in diseases other than typhoid, has yielded to injections of camphorated oil, when other remedies had failed.

Bromides in the Treatment of Epilepsy.

DR. H. A. HARE. "To increase the effectiveness of Bromides in the Treatment of Epilepsy. *Therapeutic Gazette, Nov. 15, 1900.*

Dr. H. A. Hare recommends that an endeavor should be made to render the body more sensitive to the action of the bromides by withdrawing the chlorides from the diet. It is generally held that about 200 grains of salt is required by a man of average weight every day, and that at least 35 grains should be provided, though he may not

thrive on this. If the diet is made to consist of milk, eggs, meat, meal, and potatoes the amount of chlorides obtained is but small. The patient is thus starved of this article of food. If the bromides are then administered, Toulouse asserts as much as 60 grains of bromide of sodium given each day, will cause a great decrease in the number of attacks, and this amount may afterwards be cut down to 30 grains daily. It is believed that the most active forms of epilepsy are especially amenable to this treatment, and in these if it be necessary to cut the quantity of salt down to the lowest possible measure, an absolute milk diet may be insisted upon. Such limitation of the iodium chloride however cannot be continued over a long period in consequence of the danger to nutrition; but it may be useful in specially selected cases when it is necessary to produce rapidly a bromide influence.

On the Treatment of the Pyrexial State.

Among the papers presented to the 13th International Congress, in Paris, was one by M. A. Robin, on the treatment of fever. Mr. Robin considered that this should be based upon the study of metabolism in the patient. Two types of pyrexia were to be recognized. 1st, the simple, where oxidation and respiration were increased, and 2nd, the grave, the result of severe intoxication, where oxidation was diminished, and dissimilation increased. In fever of the first type, antipyretics, the controllers of oxidation, were indicated. In the second type, however, these drugs were injurious. Here three indications existed. First, the phenomenon of disintegration should be diminished, by the use of certain antipyretics, such as quinine, if given in small doses, $7\frac{1}{2}$ grains to 9 grains, daily. Large doses would have the opposite effect. Second, oxidation should be encouraged by aëration, the inhalation of oxygen gas, the drinking of large amounts of fluid, and by hydrotherapeutics. Third, the excretion of waste products must be facilitated, and their retention prevented. For this purpose, it was necessary that they should be soluble. The author thought that by the administration of salicylic and benzoic acids, soluble glycocoll was converted into the soluble salicylate, salicyluric acid and hippuric acid, which were easily eliminated from the urine.

A. D. Blackader.

Pathology.

UNDER THE CHARGE OF J. GEORGE ADAMI.

Cirrhosis of the Liver.

MAUDE E. ABBOTT, M.D. "Pigmentation Cirrhosis of the Liver in a Case of Hæmochromatosis." *Trans. Path. Soc. London, Vol. LI., Pt. 1, 1900.*

This paper is a very full study of a case of this very rare condition which was brought before the Montreal Branch of the British Medical Association in May, 1898, by Drs. Stewart and Adami, a case which was the first of its kind observed in America, and indeed the first recorded as occurring in a female.*

Hæmochromatosis is a condition of pigmentation of various organs of the body and of the skin, first studied as an entity by Von Recklinghausen in 1889, the pigment being iron-containing and in fact hæmosiderin. Advanced cases show, almost without exception, an extensive cirrhosis of the liver with great pigmentation of the organ and in addition to this, a condition of chronic interstitial pancreatitis with diabetes. In fact the cases of "Diabète Bronzé" of French writers are cases of this condition.

Now the ætiology of these three conditions, cirrhosis, diabetes and hæmosiderosis, is alike obscure and it is well worth asking whether the one condition be dependent upon the other or whether all are due to the action of one common cause, and Dr. Abbott, in her study of the case in question, brings forward observations and evidence which materially advance our knowledge in the causation of at least one of the conditions, namely, the hæmochromatosis. The patient, a woman of 50, was admitted to the Royal Victoria Hospital under Dr. Stewart in July, 1897, and her history was rather characteristic. For more than 10 years she had been in the habit of taking a glass or two of gin—undiluted—daily, though of late the gin had been replaced by beer. For years also she had been in the habit of drinking a mixture of vinegar and soda two or three times daily. It is not surprising that with this history for two years previous to admission there had been symptoms pointing to gastric irritation, with pain and vomiting at intervals. Upon admission the skin had a dark bluish or slaty color, the color was so characteristic that she

* While Dr. Abbott was engaged in studying this case Dr. T. Opie, of Baltimore, published an admirable study of another case in the *Journal of Experimental Medicine*, Vol. 4, 1899.

was known throughout the hospital as "Blue Mary." There were physical signs pointing to effusion into both pleural cavities; there was cough with scanty brown sputum, and frequent vomiting after meals, while in the epigastrium could be felt a firm hard mass having a rough or convex surface with well defined borders. The movements of this mass were synchronous with those of the liver. The spleen was considerably enlarged and there was frequent epistaxis. The urine presented at no time abnormal characters save an occasional trace of albumin; sugar, although frequently tested for, was never found present. The diagnosis made was, doubtfully, either malignant disease of the liver with secondary pigmentation, hepatic cirrhosis, or disease of the head of the pancreas with adhesion to the liver.

In April, 1898, she suddenly became worse, passed into a semi-stuporose state and died on the following day. The cause of death was found to be hæmorrhage from the varicose submucous veins of the œsophagus. The liver was found to be the seat of a very extensive cirrhosis with abundant adhesions to the diaphragm; the organ presented everywhere small lobular islands of dirty yellowish color surrounded by bluish-grey fibrous tissue. The spleen was relatively enormous and the pancreas showed a fairly advanced condition of interstitial pancreatitis. There was mixed nephritis and pigmentation of the stomach and intestines.

In studying this case Dr. Abbott points out, following Kretz, that a certain amount of hæmosiderosis is common in conditions of cirrhosis. Among 16 cases of cirrhosis examined by her from material at the Royal Victoria Hospital, she detected the condition 6 times. On examination of other livers, not cirrhotic, she found in all cases a history of localised blood disintegration either in the form of hæmorrhage or chronic suppuration, together with, in all cases a history of some intestinal disturbance. Indeed, as she points out, what is common in all these cases, is the evidence of more or less chronic intestinal disturbance. Hintze has pointed out that the earliest stage of recognisable hæmochromatosis is that in which the walls of the small intestine alone are involved.

She suggests the following conclusions:—

1. In general hæmochromatosis some primitive agency, as yet unknown, is at work leading to (a) an increased destruction of hæmoglobin, either in localized hæmorrhages or within the blood stream—or perhaps sometimes within the parenchymatous cells themselves—and (b) a degeneration of the cells of certain organs in which they become unable to throw off the granular pigment deposited in them, and becoming loaded, finally disintegrate.

2. The cirrhosis would seem to be of the nature of a chronic interstitial inflammation secondary to the presence in the tissues of pigment set free after the destruction of the parenchymatous cell.

3. Hæmosiderosis is observed in her case, as in many in the literature, to be associated with the history of intestinal disturbance and at times a prolonged suppuration.

These facts suggest that the primitive agency leading alike to blood destruction and cell degeneration may be bacterial in its nature.

Obstructive Biliary Cirrhosis.

W. W. FORD, M.D., D. P.H. "Obstructive Biliary Cirrhosis." *Amer. Journ. of Medical Sciences*, January, 1901.

Obstructive biliary cirrhosis was only established as a distinct pathological condition in 1874 by Wickham Legg, and the observations of Charcot in 1876 caused the existence of the condition to be generally recognized. Experimentally, as pointed out by Legg and previously by Wyss in 1866 and by Meyer in 1872, closure of the common bile duct in animals leads to the development of the condition of cirrhosis. In 1882 Mangelsdorff of Leipsig collected together various cases of cirrhosis and was able to report 184 cases due to obstruction of the biliary passages. He concluded that no particular variety of cirrhosis may be said to be dependent upon disease of the bile passages, that practically any condition of fibrosis of the liver can follow obstruction of the ducts. It is rather remarkable that while in eight years, 1874 to 1882, Mangelsdorff was able to collect such a large number as 184 cases, in the literature since Mangelsdorff's paper appeared, that is to say, from 1882 to 1900, Dr. Ford, although he made the fullest use of his opportunities to study in the Surgeon-General's Library at Washington, only came across 21 distinct cases of cirrhosis of the liver due to obstruction of the bile passages. Evidently the observations of Legg and Charcot had called especial attention to this form during the years immediately following their publications, for to these 21 cases Ford was able to add 3 cases taken from the records at the Royal Victoria Hospital—in other words, the condition is much commoner than is indicated in the literature.

Dr. Ford gives a full study and analysis of these 24 cases.

The causes of obstruction are: (1) Congenital deficiency of the bile ducts; this is the most frequent cause of complete obstruction, the infants usually dying at the age of 6 or 8 weeks with the liver enormously enlarged and profound jaundice and cachexia. (2) Gall stones; this stands next in order of frequency and according as the flow of bile be partially or entirely cut off so was there found either an interlobular cirrhosis of moderate extent, or the more advanced stage of the condition. (3) Cancer of the head of the pancreas and (4) enlarged glands at the hilus of the liver are rare causes of the condition.

Dr. Ford is inclined to regard the presence of new bile ducts or otherwise, strands of degenerated liver cells forming a wreath around the

larger old bile ducts and surrounded by a considerable amount of fibrous tissue, as characteristic of at least the early stages of the condition. He points out that in the lower animals, as shewn by Vaughan Harley, the cirrhosis is not associated with infection, it is purely the result of obstruction and of an irritation of the tissue immediately around the bile ducts. He doubts whether in man there is not always a certain amount of accompanying infection, or what indicates infection, namely a moderately acute inflammation. While anatomically the type of the cirrhosis of the liver seen in man cannot, save possibly in the earlier cases, be differentiated anatomically from the type of liver seen in Hanot's hypertrophic cirrhosis with jaundice, nevertheless the symptom complex of obstructive cirrhosis is so absolutely different from Hanot's cirrhosis in the variety of its symptoms and in the frequency with which they occur, as to justify the statement that obstructive biliary cirrhosis is a distinct morbid condition and quite apart from any other variety of cirrhosis of the liver.

He gives the following valuable table of the clinical distinctions between Hanot's and obstructive biliary cirrhosis:—

	HANOT'S CIRRHOSIS.	OBSTRUCTIVE CIRRHOSIS.
<i>Course of Disease.</i>	Chronic.	Acute.
<i>General Health.</i>	Good.	Poor.
<i>Emaciation.</i>	Slow.	Rapid.
<i>Loss of Weight.</i>	Slow.	Rapid.
<i>Intermission of symptoms.</i>	Common.	Does not occur.
<i>Fever.</i>	Common.	Rare.
<i>Anorexia.</i>	Rare.	Common.
<i>Good Appetite.</i>	Common.	Rare.
<i>Vomiting.</i>	Rare.	Common.
<i>Jaundice.</i>	Slight at first, increasing.	Deep from the first.
<i>Clay-colored stools.</i>	Rare.	Constant.
<i>Bile-stained urine.</i>	Common.	Constant.
<i>Enlargement of Liver.</i>	Common.	Common.
<i>Contraction of Liver.</i>	Rare.	Common.
<i>Ascites.</i>	Rare.	Common.
<i>Edema of Extremities.</i>	Rare.	Common.
<i>Caput Medusae.</i>	Rare.	Common.

Reviews and Notices of Books.

THE ANATOMY OF THE BRAIN. A Text-book for Medical Students. By RICHARD H. WHITEHEAD, M.D. Professor of Anatomy in the University of North Carolina. Illustrated with forty-one engravings. \$1.00. The F. A. Davis Co., Philadelphia.

This small monograph is intended to supply the growing want of up-to-date anatomical knowledge of the central nervous system. There is confessedly no part of human anatomy so puzzling as this, and the great strides that have been constantly made in brain surgery as well as in clinical work in diseases of the nervous system make it necessary for every progressive practitioner of medicine or surgery to possess a work of this kind, giving, as it does, the latest and most approved nomenclature as well as a profusion of illustrations showing the mode of development and the ultimate anatomical construction of the central nervous system. The explanatory text has the merit of being concise and at the same time sufficiently descriptive for the reader to acquire a clear understanding of a subject which many of us have been in the habit of regarding as hopelessly involved and incomprehensible. The author is certainly to be congratulated on the success of his undertaking.

DISEASES OF THE NOSE AND THROAT. By J. PRICE BROWN. Illustrated with 159 engravings, including six full-page colour plates and nine coloured cuts in the text, many of them original. Philadelphia, New York and Chicago, The F. A. Davis Company, 1900.

The author, in preparing this work for the student in medicine and the general practitioner, is to be congratulated upon the results of his labour. The subjects are presented in a very readable form and are generally in keeping with the views of the present day. The reviewer, however, differs from the author in several points. In the first place, it seems extraordinary that diseases of one of the most important of the accessory cavities of the nose, the frontal sinuses, should not be discussed but delegated to the oculist. Why work which properly belongs to the rhinologist should be undertaken by the oculist is hardly explained by the author in his preface. It is quite true that many advanced cases of disease of the frontal sinus may produce symptoms which may involve the eye and orbit; but how much more frequent are those cases which only produce only nasal symptoms which demand proper attention; and who ought to be thoroughly capable of recognising these lesions and properly treating them but those doing rhinology?

The subject of deformities of the nasal septum does not include Ash's operation, which is now so frequently performed in proper cases with such satisfactory results. In the treatment of epistaxis a remedy which is used frequently and with considerable satisfaction, supra-renal capsule, is not mentioned.

Then again there is an entire omission of diphtheria from the work, and it seems strange to omit a description of the symptoms, for the relief of which an operation (intubation) is described. It hardly seems consistent to describe an operation for the relief of the symptoms of a disease of which no mention is made.

In the subject of spasm of the glottis no mention is made of the status lymphaticus as a cause.

The publishers are to be congratulated on the printing, colour-plates and cuts.

H. S. B.

A TEXT-BOOK OF DISEASES OF THE NOSE AND THROAT. By D. BRADEN KYLE, M.D. Philadelphia, W. B. Saunders, 1900. Canadian Agents, J. A. Carveth & Co., Toronto. Price, \$4.00.

In this work we have diseases of the nose and throat presented in an entirely novel and interesting manner, being arranged "according to the pathological alterations caused by them." The work itself in all its details is a result upon which the author is to be congratulated, and it will be found very useful not only to the general practitioner, but the specialist also will find it a capital book of reference.

Interest is added to the book by the articles of Dr. Keen, in which his own method of dealing with diseases of the larynx requiring surgical interference are fully described. The various subjects under consideration are fully elucidated and the treatment thoroughly dealt with.

The coloured plates and electrotypes are exceptionally good, and the *tout ensemble* of the work reflects great credit upon the publishers.

H. S. B.

A MANUAL OF PRACTICAL HYGIENE. By CHARLES HARRINGTON, M.D. Professor of Hygiene, Harvard University Medical School. Philadelphia, Lea Brothers and Co. 1901. Price, \$4.25.

Dr. Harrington has succeeded in writing a book specially well adapted for the needs of advanced students in hygiene and for those graduates who are making a special study of the subject. At the same time the style is clear and simple and the treatment of the topics dealt with makes it suitable as well for medical students and general practitioners. The chief drawback to its use as a general text-book appears to be that the general subject of infectious disease in relation to hygiene receives rela-

tively little attention, though disinfection and quarantine receives very thorough treatment.

The sections on food and on laboratory methods are better treated than in any of the existing works on hygiene, this part of the book having the completeness of a monograph.

Apart from a few minor errors and omissions, we have nothing but praise for the book, with the proviso that, to obtain a complete survey of the subject, an additional work, such as Abbott's *Hygiene of Transmissible Diseases*, becomes necessary, and this will probably interfere considerably with its general use as a text-book by the numerous class of readers whose library on the subject of hygiene is limited to a single volume.

W. J.

AFFECTIONS CHIRURGICALES DU TRONC. Mamelles et Organes Génitaux de la Femme. Statistiques et Observations. Par le Dr. POLAILLON, Chirurgien Honoraire de l'Hotel Dieu, Professeur Agrégé a la Faculté de Médecine de Paris. Paris, Libraire Octave Doin, Editeur. 1901.

The author is issuing a series of volumes on surgical subjects. This present volume is that devoted to female sexual organs, including the breasts. He does not profess in these volumes to give the profession a treatise on surgery in the ordinary sense, but rather the record of a large personal experience during twenty years in the great hospital with which he is connected. He therefore says that the book is not a treatise on gynæcology, "mais un recueuil de faits complétés par les réflexions d'un clinicien."

The first eighty-six pages are devoted to diseases of the breast and comprise an experience of 446 cases. Of these ten were in the male sex. The number of operations done was 360. In this section, as all through the work, the author gives the whole of his experience in numbers, while illustrative cases are briefly recorded, and the results favourable and otherwise candidly set forth, for as he remarks in his preface, "il est moins utile de connaître les succès que les insuccès et les fautes qu'il faudra éviter."

The subsequent portion of the volume is devoted to the genital organs and embodies a large experience of the whole range of gynæcology. In the light of modern American procedure, some of the author's methods are decidedly antiquated. If, for instance, we take the great question of the surgical treatment of uterine myoma, we find that he adheres to the old method of extraperitoneal treatment of the pedicle, by constriction with elastic ligature and supporting pins. We are not, therefore, surprised to hear of a mortality of 43 per cent., and in those cases that

recovered of a number of annoying complications during convalescence and subsequent ventral hernias. Polaillon, however, admits that in future he will practice the intraperitoneal treatment of the pedicle. He nowhere speaks of having done the conservative operation of myomectomy.

In the treatment of metritis, acute and chronic, of infective origin, such as follows abortion or labour, attended with profuse leucorrhœa and menorrhagia, the author is a strong advocate of a method of treatment, which, so far as we know, is little if at all practiced out of France, and probably, so far as our knowledge of this literature enables us to judge, very little even in that country. This is by the introduction into the uterine cavity of crayons of chloride of zinc paste. Our experience of this agent would lead us to dread excessive action, if not complete destruction of the uterine mucosa. The author admits this danger, and insists on the necessity of experience and judgment. He recommends it especially in hæmorrhagic cases after abortion and others. He relates two cases of intractable uterine hæmorrhage, in which without result the curette had been repeatedly employed, but which yielded to four successive applications of the chloride of zinc paste, the cavity of the uterus being obliterated. By most gynecologists such a case would probably be treated by extirpation of the uterus with very little greater risk to life. Seven cases of infective puerperal endometritis of grave character with high temperature were treated with the chloride of zinc crayons. All recovered, and the author gives a composite temperature chart showing rapid defervescence.

The volume is illustrated by reproductions of a number of drawings of perhaps indifferent value. It is the honest record of the total experience of twenty years of a wide hospital experience in which mistakes, failures, and disasters are all set forth with equal clearness as successes. Would that many more such works were written and replaced the flood of compilations to which we are constantly being treated.

W. G.

PANAMA AND THE SIERRAS, A DOCTOR'S WANDER DAYS. By G. FRANK LYDSTON, M.D. Illustrated from the Author's original photographs. The Riverton Press, Chicago. 1900.

In these pages the author, a well-known Chicago medical man, in a series of sketches, humorous and fanciful, describes the scenes and incidents of a holiday trip. He resolved to revisit California, the land of his birth, which he had left as a boy. Consequently, leaving New York by steamer, he sailed to Colon, crossed the Isthmus by rail to Panama, whence by a coasting steamer he reached San Francisco. The ship called at all the principal ports along the coast and remained long

enough to allow an opportunity to get a glimpse of each. The author has improved his opportunity in a series of very interesting descriptions.

In California he revisited many scenes of mining camps and villages with which he was familiar in his boyhood, and his records afford numerous illustrations of the many uncertainties of gold mining. Some of Dr. Lydston's readers who have invested in gold mining stocks but have never visited gold mines, and still less been practical miners, know a good deal about such uncertainties. To prospective investors in mining shares the author gives this advice:—"Go and look at that hungry hole in the ground before you put your money into it. Having looked, go home and rent a box in a safety-deposit vault and lock up your funds therein."

We know of no better book than this to recommend to the tired doctor for an hour's light and amusing reading after a hard day's work. Some of our Montreal readers will doubtless be interested in the quotations from the book by our old friend and former townsman, Dr. Wolfred Nelson, entitled "Five Years at Panama."

The illustrations of Dr. Lydston's book for the most part add much to its interest, but we question the taste which lead him to include "the necktie party," a reproduction of a photograph of four men hanging, the work of a Vigilance Committee.

W. G.

A SYSTEM OF PRACTICAL THERAPEUTICS. Edited by HOBART AMORY HARE, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia, Physician to the Jefferson Medical College Hospital. 2nd ed., revised and largely rewritten. Vol. I. Lea Bros. & Co., Philadelphia and New York. 1901. Price, \$5.00 per volume.

This system has been prepared with the view of presenting to the general practitioner what is known of the best methods of treating disease.

The first edition, published nearly ten years ago, met with a warm reception from the medical press. The present edition has undergone a most complete revision, more than half of the articles being entirely new. The volume opens with a chapter on general therapeutic considerations, by Prof. H. C. Wood, and contains articles on preventive medicine, and on the treatment of diathetic and nutritive diseases. Among the more important contributions we would mention one on nutrition and foods, by Dr. Burney Yeo, of London; one on the rest cure for neurasthenia and hysteria, by Dr. John K. Mitchell; one on hydrotherapy, by Dr. Simon Barach; and one on disinfection, by Dr. Coplin. Electrotherapeutics is treated by Dr. Rockwell, climate by Dr. Solly, and mineral waters in their medicinal uses, by Dr. Crook. Among the diathetic diseases noticed we have read with much pleasure the article on chronic

articular rheumatism and gout, by Dr. James Stewart; on diseases of the blood, by Dr. Ralph Stockman, of Edinburgh; and on tuberculosis, by Dr. Flick. We have very much pleasure in speaking in the highest terms of the value of this work to all engaged in the general practice of medicine, as affording a text-book which may very fairly be said to represent with completeness the practical aspect of the therapeutic art as it exists to-day.

A. D. B.

A MANUAL OF THE DISEASES OF CHILDREN. By JOHN MADISON TAYLOR, Professor of Diseases of Children at the Philadelphia Polyclinic; and WILLIAM H. WELLS. 2nd edition, thoroughly revised and enlarged. P. Blakiston, Son & Co., Philadelphia.

The authors can very fairly claim to have presented in a clear and concise manner the chief points in the description, differentiation, and treatment of the diseases of childhood, special prominence having been accorded to treatment. The book forms an octavo volume of over 800 pages, and contains excellent chapters on the general hygiene of infants and children, and also general considerations on physical development, and conditions requiring surgical procedures. The work we are sure will prove of much value to students and physicians interested in this department of medicine.

A. D. B.

A MANUAL OF MODERN SURGERY. An exposition of the accepted doctrines and approved operative procedures of the present time. By JOHN B. ROBERTS, A.M., M.D., Professor of Anatomy and Surgery in the Philadelphia Polyclinic, etc. Second edition, revised and enlarged. Illustrated with 473 engravings and 8 plates in colors and monochrome. Pp. 842. Philadelphia and New York, Lea Brothers and Co. Price, \$4.25.

In these days of the many-volume treatise by many writers, it is a pleasure to meet with satisfactory work by a single writer, for, as the author of this work well says in his preface, "a volume from a single pen may be more equable in its teachings than a composite book from many minds." To embody in the space of a single volume of 814 pages an exposition of the doctrines and procedures of modern surgery was indeed a most difficult undertaking, but the author has very skillfully accomplished this end. It is true that he has at times sacrificed detail for the sake of brevity, merely mentioning that an operative measure should be undertaken without describing how it should be done. It may also be noticed that many names that are familiarly associated with methods of treatment have been omitted, a questionable advantage to the student

who may be required to possess this knowledge. Of the many excellent chapters, the one on Fractures is perhaps the best, this most important subject being dealt with in a very practical and comprehensive manner. The illustrations which are numerous, many being from the author's own cases, serve well to illustrate the text. Taken as a whole, this book is one of the best and most practical of the treatises on up-to-date surgery that have recently appeared.

PULMONARY CONSUMPTION, PNEUMONIA, AND ALLIED DISEASES OF THE LUNGS: Their Etiology, Pathology and Treatment, with a Chapter on Physical Diagnosis. By THOMAS J. MAYS, A.M., M.D., Professor of the Diseases of the Chest, Philad. Polyclinic, etc. E. B. Treat & Co., New York and Chicago.

This book has been written with the object of proving that pulmonary phthisis is, in the majority of cases, a neurosis, and as a consequence that all treatment should be directed to the nervous system.

A good deal of space is devoted to a collection of cases from the literature relating to the association of affections of the nervous system and phthisis, and on this and certain other facts the writer bases his views on the etiology of phthisis. A single page is devoted to the tubercle bacillus as an etiological factor in the disease. Whilst admitting the bacillus as an occasional factor in the propagation of phthisis, the author regards its efficiency in this respect as overestimated. The contagiousness of phthisis is rejected, and the value of the bacillus in the diagnosis is not even referred to. So far as we can see, tuberculin is not mentioned. We can hardly believe that the author is quite ignorant of existing views on the bacillary theory, but if so there is no serious attempt to refute them.

Treatment is discussed fully. In addition to the ordinary measures of rest, over-feeding and climate, great stress is laid on large doses of strychnine and injections of nitrate of silver over the course of the vagus-nerve.

We cannot recommend this book as a reliable guide in affections of the lungs. Much of what is good has been better described elsewhere, and the failure of the writer to make out a good case for his theory takes away much of its *raison d'être*.

THE INTERNATIONAL MEDICAL ANNUAL: A Year-Book of Treatment and Practitioner's Index. E. B. Treat & Co., New York and Chicago.

This well-known annual has now attained its nineteenth year. The book is divided into two sections. In the first a short account is given of new drugs and their action, whilst the larger portion of the work is

devoted to the treatment of various conditions, medical and surgical, arranged in alphabetical order.

Although principally devoted to treatment, the annual gives a good deal of attention to pathology, and contains many useful hints in diagnosis. Some of the plates, especially those referring to the parasitic affections of the skin, are excellent.

As a ready work of reference this annual is of great value, and no practitioner can fail to benefit by a frequent reference to its pages.

A PRACTICAL TREATISE OF MATERIA MEDICA AND THERAPEUTICS, WITH SPECIAL REFERENCE TO THE CLINICAL APPLICATION OF DRUGS.
By JOHN V. SHOEMAKER, M.D., LL.D. 5th ed., thoroughly revised. F. A. Davis Company, Philadelphia.

This volume is said to be specially prepared for the use of students, and presents very fully the pharmacology and the therapeutic applications of all the drugs entering into either the British or the United States pharmacopœia. Prescriptions illustrating the mode of employment of the several drugs are very numerous and very complicated. We question whether the author himself could in all cases state the exact physiological action of some of his prescriptions. For this reason we should have preferred that in an edition prepared especially for students' use that simple illustrations should have been employed. In other respects we have no doubt the work will prove of value as a text-book for the medical student.

A. D. B.

PROGRESSIVE MEDICINE: A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by HOBART AMERY HARE, assisted by H. R. M. LANDIS, M.D. Vol. I, March, 1901. Lea Brothers & Co., Philadelphia and New York. Price, \$10.00 per annum.

This volume includes a review of recent advances in our knowledge in the following departments: surgery of the head, neck, and chest; infectious diseases, including acute rheumatism, croupous pneumonia and influenza; diseases of children; pathology; laryngology; and otology. We have from time to time referred to the volumes of this most excellent review of the medical and surgical sciences, with much commendation. The present volume is in no wise behind its predecessors, and in our opinion this practical review is one of the most useful works that the medical practitioner can possess. The information is very carefully collated and placed in the most interesting and practical manner before the reader.

A. D. B.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

Stated Meeting, March 8, 1901.

JAMES PERRIGO, M.D., PRESIDENT, IN THE CHAIR.

Drs. George Hall and Hugh Lennon, of Montreal, were elected ordinary members of the Society.

Suppuration of the Genito-Urinary Tract.

DR. MACPHAIL showed a specimen, consisting of the genito-urinary organs from a man, which had been originally classified as belonging to the class of surgical kidney due to tuberculosis, but there was no evidence of the presence of tubercle bacilli in any part of the tract. The only organism found was a diplococcus in many respects resembling the gonococcus. The interesting point was the causation, the point of origin seeming to be the prostate gland. Suppuration had begun in the prostate and extended up to the kidney.

Otomycosis.

DR. H. S. BIRKETT gave the following report:—

The case which I wish to report this evening is commonly called otomycosis. It is not the clinical history which is of importance, but I will give a few facts. The patient, a woman 45 years of age, complained a good deal of an itching sensation in both ears with a moderate amount of deafness. On examination I found each auditory canal blocked with a black material lying on it, and extending from the meatus almost as far as the tympanic membrane, occupying chiefly the anterior wall. There were a few red spots on the surface of this, and it occurred to me that this was a mixed growth. Though mention in the literature of this subject is not uncommon, many observers having reported the red and yellow varieties, no definite cultures have been made in any case so far as I know. I therefore asked Dr. Johnston to investigate the matter and find out whether this was a mixed growth or not. It turned out to be the common *aspergillus nigricans*. Of other varieties Dr. Johnston may have something to say. Treatment consisted in the instillation of a saturated solution of boracic acid in alcohol. Six months later there was no reappearance of the growth and the hearing was considerably improved. The patient was suffering from a form of eczema at the time

and as this fungus grows more favourably on moist surfaces it may be that this proved a factor in its development.

DR. WYATT JOHNSTON said that the culture showed the characteristic appearance of the specimen at the time of removal. There were little heads projecting above the surface of the growth. The fungus was characterized by peculiar spreading-out rays on which the spores were arranged. It grew very rapidly on potatoe and, as far as he could make out, there was only one form of fungus although bacteria were present. With regard to the species he was a little uncertain. It appeared to correspond with *aspergillus nigricans*, but there were a number of different forms with very similar appearances. It did not appear to be the *fumigatus* as it was black at first and only got smoky afterwards, whereas the *fumigatus* followed the opposite order, becoming black last. He had tested the fungus on rabbits, and it produced little nodules which disappeared some months later. The fungus was found in fowls and often in dogs, more particularly in the spaces within the bones. An epidemic of this fungus in the bones of many of the fowls of one of the zoological gardens was on record.

Ectopic Gestation with Subsequent Normal Pregnancy.

DR. D. J. EVANS reported this case. See page 269 of the April number.

DR. SPRINGLE said that the patient had been under his care for some months previous to her marriage suffering from ovarian disease, but had apparently got well. She had come to him and asked him whether she had better marry, and been advised against doing so. Ten weeks after her marriage she had again consulted him, and she had then had all the symptoms of a ruptured tubal pregnancy, a mass being felt in the pelvis and a certain amount of discharge of decidua coming from the uterus. She was removed to the Montreal General Hospital, where she was also seen by Dr. Blackader. On opening the abdomen quite a large quantity of blood was found in the peritoneum together with a ruptured tubal pregnancy on the right side and a unilocular cyst of the left ovary. The right tube and the pedicle of the left ovary were tied off with silk and removed. The left tube and right ovary seemed to be in good condition and were not removed. The wound was closed and she made a good recovery.

DR. ELDER referred to a previous discussion on this subject which had followed the report of a case by Dr. Smith, who had advocated removing the healthy tube to prevent a possible second tubal pregnancy. Since then Dr. Elder had seen two cases of confinement, one of which he had operated upon himself for ruptured ectopic gestation at the Montreal General Hospital. It was not, however, exactly similar as the ovary and tube of the same side were removed. In the other case the right tube

and ovary were removed for ectopic gestation and a subsequent operation had been performed for appendicitis. He thought the fact that some one had collected as many as seventy cases where a second tubal pregnancy had occurred did not prove that all cases should be so treated as to prevent this accident happening.

Fungating Growth of the Foot.

DR. WYATT JOHNSTON showed a foot amputated by Dr. Armstrong for a peculiar fungoid tumour. The growth projected like cauliflower or Brussel's sprouts. There was a large ulcerating surface with periostitis and thickening of the tibia and fibula. The bones of the foot and the metatarsal bones and phalanges were very much atrophied and softened so that they could be readily cut with a scalpel. A microscopical examination showed the condition to be due to a hypertrophy of the connective tissue and an overgrowth of the sweat glands. The tissues were sodden and oozed serum very abundantly on being cut into. On the under surface was the extensive curious fungating condition.

DR. SHEPHERD had seen the case before amputation took place, and thought it was more like a verrucoid form of syphilis than anything else.

Stated Meeting, March 22, 1901.

JAMES PERRIGO, M.D., PRESIDENT, IN THE CHAIR.

Bothriocephalus Latus.

DR. W. F. HAMILTON exhibited a specimen of this tape-worm. See page 350.

DR. FINLEY drew attention to the fact that Dr. Johnston had brought before the Society on a previous occasion another case of bothriocephalus latus which, if he remembered correctly, was in an Irishman. He referred to the association of anæmia with the presence of the parasite, the type of anæmia being sometimes indistinguishable from pernicious anæmia, both in the appearance of the patient and in the blood characters. It was possible that some of the unexplained cases of persistent anæmia were due to this parasite.

Notes on Three Cases of Phthisis.

DR. E. A. ROBERTSON read the reports of these cases, which will be published later.

Chronic Malignant Endocarditis.

DR. F. G. FINLEY reported this case, and DR. MACTAGGART exhibited the pathological specimens from it. See page 333.

DR. W. F. HAMILTON remarked that, from the appearance of the speci-

men, he thought it possible that there was either rupture of some of the chordæ tendineæ or ulceration of some of the columnæ carneæ. If in the blood stream there had been floating some infiltrated or thickened portions of muscle, this might explain the phenomena.

DR. ANDERSON stated that at the autopsy there was no evidence of rupture of the chordæ tendineæ. The presence of abscess formation or breaking down of an infarct in the spleen pointed to either an ulcerative or malignant endocarditis.

DR. W. E. DEEKS considered the fact of the presence of a presystolic murmur during life with no stenosis of the mitral valve was of interest, as some authors believe that presystolic murmurs never exist without stenosis. Here the vegetations on the valve had been the cause of it. He referred to cases which had come under his notice in which in an old case of endocarditis, a fresh attack of endocarditis had been induced by influenza; and also to one or two cases where a pleurisy had supervened in connection with the acute onset of endocarditis following influenza where the bacillus of influenza had been demonstrated. It was possible that an influenza had had something to do with the production of this condition.

DR. FINLEY, in reply, said that Dr. Anderson had answered Dr. Hamilton's question, and he agreed with him that the rupture had been a post-mortem phenomenon. He referred to cases shown before the society, one by Drs. Martin and Hamilton, and one by himself, in which a presystolic murmur had been present without stenosis. In his own case there had been an adherent pericardium. He was unable to say whether influenza had had to do with the production of the disease, as the bacilli had not been found, and as far as he knew had not been looked for.

Sarcoma of the Nasal Septum.

DR. R. N. CRAIG reported this case, which will be published later.

DR. BIRKETT said that many of these cases of reported sarcomas were really of carcinomatous nature. Seven years before he had had a case under his care and had had an opportunity of examining it frequently since and there had been absolutely no recurrence. Many authors, too, reported cases as not recurrent because they allowed too short a time to elapse to determine the matter. The disease was a fairly common one, over one hundred cases having been reported.

DR. G. T. ROSS asked if there had been any examination of the neighbouring glands.

DR. CRAIG, in reply, said that he had stated that this was an uncommon condition on the authority of Bosworth of New York and Schmidt of Frankfort. There had been no lymphatic enlargement at all, either

in the neck or in the neighbourhood of the growth, and no induration was present.

Insanity in Women from a Gynæcological and Obstetrical Point of View.

DR. A. L. SMITH read a paper on this subject, of which the following is a synopsis:—

From the careful consideration of a large number of recent articles by writers of great knowledge of this subject, added to the writer's own somewhat limited experience, he felt justified in coming to the following conclusions:

1st. Insanity is not hereditary, as is generally supposed, but it is sometimes contagious.

2nd. Insanity in the majority of cases is not due to organic disease of the brain but to functional disorders of its circulation and of its circulating fluid.

3rd. In many cases in women the disorder of the brain's circulation is caused by reflex irritation, carried by the sympathetic from the pelvic organs and caused by retroversion of the uterus, cirrhotic ovaries, fibroid tumor, etc.

4th. In other cases it is the fluid circulating in the brain which is at fault; in some it is too poor in quality because the digestive apparatus is being interfered with by reflex irritation of the sympathetic due to lacerated cervix, endometritis, etc.

5th. In a lesser number of cases the brain is prevented from working because the blood is badly oxygenated or loaded with uric acid or other poisons.

6th. Hundreds of cases are now on record of insanity being cured by removal of the cause; the greatest number of mental cures have followed ventrofixation and shortening of the round ligaments for the removal of retro displacements while many others have followed the ablation of fibroids, cirrhotic ovaries, the repair of lacerated cervices and even curetting.

7th. Such being the case, it is the duty of the family physician to examine carefully every woman in his practice who becomes insane or to have her examined by a gynæcologist, and if any pelvic disease is discovered it should be remedied.

8th. It is the duty of every medical superintendent of an insane asylum to have a systematic examination made, preferably under anæsthesia, so that unsuspected sources of irritation of the sympathetic situated in the pelvis may be removed. In one asylum alone this course has resulted in improvement in 66 per cent. and recovery mentally of 42 per

cent. of those operated upon, although the pelvic troubles had existed for from six to sixteen years.

9th. If anything is done it must be done thoroughly as several cases have been reported where no benefit resulted until a second and more complete operation was performed.

10th. In view of the number of women who become insane from uræmia more care should be exercised by practitioners in preventing this condition. All Protestant physicians should, with the advice and approval of one or two colleagues, empty the uterus before the kidneys become permanently damaged. (Catholic physicians are not allowed by their church to sacrifice the ovum in order to save the mother.)

THE ASSOCIATION OF AMERICAN PHYSICIANS.

The Association of American Physicians met in Washington on April 30th, May 1st and 2nd, 1901. Dr. William H. Welch, of Baltimore, President, in the chair.

In his address Dr. Welch spoke of the advantages offered to students of medicine in the schools of the United States. In respect to post-graduate work in laboratories, America was second to none, but the same could not be said of clinical medicine and surgery, where the only way open to those who desired to become proficient in teaching was through dispensary work and private practice. In other words, the training of physicians had not kept pace with the training of scientists. Dr. Welch also referred to the losses the Association had incurred during the year through the death of so many eminent men, Drs. James T. Whittaker, Jacob M. DaCosta, William H. Draper, and Samuel C. Busey having passed away. Of these, three had been ex-presidents of the association, and all were numbered among the list of founders.

An Undescribed Cardiac Sound.

Dr. Hobart A. Hare, of Philadelphia, described a peculiar vibrating systolic sound heard principally in debilitated patients over an area extending one inch to each side of the sternum at the level of the nipple. It somewhat resembled a friction rub, but was not friction, and the author believed it to be due to vibration of the chordæ tendinæ in an incompletely contracting heart. It could not properly be called a hæmic murmur. Nervousness, but not exercise, increased its intensity. It was best vocalised by the word "ching." Dr. Osler stated that in weak hearts he had heard a sound at the apex somewhat resembling a friction rub and one at the neighbourhood of the sternum of a more crunching character.

The Frequency and the Diagnosis of the Flint Murmur in Aortic Insufficiency.

Dr. W. S. Thayer of Baltimore had found the Flint murmur 45 times in 74 cases of aortic regurgitation. In 12 of these mitral stenosis had been demonstrated at autopsy, while in 17 the mitral valve was normal, and in other cases various changes of the valve were found. Dr. Welch stated as his opinion that a presystolic murmur meant stenosis

of the mitral valve. The following he described as the characters of the Flint murmur:—It is not so hard nor so intense as the sound in mitral stenosis, and the thrill is less frequent and less intense. The characteristic valvular short first sound of mitral stenosis is absent. As an aid to making a diagnosis from mitral stenosis, the absence of endocarditis, and the presence of arterio-sclerosis are of value.

The Causes and Clinical Features of Right-Sided Cardiac Hydrothorax.

Dr. Alfred Stengel, of Philadelphia, pointed out the difficulty of distinguishing between unilateral cardiac hydrothorax and inflammatory pleural effusions. He referred to the greater frequency of right-sided hydrothorax, and held that it could not be accidental. It occurred mostly where there was considerable enlargement of the right side of the heart, and the probable explanation was obstruction of the great azygos vein as it empties into the superior cava by pressure of the enlarged right heart. The anatomical relations of the parts made this explanation the likely one.

Myocarditis and Fatty Degeneration of the Heart.

Dr. Beverly Robinson, of New York, pointed out the frequency of fatty heart in cases of anæmia, gout, and obesity; and held that it added greatly to the danger of anæsthesia. He thought physicians should be careful in advising operations in such patients.

Hæmorrhage into the Pleura from a Pyothorax.

Dr. A. Jacobi, of New York, related the case of a boy aged nine years in whom this condition had occurred. The physical signs and symptoms of pleural effusion were present, and a needle inserted had revealed the presence of pus. Resection of the sixth rib was performed, and first pus, then blood-stained pus, and then pure blood, drained away. The bleeding was seen to come from tufts of granulation tissue on the pulmonary pleura and was controlled by packing the pleural cavity with gauze. Recovery was complete but slow.

Case of Cyst of the Omentum.

Dr. Jacobi also reported this case. An Italian girl of 7 with marked swelling of the abdomen had been tapped twice and two quarts of blood-stained serum drawn off in each instance, followed by an apparent cure of the condition. On a third attempt the trocar was obstructed, when the abdomen was opened, and a thin-walled, multilocular cyst found attached to the great omentum.

A Case of Pneumonia complicated by Pseudomembranous exudate on the mucous membranes of the mouth, tongue, pharynx, nares, conjunctivæ, glans penis, anus, etc., caused by the diplococcus pneumonia.

Dr. Charles Cary, of Buffalo, reported this remarkable case, which occurred in a boy aged 11 years. The symptoms suggested that the membrane was also present over the entire length of the digestive system. The patient recovered.

Further Notes of a Case of Pernicious Anæmia reported at the meeting of 1900.

Dr. E. P. Henry, of Philadelphia, related the further history of this case previously brought before the Association. From his experience the author holds that the presence of megaloblasts does not certainly determine pernicious anæmia, these cells being found in other forms of anæmia as well. The diagnosis of the disease is best made by the aggregate of symptoms.

Report of the Progress of cases of Pernicious Anæmia presented to the Association in 1900, and a report of a case of pernicious anæmia with diffuse spinal cord lesions, with post-mortem findings.

Dr. Frank Billings, of Chicago, added a further report of the history of 20 cases of this disease which he had contributed the previous year. He stated that he had adopted a method for determining what he calls the volume index of the blood. The percentage of red cells is estimated with the hæmatocrit and counted by the hæmocytometer, and a fraction is thus obtained, of which the former is the numerator and the latter the denominator.

Acute Miliary Tuberculosis, Primarily Splenic.

Dr. David D. Stewart, of Philadelphia, reported a case of this nature developing in a nurse who had charge of a tuberculous patient. General rapid tuberculosis developed about two weeks after she took charge of her patient, and the autopsy showed the spleen to be the probable starting point of the disease.

Notes on Relapsing Fever in Hodgkin's Disease.

Dr. John H. Musser, of Philadelphia, reported two cases of Hodgkin's disease in which a febrile period of from 6 to 9 days was followed by apyrexia lasting from 11 to 15 days. In one of the cases tubercle bacilli were discovered in the sputum, and blood from the same patient injected

into a rabbit led to the development of lymphomata in the animal's lungs. The fever was believed in both cases to be due to tuberculosis.

A Study of Granular Degeneration of the Red Blood Corpuscles.

Dr. Alfred Stengel read this paper for Drs. C. Y. White and William Pepper, of Philadelphia. The granules were found in workers of lead, both with and without symptoms, and were extremely constant. They were demonstrated by staining methods, showing a special affinity for certain basic stains. It was thought that their presence might form a valuable aid to the diagnosis of lead poisoning. Experimental administration of doses of lead to dogs had been followed by the discovery of them in the blood.

This concluded the first day's session.

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

EDITED BY

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PREMIUMS TO SUBSCRIBERS.

One of the leading New York weekly journals announced in a recent issue a new feature under the heading of "Subscribers' Discussions." The topic on which discussion is invited is to be announced in advance, the first one being: "What is the best way of treating the stump of the umbilical cord?" and a prize of \$25.00 will be awarded to the subscriber who furnishes the answer most satisfactory to the editor and his advisers. Competitors are limited to subscribers to the journal; members of the editorial staff of the journal making the announcement and all persons known to be engaged in medical journalism, are disqualified. Moreover, no importance will be attached to literary style, and the winner of a prize will be debarred from competing for the rest of the year, the prizes being offered monthly.

In the editorial comment on the above offer it is stated that the object which it is intended to accomplish is to obtain "a number of expressions of opinion on some subject of every-day interest from the "rank and file" of the profession, who do the great bulk of family practice"; and it is very truly remarked that "most general practitioners have very decided convictions founded on their own personal experience, convictions for which they are able to give very good reasons." While the object in view

is a worthy one, the limiting of competitors to subscribers only, the condition that each competitor can only obtain a prize once a year, no matter how his contribution may rank in comparison with those of other competitors, and the prominence given to the fact that literary merit is of no value in judging the contributions, all tend to make the offer more of the nature of a premium to those who subscribe for the journal, than would at first sight appear. A practitioner of some years' standing generally has very decided opinions regarding the value of his favourite methods of treatment, and the privilege of having his views appear in one of the leading weekly journals (regardless of his power of expressing himself correctly), with the added hope of obtaining a \$25.00 prize, should be a strong inducement to him to become a subscriber.

We can see no objection to the offering of premiums; but the natural inference is here, as in all commercial transactions, that the article requiring a premium to make it sell, is not considered by the buyer worth the price put upon it, without the premium.

HOSPITAL APPOINTMENTS FOR WOMEN.

Miss Helen MacMurchy, M.B., of Toronto, writing in the *New York Medical Journal* of April 27, 1901, on the question of hospital appointments for women, gives a list of 559 medical appointments held by women physicians, compiled for the Woman's Medical College, Toronto. Of these positions, 215 are resident, 302 (including 114 resident) are in the United States, and 188 (including 99 resident) are in the British Empire.

We note that the large majority, as would be expected, are in special hospitals for women and children and maternities, but both special and general hospitals of all descriptions are represented, and in both England and the United States, a fair proportion of the appointments are as assistant physicians or internes to the State Insane Asylums. Canada is conspicuous by its absence from the list.

THE LADY MINTO COTTAGE HOSPITAL FUND.

At the Third Annual Meeting of the Board of Governors of the Victorian Order of Nurses in Canada, held on March 14, 1901, a resolution was adopted in respect to the proposed Queen Victoria Cottage Hospitals. Briefly stated, the resolution pledged the support of the Board of Governors to a scheme to establish Cottage Hospitals in the North-West Territories and elsewhere in Canada, under a title of "Queen Victoria Cottage Hospitals," in commemoration of the life of our late gracious and beloved Queen. For this purpose a special fund is created, called "The Lady Minto Cottage Hospital Fund," to be kept in a separ-

ate account from the other funds of the Victorian Order and used only for the establishment and maintenance of such hospitals.

A committee was appointed with His Excellency the Governor-General of Canada as Chairman, Mr. J. M. Courtney, C.M.G., Treasurer, and Mr. James W. Robertson, Secretary, with full power and authority to carry out the provisions of the proposed plan. A small pamphlet has been issued by the Secretary setting forth the details of the proposed scheme and the need and value of the establishment of such hospitals. We have obtained the following particulars from this source.

Since the Order began its work in 1897-1898 it has helped to provide such hospitals in five localities, and they have proved of the greatest value and are doing good work, particularly in the more distant and sparsely settled localities where the sick poor are unable to reach the city hospitals. Among these five, one, at Vernon, B.C., has become self-supporting through the fees paid by patients and those obtained by District Nursing. Attached to the pamphlet is a plan for a six-bed hospital with an estimate of \$3000 as the cost of establishing and of \$1,850 as the yearly cost of maintaining the same.

The scheme as outlined above is carrying out one of the objects of the Victorian Order, which the Royal Charter of the Order states, Section 5 (d), is "to assist in providing small Cottage Hospitals or Homes." An appeal is being made to the prominent people of Canada to provide the funds necessary for this purpose.

The following officers were elected at the Sixth Annual meeting of the Western Ophthalmologic and Oto-Laryngologic Association held in Cincinnati, April 11th and 12th: Dr. C. R. Holmes, Cincinnati, O., President; Dr. W. L. Dayton, Lincoln, Neb., 1st Vice-President; Dr. J. O. Stillson, Indianapolis, Ind., 2nd Vice-President; Dr. H. W. Loeb, St. Louis, Mo., 3rd Vice-President; Dr. O. J. Stein, 100 State St., Chicago, Treasurer; Dr. William L. Ballenger, 100 State St., Chicago, Secretary.

The next meeting will be held in Chicago, April 10th, 11th and 12th, 1902.

The Twenty-fifth Annual Meeting of the American Dermatological Association will be held in Chicago on May 30th and 31st and June 1st, 1901. Dr. Francis J. Shepherd, Professor of Anatomy, McGill University, the President, will deliver his address on the morning of May 30th. Among the papers to be read are four on Blastomycetic Dermatitis, one of which is contributed by the President. A general discussion has been arranged for on the symptomatology, etiology, pathology and diagnosis of diseases of the nails. An exhibition of photographs, drawings,

microscopical preparations, etc., has been provided by the local members of the society. The meeting promises to be one of the most successful in the history of the association.

We heartily congratulate our colleague Dr. James Stewart in having been elected Vice-President of the Association of American Physicians. If we mistake not, the only resident Canadian who has been similarly honoured by this distinctly select association, was his predecessor in the chair of medicine at McGill, namely, the late Dr. R. Palmer Howard. Dr. Osler, we need scarce remark, has since he left us been both Vice-President and President.

The following appointments have been made in the Faculty of Medicine of the University of Bishop's College:—Frank R. England, M.D., Professor of Surgery; W. G. Reilly, M.D., Lecturer in Anatomy; Robert H. Craig, M.D., Lecturer in Laryngology; W. E. Deeks, B.A., M.D., Lecturer in Medicine; James M. Jack, M.D., Lecturer in Dermatology and Registrar of the Faculty; Louis Laberge, M.D., Lecturer in Hygiene and State Medicine; E. A. Robertson, B.A., M.D., Instructor in Gynæcology; and C. E. Gurd, B.A., M.D., Instructor in Gynæcology. In addition to these the following members of the teaching staff have received new positions: W. Grant Stewart, B.A., M.D., Lecturer in Medicine; A. J. Richer, M.D., Lecturer in Medicine; G. T. Ross, M.D., Lecturer in Laryngology; William Burnett, M.D., Lecturer in Obstetrics; and Frank J. Hackett, M.D., Lecturer in Surgery.

The 26th Annual Meeting of the American Academy of Medicine will be held at the Hotel Aberdeen, St. Paul, Minn., on Saturday, June 1st, 1901 at 11 A.M. (Executive Session; the Open Session beginning at 12.00 M.), and continuing through Monday, June 3rd.

The principal features of the Meeting will be a Symposium on "Institutionalism," and another on "Reciprocity in Medical Licensure." Series of valuable papers on both topics have been promised, as well as interesting papers on some other subjects. The President's Address (Dr. S. D. Risley, of Philadelphia) will be delivered on Saturday evening, June 1st, and the Annual Social Session held on Monday evening, June 3rd.

Members of the profession are always welcomed to the open sessions of the Academy. The Secretary (Dr. Charles McIntyre, Easton, Pa.) will be pleased to send the programme, when issued, blank applications for fellowship, etc., when requested to do so.

It was with great pleasure and satisfaction that, in the list of South African honours, we noted the conferment of the D.S.O. upon two members of our profession attached to Canadian regiments, namely, upon Dr. A. N. Worthington, of Sherbrooke, Surgeon-Major of the Second Canadian Mounted Rifles, and Dr. C. B. Keenan, Surgeon to the Strathcona Horse.

The sterling work accomplished by both, although little commented upon by the public press, had become known to us through the unstinted praise bestowed upon them by the returning members of these two regiments, and well have they deserved this special distinction, a distinction regarded by most officers in the British Army as even more valuable than the Victoria Cross; for the latter is granted for particular acts of heroism, provided they are observed. Now many a brave deed escapes unnoticed and, what is harmful, many an act of bravado is chanced in the hope that it may lead to the V.C. The D.S.O., on the other hand, is conferred for steady and thorough performance of duty throughout a campaign. It marks the recipient as one to be trusted in any work assigned to him.

We are particularly gratified to think that the men thus distinguished are closely connected with us in Montreal. Both are old McGill students, both known to us at the time of their appointment as peculiarly fitted to do us and Canada credit.

The much abused corset has at last found a defender, at least under certain circumstances, in Dr. A. E. Gallant, of New York, who recently, in a paper read before the Section of Gynæcology of the College of Physicians of New York, stated that it was of benefit in the treatment of movable kidney. He contends that in 90 to 95 per cent. of the cases of pain or discomfort produced by a movable kidney the symptoms can be relieved by the proper use of the corset. He does not wish to be understood from this as advocating the general use of corsets, but as women persist in wearing corsets, and as specially made belts and pads are difficult to adjust satisfactorily, it is better to teach them to wear their corsets properly. The method, however, described as the proper one will not, we fear, meet with the approval of the wearers of this article of dress any more than the discarding of it altogether does, for it is made tight fitting below and loose at the waist.

According to his directions the corset should be as long in front as can be worn, and two inches smaller than usually worn. It is then put on in the reclining position before the patient rises in the morning, laced as tightly as possible at the lower part, the abdomen being drawn upward to facilitate this, and the kidney is pushed up under the ribs

before fastening the upper end. This is not a new idea and its efficacy, it is said, can be still further increased, though we forget with whom the suggestion originated, by fixing a pad in the proper position to keep the kidney in place, on the inner side of the corset.

On Monday, May 6th, the fortieth anniversary of Sir William Hingston's appointment as Surgeon to the Hotel Dieu was celebrated by a function held at the hospital in his honour. The ceremonies opened with the celebration of the Mass in the chapel of the hospital by Archbishop Bruchesi, after which the surgeons connected with the hospital presented Sir William with an address accompanied by an urn of great value. A second address was presented by the students of Laval University who had assembled in the operating theatre to do honour to their professor. Dinner was served in one of the large halls of the institution which had been tastefully decorated for the occasion, the guests comprising many of the leading members of the medical profession and of the clergy, Archbishop Bruchesi presiding. After doing justice to the excellent repast furnished, the Archbishop congratulated Sir William on his useful life, and thanked him for the good work he had done for the institution, for the poor and the sick. Sir William replied in a very happy manner, recalling many of the incidents of his connection with the hospital. Dr. Brunelle spoke on behalf of the Medical Staff of the hospital, expressing their appreciation of their senior surgeon, Sir William. Letters were read from Dr. Macdonell and Dr. Craik, Dean of the Medical Faculty of McGill University, regretting their inability to be present to do honour to their old fellow student, and Dr. Leclerc, on behalf of Sir William's old fellow students, warmly complimented him on the distinction he had received. Not the least pleasing part of the function was an address, presented by Dr. Jacques, the medical superintendent of the Hotel Dieu, from the patients who had assembled in one of the wards.

We wish to add our congratulations to those of his colleagues, and note with pleasure that although in his seventy-third year, Sir William is still actively engaged in the practice of his profession, and has lost none of that skill as a surgeon with which his name has always been connected, and which has won him so much honour.

Obituary

THE HON. J. J. ROSS, M.D.

The Hon. John Jones Ross, M.D., died on Saturday, May 4th, at the age of 68. While a successful practitioner and one who was always held in the greatest respect by the profession, the Hon. Dr. Ross was better known to the people of Quebec as a politician. He entered politics in 1861, at the early age of 28, as a member of the parliament of old Canada and remained continuously in public life until his death. In spite of the ups and downs of political favour, his was a successful career. He was at various times speaker of the Senate, president of the Legislative Council and a member of Sir Charles Tupper's Administration. He was twice elected President of the College of Physicians and Surgeons of Quebec, in 1888, and 1892.

As indicating in what estimation he was held by the public, we cannot do better than quote the words of an editorial in one of our daily papers: "During his long career before the public his name was identified with much that told for the future of this province, that tended to the advancement of Canada, but never did the breath of scandal, which has so often tarnished a public reputation, touch the name of John Jones Ross."

Proceedings of the McGill Medical Society of Undergraduates.

LEUCOCYTOSIS AND TYPHOIDAL PERFORATION.

BY

COLIN K. RUSSEL, B.A.

Much has been written of late on the subject of leucocytosis in typhoid fever and special value is attached to its diagnostic importance in impending or actual perforation. Upon what degree of leucocytosis we ought to depend has not been elucidated, though one realizes that the more marked this sign is, the greater may be our assurance in deciding on the presence of a serious complication.

As to the nature of the leucocytosis, differential counts have shown that the most marked relative increase occurs usually in the mononuclear cells, a condition to be expected in view of the preponderance of lymphatic gland involvement in enteric fever. Experience in the hospital wards with cases of typhoid fever has shown that the leucocyte count may not be accepted off-hand as positive proof of the nature of the complications even where a perforation has been suspected, for other conditions resembling perforation in their symptoms may yield marked leucocytosis, while, on the other hand, in cases of actual perforation there may be sometimes a diminution of the number of white cells found in the blood.

In 37 examinations of uncomplicated cases of typhoid fever the leucocytes showed a variation between 200-12,000, an average of about 6,500. All counts were made as remotely as possible from the digestive period in order that I might obtain more uniform results. Of the number of complicated cases examined, the blood counts have shown more instructive and interesting results, results which, while showing the importance and diagnostic value of blood counts in enteric fever, nevertheless teach the important lesson that grave exceptions may occur and one may readily be led into error by attaching too great a significance to leucocytosis as a sign of perforative peritonitis. A few examples will readily explain the results obtained:—

CASE I.—Typical case showing value of blood examination— Very doubtful signs of Perforation—Leucocytosis 28,000— Operation, Perforation Found—Recovery.

A boy, *æt.* 7, was admitted from Dr. C. W. Vipond's practice to the Royal Victoria Hospital on the 11th day of the disease. The malady had been attended by the usual symptoms incident upon incipient typhoid fever and on the tenth day he complained of gradually increasing pain in the abdomen, especially in the right lower quadrant. There was no

alteration in the pulse or temperature to indicate radical change, nor did the abdomen present, apart from slight general tenderness, and rigidity, distension or obliterated liver dulness. He vomited once a small amount of food.

Dr. Garrow saw him in consultation and ordered his immediate admission to the Hospital, where he was carefully watched for the next few hours and the blood counts by Dr. Tooke showed in four different examinations an average of 28,000 white cells. A few hours later he was thought to have a slightly increased rigidity, and Drs. Bell and Martin recommended operation, which Dr. Garrow performed. The perforation, which was promptly discovered near the mesenteric attachment of the ileum, was sutured and the boy made a good recovery.

After the operation the leucocytes diminished, two days later being 19,000, and two weeks subsequent to the operation, 9,000. This, then, was a typical case to illustrate the value of leucocytosis, which was the main feature upon which was based a conclusion as to the necessity for operative interference.

CASE II.—Signs of perforation, definite—Leucocytosis only 12,000 twelve hours after perforation occurred—Operation—Recovery.

Mrs. T. This patient was admitted to the Montreal General Hospital under Dr. Shepherd as an emergency case; she had developed signs of perforation on the 14th day of the disease, and was operated on soon after admission.

In this case I was enabled to examine the blood immediately before operation, and the patient, apart from the local condition in the abdomen, was in a good state for operation. The white cells numbered only 12,000, but the perforation signs were characteristic. Operation was performed and the bowel duly sutured. The patient enjoyed an uninterrupted recovery.

CASE III.—Perforation—Leucocytosis 4,800—Operation—Death.

Mr. V. Admitted to the Montreal General Hospital under Dr. Molson on the 16th day of the disease with a blood count of 6,100 and no evidence of complication. Four days later the classical signs of perforation suddenly developed. A careful blood count was made by Dr. Henry, three hours later, showing only 4800 white cells. Operation was performed, the ruptured bowel discovered and promptly sewed, as were also six other ulcers which had already nearly eroded the thickness of the intestine. The patient unfortunately succumbed to the disease.

CASE IV.—Signs of perforation—Leucocyte count averaged 14,500—Operation—No perforation found—Recovery.

Mr. St. L. This case was one of two which presented features of unusual interest and instruction. The patient came to the Royal Victoria

Hospital under Dr. W. F. Hamilton's care on the 10th day of the disease, presenting the typical signs of typhoid fever with reaction to the Widal test. For four days the disease ran the usual uncomplicated course, when suddenly, on the evening of the 14th day of the malady, he developed pain in the abdomen, chiefly in the left lower quadrant. The pain gradually increased until within 32 hours marked rigidity was present. Dr. Ballantyne made two blood counts in succession at this time, the white cells numbering respectively 16,000 and 13,000, an average therefore of 14,500 before operation was commenced.

The operation by Dr. Garrow, however, showed neither signs of perforation nor peritonitis, the condition of the bowel being merely such as is to be expected at that stage of the disease. The abdominal wall was again closed and the patient has since run the usual favorable course of the disease without complication. The blood counts made on the day following the operation revealed in the average of three counts, less than 10,000 white cells.

CASE V.—Signs of perforation—Leucocytosis 17,000—Operation—No perforation found—Mesenteric gland unusually large and swollen—Recovery.

Miss O. In this patient, *æt.* 39, at the Montreal General Hospital, under Dr. Lafleur, the course of the disease had been favorable up to the 17th day, when, one hour after a bath, pain suddenly developed in the right iliac region, progressively increasing and with gradually developing rigidity. The tenderness and distension became so marked as to arouse grave suspicion of perforation and a blood count was made showing 17,000 white cells. Two hours later there were 14,000, and after a period of two hours more the cells were reduced to 10,000; showing in other words for typhoid fever a moderate degree of leucocytosis.

Upon consultation with Dr. Armstrong operation was decided upon and performed a few hours later, the local symptoms not having shown any signs of abatement. The laparotomy, however, failed to reveal any perforation, though two of the ilio-cæcal glands were unusually tense and swollen. In the absence of anything further the abdominal wound was closed and the patient made an uninterrupted recovery, no further sign of perforation developing.*

CASE VI.—Very definite signs of perforation—Blood count 14,000 to 11,000—Delay in operating to watch progress—Sudden general peritonitis—Leucocytosis 82,000—Operation—Death.

Mr. A. This patient, an adult male, was admitted to the Royal Victoria Hospital under Dr. Martin on the 12th day of the disease with the characteristic symptoms, signs, and reactions of enteric fever. Two days later he developed rather suddenly some pain in the region of the spleen,

* This case is reported in full at page 89 of the February number.

with tenderness on pressure over the ribs in that area; there was no rigidity nor abdominal tenderness elsewhere; the pulse remained unaltered and the leucocytes numbered 12,000. The condition remained thus for the following 18 hours, except that his general condition seemed slightly more serious and some tenderness developed in the right iliac fossa as well. The pulse, however, which had been about 96, was not raised during this time over 104, and there was still no increase in the rigidity.

The blood examinations were made every three hours by Dr. Tooke, and showed never more than 12,000 to 14,000 white cells. For this reason, and more especially after the experience recorded in Cases 4 and 5, operation was not immediately performed. The patient, a few hours later, became suddenly collapsed, with signs of general peritonitis, vomiting, rigidity, great tenderness and a rapid pulse. It was then for the first time the blood counts rose appreciably, 33,000 white cells being present. The two previous cases had had a higher leucocyte count, without perforation, and with signs which in the early stages of the malady were far more characteristic of perforation, and yet the operation had revealed nothing. With all the signs present of collapse in this case and a pulse which could scarcely be felt, when Dr. Bell saw the case, the recovery after operation was not to be looked for, and the patient succumbed a few hours later.

Remarks:—That one may obtain marked variation in the leucocyte count in typhoid fever is well known, and in Dr. Cabot's comprehensive observations he has shown that, even where no complications are evident, one may obtain an average of over 15,000 white cells to the cmm. Further, that where certain abdominal complications, other than perforation, exist, the leucocytosis may rise to a very marked degree. Moreover, in the case cited by him of capillary bronchitis complicating pneumonia, the white cells numbered 9,000 to the cmm.

In a number of complicated cases of typhoid which I have examined, the same results could be determined in one patient in whom the only discernible complication was a simple bronchitis, there were 20,000 leucocytes to the cmm. In a case of cholecystitis, 13,000; in one of mild middle-ear disease, 13,000; and in a case complicated by general sepsis the white cells, as was to be expected, showed a similar increase, namely 13,000.

The cases above cited lead in the main to the following conclusions:—

- (1) That in perforation it is the general rule to have a leucocytosis, but that the degree may vary within wide limits.
- (2) That the leucocytes, while appearing as a rule early, may not be at all marked until the general peritonitis and collapse have supervened.

(3) That there may be an utter absence of leucocytosis with marked perforation and peritonitis, in fact, that the white cells may be lower than normal.

(4) That with typical signs of perforation and a definite leucocytosis, there may be no such complication present and an operation may be performed unnecessarily.

(5) That a marked degree of leucocytosis may occur in complications other than perforation, for example, bronchitis, cholecystitis, etc.

(6) That with pain and tenderness in the abdomen, coming on suddenly during an attack of typhoid fever (and in the absence of evidences of cholecystitis, or other definite complication), and a distinct leucocytosis, even without other signs of perforation, an exploratory operation is justified, even advisable, thereby obviating the dangers of a fatal issue from too great a delay. The exploratory operation in cases 4 and 5 done unnecessarily, resulted in no consequences and the patients made a satisfactory recovery.

MALARIA—ITS ETIOLOGY, RECOGNITION AND TREATMENT.

BY

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Definition.—Osler in his classical work defines Malaria thus:—"An infectious disease characterized by (a) paroxysms of intermittent fever of quotidian, tertian, and quartan types, (b) a continued fever with marked remissions, (c) certain pernicious rapidly fatal forms, and (d) a chronic cachexia with anæmia and an enlarged spleen."

Etiology. Distribution.—It is a widespread malady in the subtropical countries of Europe, America, Asia and Africa. Europe Southern Russia and certain parts of Italy, are the chief seats of the disease. The foci of epidemics in Germany, France and England are becoming every year more and more restricted. In America there has been a miraculous amelioration as to the extent and severity of the disease during the last half century. It has gradually disappeared from New England where it once extensively prevailed. In New York City mild types of the disease are not uncommon. In the valleys of the Delaware and Schuylkill, formerly hot-beds of the disease, malaria has succumbed to the effects of subsoil drainage and cultivation. It is still, however, fairly prevalent around the low-lying inlets of the Chesapeake. In the Southern States, and Lake Erie and St. Clair regions, malaria prevails at the present, but in diminished prevalence and intensity. The St. Lawrence Valley remains fairly free from the disease, though the great hospitals of Montreal treat several cases every summer and early autumn—cases which, for the most part have been imported

by the numerous vessels, which ply their trade between this port and the various malarial countries as Belgium and the East. The annual reports of the Royal Victoria Hospital give an average of 3 cases annually, while those of the Montreal General Hospital give an aggregate of 106 cases.

In India, malaria is almost an inevitable companion in the lowlying districts of Burmah and Assam, and is a scourge to European and native alike.

In Africa, malaria forms an imposing barrier to the civilization of the coast and river basins. The Black Water Fever of the Gold Coast is a very fatal form of hæmoglobinuria which is now generally recognized as due to the malarial plasmodium.

Telluric Conditions:—This is an undoubted factor in the etiology of the intermittent fevers. Malaria is especially prevalent in low marshy regions, rich in vegetation, and especially so in districts "such as the Roman Campagna" which have been allowed to fall out of cultivation; estuaries, ill-drained low-lying districts and old river beds are favorite haunts for the plasmodia of malaria. A subsoil impervious to moisture is particularly favorable to the development of the infection. The clearing of forests and subsoil drainage have done much to do away with malaria in New England and parts of Western Canada, but, Osler says "even these improvements cannot always explain the disappearance of the disease, since in many districts there are marshy tracts and low-lying lands, in every respect like those in which, even in the same latitude the disease still prevails." Hence this writer concludes that it is impossible to determine from the nature of the soil and climate if any given locality be malarial or not; and that the only means of deciding this point is by noticing the effect of residence in such a place on the human subject.

Season:—The effects of the season on the prevalence of malaria differ with the climates. In the Tropics, as India and parts of Africa, the maximal period corresponds to Spring and Autumn, the minimum to Summer and Winter. In the more temperate countries, such as the central parts of the United States, there are a few cases in May, but the vast majority occur in September, October and even November.

Meteorological Conditions:—(1) Heat of moderate degree is one of the essential factors for the development of the organism; malaria is more prevalent the World over during a prolonged hot summer. In those latitudes where the mean summer temperature does not exceed 15 to 16° C., malaria ceases to exist. Not only the number of cases, but also their severity is in direct relation to the temperature elevation." (2) Moisture is another but not so definite a factor. Thus in the Tropics the intermittent fevers are prevalent in the rainy seasons, but in the temperate

climates this relationship does not exist and the cases are most numerous after a dry summer.

Yet if the heat or the moisture be extreme, the development of the virus receives a temporary check. (3) Winds may play some part in the spread of the disease; thus the planting of trees has been held to interfere with the transmission of the virus. This is explained by many as due to the drying of the soil by the rapid growth of trees, like the Eucalyptus. (4) Altitude—It has long been known that the distribution of the malarial poison is influenced by gravity, thus persons dwelling in elevated buildings or in the upper stories of houses, have escaped malaria, while their less fortunate neighbors, who occupy more humble dwellings have succumbed to the insidious microbe.

Specific germ:—Historical.—For a very long time the infectious nature of the malarial fevers was suspected. In 1847 Meckel pointed out that the pigment in the blood of a malarial patient, was contained for the most part in round ovoid or spindle-shaped protoplasmic masses, which no doubt were the malarial parasite. This observer failed to recognise any connection between the pigment and the disease. In the next year, 1848, the great Virchow described and depicted in the blood of a malarial patient, pigmented bodies, many of which, from the description and accurate drawings, were no doubt phagocytes, while others were unquestionably the plasmodia, which were to be recognised thirty-two years later by another. Hirsch in a monograph in 1850 recognised the connection between the presence of the pigment and the intermittent fevers. Planer in 1854 believed that the pigment circulating in the blood arose during the fever, and he believed it was the cause of many of the symptoms. The association of pigmentary leucocytes with malarial fever and the diagnostic importance of this condition was thus recognised by many observers before the actual discovery that the pigment was primarily contained in the body of a living parasite. To Laveran, a French army-surgeon stationed in Algiers, belongs this honour.

In December, 1880, in a report to the Société des Hôpitaux he described three forms of organisms: (1) Spherical bodies; (2) Flagella; (3) Crescentic bodies. Laveran found these bodies only in malarial fever and they disappeared under treatment with quinine. Hence he concluded "that there exist in the blood of patients with malarial fever, parasitic elements which have hitherto been confounded with melaniferous leucocytes: the presence of these parasites in the blood is probably the principal cause of the manifestation of paludism." This preliminary report having been received with the sneers and scepticism that welcome all advances in science, was followed in 1881 by a monograph in which he christens his newly discovered parasite as the "Oscillaria

Malariae." Shortly after this he added to the three forms of parasites already described, a fourth form, very much smaller than the previous, but which contain motile or non-motile pigment granules. These he considered to represent one of the phases in the development of the parasitic bodies above described. He maintained that these pigmented bodies were cysts containing the motile filaments, which in the free state represent the organism at its stage of most perfect development. The dancing movements of the granules he believed to be communicated by undulations of the protoplasm.

Laveran's observations were first confirmed by Richard, who accepted all the former theories in the life-history of the organism. At this time the scientific world was more interested in the work of several observers (Klebs, Tommasi-Crudeli, Marchiafava and Celli), who believed that they had isolated a bacillus which had a direct etiological relation to malaria. In many of the red corpuscles they found small round bodies, resembling micrococci, which were stained by methylene blue; further they found larger areas containing dark pigment granules, which areas they believed to be due to degenerative changes in the red discs brought about by presence of parasites. The crescents, they said, were simply due to decolorization of the periphery of the corpuscle. In 1885, however, they recognized that they had been dealing with a parasite and not with degenerative changes. But they maintained, and rightly so, that these parasites were intra-corpuscular, and not attached to the surface of the disc, as Laveran and Richard thought. Further, they were the first to call attention to the extreme amoeboid activity of these small non-pigmented forms and to suggest that the segmentary bodies represent a process of reproduction. Every observer of importance who had proper opportunities for the investigation of malaria confirmed Laveran's observations. In America, Councilman, Osler, Abbot, James and Dock contributed largely to the literature on the subject.

The year 1885 marked a new era in the researches of malaria. Golgi of Parva, founded a new school, which had for its main teaching that one may distinguish different types or possibly different species corresponding to the main types of malaria. This school was diametrically opposed to Laveran's school, which held that the malarial parasite is a single polymorphous organism, and that there is no constant relation between the different forms in which it appears and the various types of fever. Golgi was the first to point out that each paroxysm is always associated with the segmentation of a group of malarial organisms and that the severity of the attack is dependent upon the number of parasites present in the blood. Further, he observed that the tertian and quartan parasites exist in the blood in great groups, all the members of

which are approximately at the same stage of development. He described accurately the cycle of existence of the quartan parasite from the small non-pigmented bodies to the beautiful rosette forms which develop into six to twelve round hyaline bodies, each with a central reproductive point.

Councilman in 1887 was one of the first to emphasize the fact that the irregular and continuous fevers are associated with a different type of organism. Canalis in 1889 gave an elaborate description of the "crecents" of æstivo-autumnal fever, which was afterwards confirmed by many authorities in Europe and America.

Many observers have attempted to classify the various forms of the organism found in malaria. Most Continental writers describe 4 or even 5 forms. Dock, Osler and Thayer of this Continent, recognise only the tertian, quartan, and æstivo-autumnal varieties.

The *Tertian Parasite* accomplishes its cycle of development in 48 hours: hence sporulation and the paroxysm occur on every third day, when a single or group of parasites is concerned. It begins its life history as a small, hyaline, amœboid body in which fine brown granules rapidly appear and are thrown into active motion. The amœboid movements are slower and the granules are smaller and of a more reddish colour than are those of the quartan type; the outline of the plasmodium is very indistinct. The corpuscle begins to be decolorized early in the development of the parasite and this type tends to cause the blood corpuscles to swell and become larger than normal. The segments of the sporulating organism number 15 to 20 or even more, each of which is smaller than in quartan variety and contains no central refractive spot.

Quartan parasite:—Its life cycle lasts about 72 hours, hence, if only one group be present, sporulation will occur on every fourth day. The organism closely resembles the tertian, but the amœboid motion is slower; the pigment granules are coarser and darker and in less active motion; the fully developed organism is smaller; and the corpuscles tend to shrink about the parasite and to assume a deeper perhaps somewhat brassy hue. In sporulation the segments are fewer, 5 to 10, and form beautiful rosettes, being arranged with great regularity about the central pigment clump.

Æstivo-Autumnal Parasite:—The exact duration of the cycle of development of this variety is a much mooted point; it probably wants from twenty-four hours or less, to forty-eight hours or more. The arrangement in groups occurs at the onset of the disease, but often gradually disappears, and organisms at different stages of development will be found. The parasite itself is considerably smaller than the other varieties—being less than one-half of a red-cell; the pigment is scantier,

often consisting of a few minute granules. The later stages in its development are only to be seen in the blood of the spleen and bone marrow. The affected corpuscles may become shrunken, crenated and brassy in colour. At the end of a week one will find larger refractive, eccentric or round bodies with central clumps of coarse granules which bodies are characteristic of this type of malaria, but whose significance is a matter of dispute.

The segmentation of the tertian and quartan parasites, according to Golgi, begins eight to ten hours before the paroxysm and continues during its first hours, while at the same time fresh hyaline bodies begin to appear in the red cells; the actual entry of the newly formed segment into the corpuscle has never been observed.

Flagella.:—From the full grown tertian and quartan parasites and from the incompletely developed æstivo-autumnal variety, long, actively moving flagella may develop. This process of flagellation is to be observed within 8 to 20 minutes after the blood has been withdrawn from the body and never occurs in the circulating blood. The length of the flagellum varies from one-half to three or four times the diameter of the red cell. They also vary in number from one to six, and they may be attached to any portion of the circumference. Fine detached flagella are also sometimes seen. According to Macallum, the flagella represent the male elements in a sexual process, and according to Manson they represent the form in which the parasite exists outside the body. This latter suggestion is supported by the fact that Ross in India discovered these flagella in the blood from the stomach of mosquitoes which had been allowed to feed on malarial subjects. On the other hand, if Macallum's suggestion be true, they are certainly not degenerate elements, in spite of Bignami's statement that the crescents from which these bodies develop are sterile elements as long as they remain in the human body. Sacharoff considers the flagella as chromosomes originating in the nuclei of the body of the parasite, while the flagellation he considers as a process of perverted karyokinetic division, accomplished in a violent manner.

Classification.:—The plasmodium of malaria, all agree, belongs to that great division of the animal kingdom, to wit, the Protozoa. Osler considers it to belong to the genus of the Hæmocytozoa which is usually placed among the Sporozoa; others place it among the Hæmosporidia.

Culture and Inoculation Experiments.:—All, or nearly all, attempts to cultivate the parasite, by the most varied methods have hitherto failed and proved uniformly unsuccessful, Saccharon, however, succeeded in keeping parasites alive for an entire week in leeches which were kept on ice. In the case of the æstivo-autumnal variety, he found forms with:

actively amoeboid movements and normal staining reactions after seven days, while an inoculation on the fourth day was successful.

Inoculation experiments have proved more successful. Gerhardt first showed that malaria could be transmitted by the inoculation of an individual with the blood of a malarial patient, but strangely enough, his results were obtained before Laveran had discovered the parasite. In most cases, 1 c.c. of the infected blood was introduced by means of a sterilized Pravaz syringe, either subcutaneously or intravenously. In 16 out of 18 cases the type of organism which was believed to have been introduced, re-appeared in the blood of the infected individual. The average duration of the incubation period was 11 to 12 days. De Mattei proved experimentally that the symptoms of malaria are produced by one variety of the organism only, the growth and development of which is associated with the disappearance or diminution of the other variety. Further it has been noticed that to the variety of organism which is in the greatest preponderance, are the symptoms entirely due.

Manner of Infection.—Malaria is supposed to enter the system in various ways. The three forms of entry are : (1) respiratory tract, (2) digestive tract, and (3) the skin, by bites of insects. (1) Theoretically, there can be little doubt that infection may occur through the respiratory tract, yet we have no absolute proof of this occurrence. (2) There is no positive, and much negative evidence, against infection by the digestive tract. Celli and Marion allowed several individuals to drink large quantities of water from the pontine marshes without ill effects. Some went further and allowed them to drink the blood of malarial patients without positive results.

The Mosquito malarial theory is a very old one. Two years ago Manson, of the London school of Tropical Medicine, directed two experiments, one of which was to prove the theory in a positive manner, the other by negative inference. For the first, Manson's son living in London allowed himself to be bitten by insects brought from Italy and developed typical symptoms of double tertian fever. For the second experiment two physicians and two attendants were sent out to the Roman Campagna where they lived in a mosquito proof hut during the entire fever season (July 19th, to October 19th). All the surrounding inhabitants suffered from malaria but the four occupants of the hut, although spending the entire day in the open air, protected by veils, and sleeping at night with the windows wide open, but protected by wire netting, never developed malaria. Nevertheless, in the face of these very suggestive experiments the theory went out of favor for some time. Since the discovery that Texas Fever and certain cattle diseases are transferred by means of suctorial insects there has been a gradual return to the old

theory that malaria, in many instances at least, must be transferred by the bites of mosquitoes. In 1898, Ross of the Indian Medical Service published some remarkable observations. He observed the behavior of the parasites in the blood within the stomach of mosquitoes fed upon human beings. Ross fed the gray mosquito upon the blood of birds containing the mature *Laverania*, and always found on the second day peculiar bodies embedded in the stomach wall of the mosquito. These bodies gradually grew until the 6th day or later, the pigment in the meantime disappearing; they protruded from the wall of the stomach into the body cavity. No such elements were ever found in mosquitoes fed upon non-infected birds, while he traced the appearance of fresh groups after feeding upon infected birds. Later on Ross noted that the coccidia-like elements ruptured and set free numerous spindle-shaped bodies to which were due the striated appearance of the ripe coccidium. Further, great numbers of these plasments were found in the circulation. Next, Ross discovered in the neck of the mosquito a minute structure of the nature of the veno-salivary gland, in the cells of which these coccidia-like bodies were found to ripen and cause in 8-10 days a great accumulation of the thread like elements, which he believed to represent the infectious agent. He then fed the mosquitoes on infected sparrows and after a little more than a week he allowed the mosquitoes to bite non-infected animals. In 22 out of 28 birds, after an incubation of from 5 to 7 days, there was developed an intense infection—many of the birds actually dying—an unusual event. If this be true with the protosoma in birds, there is good reason to believe that the mosquito may not only play the part of an intermediate host, but be the direct conveyer of infection in connection with the parasites of human beings. In fact Koch says:—"The more I study the disease the more do I incline towards the opinion that the mode of infection by means of the mosquito is the main, probably the only one." Wherever one goes one finds a relationship of both place and time between the presence of malaria and the mosquito. The negroes of Asambara Mountain in Africa, call this malady "Inbu" and when asked how they acquired the disease, they reply that they were bitten by an insect of the lowlands which they also call "Inbu," and which is the mosquito. The same belief prevails in Italy and the Tyrol.

Grassi, an Italian, has not been idle, and has discovered 3 species of mosquitoes whose association with malaria is so definite that he asserts that the mosquito theory explains all the phenomena of malaria. Nay more, he has shewn that one variety, the *Anopheles Claviger* is associated in locality and season with the tertian parasite, while two others, *Culex Pernicularis* and *Culex Malariae*—occur in the localities and sea-

sons in which the æstivo-autumnal fevers predominate. Another Italian, Bignami by name, after several failures, obtained adult mosquitoes from a most malarious district and liberated them in a room in which slept a young man who had never suffered from malaria and who came from a non-malarial district. As a result the youth was frequently bitten by insects, and after continual residence for a month in this room, he developed fever followed later by a chill, and two weeks later his blood contained characteristic crescents. He concludes his discussion as follows, "So much is certain, inoculation up to the present, is the only means for which experimental demonstration has been obtained."

Recognition.—*Paroxysm.* The regularly intermittent fevers are characterized by recurring paroxysms of so-called "ague" in which chill, fever, and sweat followed each other in regular sequence.

Preceding the paroxysm by a few hours the patient experiences unpleasant and uneasy sensations, sometimes a headache. In a case which I reported at the Montreal General Hospital last September, the patient suffered from dyspnoea and indefinite pains in the epigastrium for about an hour before the paroxysm.

Cold Stage.—Even before the chill begins, there is some rise in temperature. The patient begins to shiver, the face looks cold, the teeth chatter, and the movements may be so violent as to literally shake the bed in a most audible manner. The skin temperature is reduced as shewn by the surface thermometer, but the rectal or oral temperature gradually rises until it may reach 105 or 106° F. During this stage no amount of clothing affords any degree of comfort to the sufferer. This chill lasts from 10 to 60 minutes.

Hot Stage.—There are now sudden flushes of heat and the surface temperature becomes gradually increased; the skin is reddened, the face flushed, pulse full and bounding; delirium may occur leading to deeds of violence. The patient complains of a severe throbbing headache. The internal temperature gradually falls. This stage lasts from half an hour to three or four hours. An intense and insatiable thirst is present.

Sweating Stage.—Beads of perspiration break out and soon the body is bathed in a copious perspiration, drenching the patient's clothing and bedclothes. In this stage all discomfort disappears and soon the patient, thoroughly exhausted, falls into a deep and refreshing sleep.

The above is a description of a typical paroxysm but variations are quite common. There may be only a slight sensation of chilliness instead of a chill; there may be a hot stage alone, or accompanied by slight sweating. The spleen is enlarged during a paroxysm and may be felt distinctly below the costal margin. Labial herpes is a common syn-

drome. Between the paroxysms the patient feels perfectly well and is usually able to get up and about. After several paroxysms or after a course of 10 to 14 days, the chills may stop spontaneously, but in such a case recurrence is very liable. Eventually the condition becomes chronic and forms the so-called Malarial Cachexia of which the chief characters are pure anæmia, from the destruction of the red cells by the plasmodia, an enormous enlargement of the spleen (the so-called "ague cake"), marked cachexia, and profuse hæmorrhages, particularly retinal.

The febrile paroxysm, according to Laveran is due to the irritating influence on the nerve centres of the parasites, which, having remained during the apyrexia in the internal organs, suddenly enter the general circulation. Richard, on the other hand, believes that the rapid multiplication of the parasites produces the fever, which represents the reaction of the organism against the invaders; they excite the fever, the fever destroys them and falls in turn. Golgi attributes the paroxysm to the invasion of the red-cells by a new group of parasites, and the severity of the paroxysm depends upon the number of fresh organisms which attacked the red-cells. It was later shown by Antolisci that the severity of the paroxysm depended upon the number of segmentary bodies rather than on the number of new organisms.

Bacelli first formed a chemical or toxic theory which is now generally adopted. He shewed that the paroxysm depends upon the entrance into the circulation of as yet undetermined poisons, which are set free at the time of the sporulation—poisons due either to the act of sporulation or to substances liberated from the disintegrated corpuscles. These poisons are injurious to the nervous system, especially to the vasomotor ganglia.

Types of Fever:—There are two types of the regularly intermittent fever, viz:—the tertian and the quartan. Of these the quartan is the rarer form.

The tertian type depends upon the tertian parasite whose life cycle lasts 48 hours, in consequence of which sporulation occurs every third day. The paroxysms occur synchronously with the sporulation. This is true if there be infection with only one set of organisms. As a rule there are two sets of organisms which sporulate on alternate days giving rise to a "quotidian" or daily paroxysm termed "double tertian."

The quartan type depends upon the presence of the quartan parasite, whose life cycle lasts about 72 hours, at the end of which sporulation occurs and consequently the paroxysm on the fourth day. If two groups of parasites be present, paroxysms occur on two successive days, followed by a day of intermission. More rarely three groups of parasites are present and we get quotidian paroxysms.

There may be mixed or combined types of fever, due to mixed infection with the tertian and quartan parasites.

Irregular, remittent or continued fevers occur in temperate climates chiefly in the summer and autumn, hence the term "æstivo-autumnal fever." It is due to the presence of the æstivo-autumnal parasite, the duration of whose life cycle is subject to many variations, while the absence of arrangement into definite groups is not infrequent. The symptoms as might be expected, are irregular. The chart shows all sorts of variations. It may be a regular intermittent fever at varying intervals from 24 to 48 hours; usually the duration of the paroxysms average over 20 hours instead of 10 to 12 hours. The onset may occur without chills or even chilly sensations. The temperature rises gradually and may fall by lysis instead of crisis.

From the anticipation of one paroxysm or the retardation of another a more or less continuous fever may result. Again, there may be continuous fever without marked paroxysms. The facies of the patient together with the splenic enlargement very definitely suggest typhoid fever. Delirium of a mild type may occur. Some cases subside within a week; others last for 10 or 14 days; others again assume the character of the pernicious malaria and terminate fatally. The fever yields readily to quinine.

Treatment. *Prophylaxis*.—Newcomers to malarial districts can take precautionary measures. Although I have shewn that the poison does not enter by the alimentary tract, it has been customary since time immemorial to boil the drinking water. This is good routine practice, but it is not effectual against malaria. Quinine in varying doses is the best. Some recommend 10 grains daily, others say 2 grains three times a day is sufficient

Treatment Proper.—The cold stage of the paroxysm may be relieved by wrapping the subject in warm blankets and by the administration of warm drinks. Quinine is the specific for malaria and for many years before the discovery of the plasmodium it was used empirically. Laveran afterwards proved that a 1 to 10,000 solution of quinine when run under a coverglass immediately arrested the movements of the parasites. As long ago as 1867 Binz pointed out that the efficacy of quinine depended upon its action as a protoplasmic poison on some lower organism which he assumed to be the cause of malaria.

Golgi made a careful study of the action of the drug on the tertian and quartan parasites, and pointed out the following changes which the quartan parasite underwent:—(1) In the intra-corpuseular stage it shows a coarse granulation and the protoplasm some cloudiness. (2) Occasional new abortive segmenting forms which are smaller than normal. The changes in the tertian parasite are still more marked, owing no doubt to its greater activity. The body is round and non-

motile and shews a sharper outline while the pigment has a peculiar metallic lustre and tends to collect in clumps.

Another observer asserts that three hours after the administration of a small dose of quinine, the amœboid movements of the tertian parasite shewed a marked diminution in activity, and in several hours they are diminished in number and some even are pigmented. In the case of the æstivo-autumnal type it has been noted that after quinine there is no increase in the number of the shrunken brassy corpuscles and that the included parasites are incapable of further development. But all observers agree that the crescents are affected slowly if at all by quinine. More recently it has been shewn that quinine destroys the staining properties of the chromatin of the nucleus and that segments of the rosette forms show no nucleolus.

Further, it has been shown that the drug acts most readily during and immediately after sporulation, when the parasites are free in the circulation. In the words of Marchiafava and Bignami "Quinine acts on the amœba of malaria during those phases of its life in which it absorbs nourishment and develops; when the nutritive activity comes to an end, the transformation of the hæmoglobin into black pigment being accomplished and the phase of reproduction begins, the quinine becomes inefficacious against this process."

It is also possible to have some effect on the parasites of the tertian and quartan parasites in the intra-corpuscular stage by a dose of quinine 10 to 12 hours before the paroxysm. This is not so easy in the case of the æstivo-autumnal. Hence it is the endeavour of the thinking physician to have a maximum amount of quinine in circulation at the time of the paroxysm and shortly before. A large dose of quinine (10 grs.) just before the paroxysm is expected, will not prevent the paroxysm, but will destroy a large portion of the group of parasites and so prevent its further recurrence. The best practice is to give large doses of quinine, says 20 to 30 grains in 24 hours for first three days and reduce to 2 to 5 grains daily, for next two or three weeks. Larger doses may be necessary in the æstivo-autumnal variety, but 30 to 40 grs. daily should be sufficient. By giving single doses some hours before sporulation it is possible to change a double tertian into a single tertian, and a double or triple quartan into a single or double quartan.

Forms of Administration:—The pills and tablets are not suitable as they do not dissolve readily enough. Capsules of the sulphate is a good method. Quinine in solution is also of service. When it is important to get the system under the influence of the drug very rapidly, as in the æstivo-autumnal variety with pernicious symptoms, the drug may be administered hypodermically as the bisulphate (30 grs.) in conjunc-

tion with tartaric acid (5 grs.) every 3 hours. The muriate of quinine was used in 10-20 grs. doses by Thayer in severe and pernicious malarías. Some also recommend the use of antipyrin in conjunction with quinine. Ziemann has recently recommend intra-muscular injection, as into the glutei which is not painful when the proportion of quinine to fluid does not exceed 1 to 4. Some recommend in very pernicious cases the intravenous injection of the bimuriate of quinine (15 grs. to 3 ii of water).

Euquinine, another carbonate of quinine, is a new and tasteless product. Gray maintains that in addition to being tasteless, smaller doses are necessary to reduce the temperature. But its chief objection is that it causes tinnitus aurium, deafness and visual derangements in a more marked degree than the same dose of quinine. The dose of Euechinin should be somewhat less than twice that of quinine, says another authority.

Methylene blue has been recommended by some observers, but while it has a definite action on paludism, it is materially less efficacious than quinine.

Before closing let me add just a word about Malarial Hæmoglobinuria—the black-water fever—which was thought at one time to be due to the toxic action of quinine. Such was the opinion of Koch and many other notable authorities. Denmance asserts that while it is true that malaria is a predisposing factor to hæmoglobinuria, the latter is most likely to occur in cases which have been neglected or not properly treated at the beginning, never as a result of quinine, but because quinine has not been given at a time when it alone would have arrested the process of the malarial infection. This is a somewhat sweeping assertion. Thayer, in an article in *Progressive Medicine*, 1899, takes a more rational view. He says: "(1) If the attack has come on without quinine and there are active parasites in the blood, quinine must certainly be administered. (2) If under the same circumstances parasites are absent, quinine is uncalled for. (3) If there is reason to believe that the attack has been precipitated by quinine, the drug should certainly be stopped, unless evidence of a very severe infection continues. To treat malarial hæmoglobinuria the microscope is an absolutely indispensable adjunct."

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