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THE  
MONTREAL MEDICAL JOURNAL.

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Vol. XXX.

JULY, 1901.

No. 7.

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Original Communications.

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THE ADDRESS IN MEDICINE.

BY

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*Delivered before the Maritime Medical Association, Halifax, July 4, 1901.*

Mr. President and Gentlemen:—

The parable of the unjust judge who finally yielded to the importunities of the litigious widow finds its parallel in the present instance.

Some time in September of last year, on the occasion of the meeting of the Canadian Medical Association in Ottawa, I met the genial president of the Maritime Medical Association, and in an unguarded moment allowed him to sound me on the question of delivering the Address in Medicine at the meeting of the Maritime Medical Association and the Medical Society of Nova Scotia, in the following July. There seemed to be plenty of time to consider the matter, and I gave I fear an evasive answer, trusting in my innermost soul that time would obliterate on both sides the recollection of this interview. My hopes, however, were shattered some months later by receiving a more pressing invitation, and, while still balancing between yea and nay, a second letter arrived informing me that the Executive Committee was to meet in two or three days to make out the programme. I felt that an immediate decision was unavoidable, and somewhat reluctantly telegraphed Dr. Muir an acceptance of his offer. Since then I have had occasion to repent at leisure.

That I am delighted on the present occasion to meet such a representative gathering of my confrères of the Lower Provinces, goes without saying, but I should have preferred to come as an appreciative

listener, rather than to attempt to interest you with an address the inadequacy of which I keenly feel and regret.

The choice of a subject that would interest the largest number of my hearers was not the least difficulty to be met, for on such an occasion one must not on the one hand be satisfied with glittering generalities, much less platitudes, nor on the other, treat a particular subject with a detail that might become wearisome, or at least would not be in keeping with the general purpose of an address in the broad field of Medicine. And herein precisely lies the difficulty; for the larger the subject the harder it is to present it in an acceptable and intelligible form.

As the old rhetoricians were wont to say—the greater the extension the less the intention. Many subjects of the greatest professional interest, moreover, which were formerly in the sphere of thought and action of the physician (using the term in its restricted sense), are now claimed as their own by the specialists or the general surgeon. In medical and surgical practice, as in international politics, there are “spheres of influence,” which are more or less constantly changing, and fields of thought and action are “gerrymandered” not less than political constituencies. Consider for a moment the inroads that the general surgeon and the specialist have made, and are making, into the “sphere of influence” of the physician. Perhaps the earliest, and to my mind an unjustifiable, transference has been that of syphilis, first to the province of the general surgeon, and then to that of the genito-urinary specialist. In nearly all of its manifestations, certainly in its later and more serious ones, syphilis is essentially a medical disease, amenable to our two best-known specifics, and not requiring operative intervention or instrumentation of any kind. I know that on this side of the water, physicians commonly treat syphilis, but it is not so everywhere, and there is less excuse for an extensive article on syphilis in a text-book of surgery, than for an article on appendicitis in a text-book of medicine. In the case of appendicitis the change of allegiance, so to speak, has undoubtedly been for the well-being of the patient and the good name of the profession, and it cannot be denied that there is a satisfactory contrast between the new style of patient and the old—the old so often with sunken cheeks and eyeballs, thready pulse and distended abdomen, succumbing to general peritonitis under a double poisoning by toxins and heroic doses of opium—and the new, with almost immediate relief of pain, the avoidance of general peritoneal infection, rapid convalescence and full diet in ten days or a fortnight.

*A priori*, it would seem that a tuberculous peritonitis with effusion

should be as amenable to purely medical treatment as a pleurisy with effusion (which is, in the vast majority of cases, a tuberculous lesion) both being localizations of tuberculous infection to serous membranes, and yet we know such is not the case. It is certainly proved by statistics that opening the abdomen and draining the effusion, not simple tapping, is more likely to be followed by a favourable result than if a purely expectant treatment, perhaps with paracentesis, be adopted.

Cholelithiasis is another affection that the surgeon has laid claim to and in which the most brilliant results have been achieved. Unquestionably it is better that the surgeon should incise the common bile-duct, remove the obstructing stone and neatly sew up the duct, than that the physician should make a "mayonnaise" of the contents of his patient's duodenum by the administration of massive doses of olive oil, in the futile hope of washing out or dissolving, in some mysterious way, the offending foreign body. And if the stone be in the cystic duct, how much more rational it is for the surgeon to perform a cholecystotomy, than to trust to luck that the stone will slip back, or to administer drugs in the hope that by their means a body measuring half an inch in diameter will be forced through a corkscrew-like tube the size of a crow-quill. A comparison between the size of the average gall-stone and the diameter of the cystic duct is not calculated to inspire one with a blind belief in Providence.

Still more recently surgery has stepped into realms that were once the undisputed territory of the physician.

Ulcer of the stomach, at least in its two most formidable events, hæmorrhage and perforation, has benefited largely from surgical intervention. In the case of cancer of the stomach the surgeon sarcastically remarks that if the physician would only make an early diagnosis he would cure the patient, and in any case he is willing to help the patient—and the physician—by easing the downward path of the patient by a gastro-enterostomy.

One might extend the list by mentioning simple gastrectasis and gastroptosis, and enteroptosis, all of which may at least be alleviated by surgical procedures.

Even ascites from cirrhosis of the liver has found its surgical enthusiasts, and now pulmonary tuberculosis is to be arrested and even cured by a surgical procedure, the production of an artificial pneumothorax by pumping an innocuous gas into the pleural sac. There are some who think that a year or two in the Adirondacks, the Laurentians or Colorado is a less hazardous method of arriving at a similar result.

Aneurism of the aorta is undoubtedly in some comparatively rare cases influenced for good by the insertion of gold wire into the sac, combined with the passage of an electric current through the wire, but I confess I read with some surprise the sweeping statement made quite recently in the journal of a very celebrated institution, to the effect (I quote textually) that "this dreadful malady is usually a surgical disease."

It is true the author of this remarkable statement is a gynæcologist, and we know that gynæcologists are particularly sanguine in regard to operations. The results actually given by the writer do not, however, bear out his contention. In 23 cases treated by the combined wire and electrolysis method, relief of pain and other symptoms occurred in nine cases, or 39 per cent., and possibly life was prolonged, but in 10 cases, 43 per cent., "death was probably hastened." Four cases, three thoracic and one abdominal, were cured, but, says the writer, "here we must speak with reserve, for knowledge of the living patient or proof gained by autopsy are at our command for but two of these cases." No doubt aneurism of the aorta is in the vast majority of instances a hopelessly fatal disease, but cannot many of us point to cases in which the symptoms have been markedly alleviated and life prolonged for many months, even of comparative usefulness, by periods of rest in bed, restriction of diet and drink, and possibly the use of iodide of potassium? Such measures at least have no tendency to shorten life.

It would not need a great stretch of the imagination to conceive that in the not distant future, some daring surgeon should devise a "valvulotome" by means of which a button-hole mitral valve might be safely incised and then dilated, or taking the opposite condition, an instrument for "taking in the slack" and shortening up the *chordæ tendineæ*.

We have long since ceased to be surprised at anything. One might well ask if there is anything else left for the physician. The infections? Is not the hope of the future in bacterio—and serum—therapeutics, and here again, is it not the bacteriologist, the laboratory worker, who discovers the antitoxins and the curative and prophylactic sera that the physician uses in his daily practice? Moreover, preventive medicine is ever narrowing this field of action, and we may look forward to the state of affairs portrayed some years ago in a caricature of "Punch," where a long procession of disconsolate physicians is represented wandering the streets of the model city "Hygeia" crying with one voice—"we have no work to do."

It may seem strange to you that in an Address in Medicine I

should so inconsistently raise the pean of victory for surgery and bacteriology. Believe me, this is not done in an envious or carping spirit, but merely to illustrate the fact that in the matter of the successful treatment of disease, the surgeon and the bacteriologist have undoubtedly made greater strides than the physician, though in the purely scientific aspects of professional knowledge I think it must be admitted that the physician has at least equalled the attainments of his surgical colleague.

The chief advances in medicine (using the term in its restricted sense) have been in the elucidation of obscure points in etiology, the more accurate description of the clinical phenomena of disease, and the improvements of methods of diagnosis.

To a few of these I would especially like to draw your attention. The field being so vast and the labourers so many, it would be impossible to do justice to the whole subject, and I trust you will forgive me if I take as illustrations a few of the more common affections which form the bulk of the daily experience of the physician.

Among these, pulmonary tuberculosis claims the first place on account of its extensive prevalence and the prominent place it occupies in the mortality statistics of nearly every country on the face of the globe. Since the epoch-making discovery of Koch, nineteen years ago, there is surely no one, whose opinion is worth considering, who does not recognize that tuberculosis has been finally and definitely removed from the group of so-called constitutional diseases, to occupy its rightful place among the specific infective diseases.

The recognition of this fact has profoundly modified our views in many directions. Heredity as a factor in the transmission of tuberculosis has lost ground in proportion to the ever multiplying proofs of the frequency of infection, and though it cannot be denied that a certain bodily condition, made up of many as yet imperfectly defined elements, does form a favourable soil for the growth and multiplication of the tubercle bacillus, it also cannot be denied that an individual inheriting such a bodily condition, if removed from all the known sources of infection and placed in a suitable environment is not more liable to develop pulmonary tuberculosis than his more favourably constituted fellow-being. Many of the so-called hereditary cases of pulmonary tuberculosis are nothing more than examples of family infection, one member after another of a family becoming infected through a period extending perhaps over many years. Most of us could cite cases in support of this view; I know of several that can be explained satisfactorily in no other manner. It would be interesting to know whether this method of family transmission, what might be

called pseudo-heredity, is to be observed more frequently in the country and in small towns than in the larger centres of population. City folk change their domicile more frequently than the inhabitants of rural districts, and one would expect that family infection would be found more frequently in the case of families who had occupied the same house for a long term of years.

A medical friend practicing in a small village in the Province of Quebec, a health resort for city people in the summer, told me that he had come to the conclusion that so far as his district was concerned, pulmonary tuberculosis, which was quite common there, was in most instances due to family infection in the domicile.

That house infection, whether of members of the same family or of subsequent occupants of the infected house, is a very common factor in the spread of tuberculous disease can hardly be doubted when one examines the maps of districts in certain cities, where the infected houses have been plotted, showing the frequency of tuberculous cases in certain houses, while the immediately adjoining dwellings have remained free from any cases of the disease. Public ordinances forbidding spitting in public buildings and factories, and in tramways, railway carriages and other public conveyances, are no doubt very useful, but I am convinced the danger from such sources of infection is infinitesimal compared with that incurred in living from year to year in a house that is, or has been infected by one or more individuals suffering from chronic pulmonary tuberculosis, and until strict disinfection of such infected domiciles becomes the law and is scrupulously carried out, we must not expect to see any great diminution in the incidence of pulmonary tuberculosis. No doubt if proper precautions were taken by the infected individual in the regard to the disposal of his expectoration the danger of infection would be minimized, but knowing how rarely such precautions are systematically observed by the patient or enforced in any but a half-hearted way by most physicians, except in sanatoria, it seems hopeless for the present to expect any diminution of house-infection by this means. It might seem superfluous at the present time to insist on the necessity of early diagnosis in tuberculous disease of the respiratory passages, were it not a fact that in so very many instances the diagnosis is still made too late—not necessarily too late for a fair prospect of arrest or even cure of the disease—but too late in the sense that it might and should have been made earlier, and have saved the patient both time and expense in his subsequent search for health. I am not going to weary you with a recital of all the subjective and objective signs that point to early tuberculous infection of the lungs; any properly trained physician knows these.

Failure to make an early diagnosis is due too often to sheer carelessness or hurry on the part of the physician—to errors of omission rather than of commission. A hasty examination, with only a few square inches of the upper part of the front of the chest exposed, or worse still a perfunctory so-called auscultation through two or three thickness of clothing, results in a diagnosis of a “cold” or a “bronchial catarrh,” and meanwhile the the bacilli are doing their work thoroughly.

A curious thing is that very often the diagnosis is persisted in, though the “bronchial catarrh” has not “yielded to the usual remedies,” and something more radical in the drug line is then tried. It ought to be an axiom that any “cold” or “bronchial catarrh” that has lasted a month is to be looked upon with the greatest suspicion, and calls for a thorough examination of the respiratory tract, if that has not already been done.

And indeed, why wait so long? There is, moreover, no excuse for not examining the sputum for tubercle bacilli in all cases of disease of the respiratory passages. If one does not possess the material, or is not familiar with the simple technique, required for this examination, is it not a very easy matter to thinly smear half a dozen microscope coverslips and send them, or perhaps better still a specimen of the sputum in a clean bottle, to the nearest hospital that possesses even the most elementary clinical laboratory? A patient will not object to a fee for such an examination if it be made clear to him that it is a necessary preliminary not only to the diagnosis of his case but to its successful treatment. Thorough physical examination of the chest and routine examination of the sputa would certainly save a number of patients from a long and too often eventually fatal illness. In a few cases the examination of the sputum may not be conclusive, while the physical signs and the subjective symptoms still point strongly to tuberculous disease. If possible in such cases the patient should be tested with tuberculin—but, I repeat, such cases are rare.

It is to be supposed that once the diagnosis is established, and that early, the patient is to be told frankly what is the matter with him, and urged to place himself in surroundings most favourable to speedy recovery from his incipient infection.

Practically this means that he must have rest in the open air, and as abundant a diet as his digestive organs will admit of, preferably in those climatic surroundings which we know from experience afford the largest percentage of recoveries from incipient pulmonary tuberculosis. The first two desiderata, rest and food, can be obtained anywhere and by nearly everyone. It is in regard to the last that the difficulty lies.



Social and domestic questions arise in very many cases that militate against change of domicile, but by insistence these may often be overcome. Speaking generally, one does not usually get well from tuberculosis in the locality in which it was contracted, and yet with those that for one reason or another cannot or will not change their residence, much may be done by insisting that if they remain at home they must live as they would do, were they sent to the Adirondacks, the Laurentians, the Canadian Rockies or Colorado.

Before leaving the topic of pulmonary tuberculosis I wish to repeat the opinion already expressed, that pleurisy with serous effusion, the so-called *pleuritis a frigore*, is in the vast majority of instances a manifestation of tuberculous infection. This conception, advanced some twenty years ago by the French clinicians, especially by Landouzy, and based on evidence of a clinical, pathological and experimental nature, is certainly gaining ground. Osler expresses himself decidedly of this opinion. "I confess (he says) that the more carefully I have studied the question the larger does the proportion appear to be of primary pleurisies of tuberculous origin." The evidence rests on the following facts:—

Firstly, in a number of instances, undoubted evidence has existed of prior or concomitant tuberculous manifestations in the pleuritic patient.

Secondly, in individuals who were apparently healthy before the onset of pleurisy, and who have died during the period of active effusion, the post-mortem examination has proved the tuberculous nature of the pleurisy.

Thirdly, a large number of cases that have recovered from pleurisy with effusion sooner or later present unequivocal signs of tuberculosis, usually of the lungs. This is so common that I never fail to ask a tuberculous subject if he has ever had pleurisy with effusion, and though I cannot give you exact statistics, it is remarkable how often the answer is affirmative. The experimental evidence, however, is even more conclusive.

Guinea-pigs inoculated with a sufficient quantity (15 cub. cm.) of the serous exudate succumb in very large proportion to miliary tuberculosis. It is true that even careful microscopic examination of the serous exudate fails in most cases to reveal the presence of tubercle bacilli, but it must be remembered that the bacilli are few in number and the effusion usually copious, so that the inoculation test with massive doses of serum, is more likely to prove positive than the search for bacilli.

The experimental evidence is further strengthened by the fact that

a large number of patients with serous pleurisy react to tuberculin, even when there is absolutely no evidence of tuberculous disease in the viscera.

The recognition of the tuberculous origin of serous pleurisy has somewhat altered our opinions as regards the proper treatment to be adopted in such cases, particularly in the matter of the removal of the effusion by tapping. It has been shown that the exudate contains a small amount of tuberculin, and the absorption of this is believed to produce at least a temporary immunity against further extension of the tuberculous process in the tissues.

Certain it is, that serous pleurisy tends, more than any other tuberculous lesion, to run a more or less definite course and to end spontaneously in recovery. If this be so, it follows that tapping ought not to be performed early and often, but should be reserved for those cases in which an excessive amount of fluid threatens either, immediately, the proper functioning of the circulatory apparatus, or, ultimately, the integrity of the lung from too long continued pressure.

Another corollary is that the subjects of serous pleurisy, should in their convalescence have the same treatment as individuals suffering from incipient pulmonary tuberculosis, that is to say, hyper-alimentation and a more or less prolonged sojourn in suitable climatic surroundings. In any case it is well to keep such patients under close observation for the first indication of pulmonary involvement.

Turning now to typhoid fever, which next to tuberculosis is one of the most wide-spread of the infections, there is little that is new to be said concerning its etiology. That it is of microbial origin is now universally admitted, and that it is mainly a water-borne and easily preventible disease is no less true, as has been demonstrated on a large scale in several communities. For its appalling prevalence in most of the large centres of population in America, and in many of the smaller ones, we have to thank the apathy, not to say criminal negligence, of our municipal governing bodies in matters relating to the public health. They are too busy granting important franchises for nothing to powerful corporations and letting out public contracts to the highest bidders to have time to give such an unproductive matter as the health of the citizens they represent. Take the city of Montreal, for instance. How can the municipal council be expected to take serious and intelligent action in the prevention of typhoid fever, which is at all times endemic, and too frequently attains the proportions of epidemic distribution in that city, when sectional bickerings and the narrowest ward politics prevent us from having even an approach to adequate accommodation for actual cases of the more virulently contagious diseases?

But, really, the question is too-depressing to dwell upon, and I crave your attention for a few remarks on the treatment of typhoid fever in general, and in particular on the diagnosis and treatment of its most formidable event—perforation of the bowel.

A fairly extensive experience of this disease may give a certain personal flavour to what I have to say, and for this I apologise beforehand. In the matter of diet, to begin with, I may say that my opinions have undergone a considerable, and, I trust, a salutary change. That an exclusive diet of milk and animal broths is the ideal one for the enteric patient, is at the present time untenable. Brought up in this faith, I have since many years, entirely abjured it, and in common with many others of more extensive experience, I am in the habit of allowing the patient to take throughout the course of his illness, such articles as gruel, custard, oranges, jellies, soft-boiled or poached eggs, clear soups and purées, milk toast and even scraped beef, provided always that such food is well borne by the stomach and does not produce intestinal disturbance. Such a dietary appears to be innocuous, and certainly relieves the monotony of frequently recurring libations of milk.

I am a frank advocate of the treatment of typhoid fever by hydrotherapy, according to the method of Brand, or a slight modification of it. None of the objections urged against this method, and they are many, and some well-grounded, ought to weigh in the balance against the mass of evidence that points to ultimate good for the greatest number. Hydrotherapy is not, and never has been, claimed to be a specific treatment. It is antithermic, tonic to the cardio-vascular system, sedative and tonic to the nervous system, and eliminative through the renal organs, but it is not bactericidal or antitoxic. Doubtless in the near future the ideal treatment for the infections in general, a reliable antitoxin, will be discovered, and indeed we have the promise of this in the partial success of the recent prophylactic inoculations practised in the South African campaign and in India. Pending this, I refuse to be led away by any Ignis Fatuus of antiseptic or eliminative treatment based, if not on erroneous ideas of the pathology of the disease, at least upon an unreasonable faith in the efficiency of small doses of feebly antiseptic substances upon the length and breadth of the intestinal mucosa and, still more incredible, upon micro-organisms distributed in the deeper tissues, the viscera and the circulating blood.

In the whole field of medicine there is probably nothing that calls for more careful investigation of clinical phenomena, a nicer balancing of probabilities and a greater judgment than the early detection of typhoidal perforation; and its immediate corollary, the advisability or the non-advisability of operative intervention. The early diagnosis, that is,

sufficiently early to afford a reasonable hope of success for the surgeon, is fraught with many difficulties, and even the most experienced clinicians have made mistakes, on the one hand diagnosing a perforation where none was found to exist at the time of operation, or on the other, deciding against perforation which an autopsy subsequently revealed.

Uncomplicated typhoid is, so far as the abdominal symptoms are concerned, usually a painless disease. It is true that transient meteorism and diarrhoea (especially if profuse), may be accompanied by wandering colicky pains in the abdomen, but the occurrence of sudden, severe, localized abdominal pain in a typhoid patient is to be held as very strong evidence of perforation of the bowel, or at least of a localized peritonitis immediately preceding a perforation. This should in all cases be a note of warning, and if it be associated with rigidity of the abdomen on palpation, it is difficult not to draw the immediate inference that perforation has actually taken place. There may at this early period be very little constitutional disturbance. Probably the pulse rate will rise, but I am convinced that any reliance on variations of the temperature curve as an aid to the diagnosis is unwise. Nausea and vomiting will not necessarily be present, and to wait for meteorism to develop is not making an early diagnosis. The point that I wish to make, however, is that in making an early diagnosis the inferences drawn from the local signs in the abdomen should outweigh those derived from the general condition of the patient.

No reliance is to be placed upon an increase in the white elements of the blood as an indication of early peritoneal infection. Of this we have had several instructive examples quite recently in Montreal. Delirium or a stuporose condition and excessive meteorism vastly enhance the difficulty of early diagnosis of perforation, and indeed may make it impossible. This, it may be said in passing, is no small argument in favour of hydrotherapy, for delirium, coma and meteorism are of the rarest occurrence in patients who have been systematically bathed.

Given an early diagnosis of perforation, should the patient be given the chance for life that is afforded by surgical intervention? Undoubtedly, yes! in many, probably the majority, of the cases. Medically treated, perforation is practically a hopeless condition from the outset, and surgically treated, the patient has at least a chance of recovery—how much of a chance it is yet too early to say, for we must have a larger experience and more extensive statistics, but even those we have are quite encouraging. It must be admitted that there are some cases in which it is better, however reluctantly, to let the patient die with the peace of mind and body borne of adequate doses of morphia, than to hasten his demise by a few hours for the sake of viewing later

at the autopsy, an intestinal suture that is all that it should be, impervious to gas and liquids. These are the cases that are the most worrying and in which a sober judgment is most needed. It is difficult to say in a general way what leads the physician and the surgeon to agree upon the non-advisability of operation. Sometimes it may be the rapid onset of signs of general peritoneal infection, sometimes a very rapid pulse or cyanosis, sometimes the age or general condition of the patient, sometimes in prolonged cases, a fear that an operation would be the proverbial last straw. If the patient be in good condition this last consideration need not trouble the practitioner, for it does not appear that the operation, even if it should turn out to be an exploratory one, (which has happened more than once) diminishes the patient's chances of recovery from the typhoidal infection, or materially alters the subsequent course of the illness. Finally, as regards the time for operative intervention, it seems to be the latest opinion that, if possible, the operation should be undertaken not later than twelve hours after the occurrence of the first symptoms, but that the patient should be allowed to recover from the actual, or supposed, shock immediately following a perforation.

I fear I may have become wearisome with details of what may not be a "live issue" with many of you, and that little time is left for other topics worthy of at least a brief mention. Among these, few can lay claim to greater interest than the diagnosis of meningeal inflammations in the light of two comparatively recent, and as yet insufficiently appreciated, methods of physical examination—Kernig's sign and rachicentesis, or, as it is better known, the lumbar puncture of Quincke. Both of these procedures are really very valuable additions to the physician's diagnostic armamentarium, the first enabling him to affirm or deny the existence of meningeal inflammation in general; the second, in addition, affording him a certain method of differentiating the various forms of meningitis according to the bacterial species that is the cause of the inflammation.

Kernig, a Russian physician, described in 1884, a physical sign which seemed to him to be present exclusively in affections of the pia mater, and particularly in those attended with inflammation. This sign consists in a tonic contraction of the flexor muscles of the thighs, when the thighs are at a right angle with the body and the legs extended upon the thighs.

In a healthy individual it is possible to extend the leg completely, or almost completely, with the thigh in such a position, while in a patient suffering from meningitis it will be found that, soon after the leg has been extended a little beyond a right angle with the thigh, a

progressively increasing resistance to further extension is offered by the marked tonic contraction of the muscles at the back of the thigh. If the attempt to extend be persisted in, pain in the lumbar region is produced, and instead of a further extension of the leg being effected, the pelvis will be raised.

The sign may be elicited in two ways, either by having the patient sitting straight up on the edge of the bed, in which case, extension of the leg to a certain point immediately produces the phenomenon, or, with the patient lying flat on his back, the thigh is first brought to a right angle with the body, and the leg then extended until flexor spasm is observed.

It is remarkable that such an easily recognized sign should have attracted but little notice, and that not very favorable, for 14 years.

A revival of interest in this test was inaugurated by the publication of Netter's statistics in 1898 and 1899, and those of Herrick, of Chicago, in 1899. From these it appears that Kernig's sign was found in ninety per cent. of all cases of meningitis.

In 100 cases of disease other than meningitis Herrick found this sign in only two; in one of these there was a cerebral lesion (subdural hæmorrhage), in the other a local cause of contracture in the lower extremity.

Before applying this test it is necessary to exclude any local cause for flexor contracture, such as arthritis of the knee or hip joints, organic disease of the spinal cord, and sciatica.

Though no entirely satisfactory explanation of this phenomenon has as yet been advanced, it is highly probable that it is partly due to an exaggerated tonus in the muscles at the back of the thigh.

The lumbar puncture of Quincke, is a less simple means of detecting meningeal mischief, but affords at the same time more definite information.

Proposed by Quincke in 1891, this method of diagnosis, was not utilized to any extent, in America at least, until five or six years ago, and even now has not obtained the general recognition that its value entitles it too. In a text-book of Medicine published this year in England, I find no mention of lumbar puncture as a means of diagnosis in meningitis. The technique is not difficult. The patient lies in bed on the right or left side, according to the choice of the operator, with the back well bowed, the knees drawn up toward the abdomen and the head and neck well bent forward. To ensure stability in this position it is well to have a firm pillow, or sand-bag, under the flank and abdomen, and an assistant holding the patient's legs and shoulders, to prevent movement of the spine during the puncture. The lumbar

region of the spine is thoroughly scrubbed with soap and water, and then washed over with sublimated alcohol. Having previously disinfected his hands, the operator selects either the second or the third lumbar space, which is usually easily located and may be marked beforehand, and an area of skin the size of a five cent piece over the middle of either of these spaces is made anæsthetic by a sub-epidermal injection of cocaine. An aspirating needle of small calibre, not less than four and one-half centimetres long for children, and seven centimetres long for adults, previously sterilized by boiling, is then slowly thrust forward and a little upward and inward into the space selected, one centimetre from the median line. As the spinal dura is pierced a sensation will be felt as if the point of the needle were going through a thin and tense bladder of india-rubber. When this occurs the operator should stop, and almost immediately the cerebro-spinal fluid will begin to flow from the needle, usually more or less rapidly drop by drop, but sometimes in a distinct jet. The fluid should be collected in a sterilised test-tube for microscopical and bacteriological examination. It is not as a rule necessary or advisable to exhaust the fluid with a syringe. The needle is then withdrawn, and the seat of the puncture may be smeared with collodion. The quantity removed varies a good deal, but it is common to get from 10-20 c. c. in cases of meningitis. The character of the fluid as it collects in the tube gives important information, apart from any further examination. If absolutely colorless and clear, it is normal cerebro-spinal fluid; if only slightly turbid and of a very pale straw yellow tint, the case is almost certainly one of tuberculous meningitis, and if quite turbid and rapidly depositing a sediment, it is most likely to be either cerebro-spinal fever, pneumococcus infection, or some secondary septic meningitis. In any case, turbidity of the fluid, however slight, is due to cellular elements, and cellular elements mean an inflammatory process, normal cerebro-spinal fluid being free from cells.

Microscopic examination of the sediment shows mainly two types of white blood cells, the ordinary polymorphonuclear leucocyte, or pus cell, and the small mononuclear leucocyte, or lymphocyte, with large nucleus and a thin rim of protoplasm. It is constantly found that the pus cell is found in large numbers in cerebro-spinal fever and the septic forms of meningitis, while the lymphocyte is almost the only cell found in tuberculous meningitis. Bacteriological examination of dried cover-slip preparations of the sediment shows the *diplococcus intracellularis meningitidis* of Weichselbaum in the case of cerebro-spinal fever, usually in considerable numbers, while a careful search may reveal a very few tubercle bacilli in tuberculous meningitis. In

the other forms we find the pus organisms or the diplococcus of pneumonia. In suspected tuberculous cases, the bacilli being usually very few and hard to find, it is better to use animal inoculations, if absolute proof is desired. I wish to insist however, that a very slightly turbid and coloured fluid (almost like Montreal water) with scanty sediment containing almost exclusively the small celled leucocyte, is practically evidence of the tuberculous nature of the meningitis.

Lumbar puncture is not a dangerous operation, if carefully and aseptically carried out, and personally I have not seen any harmful results following it, though it is stated that in some cases of cerebral tumor untoward symptoms have been observed from a too sudden lowering of the intracranial pressure.

One would suppose that Chlorosis was a disease about which little that was new could be said. We are thoroughly familiar with its symptoms and with its clinical course: its predilection for the female sex, its frequent association with latent pulmonary tuberculosis, or with ulceration of the stomach, and the fact learned from repeated experience, that with rest, fresh air, good food and the exhibition of ferruginous preparations and laxatives the great majority of chlorotics are eventually restored to health. We know further that the blood count in such cases very constantly shows a notable diminution of the hæmoglobin value in the individual red corpuscle with very little, or no reduction, in the actual number of the red blood cells.

Though no definite or satisfactory explanation of the relative poorness of the hæmoglobin in the corpuscles had been given us, we had been taught that it was due to a deficiency in the production of hæmoglobin—a defective hæmogenesis—the underlying cause of which was more or less obscure.

It would seem, if certain recent experiments are substantiated, that our ideas of the ultimate etiology of chlorosis must be entirely modified. I refer to the work lately carried out in the pathological laboratory of Queen's College, Belfast, by J. Lorrain Smith. The details of these experiments are too technical to be entered into on the present occasion. It will be sufficient to say that the method consists in administering a given volume of gaseous carbon monoxide to the patient and estimating from this the total oxygen capacity of the blood, hæmoglobin having the same degree of saturation for both of these gases. The total oxygen capacity, or in other terms, the total amount of hæmoglobin, having been thus ascertained, the volume of the blood is estimated by comparing a measured quantity with an equal sample of ox-blood, of which the oxygen capacity per 100 cc. has been determined. Applied to the investigations of the different



forms of anæmia, this method gave instructive results, the most important of which was, that the total volume of the blood was much more variable than the total amount of hæmoglobin.

It was found that in chlorosis the volume of the blood was increased in proportion to the severity of the disease, the total amount of hæmoglobin at the same time remaining approximately normal. This increase of the normal plasma of the blood is accompanied at first by an increase of the cellular elements, and consequently, since the total hæmoglobin remains the same, we have a diminished amount of hæmoglobin for each corpuscle. In chlorosis, then, there is a condition of hydræmic plethora, which serves to explain many of the clinical phenomena of the disease—the dyspnoea and the rapid action with hypertrophy and dilatation of the heart, necessitated by the larger amount of blood that is to be driven through the pulmonary and systemic vessels. Probably also the functional cardiac murmurs are due to over-distention of the vascular system. Though the author does not mention it, is it not likely also that we have in this demonstration an explanation of the unquestionable fact long ago insisted upon by the late Sir Andrew Clark—though for an entirely different reason—that purgatives which deplete the circulation are of the greatest value in the treatment of chlorosis?

In the sphere of etiological research nothing more brilliant has been accomplished in the last few years than the discovery of the mode of infection in malaria and yellow fever. In the case of malaria we have been able to follow step by step, in both medical and non-medical current literature, the accumulating proofs that suctorial insects are the chief, if not the only, agents in the transmission of this disease from one person to another.

Through the initial labours of Surgeon Major Ross, of the Indian Medical service, and the subsequent investigations of Grassi, Bignami and Bastianelli, in Italy, and of the Sierra Leone Commission, it has been definitely established that certain mosquitoes of the genus *anopheles* are the habitual intermediate hosts of the malarial parasites of men, that these parasites undergo certain changes in the bodies of mosquitoes infected by them, and that such infected or as they are now termed—malariaed mosquitoes, are capable in turn of conveying malarial infection to human beings. It has further been shown that protection from mosquito-bites is the most effective means of preventing the infection of the individual by the malarial parasite, and that where the malaria bearing mosquito does not exist, malaria as an endemic disease is unknown.

By these researches a flood of light has been thrown upon the dis-

tribution of the malarial fevers, and a satisfactory explanation afforded both of the peculiarly localised endemic character of malaria, and of its different incidence in localities possessing the same climatic, telluric and geographical characteristics.

For a similar elucidation of the vexed problem of yellow fever infection Science is indebted to the labours of Surgeon Walter Reed of the United States Army and his collaborators in Cuba. In this case the infective agent of the disease is as yet unknown, Reed having conclusively proved that the much talked of *bacillus icteroides* of Sanarelli stands in no causative relation to yellow fever.

The investigations, undertaken during the winter of 1900-01, were directed entirely to the mode of infection and were carried out with a precision and thoroughness that compel acceptance of the results obtained. They form indeed a model for similar scientific research and will be a lasting monument to the industry and competence of their authors. In a carefully selected experimental sanitary station, protected from infection from without by the most stringent regulations and under daily medical supervision, a number of non-immune individuals were subjected, with their full consent, to the repeated bites of mosquitoes (*Culex Fasciatus*) that had previously fed on the blood of yellow fever patients in the second and third day of their illness and had been kept not less than twelve days at an average temperature of 82 degrees. As a result of this experiment four out of five of the individuals bitten developed an attack of yellow fever in from forty-one hours to five days and seventeen hours, while the other non-immunes who had not been bitten remained entirely free from the disease. In the one negative result, it was subsequently found that the mosquito used in the experiment had not been kept at the temperature required to develop infective power. When this little epidemic of yellow fever had subsided, a sixth non-immune was inoculated with a positive result, making five successful inoculations out of six. In another series of experiments, blood from yellow fever patients was injected subcutaneously into non-immunes, with three positive results and one negative one. Again, to decide whether or no yellow fever is conveyed by fomites from bedding or clothing soiled with the secretions, discharges, or blood of yellow fever patients, non-immunes were exposed for a prolonged period to such possible sources of infection with an entirely negative result in every case. The conditions under which the experiment had to be performed are so gruesome and revolting, such as the wearing of the unwashed and foully-soiled bed clothing of yellow fever patients, and worse still, that it is a marvel that any human being could consent to be subjected to it. Finally, to determine how a house

became infected with yellow fever, a one-room, mosquito-proof, but thoroughly ventilated building was erected and in this were set free a number of mosquitoes that had bitten yellow fever patients. Two non-immunes were then allowed to enter this building and remain only long enough to get bitten several times, about half an hour. One of these men developed an attack of yellow fever in a little under four days. On the other hand two non-immunes slept in this building for eighteen consecutive nights, protected by a wire screen partition from the mosquitoes and both remained in perfect health. It is hardly possible to over-estimate the importance of these very conclusive observations. Not only will the prophylaxis of yellow fever be established on a thoroughly scientific basis, but a vast amount of needless and troublesome disinfection will be saved to those who have either actually come into contact with yellow fever patients, or are returning from a locality where yellow fever is prevalent.

I cannot conclude this already too lengthy address without thanking you, Mr. President and gentlemen, for the honour you have done me in affording me the opportunity of addressing you to-night, and while I regret that my remarks have fallen so far short of the importance of the occasion, I assure you that I shall cherish a vivid remembrance of your unfailing kindness and whole-hearted hospitality, and of the very pleasant days spent in and about the beautiful city of Halifax.

## ADDRESS TO GRADUATES IN MEDICINE.

BY

WILLIAM GARDNER, M.D.,

Professor of Gynæcology, McGill University; Gynæcologist to the Royal Victoria  
Victoria Hospital, Montreal.

*Delivered at the Annual Convocation in Medicine of McGill University,  
June 14, 1901.*

GENTLEMEN OF THE GRADUATING CLASS:—

It is my pleasing duty this year, on the part of the Faculty, to briefly address you on this, to you, great occasion of your attaining to the Degree of Doctor of Medicine and Master of Surgery of this University.

Let me then first extend to you our most hearty congratulations on this auspicious occasion, and to say how great an honor I feel it to be, that I am thus permitted to be the first, metaphorically speaking, to take you by the hand. Believe me, gentlemen, this is no empty form of words. Who, I ask, can so heartily sympathize with you and enter into your feelings as your teachers, who have been for years straining their energies in your interests, and have themselves passed through similar experiences. I cannot but recall how, thirty-five years ago, I occupied a position like yours to-day and proudly if blushing received my degree at the hands of our late noble, gifted, and high-minded principal, Sir William Dawson. No words of mine are likely to influence or enhance your estimation of the value of the parchments you have thus acquired, but I cannot refrain from reminding you that to-day you graduate from a medical school whose curriculum is equalled by few and excelled in severity by none on this Continent, and we proudly point to the approval of a discriminating profession and public, as shewn by a steadily increasing number of candidates for our degree. We are constantly stiffening our requirements and narrowing our portals but the number of our students constantly increases and in the session just closed has reached a figure never before equalled.

Gentlemen, it is customary, and we believe it to be the duty of those who have been your teachers, when you are thus dismissed, when the bond which has linked us for four years as preceptors and pupils is to be severed, to improve the occasion by addressing you a few words of counsel and warning. Success in this the profession of your choice, is of course the object of your ambition. With all our hearts, gentlemen, we wish you that success in the best sense of the word. We have endeavored to impress you with the fact that if you are to succeed in

such a sense, you must deserve it. By a successful career I do not mean that of necessity it must be a long and brilliant one. There are many obscure village practitioners who, in reality, are more successful than others who seem to float on the highest wave of worldly prosperity. To the country or village practitioner are given opportunities for the development of independent judgment and self-reliance, faculties or qualities which often remain latent in his brother of the city with ample opportunities for consultation when he is in deep water. In this way there are often developed in the country such men as we do not often see in the city.

If in selecting the profession in which you this day graduate, you have looked at what is the true end of knowledge and work,—to relieve the suffering and to minister to the comfort of man's estate, to lessen the sum of human sorrow on earth,—you have chosen a profession which yields the fullest satisfaction to your aim and the highest scope to your work. You have, during the last four years, been learning in order to act, the end of all knowledge being action and the end of all action ought to be to promote the welfare and progress of mankind upon earth. In no profession are the opportunities for doing this good work so great and constant as in ours. To the least of us as to the greatest, occasions of tender sympathy and patient help occur every hour in the daily routine of our work; and no profession therefore rests so little for appreciation upon any adventitious circumstance of time or place, or so little needs extraneous titles of honor to give it dignity and respect. Put a doctor in the midst of the wildest savages and they will respect the medicine-man, when the lawyer's fluent sophistry and the preacher's pathetic eloquence may not gain them consideration, or save them from death. Associations which send missionaries to the heathen constantly recognise this fact. Protected by his medical skill David Livingston passed unharmed and esteemed among the savage tribes of Africa.

To-day, gentlemen, you enrol in the great band of workers of our profession at a time when the position of medicine in the estimation of the race, and when its capacities for the prevention of disease, the saving of life and the relief of human suffering, are far in advance of what they ever have been,—far in advance of what they were even twenty years ago.

There are many important functions to perform and positions you will be called on to fill, other than those of a strictly professional capacity. The family physician is, now-a-days, often the most trusted counsellor and adviser. He occupies the same position as did the priest of old. Hence, without doubt, he has vast influence for good, but also

possibly for evil, if not properly exercised. Perhaps this is going too far. At all events it is safe to say that the field is divided between the clergyman and the physician.

You will thus be called upon in season and out of season to advise families and individuals. Your ability to do this well must depend, not only upon strictly professional attainments but upon the position you have acquired in the confidence of your patients, and this will depend largely upon general culture,—a knowledge of men and things rightly used. Apart from the function of adviser and counsellor in matters other than medical, the family doctor exercises a great influence upon the morals and manners of his patients. Your conduct and deportment should be that of educated gentlemen, tidy and cleanly in person, in manners a pattern. You must remember that to many families and individuals, you will be the only person except the clergyman who has an opportunity to exercise such an influence.

In your relations towards your patients you must preserve a judicious reticence. Your patients have a perfect right to demand of you that you shall keep sacred, facts concerning them learnt by you in a professional capacity. There is, as you have doubtless learnt, only one exception to this rule, and that is when you are called upon to give evidence in a court of justice.

While thus keeping before you the high ideals which ought to govern your conduct and course of action toward your patients and the community generally, you must not suppose that you will escape much discouragement, ingratitude and misrepresentation. If your sensibilities are keen, and those of the young doctor are apt to be so, many darts and pin-pricks will fall to your lot. Some of those will be real, but many will be fancied on your part. Beware of taking heed to the gossip of small minds in the community in which your lot is cast. Our profession is by no means free from this class of mind, and there is nothing some persons in every community so much enjoy as to set the village doctors by the ears, to disturb the cordial feeling which ought to exist between you and your professional brothers. You cannot afford to be isolated. The occasions will be many when you need each other's help, sympathy and counsel. While in the conscientious exercise of the best you can give to your patients, you will have much in the way of appreciation and gratitude, but I have already told you that you must also be prepared for much misrepresentation and ingratitude. We doctors get much praise when we little deserve it, and much blame when we as little deserve it—we must be content with an average.

You will be early impressed by the immense gullibility of human beings, of their capacity for being humbugged. When old Thomas

Carlyle said that the then thirty millions of population of the British Islands were mostly fools, he made one of his strong statements, but one which contained a considerable measure of truth. It may be safely assumed that the British Islands have no monopoly of gullible human beings.

An important function of modern medicine—if not the most important, certainly one steadily growing as we make progress—the prevention of disease. You will, I hope, pardon a brief allusion to certain instances in which you may do much to prevent disease. You all know that there seems ample evidence to show that insanity is on the increase. The strenuousness of modern life must in the main be held accountable. You also know equally well that in scarcely any other disease does hereditary taint play so important a part in causation. The marriage of persons with such tendencies is therefore a most serious question. You will not always, probably not often, be asked for your advice on such points, but it will be your duty to speak with no uncertain sound, and to give it with all the necessary tact and authority. It will be often without avail. In these matters few persons are disposed to look to anything beyond their immediate gratification. If we were to say to two persons passionately in love with each other, that they may beget children, one of whom would certainly die prematurely of consumption, another become insane, and a third perhaps commit suicide, I am afraid that in three cases out of four, they would not practice self-denial and prevent so great calamities, but rather self-gratification and trust the universal plan will all protect.

You are doubtless aware of the intimate relation between the spread and prevalence of typhoid fever, cholera, diphtheria and other diseases, and the water supply of households and communities; and it is in the case of small towns and villages, rather than large cities, that such modes of diffusion especially obtain. Pardon me if I draw your attention to one of the most remarkable instances ever recorded—the outbreak of typhoid fever in the town of Plymouth, Mass., some years ago. In that town of eight thousand inhabitants, one imported case of the disease, by contamination of the water supply, led to the infection of no less than one-eighth of the whole population. One thousand cases of such a disease as typhoid fever, with, let us say, a mortality of eight or ten per cent.—try if you can to imagine such a calamity. Now it is from our profession surely, if any, that the influence with local authorities, families and individuals, needful to avert such disasters, must come. Here then, is an important field in which the young practitioner may do a vast amount of good to the community in which he lives, and to his own reputation. I will only, further, in this con-

nection, draw your attention to the necessity for your looking to the sanitary condition of dwellings as affecting the health of their inmates. The women and children of the community you live in will constitute a large majority of your patients, and this not only because they are more numerous, but because also they live more indoors and are much more susceptible to disease-producing influences than the adult males. On all such matters you will find a vast amount of ignorance and apathy on the part of husbands and fathers, frequently baffling, with sadness it must be admitted, the best directed efforts to counteract them.

I take it that the great object of the largest number of you is to obtain practice, to get patients, and this requires time. No clientèle well worth having, can be suddenly obtained. A practice quickly acquired is liable to be as quickly lost; you will therefore doubtless have to wait. Do not be deluded by instances you may hear of in which by some lucky chance a man suddenly works his way to fame and fortune. The celebrated English physician, Dr. Arbuthnot, is said to have suddenly become a fashionable doctor by his happening to be at Epsom when the carriage of the Prince of Orange was upset. There is doubtless a small amount of truth in this and similar instances. For the most of you it will be but a waste of time to sit behind a brass doorplate all day long doing nothing, or even drive about in a carriage with no patients to visit. All such expedients, sometimes resorted to, generally fail. You must wait, actively working while you wait. The exact form of work I cannot prescribe, but it may be at home, in a dispensary, a hospital or a medical school. You must also make your labors known, by medical societies, by journals or by separate publication, and be prepared to have been criticised and perhaps condemned; and it is well for all of us that our work should be criticised. If there is no medical society in your town or district one of the first things for you to do is to try and found one.

While waiting for practice and always throughout your medical career, you must read in order to keep pace with the progress of medical knowledge. It is after all but a small part that each of us can contribute to medical knowledge, but the sum of the contributions of many workers amounts to much. You must therefore acquaint yourselves with the work of others by reading books and monographs, but especially medical journals. But the periodical literature of medicine is exceedingly copious and sometimes of such a character as to more than justify the suspicion that the existence of it is rather for the necessities of the editors and writers than the hoped-for readers. You must therefore select for this and for another reason—for many of you money to subscribe will fail if time to read do not. But pardon me if I say that a single useful hint well repays the annual subscrip-



tion to a medical journal. I make no apology for attempting to guide your choice by advising you to take, first, the Montreal Medical Journal, the organ of your Alma Mater—a journal of which those who conduct it believe they have just reason to be proud. Then you must take and read the London Lancet and the British Medical Journal. The great ability and the high professional tone of their leading articles and the discrimination shewn in the choice of other matter, give them a position unequalled in medical journalism. The medical man who for ten years faithfully reads these journals must inevitably be a better man than his neighbour who systematically neglects them. Of American Journals, the Medical Record, the Medical News and the Philadelphia Medical Journal, may be selected. These will cost you about twenty-five dollars a year. But to all of you who aspire to a position at all above the rank and file, who are not content with the bottom rounds of the ladder, where throngs the crowd, I would say you must not be content with the medical literature of your mother tongue, you must know French and German, and if you have not hitherto acquired them, I would begin now when for a year or two most of you will have plenty of spare time on your hands. As soon as you can you must get to the old world to visit the justly renowned clinics and hospitals of England, France and Germany.

It has been said by some that to get on in medicine capital is necessary. If by capital money is meant, then I say it is not essential. Some of the most successful men have had no money to begin with. In fact, if you have money to invest, there are many ways to get a better material return than medicine. The capital essential to success is brains and industry, and it may be a comfort to many of you to know that these will suffice. No doubt a little money will sometimes greatly assist, but just as often it enervates or paralyses. In the study and practice of medicine your tastes and objects are doubtless varied, but the great majority of you must of necessity be general practitioners. In these days of prolific specialism, some of you may aspire to special work thinking it easy and remunerative. Well, it may be remunerative in a few instances of marked success, but that it is ever easy when successful, I deny: I would further say to those of you who aspire to special practice that if you are to be either safe or successful specialists you must first have a wide knowledge and experience of general medicine and surgery. Success in special practice depends largely on having acquired the confidence of the profession of the community in which you live, and this you cannot get without attainments which entitle you to it.

We have special congratulations for those of you who have attained to honours and prizes. They are the fruit of honest hard work, and we

are pleased to know that the class as a whole approves. I beseech you however to avoid making improper use of them. A short time ago I was shewn a country newspaper from the western part of Ontario containing a professional card which read as follows:—"Dr....., Graduate in Medicine and Gold Medallist of McGill University." It is true that the card stated facts, and while to laymen it may seem pardonable or even justifiable to thus publicly make known academic success, from the point of view of high professional tone it must be deplored and condemned. So are all newspaper notices of medical men in connection with operations, accidents and the like. I have lived long enough in this City to watch the careers of several men whose names were constantly for a time in the newspapers. None of them have attained to any enviable position, and most of them have utterly failed.

It must, however, be admitted that in these days of the ubiquitous reporter, the medical man is not always responsible for the appearance of his name in the newspaper.

I believe I cannot better indicate the spirit by which we should be animated in practising this profession of ours than by quoting to you the following words of an eminent surgeon:—"Our manners should ever be but the expression of the habitual frame of our mind; and the habit and temper of mind which should animate us in our ministrations to the sick, I can in no way so well indicate as by paraphrasing the words which so expressly tell us of the Divine Physician's tender care and true sympathy for us in our soul's sicknesses, namely, we must be touched with a feeling of their infirmities. The refining and elevating influence of such true sympathy will keep us from ever making our noble office subservient to any ignoble end; and though it may interfere with our becoming rich, yet it will raise us into a higher and purer atmosphere above the petty vexations and disappointments of professional life. For what if by our work, we become neither rich in worldly wealth nor great in the world's esteem? Surely a good name is rather to be chosen than great riches and loving favor rather than silver and gold. And though we may achieve no social distinction, we may by the Divine help, one day find, as many have found who are now gone to their rest, that the conscientious discharge of our duty in that profession which brought us neither wealth nor rank has been to us none other than the House of God, aye, and the very Gate of Heaven."

Again, wishing you a full measure of success, and assuring you of our continued watchful interest in your future career, I bid you for my colleagues and myself—Farewell!

## MUSEUM NOTES.

(Notes on Specimens of Interest and upon Work done in the Pathologica Museum,  
McGill University.)

BY

MAUDE E. ABBOTT, B.A., M.D., Assistant Curator.

### · UNIQUE CASE OF CONGENITAL MALFORMATION OF THE HEART?

*Defect of the Interventricular Septum; Rudimentary Right Ventricle; Patent Foramen Ovale; Great Dilatation of Right Auricle and Right Auricular Appendix.*

From a Case Reported by A. F. Holmes, M.D., Montreal, Lower Canada, in the  
*Transactions of the Medico-Chirurgical Society of Edtnburgh, 1824.*

This specimen which presents a condition of great pathological rarity as well as of clinical significance, is also most interesting to Montrealers and to those at McGill from a historical point of view. For the name of Dr. Andrew Holmes is well-known to most of us as that of one of the four medical men who, in 1824, initiated courses of lectures for medical students in this City, which, in 1828, became incorporated as the Medical Faculty of McGill University. The incorporation of the already fully organised medical school, securing to the College the bequest of its Founder.\*

Dr. Holmes was also one of the pioneer founders of the Montreal General Hospital and was connected with that institution from his 26th year until his death in 1860. He with others founded the Natural History Society of Montreal, and was its first President.

Alfred Sandham, writing of the Holmes' Gold Medal in 1872, speaks as follows:—"The medal was founded by the Faculty of Medicine in 1864 in honor of the late Dean, Professor Holmes, than whom, it may be said, that no man ever lived more conscientiously and few have died more beloved. It is a most deserving and grateful tribute to the memory of departed worth, associated as it is with the name of one who was the Founder of the first medical school in Canada, and who for nearly forty years remained in connection therewith."

Dr. Holmes is said to have been a detailed and conscientious rather than a brilliant lecturer and he was an indefatigable student. The

\* The bequest of the Hon. James McGill was to take effect on condition that there should be erected within ten years on the estate of Burnside "A university or college for the purpose of education and the advancement of learning in this Province with a competent number of professors and teachers to render such establishment effectual and useful for the purpose intended."

scattered papers from his pen which I have been able to examine from the journals of the time, give evidence of this; they show deep research and a widespread interest extending far beyond the subject with which he deals. Indeed, he seems to have been a man of high scientific gifts, who left his mark upon his time in many directions. He was above all things a collector, was a botanist, mineralogist and geologist, and left behind him a valuable herbarium and collections of minerals which still form important parts of the Redpath Museum, and the Natural History Society Collections. In the Redpath Museum these formed part of the first nucleus of what is now one of the richest parts of the University. I find a note by the late Sir William Dawson, dated 1862, as follows:—

“The new Museum contains a general collection of Zoology, a general collection of Geology and Palæontology, the *Holmes' Collection of 2,000 Canadian & Foreign minerals*, the *Holmes' Herbarium, containing specimens of nearly all the plants indigenous to Lower Canada*; the Logan collection of 450 characteristic Canadian fossils, and the Cooper collection of 2,400 Canadian insects.”

In the Redpath Museum his mineralogical collection is not preserved as a whole, but the specimens are scattered, classified among others for teaching purposes. All are named however “Holmes' Collection” and carry the original label, a small yellow paper bearing the catalogue number Dr. Holmes gave them, written by himself. An extremely interesting catalogue for these specimens can be seen in the Museum. It is entirely in his own writing. It shows his wide knowledge of mineralogy and states the source and date at which the specimens were obtained.

The herbarium here is almost more interesting to us, for, from a catalogue edited by Professor James Barnston in 1854, but made out by Professor Holmes himself, the specimens all are seen to be from the immediate vicinity of Montreal, collected from 1821 to 1825 and representing in over 500 specimens almost the entire flora of this district. This collection is not scattered among others but is preserved intact as the *Holmes' Herbarium*.

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Dr. Holmes graduated from the University of Edinburgh, in 1819, and the case before us was reported before the Edinburgh Medico-Chirurgical Society in 1823, when he was a young man of 26 and before he could have been four years in practice. Knowing his future it is very interesting to read this, which was probably his first paper of importance. On this ground I trust that the above apparent

digression from the pathological specimen forming the subject of this paper, will be pardoned.

This specimen had stood upon the shelves of the Pathological Museum for many years without a reference and its interesting history seemed to have passed beyond the ken of the present generation. Dr. Osler, however, in reply to an enquiry on the subject, stated that he remembered it perfectly, having often demonstrated it, and directed me to the Edinburgh Medical Journal in which he told me it had been reported by Dr. Holmes.

I take the liberty of republishing Dr. Holmes' article in toto, both because in itself it presents many points of interest to us of modern times and because it is so classically written that scarcely a word can be omitted without loss.

### CASE OF MALFORMATION OF THE HEART.\*

BY

A. F. HOLMES, M.D., Montreal, Lower Canada.

Communicated to the Medico-Chirurgical Society of Edinburgh, by Dr. Alison, March 5th, 1823.

The following case of malformation of the heart, is, I believe unique, as far as the appearances extend, though several, in which similar effects on the circulation must have been produced, are to be found recorded. Many of the cases collected by Dr. Farre in his Essay on Malformations of the Heart, resemble this in one or more particulars, but no one exactly. Though, from the existence of all the parts that are found in the natural state, it might be classed among cases of imperfect double heart, yet it may perhaps be more correctly considered intermediate between them and those of single heart, as from the relations and small capacity of the right ventricle, it can be looked upon only as the commencement of the pulmonary artery. The effects on the constitution of the blood would evidently be the same as if only one auricle and ventricle existed.

Isaac N., æt. 22, of a delicate habit, had been affected from infancy with a palpitation of the heart, attended by a peculiar blueness of the cheeks and lips, more remarkable at one time than another. The palpitation was much increased by quick motion, and subject to aggravation after any irregularity, which a turn for dissipation frequently presented. At these times the difficulty of respiration was great, and attended by pain in the region of the heart. For a few years past he had had a more severe attack every winter, apparently originating in

\* Republished from the Trans. Medico-Chir. Society of Edinburgh, 1824.

intemperance, commencing with bilious vomiting and yielding to blood-letting, cathartics and antispasmodics. Less severe attacks occurred more frequently, in most of which abstraction of blood seemed of advantage. That which terminated his existence commenced on the 13th of January by vomiting, which continued for nearly 24 hours, greatly anxiety and oppression and violent pain about the precordia. He was unable to lie except in one position, on his back, inclining to the left side. Any attempt to lie on his right side was followed by a sense of pain and suffocation, which obliged him to change his posture. This inability of remaining on the right side was present even in health; and if, by accident, he turned during sleep, he was awakened by acute pain.

To relieve the urgency of the symptoms, blood was abstracted on the 14th. On the 15th and 18th a blister was applied to the chest and opiates, in combination with salines and antispasmodics, were employed with but trifling relief. The tongue being much furred and skin hot, cathartics were used. These remedies were continued throughout the disease.

During its continuance it more than once appeared to yield, the patient getting comfortable sleep, and being free from pain, and the palpitation less annoying. The tongue became clean, but again furred towards the close; yellowness of the eyes and skin, and high colored urine, were more or less present during the progress of the complaint. Some time before his death, the feet began to swell, the œdema increased gradually, and was soon followed by fluctuation in the abdomen, and effusion in the chest. The presence of fluid in the pericardium was suspected from the patient being easy only while inclining forward, a symptom which appeared a few days before death, but became less prominent afterwards. At the same time a peculiar sound was occasionally heard, particularly when the ear was made to approach his breast, similar to that produced by bubbles of air entering a bottle full of water and frequent inclination to syncope, commonly induced by attempts to move, supervened.

The little probability of being of service, confined the practice in the latter part of the treatment to stimulants and anodynes, except that, in consequence of enlargement of the liver being perceived, submuriate of mercury was conjoined. No specific effect followed its exhibition, but it appeared useful by acting on the bowels. Three days previous to the termination of the case, cough came on, attended by expectoration of mucus; at first mixed with blood.

On the 8th of February, he was evidently sinking; the palpitation constant, countenance very anxious and mind depressed, much oppres-

sion, respiration short; incapacity of raising the mucus from the trachea. He died early next morning.

The pulse throughout the disease was generally very irregular; sometimes intermitting, then full and bounding, followed by a tremulous motion of the artery; at other times it was regular but small. At the beginning of the disorder the pulse was at the wrist imperceptible, and continued so, with cold extremities, for several days. It was observed, that the arterial dilatations were occasionally not synchronous with the contraction of the heart, the latter having several pulsations in the interval of those of the artery without any regularity.

A remarkable circumstance attending the case was the apparent convalescence. On the 31st every symptom was aggravated, the effusion gaining ground, and there appeared little probability of his surviving many hours. To our surprise, however, on the first he was considerably relieved, and continued to improve; the œdema and swelling of the abdomen became stationary, and for three or four days there appeared a prospect of his recovery. This proved fallacious; the urine became scanty and high colored; the thighs, penis, and left arm œdematous and his abdomen larger. He suffered less, however, than at the commencement.

The body was examined in the presence of Messrs. Arnoldi, Caldwell, and Robertson, the two former of whom attended the case with me.

SECTIO CADAVERIS:—In examining the body externally, the lower extremities, parts of generation, and lower part of the abdomen, were considerably swelled from effusion into the cellular membrane. On opening the abdominal cavity fluid of an orange color was collected, amounting to nearly a quart. The liver presented itself enlarged and hardened. The hardness was general, and extended through its substance, which, when cut into, appeared mottled with yellowish specks. The pyloric extremity of the stomach was lower than usual. A few of the glands at the root of the mesentery enlarged and hard; intestines healthy. Both sides of the thorax contained fluid, but not to a large amount. The pericardium occupied almost entirely the left cavity, the lungs being pressed into the upper and back parts; they were healthy except in containing fluid effused in their substance. Upon slitting up the pericardium, which contained from 3 to 4 ounces of serum, the heart came into view, generally enlarged, particularly the right auricle, the size of which was increased to the capacity of a pint.

When opened and cleared of the blood with which it was filled the musculæ pectinatae appeared remarkably strong. The interior rough and hard; apparently from earthy deposition, and giving a gritty feel when the knife was passed over it. The foramen ovale was pervious,

admitting easily the handle of the scalpel or the little finger. The aorta was then opened, and the section continued down into the ventricle. Its coats here and there were marked with yellow spots; the corpuscula Morgagni and two of the semilunar valves were red and increased in size. The parietes of the left ventricle were thinner than usual, and the cavity much larger than natural. Passing the finger into what appeared the opening between this ventricle and the left auricle, it passed by a large opening into the right auricle; and it was then found that there was no communication between the right auricle and left ventricle. The right ventricle was much less than natural. The pulmonary artery, of its natural size, passed from its upper end; the blood had found ingress into this ventricle from the left ventricle through an opening with tendinous margins, just below the semilunar valves of the aorta. Its size about half an inch by three-fourths of an inch. The praeternatural orifice between the right auricle and left ventricle was large, and furnished with valves similar to the tricuspid. Part of these were thickened and of a cartilaginous hardness. At the base of one of the divisions, there was a tumour of the size of a bean, containing a thickish yellow matter. The left auricle was partly concealed by the columnæ carneæ, and their tendinous terminations affixed to the valves just mentioned, and was a little enlarged but natural, as were the veins flowing into it.

The course of the circulation in this curious case must have been as follows:—The blood entering the right auricle by the two cavæ, passed almost entirely into the left ventricle, a small portion probably finding its way into the left auricle. A part of the blood would pass during the diastole of the ventricles from the left into the right ventricle, and be propelled through the lungs, to be returned into the left auricle. The blood itself would constantly remain in a state very little oxygenated, as the portion returning from the lungs would be mixed with the returned venous part, before being propelled into the aorta.

The accompanying sketch (Plate 1) may serve to explain the appearances:—

- (a) The pericardium held up by pins.
- (b) Part of internal surface of aorta with orifice of one of the coronary arteries.
- (c) The left auricle.
- (d) The left ventricle, crossed by a probe placed under the columnæ carneæ and cordæ tendineæ.
- (e) A part of the right ventricle, with the sides separated by a piece of whalebone.



- (f) The remaining part of the right ventricle. To this portion the pulmonary artery remained attached.
- (g) A probe passed through the oval opening between the two ventricles.
- (h) The passage from the left ventricle into the right auricle which was as large as the left auricular orifice.
- (i) The parieties of the left ventricle.

In the clinical history given interesting points are,—the relatively slight cyanosis that seems to have existed; it is spoken of only as “a peculiar blueness of the cheeks and lips, more remarkable at one time than another;” and the fact that the patient attained the age of 22 years in fairly good health and with apparently active habits. I find however a fair number of cases recorded of cor triloculare where patients have lived to a fairly advanced age.

Professor Ewald of Berlin<sup>1</sup> gives a case of cor triloculare biventriculare where the patient died at the age of 42 years.

Max Mann<sup>2</sup> gives a case of cor triloculare *biatriatum* dying at 22 years from a glioma of the brain, a quite independent affection.

In this report it is also very interesting to compare the keen observation which Dr. Holmes brought to bear on all the details of his case (noting fluctuation, signs, of effusion, pulse, bubbling in the chest, etc.), his close connotation of the sequence of events, his skilled post mortem technique, with an entire absence of those methods of physical examination which it would seem to us in the light of our present day knowledge almost must suggest themselves to one who was studying his case so closely. But in matters even of the purest observation suggestion seems needed to lead the way. In this connection Dr. Holmes' own words, spoken some 25 years later, in his *Valedictory address to the students of the medical faculty of McGill University* in 1851, are very striking. He says:—It is rather humiliating to look back into the history of medicine and to see the neglect of great discoveries and frequently the opposition to the introduction of great improvements. The case of Inoculation and more recently of Vaccination, may serve to show the one and the long neglect of Percussion as a means of diagnosis of diseases of the heart, the other. It was about the middle of last century that Auenbrugger published his important discovery and it was not till it was recommended by Corvisart many years after the present had commenced (in 1808) that its value became generally known. . . . .

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...I shall only finally allude to the vast improvement introduced

into practical medicine by the conjoined operations of auscultation and percussion. It is now about 30 years since Lænnec first announced his great discovery to the French Academy and it is much less since the practice of auscultation became general. Like most improvements it met with opposition at its first introduction; but this has now quite disappeared and its only obstacle is that which it shares with all other objects of pursuit, the labor necessary for acquiring expertness in its application."

The heart as it appears to us to-day as a museum specimen presents the following appearances:—

An adult heart of medium size, broad at the base and somewhat shorter than normal from the auricular-ventricular groove downward. The apex is blunt and rounded; the auricles have been opened in the usual way and show no anomalies of the entering veins. The right auricle is largely dilated and somewhat hypertrophied and there is a slit-like opening of the foramen ovale. The ventricular portion has been opened by an incision on its anterior surface through the aorta to the apex. This reveals a large roomy cavity occupying the whole inferior part of the heart and a small triangular cavity situated at the right upper angle of the larger cavity and in front of the aorta.

The larger cavity, which is called by Dr. Holmes 'the left ventricle', has four openings: (1) the tricuspid, communicating with the right auricle, guarded by the tricuspid valve (and described by Dr. Holmes as "the preternatural orifice between the left ventricle and right auricle, furnished with valves similar to the tricuspid.") (2) The mitral communicating with the left auricle and guarded by the mitral valve. (3) The aorta which rises behind and posteriorly in the median line. It is normal in direction and position but of slightly diminished calibre. (4) A diamond shaped opening with tendinous edges, not valvular in character, just below and to the right of the aortic valves and above the tricuspid, which leads into the smaller triangular cavity situated at the right upper anterior angle of the heart.

The only sign in the larger chamber of an interventricular septum, separating the venous from the arterial heart, is a *small muscular cushion at the extreme upper part of its posterior wall* which projects forward less than half an inch between the tricuspid and mitral valves which lie on either side of it.

The walls of this ventricle are about half an inch thick and the papillary muscles are very strong, especially on the left side.

The small triangular cavity situated above and to the right is called

by Dr. Holmes 'the right ventricle;' it has two openings: (1) it gives off the pulmonary artery; (2) and it communicates with the left ventricle by the diamond shaped opening which has been described above. The two cavities are separated from each other by a muscular septum over a quarter of an inch thick, which is perforated by the diamond-shaped opening at its inner end.

The *pulmonary artery* is of good size and slightly larger than the aorta in front of which it crosses from right to left; it shows no sign of disease.

At first sight this smaller cavity appears like a pouch in the wall of the ventricle, or the conus arteriosus of the pulmonary artery cut off from the right side of the main body of the common ventricle. And the anomaly before us might be considered to be two-fold:—(1) a total defect of the interventricular septum producing a cor batrium triloculare, a fairly common congenital anomaly. (2) A supernumerary ventricle, produced by the cutting off of the conus arteriosus of the pulmonary artery by an anomalous septum such as was described by Dr. Stephen Mackenzie in speaking of a heart with three ventricles as "An exaggeration of the folds of the muscular columns to which the tricuspid valves are attached."\*

Considering the matter, however, from an embryological standpoint a simpler explanation of the facts seems to suit the case better. It is one which seems to have suggested itself to Dr. Holmes also, judging by his nomenclature. For he calls the large chamber receiving venous and arterial blood from both auricles, the *left* (and not a common ventricle) and the small chamber, giving off the pulmonary and having no communication with the auricles, the *right* (and not a supernumerary) ventricle.

The interventricular septum it will be remembered is developed in early fetal life from three directions, the *septum inferius*, which grows up from the posterior wall near the apex; the *septum intermedium*, which is a prolongation downward and forward of the *interauricular septum*; and the *septum superius*, a continuation downward of the aortic septum, which forming within the aortic bulb has divided the aorta from the pulmonary artery. The septa thus derived from below, above and posteriorly, unite to form the interventricular septum not far from its upper border. The point of union remains the weakest part of this septum throughout life and is known in the adult heart as the *pars membranacea* or "undefended space."

In our specimen the *aortic septum* has fully developed, the aorta and

pulmonary arteries being in their normal relations, and perfectly formed. The aorta is moreover shut off from the chamber giving off the pulmonary by a fully developed muscular wall. The *septum intermedium* is apparently represented by the small muscular cushion projecting forward into the ventricle between the mitral and tricuspid valves.

Let us suppose that at a very early period of foetal life the *aortic septum* had been continued downwards either to meet the *septum inferius*, or, that being, defective, to meet the opposite ventricular wall, while the *septum intermedium* failed to close in and complete the division of the cavity. There would have thus resulted a chamber giving off the pulmonary partially cut off from a chamber giving off the aorta and also receiving blood from both the auricles. This latter chamber, which may be considered (in Dr. Holmes' own words), the left ventricle, having thus a great excess of work to do, would have grown much more rapidly than the other. And the wall cutting off the small cavity containing the pulmonary artery would, in the subsequent growth of the heart, have been carried round to the side of the greatly enlarged left ventricle and out of all relation to the *septum intermedium* between the mitral and tricuspid valves. And exactly the appearances seen here would have been produced.

Three plates accompany this paper:

Plate I. is a reproduction of a fine copper-plate engraving published by Dr. Holmes with his paper in the *Trans. of the Edinburgh Med. Chir. Soc., 1824*, and apparently taken from a drawing made at the time. The lettering is his own and is explained at the end of his text.

Plate IIa and Plate IIb represent two photographs kindly taken by Dr. Patrick of the heart as a museum specimen and show the interior of the two ventricles and the large arteries. Glass tubes project through the mitral and tricuspid orifices and through the diamond shaped opening between the ventricles.

Plate III. is a diagrammatic sketch of the heart to show the mixed course of the blood and the relation of its cavities. It will be seen that no chamber contains pure arterial blood, that entering the left auricle from the lungs meeting with a stream of venous blood through the foramen ovale. For this sketch I have to thank Dr. R. Tait Mackenzie.

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List of Dr. Holmes' writings accessible in the McGill Medical Library: Those papers which have seemed to me especially valuable I have underlined.

1. Case of Malformation of the Heart. Trans. of the Med. Chir. Soc. of Edinburgh, 1824.
2. *On Fleshy Tumours of the Uterus with Abscess of Ovarian, Rupture and Fatal Peritonitis.* British American Journ., 1845, Vol. 3, p. 87.
3. On Gunshot Wound of the Heart with Perforation of the Pericardium. Brit. Amer. Journ, 1846, Vol. 1, p. 227.
4. On Obstruction of the Appendix Vermiformis and on Post Mortem Appearances in Peritonitis. Brit. Amer. Journ., Vol. 2, p. 285.
5. Remarks on Dr. Nelson's Communication re the Champeau Case of Peritonitis. Montreal Medical Gazette, 1844, p. 199.
6. On the Employment of Chloroform, Brit. Amer. Journ., 1847-48. (Reporting a case where he claims chloroform was used for the first time in this Province.)
7. Valedictory Address to the Students of McGill Medical Faculty, 1851. Brit. Amer. Journ., Vol. 6, p. 51.
8. *Valedictory Address to Graduates in Medicine*, *ibid.*, 1854, p. 1.
9. Case of Heart Disease. Montreal Med. Chron., 1855, Vol. 2.
10. *Fatal Jaundice.* *ibid.*, Vol. 3, p. 281.



PLATE I.

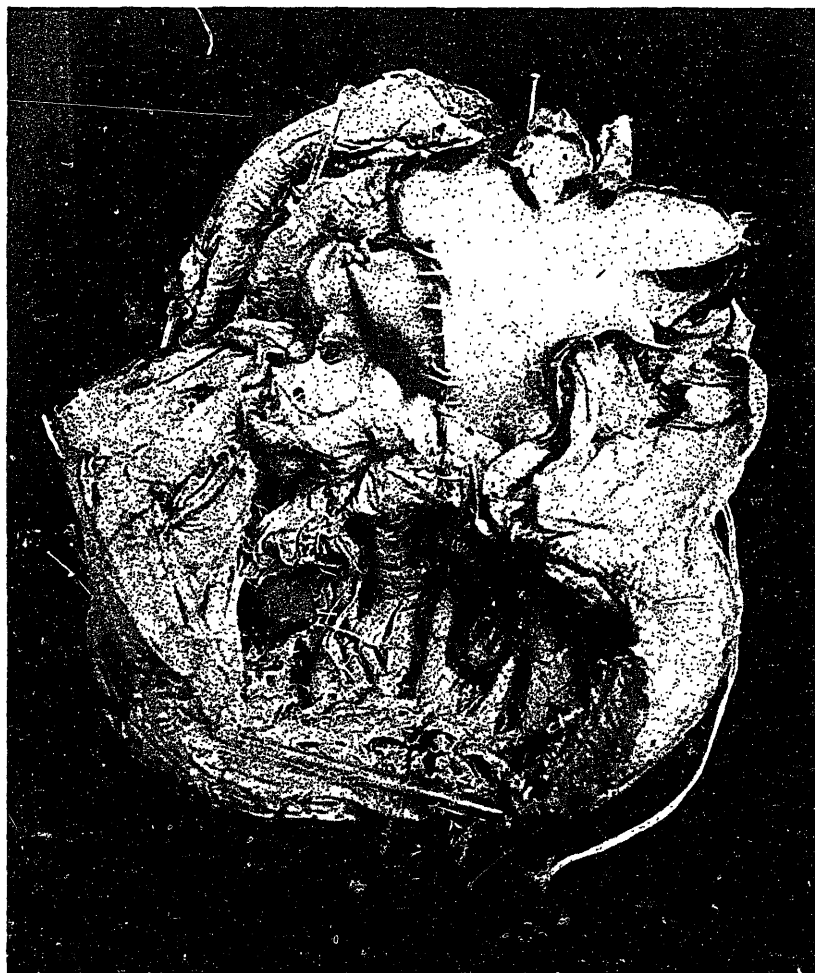


PLATE IIa.

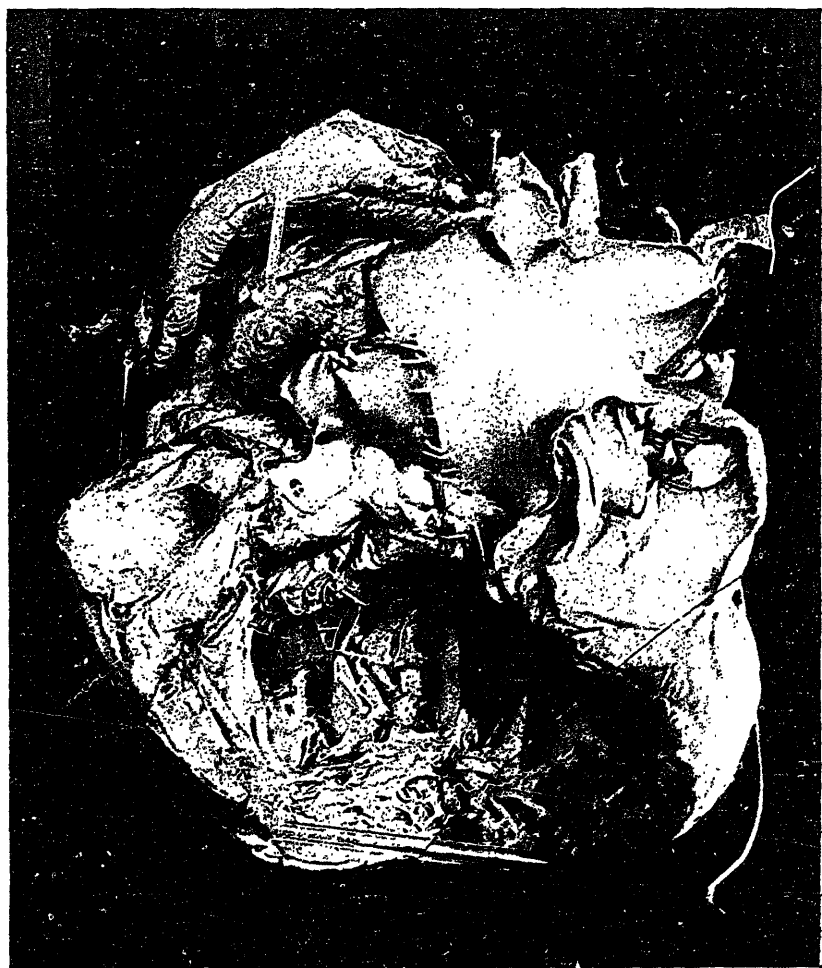


PLATE II B.



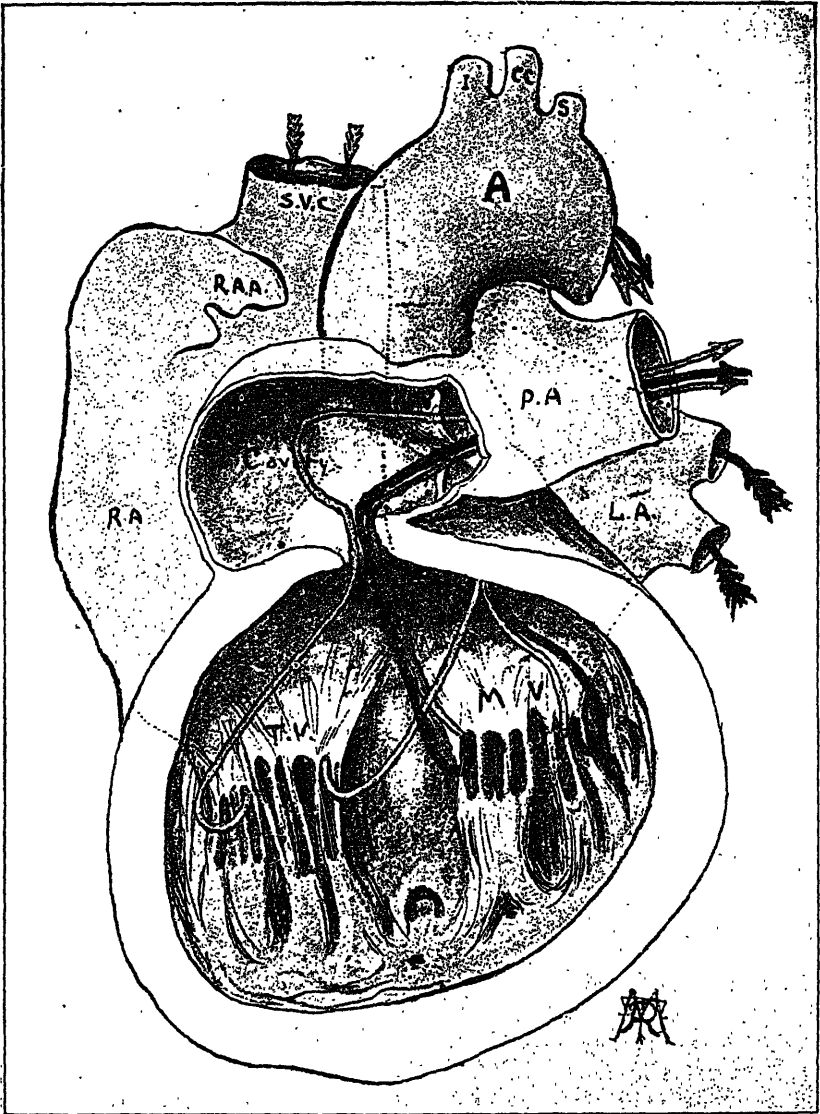


PLATE III.

Diagrammatic sketch by Dr. R. Tait Mackenzie, showing course of blood and relation of cavities. The pale line shows venous blood, the dark line arterial blood,

# ON THE ACUTE DILATATIONS OF THE HEART MET WITH DURING CHILDHOOD AND ADOLESCENCE.

BY

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All recognise readily dilatation associated with hypertrophy especially when it arises from valvular lesions easily detected by means of their accompanying endocardial murmurs. It is perhaps questionable whether we are sufficiently on the alert for symptoms of a weakened condition of the heart muscle associated with passive dilatation; nevertheless, the recognition of the existence of such a condition when present is of great importance. In the majority of instances acute dilatation would appear to be a consequence of some abnormal condition of the heart wall. Osler speaks of dilatation occurring as the result of either a weakened heart giving way under a normal strain, or a normal heart wall giving way under an increased amount of strain. Nevertheless, considering the relatively large amount of reserve force present in a normal heart, it must be admitted that a strain that breaks down the resistance of an efficiently nourished heart wall must be great indeed; and in most instances in which the cardiac muscle has given way in childhood some defect in its nutrition will be found to be an important predisposing factor.

Dilatation of the heart is most commonly met with at two periods of life: during adolescence, when the demands of the developing organism impose an increased strain upon the cardiac muscle, often defectively nourished by an impoverished blood; and again in the decadent period of life when degenerative or atrophic processes make their appearance in the heart muscle, either as a sequence to changes in the arterial walls, or as a result of some previous inflammatory condition. Of this second class, extremely important though they are, we do not propose to speak this evening, but will direct attention entirely to the dilatations which are liable to occur during early life and adolescence.

In this group the important predisposing factor is the very rapid development which takes place in the size of the heart at puberty. For the first three years of life the heart's growth is rapid and proportionate to that of the body. From the third to the tenth year it fails to maintain this relative weight; but from the eleventh to the fifteenth

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\* Read before the Montreal Medico-Chirurgical Society, June 7, 1901.

year growth is again extremely rapid (Holt). Pitt, (*Brit. Med. Journ.*, Nov. 27th, 1886) quotes Beneke who states that the annual increase in the size of the heart between seven years of age and the beginning of the development of puberty is about 8 per cent. annually of its weight, but during the changes which accompany puberty it increases from 80 per cent. to 100 per cent.

In the same paper Pitt says that it is easy to understand how with such immense developmental changes going on, the heart may prove functionally unequal to the strain which the active life of a rapidly developing boy or girl imposes. Cardiac dyspnoea in such may arise on slight provocation if the strain be further increased the heart wall may yield. Any such tendency is augmented by the existence of a second predisposing factor frequently present at this period of life, an anæmic and impoverished condition of the blood, due in many instance to faulty hygiene in home and school life.

Closely associated with this anæmia is the depressed condition of the nerve centres arising sometimes from imperfect nourishment, at other times due to over-excitement and a deficient amount of sleep, such a neurasthenic state may lead to marked impairment in the tone of both extra and intra-cardiac nerves.

Similar in some respects in its effect on the heart muscle to the foregoing is the condition of toxæmia which exists in almost all conditions of pyrexia and is specially present during an attack of one of the infectious fevers. Not only may such an attack be regarded in childhood as a predisposing factor but also as an actual exciting cause of cardiac dilatation; and many instances are recorded in which during the course of one of the more grave zymotic fevers the heart walls have become so seriously impaired both in nutrition and in nerve tone that they have yielded, sometimes quites suddenly before a slight extra demand made upon their activity. Such a yielding of the heart walls not infrequently takes place in the course of an attack of diphtheria; occasionally at a relatively early period but more frequently in the later stages of the disease; Lees (*Brit. Med. Journ.*, Jan. 5th, 1901), insists that after a severe attack it is necessary to keep a careful watch on the condition of a child's heart for at least two months. Acute dilatation, according to this writer, is frequently accompanied by vomiting, and this symptom is therefore regarded by him as an important danger signal, especially, if along with it, there is an increased pallor of the face and a feeble pulse. After the first shock has passed off the urgency of the symptoms may lessen; nevertheless a careful examination may reveal the signs of dilatation. Such patients are in imminent danger and demand most careful attention.

Forcheimer in an article in the *Jacobi Festschrift* has directed atten-

tion afresh to the occurrence of dilatation in influenza. Frequently the clinical symptoms pointing to such a condition come on early in the course of the illness and are apparently due more to the action of the poison on the nerve centres rather than directly upon the heart muscle. With this condition present the patient will be found lying in a somnolent condition with skin of mottled, deeply congested hue; the respirations hurried and pulse sometimes slow, more frequently feeble and rapid, and sometimes intermittent. A careful examination reveals no abnormal pulmonary sounds with the exception perhaps of a few large râles; the outline of the heart dulness, however, is broadened, and the tone of the first sound is impaired; the urine is normal. These symptoms may lessen greatly in their severity in from 48 to 72 hours, or more definite indications of weakness of the cardiac muscle may develop and assume an alarming character, especially if any pulmonary complication sets in. A distressing paroxysmal cough may sometimes do much to aggravate this condition. Minor degrees of cardiac dilatation may in some instances persist for many weeks after an attack of influenza is over, and call for watchfulness lest over-fatigue do serious and permanent injury.

The occurrence of dilatation in severe attacks of typhoid fever is a matter of common observation. The tendency to its development in scarlatina is greatly increased by the presence of any renal complication. Instances of such a condition are probably familiar to all. In rheumatic fever in children, acute dilatation is very liable to occur. Lees (*loc. cit.*) states that even in the most subacute attacks some acute dilatation of the heart is in his experience invariably present, but with the passing off of the rheumatic condition this dilatation lessens, and the heart muscle resumes its normal tone. That such dilatation may occur not infrequently will probably be admitted by all, but that it is invariably present repeated physical examinations by careful observers fail to verify. The following is an illustrative case which came into the wards of the Montreal General Hospital a few weeks ago.

H. E., *æt.* 14, entered the Hospital April 20th, 1901. His previous history was unimportant. On April 16th he had been taken ill with severe pain on the left side; and on the following day pain in the knees developed. He took to his bed complaining of weakness, pain and some dyspnoea.

The symptoms on entering the Hospital were as follows:—He was a fairly nourished lad, with lips and cheeks of slightly cyanotic hue. There was pain, redness and swelling over the joint of the right great toe, over the astragaloscaphoid articulation and in both knees. The pulse was small and feeble; the cardiac impulse was noted as in the nipple line and was feeble and diffuse: its vertical dulness commenced

at the upper border of third rib, and transverse dulness one and a quarter inches to right of middle line extending to the left as far as the nipple line. A soft systolic murmur was heard at the apex, the second pulmonary sound was accentuated, and a soft systolic murmur was also heard over the pulmonary cartilage.

Under treatment the rheumatic symptoms rapidly improved, and with absolute rest the transverse dulness of the heart diminished. On April 30th, it was noticed that the heart dulness began at the third space above and transversely at the right border of the sternum, extending to just inside the nipple line. On May 3rd the vertical dulness commenced at the 4th rib, the transverse at the middle of the sternum and extended to just within the nipple line. The systolic murmur at the apex was still present, the first sound was accentuated over the pulmonary. On May 18th, the area of cardiac dulness was almost normal.

An interesting fact, stated by Lees, is that although dilatation is far more common in rheumatism than in either influenza or diphtheria, it is far less dangerous. The difference is apparently due to a difference in the action of the several toxins on the cardiac muscle. Microscopical examination of sections through the muscle in a rheumatic and in a diphtheritic heart show much less destruction of the muscle fibres in the one than in the other (*British Medical Journal*, Jan. 5th, 1901, p. 9). Nevertheless it is to be emphasized that in this affection the condition of the heart wall as well as that of the valves demands the careful daily investigation of the attending physician.

Among the directly exciting causes of dilatation in youth we must undoubtedly place too severe or too prolonged exercise of all kinds, especially in running, wrestling, and swimming. This excess in exercise is, I am persuaded, liable to occur in school children if their games are not placed under the direction of a skilled instructor. Heart strain is especially liable to occur if severe contests are undertaken without previous training. Numerous instances are on record in which under such circumstances symptoms developed which pointed unmistakably to an acute dilatation having taken place. It is quite possible that such a dilatation may permanently impair the reserve force of the heart.

Collier (*Brit. Med. Journ.*, Feb. 16th, 1901,) in a paper on the results of severe muscular exertion in adolescence, states that at least two effects may be noticed; first, owing to the strain thrown upon the air vesicles a condition arises which has been termed physiological emphysema; and second, owing to the strain thrown upon the right side of the heart, over-distension of the right ventricle frequently

ensues; he adds that when we remember the enormous changes going on in the body of young adolescents and the coincident rapid growth of the heart, we are safe in assuming that at no time during what may be called the athletic period is the right side of the heart more liable to injury from over distension. The danger he considers a very real one and details several instances which came under his own observation. Not only is the right side of the heart liable to over distension but in almost all instances where lads have gone in enthusiastically for athletics, evidence of hypertrophy of the left ventricle will be present. The apex beat will be found lower and more to the left and its impulse will be strong and heaving in character. In explanation, Collier quotes Clifford Allbutt, who in a paper published nearly 30 years ago, showed that the great strain in severe muscular exercise fell on the aorta. In the earlier stages he says blood is thrown into the aorta with both increased force and increased frequency, distending it and necessitating as a consequence a greater propulsive force in the ventricle. This condition if prolonged or frequently renewed results in what has been termed physiological hypertrophy. In rapidly growing and poorly nourished adolescents such conditions may give rise to indications of distinct over-strain of the heart. As an instance of dilatation to which athletic exercises had certainly a noted share the following case may be cited:

In young girls the changes at puberty are more rapid than those in boys and are more frequently associated with anæmia and an atonic condition of the heart wall. In such generally, but especially in the class who act as domestic servants and who have a large amount of running up and down stairs to perform, symptoms of breathlessness on exertion with a disturbing amount of palpitation are easily induced, sometimes out of all proportion to the mere anæmia present. In the large number of these cases indications of a dilatation of a greater or less degree will on careful examination be found to be present.

In patients of this age, also, more frequently than in patients of more adult age, do we find dilatation as the result of those conditions which alter intra-cardiac pressure, and increase resistance to the out-flow of blood from the heart. Such conditions may be briefly referred to as disturbances in the respiratory system, in the vascular system and in the urinary system.

It is not necessary in a paper like this to more than refer to the physical signs indicative of cardiac dilatation:—the feeble, diffuse cardiac impulse; the extension of the cardiac dulness always towards the left, sometimes towards the right; the feebleness of the first sound at the apex and its altered character, it is shorter and higher pitched; the accentuation, sometimes reduplication, of the pulmonary second

sound ; the weak, sometimes slow, generally rapid pulse showing a tendency to irregularity and intermittency. Lees emphasizes another sign which would not have been anticipated, but which is usually present; a marked accentuation of the aortic second sound, even when the radial pulse is extremely feeble. This sign he attributes to tension of the aorta in his opinion by a contraction of the splanchnic arterioles due to the action of toxins. A more plausible explanation however is given by Nicholson (*Brit. Med. Journ.*, April 13th. ), who states that in extreme dilatation the arterial blood pressure must always be relatively high for the state of the heart and blood vessels, and the true value of this accentuation of the aortic second sound as a symptom, depends on its occurrence at a time when, to judge from collateral symptoms, one would least of all expect it. It may be regarded as an indication that the ventricle is straining every fibre and that the heart is arriving at a stage when no further response to stimulation is possible. If a little more work is suddenly demanded, syncope occurs. Marked accentuation of the second sound under these conditions is therefore to be regarded as a danger signal of grave significance and demands the exercise of extreme watchfulness.

Symptoms or complaints in growing children of loss of strength and energy on exertion, followed by a feeling of faintness or a feeble pulse and a desire to lie down should always lead to careful investigation of state of the heart wall.

In the treatment of the severer forms of cardiac dilatation absolute rest in the recumbent position is necessary and should be associated with a diet nourishing but carefully regulated to prevent over distension of the stomach by flatulence. In some instances it may also be advisable that the amount of liquids ingested should be reduced to a minimum. No drug has so powerful an effect upon the heart muscle as digitalis and in most of these cases its exhibition in full doses is demanded. Strychnine, although possessing a slight action upon the heart muscle, has a more distinct action upon the cardiac nerve centres and may be employed at the same time as digitalis. In those cases in which we have distinct accentuation of the aortic sound, the exhibition of the nitrites would also appear to be indicated since by dilating the superficial systemic capillaries they may lighten the work of the left side of the heart. At the onset of the acute symptoms it may be necessary to have resort to the more diffusible stimulants, ether, ammonia and alcohol.

# RETROSPECT OF CURRENT LITERATURE.

## Medicine.

UNDER THE CHARGE OF JAMES STEWART.

### Malaria.

PATRICK MANSON, M.D., C.M.G., LL.D. "Ætiology, Prophylaxis and Treatment of Malaria."

D. C. REES, M.R.C.S., L.R.C.P. "Its Parasitology, with a Description of the Methods of Demonstrating the Organism in Man and Mosquito."

LOUIS W. SAMBON, M.D. "The Intermittent Fevers and Black Water Fever."

ERNEST E. AUSTEN. "The Genus Anopheles." *The Practitioner*, London, March, 1901.

The mosquito malaria theory has brought with it an expansion of a score of facts long since observed by those who have lived in malarial countries. Those conditions which disposed one to taking the disease are favourable to mosquito life, while those conditions which are considered protective, no one knew why, are not favourable for the growth and activity of this insect. Hence, among many other facts, it is clear why the danger increases with being out of doors at night in malarial districts, and why, also, smoke and fire act as protection against the disease.

Dr. Manson remarks that the etiology of malaria, therefore, resolves itself into a study of the natural history of certain species of mosquito, the circumstances following their multiplication, those favouring their infection with the malarial parasite, and those favouring their communication of the parasite to man. Mosquitoes belonging to the genus *Anopheles* have been found efficient hosts for the parasite, while in a few species belonging to the genus *Culex*, the parasite has been seen to develop only in its earliest stage. It is thought that all the species of the genus *Anopheles*, of which there are thirty, may be dangerous to man.

There is but little doubt that the principal and usual source from which the mosquito derives its malarial parasite is man, while from what





an unhealthy district and develop the disease only after he has reached a healthy or infected region.

*Prophylaxis* may be considered from different standpoints. (1) Suppression of mosquitoes by draining of swamps and ponds, cleaning and quickening the slow-running streams, etc., etc. About households and gardens, pools and puddles should not be tolerated, flower pots and broken bottles should never be allowed to retain water until it is stagnant. "Painting" stagnant waters with petroleum will prevent the development of the larvæ.

(2) Prevention of infection of mosquitoes. This consists in insisting in all malarials using mosquito nets, or deporting all such individuals to a locality where there are no anopheles.

(3) Prevention of infection by mosquitoes. This seems to be the only prophylactic measure that can be effectually carried out. The house and the beds in the house should be mosquito proof. In application of this measure, carried out by Celli in 1899-1900 on railway employees working in a most malarial county, out of 207, ten only contracted the disease, the rest (197) remaining free from the infection.

Grassi's experiments confirm the above, while Ferrier and Tonsini's experiments of mosquito destruction by the use of kerosene on stagnant water about the convict station and lazaretto on the Island of Arsinara, and the burning of the culicidal powders in the dormitories of the prison and in the cottages, resulted in the development of no fresh cases during the entire malarial season from June to November.

The prophylaxis by quinine is worthy of consideration, and while not uniformly successful, is nevertheless to be enjoined.

*Treatment.*—Quinine is the only reliable drug in malaria. Euquinine is at present on its trial. For ordinary intermittent fever Dr. Manson recommends 10 grs. to be given when the sweating stage commences, followed by 5 grains every six or eight hours for a week, and with a view of preventing relapse, 5 grains three times every fifth, sixth or seventh day, for three months. For bilious remittent fever a full dose of calomel followed by a saline cathartic should be given at the outset and then followed by the treatment as given above for intermittent fever. The best time to give quinine is that when the spores of the parasite are free in the blood, thus an hour or so before the expected paroxysm. However, this is of little practical value. Quinine is to be given in solution and when the case is grave, hypodermically or intra-muscularly. A soluble salt, such as the sulphate, dissolved with the aid of half its weight of tartaric acid, may be used. If good effects do not follow one must double or further increase the dose. Methylene blue may be used by those who cannot bear quinine.

### The Parasitology of Malaria.

The malarial parasite belongs to the Protozoa, the sub-order or group *Hæmamoebidæ*. In genus 7 of *Hæmamoeba* there are two species of human parasites, viz.: *Hæmamoeba vivax*, the parasite of benign tertian, and *Hæmamoeba malaria*, that of quartan fever. In genus 2, *Hæmamenas*, is included the *Hæmamenas præcox*, the parasite of malignant or tropical malarial. Concerning this parasite some difference of opinion exists among the authorities.

It is generally thought that the three above-named parasites are distinct, although Laveran and many French observers maintain that the human malarial parasites belong to a single species.

The parasite of malaria is parasitic in man and in a certain genus of the mosquito, the former is its intermediate host, the latter its definite host. Among other distinguishing characteristics common to the different species, which are enumerated in most text-books upon this subject, the degree of amoeboid activity and the character of the pigment produced serve as most important diagnostic features. The most interesting feature of the life history of this parasite is the mode of reproduction. There are two such modes, the one, endogenous, asexual, by spores, and without the intervention of the mosquito; the other exogenous, sexual, and requiring a passage through a certain genus of mosquito. The former was first carefully studied by Golgi and may be called the cycle of Golgi, while the latter may be termed the cycle of Ross, as our knowledge of it is due mainly to his brilliant researches.

The human phase of the parasite is well-known to all but only recently has the mosquito phase been carefully worked out, and it may be well to follow this a little more fully. The large pigmented spheres and the well-known crescent bodies represent the forms of the parasite which require to enter the stomach of the anopheles in order to allow full development. Rees says that it is probable that a certain proportion of the spores develop into these pigmented spheres and crescents. According to Bastianelli and Bignami, these forms have been found in the bone marrow.

The spheres are found in the peripheral blood early in the course of the disease, one or two days after the onset of the fever, while the crescent bodies do not appear until about a week from the onset of the fever. These spheres seem to belong to two classes, as manifest in their subsequent development. One class presents flagella and are regarded as males or microgamocytes; the other class does not flagellate. They represent females in the sexual cycle. The sex of crescents is determined by the Romanowsky staining method, the protoplasm of the

female crescents staining more deeply, while the pigment is more closely grouped together. The flagella are to be regarded as the homologues of the spermatozoons of higher animals.

The next stage in the life of these parasites has been observed but once in human malaria, and thus this important link in the chain of the malarial cycle was supplied by MacCallum of America. Similar observations, however, have been made on the halteridium, one of the malaria-like organisms of birds. Dr. McCallum observed flagella break away and approach the non-flagellate spheres, and then one of them was seen to enter a sphere, which was momentarily disturbed. It then became quiescent and gradually elongated, the pigment gathering at the posterior or thicker end of the now fertilised cell, and assuming the shape of a spear head, it became actively motile and moved freely in all directions, piercing any blood cell that might be encountered. These observations have been confirmed by Koch and others, and it is believed that it is this body that pierces the stomach wall of a mosquito and develops into a *zygote*.

If mosquitoes belonging to this genus (anopheles) take the blood of an individual bearing crescents, it may be found later that a variety of forms develop in the stomach and intestinal tract of these insects. At first if the examination is made a few minutes after feeding, the blood in the middle intestine will be found to contain flagellating and non-flagellating spheres. On the second day one may find pigmented spheres or zygotes. In the course of a few days the pigment spheres become surrounded by a capsule. Then these spheres within the capsule divide and subdivide and produce the zygotomeres.

Upon the surface of these little spheres bud-like processes develop, giving them a hedgehog-like appearance, ten or twelve of which are contained within a capsule. Then these processes which have appeared upon the spheres within the capsule elongate and become sickle shaped completely filling the cell and causing the spheres upon which they have been formed to disappear. In this course of maturation of the large spheres they protrude through the walls of the intestine and eventually rupture setting free these sickle shaped bodies (sporozoites), which are carried over the body of the mosquito and are filtered out by the salivary glands. These bodies contain a nucleus of chromatin matter and are the actual source of infection to man, and they have been traced as far as the end of the proboscis of the mosquito. This cycle occupies a period varying from six to sixteen days or perhaps longer.

The demonstration of the malarial parasite in the human blood is a very simple matter to those who know well the appearances of normal

blood. The technique and the stains need not be described here. We also pass over the description of the parasite in the mosquito, as well as that which pertains to the method of breeding, transporting and infecting them.

The characteristics of the parasites of the different forms of malarial fever are so well described in the text-books that they need not be reproduced here.

Sambon distinguishes between the parasite of semi tertian-fever and quotidian fever, and urges a return to the use of the term "semi-tertian" after the custom of the ancient physicians. There is yet a difference of opinion among the authorities upon this point, as to whether the distinct species exist. Some maintain that the pigmented and unpigmented quotidian parasites are merely varieties of the semi-tertian parasite. Sambon remarks that Marchiafava and Celli, who first described a "quotidian parasite," while regarding it as similar to that of semi-tertian fever, distinguished it by its smaller size, less active movements, and its shorter life cycle of barely twenty-four hours.

There remain, however, the two genera with three species well-established, giving rise to the three forms of fever. What concerns the distinction between the semi-tertian and quotidian remains to be established by further observations.

A word about the cause of fever arising in the segmentation stage of the intermittent fevers. The generally accepted theory is that it is caused by some toxic substance elaborated by the parasite or derived from the disintegrated erythrocytes and set free at the time of segmentation. Sambon inclines to the view that the febrile reaction is connected rather with phagocytosis than with either the products of the parasite or necrosed corpuscles. He sees also an explanation of the irregularity and prolongation of the fever in the semi-tertian and quotidian, in the irregular and rather slow segmentation of the parasites, and because of the long duration of the paroxysms these forms of fever become very frequently subcontinuous.

Multiple and mixed infections explain many varieties observed clinically and microscopically. The idea that one often gets typhomalaria, malarial pneumonia, and many other forms of specific diseases due to the malarial parasite, must be abandoned in the light of the knowledge following upon the discovery of the hæmatozoa of intermittent fever. Pernicious attacks of malaria are usually those due to unchecked semi-tertian infections and are never found as first attacks, but are usually preceded by several attacks.

#### **Crescents.**

Laveran first described them in semi-tertian fever. From them spheres were derived, so he believed that they (the crescents) repre-

sented a kind of cyst containing the flagella. Bastianelli and others regarded them as degenerate forms of the smaller, amœboid, hyaline organism. Grassi and Feletti believed that crescents represented a distinct type of parasite which they termed the *Laverania*. According to Ewing the crescentic body is a form of the parasite adapted to further development in a new host, for in the bodies of mosquitoes fed upon blood containing crescents are found the fully developed parasite.

Whence its origin in man is yet unsettled. Mannaberg thought that the conjugation of two ring forms might account for their formation. The coccidia in rabbits, salamanders, and other animals form crescentic bodies by segmentation of a large spheroidal body. This, it is claimed, never occurs in the human subject.

The relations which crescents bear to ovoid or spheroidal forms has not been determined, but it is thought that crescents may assume a spheroidal form and extrude flagella, and that spheres may revert to crescentic forms.

Ewing's conclusion from his observations upon the habits and formation of crescents is that the ovoid and spheroidal bodies seen in ordinary stained specimens are usually younger forms than the elongated crescent, and that the spheroidal bodies in shed blood may be derived from crescents of almost any age. Do crescents sporulate? Authorities differ widely. In 1889 Canalis described segmentation in crescents with the production of eight to ten spores, and while the view that segmentation does take place is accepted by some, yet they do not regard this change as a reproductive one. It appears, therefore, that some changes do occur, yet how these changes affect the host is not determined.

Mannaberg and Manson, 1894, are in accord that the flagellate forms may represent the first steps in a cycle of existence outside the human body. Then in 1897 Simon advanced the theory that the flagella of the malarial parasite were forms of a sexual cycle; in 1899, McCallum followed this up with a confirmation of this in the halteridium of birds.

#### **Inoculations.**

The process of inducing the disease and the subsequent demonstration of the parasite in the blood have gone furthest to prove the plurality of the species of parasites inducing this disease. Altogether forty-two experiments are on record, not including those cases in which the disease was experimentally induced by means of the mosquito.

*W. F. Hamilton.*

## Review of Treatment.

UNDER THE CHARGE OF A. D. BLACKADER.

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### On the Treatment of Diarrhœas in Infancy.

It is possible that in infancy a relaxed condition of the intestinal tract may be of nervous origin, but a definite instance in which some form of nervous irritation could be regarded as the chief exciting cause of an attack of diarrhœa I do not remember to have seen. It cannot be too strongly affirmed that the great exciting cause of all the diarrhœas of infancy is the presence of some irritant in the intestinal canal, almost invariably of bacterial origin, and more or less poisonous in its systemic effects according to the particular form or forms of bacterial life concerned in its production. It is also to be remembered that at the commencement of the disorder and for a variable time afterwards, the *fons et origo mali* is limited to the contents of the gastro-intestinal tract.

With these important facts strongly impressed upon us the indications for treatment are evident: the tract must be cleared of the irritating and poisonous material, and of the pathogenic bacteria which develop in it, as promptly and thoroughly as possible, and for some days all food which is able to serve as a culture medium for the growth of such germs must be withheld. Partial starvation is much to be preferred to poisoning.

To fulfil the first intention it is desirable to make use of a non-irritating but promptly acting purgative, and, if the stomach does not resent its presence, no drug acts more promptly and effectually than a full dose of castor oil. As promptness of action is important, this dose should contain no opiate or other sedative that would in any way hinder its action. Another drug fulfilling the same indications is calomel, which has also the advantage of having some slight antiseptic action, and of being easily given and retained by the stomach. In an infant under a year old it may be administered in the form of a powder or triturate;  $\frac{1}{10}$ th of a grain every half hour for six or eight doses. If combined with sodium bicarbonate its sedative action on the gastric mucous membrane is increased. In older and lustier children the dose may be a larger one,  $\frac{1}{6}$ th to  $\frac{1}{4}$ th of a grain, repeated every half hour till one or two grains have been given. After free evacuations have been secured the calomel may be continued for another 24 or 48 hours in smaller doses at longer intervals.

If the systemic disturbance is severe, in addition to purgatives it is desirable to wash out the colon as thoroughly as practicable with normal saline solution, at a temperature from 95-98° F. In carrying out this irrigation the important points to be borne in mind are that the infant's hips must be well raised so as to favour the flow of the solution towards the higher portions of the canal, and to make sure that the flow be slow and gentle the receiver must not be raised more than two feet above the level of the child. Too great rapidity or force in the inflow of the water will irritate the sensitive mucous membranes and stimulate premature contraction of the muscular wall of the intestine with rejection of its contents before the water has penetrated a sufficient distance. Antiseptics in this solution are undesirable in my opinion, lest retention of some of the solution take place with subsequent absorption, inducing depressing effects on the circulation.

Such an irrigation if done effectually once or twice, need not be afterwards repeated very frequently. I have never been able to persuade myself that, if due care is exercised in the feeding of such an infant, I have obtained any distinct advantage from frequently repeated irrigations.

Although by these measures we may secure the evacuation from the intestinal tract of almost all its contaminated contents, any attempt to administer food of any kind, but especially milk food, to the infant, whose digestive powers have been temporarily paralysed by the attack, can only result in such food remaining more or less undigested, and acting as a new culture medium for the development of a fresh crop of poisonous bacteria. The necessity of withholding milk food is further emphasized by the consideration that even under normal conditions the digestion of milk appears to be accomplished almost entirely in the small intestine, and not, as in the adult, chiefly in the acid, and therefore to some extent, antiseptic medium of the gastric juice. Especially is this true of cow's milk the greater portion of which passes in a merely curdled condition from the stomach into the duodenum where its gastric acidity is neutralised; should the digestive secretions there be impaired in quality or quantity and digestion proceed slowly, it becomes a culture medium for the development of any pathogenic organisms with which it may be infected. Clinically, it appears to be imperative that milk foods, and especially cow's milk, should be entirely interdicted during an attack, and its use is only to be cautiously resumed in convalescence in such small quantities as can be easily and promptly digested by the infant.



My own experience corroborates that of a recent writer who says : "The physician who wishes to do his full duty to the patient must stop the milk diet at once; it matters not whether the diet is breast milk or cow's milk, or whether the cow's milk is sterilised or not sterilised; it matters not whether the stools are frequent or infrequent, neither does the character of the stool cut any figure; as long as there is evidence of intestinal derangement, the milk diet must be discontinued. It is useless to give laxatives and wash out the few bacteria, and then feed milk to the hosts that remain."

For the past few years it has been my rule at the onset of an attack of diarrhoea, to withhold all food from the infant for at least 24 hours permitting only water or a little weak spirits and water. After 24 hours a pre-digested or dextrinised gruel may be given, at first in small quantity, but the amount may be gradually increased; the intervals between the feedings should be not less than two hours. As the case improves a weak, partially predigested meat broth or essence may be added to the dietary; only such food however is to be permitted as we may feel certain will be absorbed rapidly and as completely as possible from the mucous membrane of either the stomach or upper portion of the small intestine.

It is surprising to one who remembers the very unsatisfactory results obtained from the older plans of treatment by means of astringents and even antiseptics, to note the rapid improvement that takes place in the majority of cases when these measures are carefully carried out.

At the present the administration of drugs plays only a secondary part in the treatment of diarrhoea, nevertheless we may obtain valuable assistance in many instances from their judicious employment, and for obvious reasons it is not desirable to altogether neglect them. The general concensus of opinion points to one of the preparations of bismuth, either the carbonate or subnitrate, as being of distinct benefit if given in full doses of at least 10 grains every two or three hours. If the movements are very frequent or very watery, a small amount of opium may be added in the form of the camphorated tincture of opium. Many cases unfortunately are seen too late for full advantage to be taken of the above measures and in such the presence of irritating material in the intestinal tract for many days has given rise to more or less inflammatory reaction in the superficial tissues of the intestine, chiefly of the large intestine. In such cases, in addition to the endeavor to remove the irritant by the use of purgatives and to the withholding of all fermentable food, I have seen distinct benefit result from the use of high irrigations of a 1 per cent solution of tannic acid given

twice a day. Tannic acid is of little value when given by the mouth and by checking the gastric secretions it may do distinct harm, but employed as an irrigation for the colon it has, in my opinion, a distinctly antiseptic and astringent action.

In those cases in which the fever rises above  $102^{\circ}$  F. a tepid bath at a temperature of  $90^{\circ}$  for five minutes is well borne and often of distinct advantage. I am afraid of cold rectal injections as a means of lowering temperature, regarding them as a measure liable on occasion to produce very depressing effects. Cold sponging is also of much service, but in the case of infants it is a disturbing process and its action as a systemic tonic and stimulant to elimination is much less decided than that of a general bath at  $90^{\circ}$ .

All the intestinal antiseptics that we are at present acquainted with give us but a modicum of assistance in this disorder and their use is not unassociated with a tendency to a depressing action on heart and circulation, an action which we are specially anxious to avoid. Alcohol as a heart stimulant, is of much value, and used in moderate quantities it improves digestion, stimulates absorption, and is to some extent a food.

## Reviews and Notices of Books.

**THE YEAR-BOOK OF THE NOSE, THROAT, AND EAR.** Edited by G. P. HEAD, M.D., and A. H. Andrews, M.D. Chicago, The Year-Book Publishers, 1901.

To those interested in these special departments of medicine this work will be found invaluable. Interesting articles on various diseases of these organs have been extracted, and the enormity of the undertaking may be judged from the fact that no less than over three hundred journals have been consulted in making the extracts. The occasional running comments of the editors, the reviewer thinks, rather detract from the value of the work. It is to be hoped that the editors will be encouraged in their work by the liberal support which they so richly deserve.

H. S. B.

**INTERNATIONAL DIRECTORY OF LARYNGOLOGISTS AND OTOLOGISTS** compiled by ARCHIBALD LAKE, F.R.C.S., London. The Rebman Publishing Company, (Ltd.), 1899.

This useful book contains the names and addresses of practitioners engaged in the study and practice of laryngology and otology. It is hardly expected that it can be exactly accurate considering the vast territory the names and addresses cover. In so far as Canada is concerned there is a great deal of inaccuracy. Several of the Canadian cities represented contain names of individuals who never existed. Quebec city is quite ignored. It is to be hoped that in the next issue, which is at present being revised, there will be fewer mistakes.

**A TREATISE ON DISEASES OF THE NOSE AND THROAT.** By ERNEST L. SHURLEY, M.D., New York, D. Appleton & Company, 1900.

Embodied in this work is the result of the author's experience as a laryngologist of many years practice, and as a useful addition to the general practitioner's library it is strongly to be recommended. The various subjects are treated in a thoroughly practical manner and without the usual "padding" which makes so many books uninteresting to those for whom the work is especially intended. At the end of the book is a collection of formulæ which the general practitioner will find very useful.

H. S. B.

## Society Proceedings.

### ONTARIO MEDICAL ASSOCIATION.

The Twenty-First Annual Meeting of the Ontario Medical Association was held in Toronto, on the 19th and 20th of June, 1901, the President, Dr. Angus McKinnon, of Guelph, in the chair.

DR. WILLIAM OLDWRIGHT, of Toronto, read a paper entitled, "*Three Recent Gall-Stone Cases.*" The first case, a woman aged 55 years, had been previously treated for a similar attack, and had come under notice while suffering from symptoms of gall-stone obstruction. There was intense pain, vomiting, slight elevation of temperature, and a distinct tumour in the region of the gall-bladder. At the operation there was found a great deal of inflammatory action with stenosis of the duct, and several stones were removed. The gall-bladder was stitched to the abdominal wall and drainage established in the usual way. A good recovery resulted.

The second case was that of a woman aged 65 years, seen in consultation with Dr. McLean of Woodbridge. At the operation, difficulty was experienced in finding the gall-bladder, and there was no doubt, on making an examination, of the presence of malignant disease. The patient died within twenty-four hours from hæmorrhage and shock. The operator thought that if operation had been undertaken some years before, the malignant disease might have been prevented.

The third case, a woman 40 years of age, had had symptoms of obstruction for some eighteen months. Removal of the stones revealed the obstruction to have been in the cystic duct, and resulted in a complete recovery, the patient leaving the hospital on the thirteenth day after operation.

Dr. Oldwright, in replying to the discussion following the reading of his paper, gave as his opinion that operation should be undertaken in every case after the acute symptoms had subsided, as repeated attacks led very frequently to malignant disease.

DR. HERBERT A. BRUCE, of Toronto, exhibited a woman, 34 years of age, upon whom he had performed an "*Excision of the Upper Jaw for Sarcoma.*" The operation had been performed three months after the growth was first noticed, which then consisted of a very hard swelling just behind the second bicuspid tooth, and extending backwards to the full extent of the jaw. Internally it had not extended to the middle line, and bulged externally to the extent of half an inch beyond what would be the line of the teeth. A polypoid mass was

present in the roof of the mouth, covered by mucous membrane, and also in the left nostril, which was partially obstructed. The operation was done on the 29th of April and the patient left hospital on May 18th, having made an uninterrupted recovery.

DR R. W. GARRETT, of Kingston, introduced a discussion on "*Ectopic Gestation.*" He held that the subject was one of vital importance to every practitioner, as at any time he might be called upon to make a diagnosis in a case in which this was one of the possibilities. He discussed at considerable length the causation and varieties of the condition, and thought that in a fairly large proportion of cases it was possible to make a diagnosis before rupture took place. Dr. Garrett limited his remarks more particularly to tubal pregnancy, the etiology, symptomatology and diagnosis of which were dealt with fully. In concluding, he recited the history of a very interesting case in support of his contention of the difficulty surrounding diagnosis.

DR. J. F. W. ROSS, of Toronto, confined his remarks mainly to the question of diagnosis, and was followed by many members, who all agreed in the difficulty of arriving at a definite conclusion as to the nature of some cases.

#### President's Address.

DR. MCKINNON, after referring to the honour of being chosen to fill this position, contrasted the state of medicine at the beginning of the past century and at the present day, mentioning the various advances which medical science had made. He deplored the increase which had taken place in the employment of proprietary medicines, and thought that harm was being done to the profession by the pills now sold as specifics for malaria, neuralgia, etc., etc. The literature and drugs sent out by these enterprising firms had become an intolerable nuisance. The electric belt man, the Christian Scientist, the advertising cancer-curer, the osteopath, and many other such like fakes which hang on to the skirts of medicine, he scored most unmercifully, and regretted that the public press, both secular and religious, opened their columns freely to these fulsome, untruthful and sometimes immoral advertisements, because they pay well. There was great danger to the public in permitting Christian Scientists, the "pray-for-hire-dealers," and the "Dowieites," impudently undertaking to cure infectious diseases, such as diphtheria, scarlet fever and smallpox—diseases which they are unable to recognize, and he thinks that we have come to a point where toleration and forbearance become criminal. The 2,500 medical men in Ontario should have influence enough to obtain from the Legislature an amendment to the Medical Act which will put an end to this trifling with human life. He directed attention to the delay that occurs in

securing admission to the asylums for people the subjects of acute mania, and thought it was high time the necessary steps in this department in the practice of medicine should be simplified.

DR. J. H. ELLIOTT, Medical Superintendent of the Sanatorium at Gravenhurst, read a paper entitled, "*Pulmonary Tuberculosis: Its Treatment in Special Sanatoria.*" Speaking generally, from 50 to 70 per cent. of the incipient cases were restored to health, while of all classes, from 15 to 30 per cent. were reported as cured or arrested, and from 60 to 70 per cent. as improved. The first improvement noted after entering the sanatorium was in appetite, then followed a gradual gain in weight and fall in temperature. Night sweats disappeared, the cough and expectoration lessened, and sleep was improved. The principles of the treatment were a continual life in the open air, with rest or exercise as indicated, a liberal suitable diet, symptomatic medicinal treatment, hydrotherapy, and a strict medical supervision of the patient's daily life. A strong point was made of the physician's personal supervision attainable in a sanatorium, where the doctor lives with his patients and is able to study his cases and individualise the treatment. Dr. Elliott also referred to the work already done and now being carried on in the matter of tuberculosis and serums, and expressed the hope that some day a specific would be secured for those cases at least where a mixed infection was not present.

DR. P. H. BRYCE, of Toronto, the Secretary of the Provincial Board of Health of Ontario, presented a paper on "*Vaccinal Protection against Smallpox.*" He thought that in the century which had elapsed since the introduction of vaccination, there never had been a time in which there was as much scepticism expressed against its value by the laity as at present, and, moreover, as much indifference on the part of the profession. In Ontario, between 1898 and 1899 there had been 22 recorded deaths from smallpox. He contended that five separate insertions should be made in each case of vaccination and with a known quantity of lymph. He deplored the fact that no instruction in the art of vaccinating was commonly given in the colleges. A lengthy discussion followed, in which the participants were unanimous in their approval of Dr. Bryce's remarks.

DR. FERGUSON, of London, introduced a "*Discussion on Empyema,*" taking up the medical aspect, which he stated was limited to a consideration of its pathogenesis and phophylaxis. In its etiology he spoke of four class, namely, pneumococcic, staphylococcic and streptococcic, tuberculous, and saprogenic organisms. The prognosis was best for the form due to pneumococci, which was the only form which might get well by aspiration without surgical interference.

DR. J. L. TURNBULL, of Goderich, discussed the surgical aspect. He advocated the resection of a portion of a rib, and daily washing out of the cavity in foetid cases, gradually shortening the drainage tube each day. Where the cavity would not close, he advised an Estlander's operation, mopping out the cavity with pure carbolic acid followed by alcohol to prevent poisoning.

In the discussion which followed several members expressed the opinion that the success of the operation depended mainly upon its being undertaken early and consequently on an early diagnosis being made.

DR. GEORGE H. CARVETH, of Toronto, read a paper on the "*Open Air Treatment of Disease*," describing three methods, either by wide open windows, beds on the veranda, or beds on the lawn under tents. At first he had had some difficulty in persuading his patients to undertake the treatment, but most of them after trying it were loth to return indoors. Some of the cases he had treated in this way were iritis, fracture, radical cure of hernia, rheumatoid arthritis, tuberculous disease of the spine, typhoid fever, and a case of hysterectomy.

Dr. Bryce spoke of the value of treating smallpox patients in tents, which should be double roofed and double floored, and provided with a stove. Drs. Freel, Elliott, and Hunter all related cases showing the value of open air treatment. Dr. Ryerson quoted the statistics of the treatment of enteric fever in tents and improvised hospitals in South Africa, showing that the advantage was decidedly in favour of the former.

DR. PREVOST, of Ottawa, read a paper "*On the use of Nitrous Oxide and Ether as an Anæsthetic*." After defining the qualities of what could be considered a good and satisfactory anæsthetic, he gave the results of his personal experience, with Dr. Gorrell as assistant, during two years, with the above combination. The apparatus employed was Hewitt's modification of Clovers' inhaler. Out of 307 cases, anæsthesia was induced in one minute in 24, 1½ minutes in 55, 2 minutes in 94, 2½ minutes in 47, 3 minutes in 44, 3½ minutes in 9, 4 minutes in 19, and 5 minutes in 14. With regard to the effect upon the kidneys, albumin had been observed 26 times in 434 cases. Post-operative vomiting was rare. Dr. Prevost, although the first surgeon in Canada to employ intra-spinal cocainization, did not think it should supersede ether when results like the above were obtainable by competent men.

DR. CHAS. T. NOBLE, of Philadelphia, read a paper on "*The Complications and Degenerations of Fibroid Tumour of the Uterus, with Reference to the Treatment of these Growths*."

DR. J. T. DUNCAN read a paper "*On the Importance of an Early*

*Recognition of Locomotor Ataxia—Do the Eye Symptoms Assist us?*" He dwelt upon the prominent eye symptoms present early in the disease.

DR. D. J. GIBB-WISHART, of Toronto, read "*Notes on the Use of Adrenalin.*" He reported the results of several hundred office applications to the mucous membrane of the nose, especially for controlling hæmorrhage in small operations in the nasal cavities. Its use rendered such operations practically bloodless. In the removal of adenoids or enlarged tonsils it had not proved of much service.

#### **Discussion on Gastric Ulcer.**

DR. R. D. RUDOLF, of Toronto, in opening the discussion, gave a short historical sketch of the chief literature on the subject. He propounded five questions on gastric ulcer, the first being as to its relationship to cancer, and quoted authorities showing that from 5 to 9 per cent. of all gastric cancers so arose. With regard to whether it was possible to diagnose the site of an ulcer, the speaker showed that the general consensus of opinion was against such a possibility except in rare cases, and enumerated the symptoms which might help one to come to a conclusion. Regarding the use of ergot as a styptic in gastric hæmorrhage, he was inclined to think that it might interfere with the natural formation of a clot following on the lowered blood pressure by raising the pressure. Turpentine had no such objection, and calcium chloride increased the tendency to clotting. The question as to whether cases of apparently cured ulcer were ever safe lives from an insurance point of view, he answered in the negative on account of liability of recurrence and of sudden perforation after years of quiescence. As regards operation, it should be performed immediately perforation was diagnosed, but where no perforation exists the question was not so easy to answer. Severe uncontrollable hæmorrhage should be an indication for operation in some cases, but the mortality from hæmorrhage was surprisingly small.

DR. H. B. ANDERSON, of Toronto, discussed the pathology, limiting his remarks to the common round ulcer. The condition was found most frequently between 20 and 40 years, but the mortality was greater from 40 to 60 years. Females were sufferers twice as frequently as males. The predisposing causes were enumerated, and the essential cause was, according to the speaker, hyperchlorhydria and an abnormal condition of the blood. He did not favour the theory of bacterial origin. The pathological anatomy of gastric ulcer and its terminations were discussed and illustrated by specimens.

DR. HENRY HOWITT, of Guelph, considered the surgical aspect of the question. He first took up the technique of the operative procedure for dealing with a non-perforated ulcer, dwelling on the necessity of



thoroughly washing out the stomach beforehand to render it as aseptic as possible. With regard to perforated ulcer, Dr. Howitt advocated the giving of morphia, both to keep the viscus at rest and to lessen the amount of anæsthetic required during the operation. Success depended, he thought, on the length of time elapsing before operation. Delay was dangerous. It was his practice to allow of the escape of gas by incisions in the bowels, which he made and closed before attempting the repair of the ulcer. The latter, where possible, he excised and closed the opening with two or three layers of sutures. Where this was impossible from the situation of the ulcer, he generally inverted it and closed it by layers of sutures. He recommended thorough flushing of the abdominal cavity with saline solution as one of the last steps of the operation.

DR. T. SHAW WEBSTER read a paper entitled "*Vaginal Section, Exploratory and Operative*," describing several operations, one for ectopic gestation.

DR. S. CUMMINGS, of Hamilton, read a paper on "*The Röntgen Rays in the Diagnosis of Urinary and Biliary Calculi*," exhibiting skiagraphs in illustration of the same.

DR. GRAHAM CHAMBERS, of Toronto, gave a "*Preliminary Report on the Relations of Hyperchlorhydria to 'Bilious Attacks,' some forms of Eczema, Gout, and Muscular Rheumatism*," stating that he had found hyperacidity, due to excess of hydrochloric acid, in many cases giving a history of "bilious attacks." In these same cases there was also hyperæsthesia of the mucous membrane of the stomach, and the speaker thought that many factors pointed to a relation between these two conditions and the diseases mentioned. An examination of the gastric contents of six cases of eczema showed the presence of hyperchlorhydria. The same could be said of gout, and possibly of muscular rheumatism, although the latter point was not definitely settled.

DR. W. B. THISTLE, of Toronto, discussed the "*Medical Treatment of Surgical Tuberculosis*," advocating medical treatment in many cases which were at present relegated entirely to surgery. He thought that sunshine and fresh air were too often neglected in the case of surgical tuberculosis.

DR. WALTER MCKEOWN, of Toronto, in a paper on "*Post-Operative Peritonitis*," considered that normal saline solution, either subcutaneously or intravenously injected, and the use of enemata of magnesium sulphate, would cause the elimination of the toxins by their dialysis through the intestinal walls.

The last session was devoted to business. The officers for the coming year were elected as follows:—President, N. A. Powell, Toronto; 1st Vice-President, R. Ferguson, London; 2nd Vice-President, R. W.

Garrett, Kingston; 3rd, L. C. Prevost, Ottawa; 4th, R. L. Turnbull, Goderich; General Secretary, Harold C. Parsons, Toronto; Assistant Secretary, George Elliott Toronto; Treasurer, A. R. Gordon, Toronto.

The following resolution on the necessity of vaccination was drawn up by the committee appointed for the purpose and passed unanimously:—

*Resolved*, That the Ontario Medical Association desires hereby to re-assert the opinion of the medical profession of this province:

1st. That the principles of Jennerian vaccination against smallpox, which have been now attested by the experience of more than a century, are scientifically correct.

2nd. That in order to carry out the protection through vaccination against smallpox it is necessary that the lymph used in the operation be of normal quality, and that this can be shown only by a proper amount of systemic reaction to the vaccine, as determined by the character of the vesicles, and that the absence of a normal reaction, as shown by the presence of vesicles, is no positive evidence of the immunity of the person either against vaccinia or smallpox.

3rd. That this Association emphasizes the urgent necessity that the scarification of the skin be sufficiently extensive to secure such reaction, and to this end recommend that from three to five insertions each of a quarter of an inch square be made in each vaccination. This was carried.

Medical Defence Union—On motion of Dr. J. F. W. Ross, seconded by Dr. A. Primrose, a committee was appointed to inquire into this matter, to report at the next meeting of the Association in 1902.

## Correspondence.

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### MATTERS OF PARAMOUNT IMPORTANCE TO THE PROFESSION—THE COLLEGE OF PHYSICIANS AND THE PINEAULT AND ROY LAWS.

To the Editors of the MONTREAL MEDICAL JOURNAL.

The College of Physicians has been recently condemned by the Courts of Quebec to hand over a license to practice medicine to seven young graduates of Laval University at Quebec, and, moreover, to pay to six among them a fine of \$100 each for refusal to grant it. The College of Physicians had not refused a license to these young men, but insisted before granting it on the fulfilment of the formalities required by the medical law of the Province of Quebec. The courts maintained, notwithstanding the affirmation of the College that all the requirements had not been complied with, that a license should be granted to the plaintiffs.

The question at issue is, indeed, a very important one, for it directly imperils, by substituting judicial to medical authority, not only the general welfare of the profession but especially the privileges granted by the law to the corporation of Physicians, and incidentally to its Provincial Board. Thus do we believe it to be our duty to explain to your readers the facts of the case and to note the conclusions to be deducted therefrom.

Let us first consult the revised statutes of the Province on the manner of obtaining the license of the College. Art. 3978 reads:—

“No person shall be admitted as a student of medicine, surgery or midwifery unless he has obtained a certificate of qualification from the Provincial Medical Board. No one is entitled to the license of the College on presentation of a diploma unless he has been previously admitted to the study of medicine in accordance with the provisions of this section, or unless he has passed an equivalent preliminary examination before a college, etc., etc....”

This last phrase regards Bachelors of Arts. Art. 3978 seems very clear to us, and it may be summed up by stating that a student who has not registered in the books of the College by presenting his diploma of Bachelor or his *brevet* (Provincial Board matriculation) has *no legal existence*, that is to say, is recognised neither by the law nor by the College of Physicians, and would not obtain the license even though he passed his university examinations. On the other hand, the regularly registered student, four years after the date of his registration,

is entitled to the license if he successfully passes his examination at the medical faculty where he studied, as set forth by Art. 3977 of the Revised Statutes, as follows:—

“Every person who obtains a medical degree or diploma in any university or college mentioned in article 3972, is entitled to such license without examination as to his medical knowledge and skill, provided that such diploma has only been given after four years of medical study from the date of admission to study and according to the requirements of the section, etc.”

Does this signify that the non-registered student is forever debarred from obtaining the license of the College? No: but by not registering he has placed himself in a somewhat awkward position. Having no legal existence as a medical student, while undergoing his university examination he remains ignored by the Assessors of the College, who are not authorized, either by the law or by the regulations of the College, to take any notice of his examination. Note that the law obliges the College to enact such regulations:—

Art. 3983:—

“For such purpose the Provincial Board shall appoint or elect Assessors, two or more of whom shall attend the examinations at each university, college, or incorporated medical school in accordance with one or more by-laws to be passed by the Board.”

The following are the regulations enacted by resolution sanctioned in 1894, by the Lieutenant Governor in Council.

“To be entitled to present himself for the primary examination before the assessors, each student must prove that he has been admitted to the study of medicine by this Board for at least two university sessions..... To be entitled to present themselves for the final examination before the assessors the candidates must have studied in a university, college, or school of medicine of this Province during not less than four sessions from the date of the certificate of admission to study by the Board; and they must have fully complied with the regulations of the College of Physicians and Surgeons of this Province, and, also, they must have passed the primary examination to the satisfaction of the assessors of the Board.”

The non-registered student leaves the university with a worthless diploma so far as his license is concerned. To be recognised by the College of Physicians he must do what he should have done at the very first, namely, have his name inscribed in the official register of the candidates for the license, and for that purpose pass the proper examinations before the examiners of the College. Moreover, as the law prescribes that a student only has a right to a license, inasmuch as he has obtained his diploma after four years of medical study from the date of his admission to study, the non-registered student must, after undergoing his preliminary examination or *brevet* before the College of Physicians and registering his name with the Registrar, wait four

years more before he be allowed to pass an examination before the examiners of the Board to obtain a license. It is in a way a penalty imposed on those who have not observed the rules.

But this delay of four years, it appears, offered in many cases serious obstacles. Numbers of young doctors holding valid diplomas from the universities but not having been previously admitted to the study of medicine by the College of Physicians, would seek to obtain from the Quebec Legislature their release from these four years of delay, alleging all kinds of excuses, such as sickness, poverty, absence from the country, etc. The Legislature, always compassionate, would sanction a private Bill allowing them to obtain a license from the College after examination and without delay. Finally, on account of the ever-increasing number of private Bills the Legislature tried to do away with them by authorizing the College to repeal the delay of four years. Hence the Pineault law (1898) which reads as follows:—

“Notwithstanding article 3978 of the Revised Statutes, the College of Physicians and Surgeons of the Province of Quebec is authorized to admit to practice the medical students who on the first of November, 1896, had commenced attending a medical course in a duly incorporated university of the Province of Quebec before having obtained a certificate of admission to the study of medicine, and grant them the necessary license to practice medicine, surgery, and obstetrics after having passed the examinations required for admission to study and those required for admission to practice.”

The Pineault law, as may be seen, does not exempt the non-registered students either from the matriculation examination (*brevet*) or from the license examination; it only exempts them from the four years that must elapse between the one and the other.

The Roy amendment adopted in 1900 goes further:—

“Nevertheless, the said College may, whensoever they consider that the circumstances justify them in so doing, exempt any such student from the examination required for admission to study.”

In this case there is no error, the law authorized the Board of Physicians to deliver “when circumstances justify their so doing” the license of the College to those who have no *brevet*. But this applies only to the *brevet*, and the law does not compel the College to acknowledge the university examination of students whose names do not appear in the register. If the *brevet* (matriculation examination) is abolished for non-registered students, the obligation of undergoing the professional examination before the Medical Board still exists for them, and it remains a fact that, notwithstanding the Pineault law, those students during their medical studies had no legal existence. The Board cannot, therefore, grant them a license without imposing a professional examination before its committee.

Now that we are familiar with the medical laws let us consider the facts of the case. No sooner had the Pineault law been modified by the Roy amendment (February, 1900), than several young men, having studied medicine without previously registering with the College of Physicians, petitioned to be exempted from the examination for admission to the study of medicine. At its meeting of July 1900, the Board took into consideration the petition of 34 of those young men and agreed to grant them all the benefits of the Roy amendment, provided they underwent the professional examination before the Board as required by the statutes. The motion read as follows:—"Dr. Marsolais proposes, seconded by Dr. Jobin, that a professional examination before the examination committee of the Board of Governors be demanded from all candidates from whom the Board will grant the privilege of the Pineault law (1898) modified by the Roy amendment, passed in 1890. It is then unanimously resolved that all the irregulars who have made application to the Board be given the privilege of the Roy amendment."

This resolution only confirmed the rules and regulations of the medical law and of the College, giving at the same time to all those young men the benefit of the new law. Up to this stage everything is normal; there is a perfect understanding between the Legislature and the College of Physicians.

Mr. Joseph Gosselin, a student of the University of Laval of Quebec, after being exempted from the *brevel* (matriculation) examination, refused to undergo the professional examination before the College, maintaining that, although he was not a qualified student, he had passed his university examination in presence of the assessors of the College through a special permission granted to him in 1898 by the President of the late Provincial Board of Medicine. Mr. Gosselin claimed that the Board should give him his license, since he had passed his final examination before the assessors. The Board refused to acquiesce in his demand for the three following reasons: (1) Because in 1899 Mr. Gosselin, being a non-registered student, had no legal existence, and the assessors of the College could not take into consideration his examination. (2) Because no officer of the College, not even the President, has the power to change for any reason whatsoever the laws of the Province and the by-laws of the corporation, which establish very clearly the duties of the assessors. (3) Because the Pineault-Roy law does not exempt non-registered students, and Mr. Gosselin was one in 1899 (previous to the adoption of the Roy amendment), from the obligation of undergoing the professional examination before the Provincial Board of Medicine. The Board in support of its contention

relied on its statutes and regulations; it was impossible in our opinion to adopt any other course than that previously followed under similar circumstances.

In September, 1900, Mr. Gosselin brought suit against the College to force it to grant him his license, and Judge Bonaventure Caron gave judgment in his favour in December, 1900. The College appealed from this judgment to the Court of Revision of Quebec, which confirmed the first judgment rendered.

"Whereas the Plaintiff alleges that he has successfully passed all the required examinations: Whereas the Defendant pleads that the Plaintiff is not and never has been qualified according to the laws and regulations in this respect to be admitted to the study and to the practice.....Considering that the Plaintiff and applicant is qualified to take advantage of the provisions of chapter 31 of the Statutes of the Province of Quebec passed in 1598 (Pineault law) as completed by 63 Victoria, chapter 27 (Roy law), and that he has fulfilled all the requirements for admission to the practice of medicine: Considering that the Defendant has not proven the facts adduced in his plea.. . .rejects the said defense, maintaining the said writ of mandamus, and declares it peremptory, enjoining the said College to grant a license to the Plaintiff, etc."

Thus is the College of Physicians condemned for having desired to abide by the statutes and regulations of the corporation. In virtue of this judgment an officer of the College may at will change the laws and regulations of the Board, and the Pineault law modified by the Roy amendment exempts irregular candidates, not only from the examination for admission to the study of medicine before the Provincial Board of Medicine, but also from the examination for admission to practice before the same Board.

The gravity of the situation is readily understood. The medical law has already been greatly altered by the Quebec Legislature, if the courts withdraw now from the College the limited authority which it possesses, the usefulness of the Provincial Board of Medicine is very much curtailed. It would be just as well to return to the days of 1847, when judges alone issued medical licenses. Moreover, it would be leaving a door open to the ambition of all who have not complied with the requirements of the law and thus cause disastrous results. Happily the question is not finally settled. The Court of Appeals will soon be called upon to decide the matter, and for the following reason:—

The very same day that Mr. Gosselin won his case against the College in the Court of Revision (thus confirming definitely this judgment as far as Mr. Gosselin is concerned), Messrs. Chabot, Bernard, Brunet, Paradis, Filon and Millette applied in turn to Judge Caron, laying claim not only to their license, but also to \$1,000.00 damages

each. The Judge granted to each of them \$100.00 and their license. The College immediately appealed from this sextuple judgment to the Court of Appeals, where the cases are inscribed for the coming term.

These proceedings were to be expected. The moment the civil tribunals open so widely the door of the corporation, give to the Pineault-Roy law a bearing it has not, and that was never intended to be given it; the moment they authenticated gratuitous permits not authorized by the statutes and even award damages to the supplicants, the chances become far too inviting for the irregulars, several of whom, it appears, intend to exact a license from the College, confiding in the judgment previously rendered.

Can the College of Physicians reasonably favour such transactions? Certainly not. The interests of the corporation are at stake; the Provincial Board must defend them. We sincerely hope the Superior Courts will recognize its rights, regulations and statutes, and will cover with the cloak of justice those who have followed the prescriptions of the law, and not those who have sought for one reason or another to elude them. The fifteen hundred physicians of the Province of Quebec, who at present lawfully practise their profession, and who for that purpose have imposed upon themselves all the sacrifices of work, time, and money demanded by law, are entitled to the protection of the Medical Board and of the Courts, by requiring that all irregular candidates at least comply with the law as amended.

F. P. BENOIT.



T H E

# Montreal Medical Journal.

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

EDITED BY

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VOL. XXX.

JULY, 1901.

No. 7.

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## THE JUDGMENT AGAINST THE COLLEGE OF PHYSICIANS AND SURGEONS OF THE PROVINCE OF QUEBEC.

We hope that none of our readers will omit to read very carefully Dr. Benoit's letter concerning the judgment recently obtained against the College of Physicians and Surgeons of the Province of Quebec. Dr. Benoit has put the whole case so very clearly, quoting the law and the different amendments, that each reader may readily arrive at a pretty definite understanding of the position of the College in the eyes of the law in this province. It reveals a state of things most deplorable. Indeed, it is almost incredible that things should be as they are represented in Dr. Benoit's correspondence.

The medical profession is not more interested than the public in maintaining the highest possible standard of medical education. The public are year by year demanding higher culture and greater technical skill, and they are quite within their rights in so doing. Medical education is becoming more and more difficult and scientific. To-day it requires a well-trained mind, good natural ability, and constant application over a period of four or five years, to gain sufficient knowledge to pass the professional examinations of the better medical colleges.

The high standing of medical training is not promoted by lowering the matriculation examination, nor by allowing students to begin their professional studies before passing it. The regular course of medical study is quite sufficient to absorb all the energy of the student.

The regulations of the study of medicine in Canada is the result of years of experience in this and other countries, and the laws governing it should be respected. It is always unwise to have rules that are not enforced. To let a few students through the examinations, matriculation or professional, without requiring from them the same proficiency demanded of others is to sow seeds of discontent and ill-feeling. The Governors of the College of Physicians and Surgeons will, we feel sure, have the sympathy and loyal support of the profession in their endeavour to maintain the standards of the study of medicine in this Province as established by law, and to oppose the entrance into the profession of any student through other than the regular and legal portals.

### CANADIAN MEDICAL ASSOCIATION.

WINNIPEG MEETING, AUGUST 28TH TO 31ST, 1901.

The question now seems to be, how is one to make arrangements to get away at the time of the meeting; for it seems to be universally conceded that to attend the Winnipeg meeting is the proper thing to do. The railways, having granted a single return rate to the meeting, have assisted in breaking down one of the barriers, and now one hears from all sides of physicians intending to make Winnipeg the central point of their holiday trip, and Winnipeg is making preparations for a great gathering! Many physicians, it seems, will also take advantage of the offer of the single fare rate from Winnipeg to points in Manitoba, the Northwest, British Columbia and North Dakota, after they have enjoyed the hospitality of the Winnipeg profession.

The question of Dominion Registration will come up for a full discussion—it is hoped for the last time before this thing to be desired becomes a realization.

The following is a list of some of the papers already promised:—

The Address in Medicine—J. R. Jones, Winnipeg.

The Address in Surgery—O. M. Jones, Victoria.

The Address in Gynaecology—Thomas S. Cullen, Johns Hopkins, Baltimore.

The Early Diagnosis and Treatment of Pulmonary Tuberculosis—D. Gilbert Gordon, Toronto.

The Nose and Throat in General Practice—John Hunter, Toronto.

Remarks on some Interesting Diseases of the Age—G. H. Burnham, Toronto.

Orthopædic Treatment of Deformities and Disabilities Resulting from Paralysis—B. E. McKenzie, Toronto.

Title to be announced—D. J. Gibb-Wishart, Toronto.

A Practical Way of Distinguishing between the Human and Animal Blood—G. Silverthorne, Toronto.

Infectious Pneumonia—W. S. Muir, Truro, N.S.

Sclerotic Ovaries—A. L. Smith, Montreal.

Removal of Large Tumour from Os Uteri after Labour had set in—A. Armstrong, Arnprior.

Tuberculosis in Milk—Prof. Russell, University of Wisconsin.

The Present Outbreak of Smallpox in America—H. M. Bracken, Health Officer, Minnesota.

Hamatology of the Blood—L. H. Warner, New York.

Skin Diseases—Lantern Demonstration—F. J. Shepherd, Montreal.

The Treatment of Consumption in Special Institutions—A. J. Richer, Montreal.

Disposal of Tuberculous Sputum—J. H. Elliott, Gravenhurst.

Title to be announced—G. Chambers, Toronto.

Chronic Ulceration of the Stomach Simulating Cancerous Disease—Relation of a Case of Gastro-enterostomy with Murphy Button—Recovery—J. F. W. Ross, Toronto.

Report of Cases Treated with the Hot Air Bath—W. H. Peplar, Toronto.

Title to be announced—J. H. Hutchison, Winnipeg.

Some Forms of Gastric Hyperacidity and Their Treatment—C. F. Martin, Montreal.

Syphilis as Seen by the Ophthalmic Surgeon—F. Buller, Montreal.

On the Necessity of a Better Recognition and Isolation of Trochomatous Patients in Canada—W. Gordon M. Byers, Montreal.

Title to be announced—J. L. Bray, Chatham, Ont.

Epidemic Cerebro-Spinal Meningitis—A History of Some Cases—James McKenty, Gretna, Man.

Pulmonary Tuberculosis, its Treatment and Prevention—A. P. Proctor, Kamloops, B.C.

Mild Smallpox—G. A. Kennedy, Macleod, Alta.

Title to be announced—C. J. Fagan, Victoria, B.C.

#### THE ROCKEFELLER SCHOLARSHIPS.

In founding a series of scholarships for the study of medical science, John D. Rockefeller has shown a spirit of broad-mindedness that is in many ways most commendable, inasmuch as he has not confined these donations to his own country, but has included McGill University in the number of institutions benefitted thereby. And, too, he has

done an excellent thing in seeking not to further perpetuate his name in a pile of buildings that may too often lack funds for their perpetual maintenance, but to obtain the most immediate results by placing the funds in the hands of a committee to distribute among already existing laboratories. The scholarships are eight in number, seven of them being in American Universities, the eighth to McGill; and the income provided by Mr. Rockefeller has enabled the committee to obtain the services of one or more scientists at each place, whose work will be published in the name of the Rockefeller Scholarships from the laboratories of the respective colleges.

The appointment at Montreal has been given to Dr. William W. Ford, A.B., M.D., whose services are thereby secured for some time to come to McGill University. Dr. Ford is a most able young man, and has held for the past two years the Governors' Fellowship in Pathology, during which time he has published a large amount of valuable work, chiefly upon bacteriological subjects. Indeed, at the present time there is, perhaps, no one in America as thoroughly versed, as is Dr. Ford, upon the subject of intestinal bacteria, for during the last year he has been engaged upon a work of considerable magnitude dealing with this subject.

The University, therefore, is to be congratulated upon being able to retain his services and to secure a continuation of this work in the laboratories. Had it not been for the new endowment, it is probable that Dr. Ford, having completed the tenure of his Fellowship, would have severed his connection with McGill University.

Dr. Ford is an Ohioan, who was educated at Adelbert College, Western Reserve University, Cleveland, graduating as A.B. in 1893, and at Johns Hopkins University, Baltimore, receiving his degree of M.D. in 1898. Subsequent to this he was house-surgeon in the Robert Garrett Hospital for Children, Mt. Airy, Maryland, and was later on the Interne Staff of the Johns Hopkins Hospital, Baltimore, which position he left to accept the Governors' Fellowship at McGill.

Dr. Ford sailed in July by the "Oceanic" for Liverpool, where he will remain for a short time in one of the laboratories, after which he goes to Paris to the Pasteur Institute, where he proposes to spend some considerable time in study and research. Next spring he will resume his work in the Pathological Laboratory at McGill under Professor Adami, continuing the line of investigation he will undertake while at Paris.

# Proceedings of the McGill Medical Society of Undergraduates.

## DIAGNOSIS AND TREATMENT OF OSTEOMYELITIS.

BY

E. G. MASON.

To read an elaborate paper on the "Diagnosis and Treatment of Osteomyelitis," or even one covering it fairly well, would take up far more time than could be spared at this meeting, I will, therefore, deal with the principal forms of the disease only.

Speaking of the disease as a whole, it is the result of an infection from one of the pyogenic organisms, either the streptococcus or the staphylococcus. The disease is usually started by some slight injury, particularly in children previously debilitated by the infectious fevers. However, cold, traumatism and over-exertion are frequent exciting causes, and it may follow typhoid fever.

The disease may be divided into:—(1) Acute osteomyelitis; (2) Chronic osteomyelitis, and I think I may say (3) Tuberculous osteomyelitis.

*Acute osteomyelitis* is an acute suppurative inflammation of the medulla of the bone. As a result of this acute inflammation in the medulla of the bone, that part becomes greatly congested, fluid is poured out, fills up the cancellous spaces and Haversian canals, and subsequently accumulates under the periosteum. The medulla very quickly becomes infiltrated with pus, the periosteum thickened and swollen, with pus beneath it. The suppuration under the periosteum may result without any communication with the medulla, or in some cases only after the bone is softened at some part, and communication thus established.

*Diagnosis*:—This must depend on the symptoms and the history of the patient. Usually, the first symptom to be noticed is a chill followed by a severe pain in the affected part, sometimes by redness, fluctuation and severe constitutional disturbances with a high temperature. A mild case may be attended by very slight symptoms and proceed to recovery. When the suppurative form is present, however, there may be a prominence over the affected area or a fungous abscess into which the probe readily sinks deeply. Periostitis, which is invariably present, may mask the true nature of the case. There may be violent fevers with great pain in the first instance. The fever soon

passes into the typhoid type, being accompanied by a rapid, small pulse; headache, thirst, and dryness of tongue, and stupor or delirium, so that the disease is often at this stage mistaken for typhoid or meningitis. The pain is generally intense and if the bone is superficial swelling is soon apparent over it, the skin also becoming red or livid. In the course of a few days fluctuation becomes evident and on incision pus escapes, the bone is felt to be bare in parts, while in others, while not actually bare, the periosteum peels off very readily.

Where the bone is more deeply seated or where the process is confined to the medulla, the swelling and redness may not appear so early, but in any case the pain is extremely severe so long as the patient is sufficiently conscious to refer to it. In young children it is discovered accidentally. In these the disease may traverse the epiphyseal cartilage and affect the neighbouring joint, though not necessarily suppurating. In cases where the patient is in a state of stupor, he does not call any special attention to the part, which makes diagnosis extremely difficult in such cases. In severe cases the symptoms are very grave indeed and may end in death in two or three days from rapid septicæmia, while in others the patient may survive and die subsequently of pyæmia, septicæmia, ulcerative endocarditis, or exhaustion.

Some very interesting figures concerning the occurrence of the disease, are given by Haaga in *Beit. zur. klin. chir.* for 1890. He made a study of 403 cases of acute osteomyelitis and found that the proportion of occurrence was 3.38 males to one female. Moreover, he found that 42 per cent. of these cases were between the ages of 13 and 17; below the age of 6, the percentage was much below this, and above 19 years there was almost an extinction of cases. He further demonstrated that 3-5 of all the cases occurred in the long cylindrical bones, more frequently the tibia and femur. In the tibia the disease occurred in the centre of the shaft more frequently than in any other part of the bone, while in the femur it more often attacked the lower third.

In addition to the foregoing he showed that 20 per cent. of all cases were multiple, and in 189 of the entire number more or less aggravated disturbances of the adjacent articulations remained.

Trélat in *La Tribune Médical* for March, 1891, says:—"Osteomyelitis may appear during adult life, though without doubt much less frequently than in infancy or adolescence. With adults the affection may be chronic from the first, beginning insidiously and progressing slowly.

The only diseases likely to be confused with this are: (1) typhoid fever; (2) acute rheumatism; (3) a deep-seated abscess; (4) tubercular or syphilitic disease in infancy.

In the first instance, that of typhoid fever, difficulty will only be experienced in very acute cases, where the rapid poisoning of the patient prevents his giving an account of his symptoms, and in young children who cannot tell what ails them.

In these cases, where the symptoms set in so rapidly and acutely one should suspect a septicæmic condition rather than a specific fever such as typhoid. And in all suspicious cases one ought to feel all over the body, especially the bones usually affected, to see whether pain is caused or not. If the child winces, a local cause is at once manifest. In osteomyelitis also, the pressure of the bone in an upward direction, such as tapping on the feet in osteomyelitis of the tibia or femur, causes pain.

With regard to acute rheumatism, the symptoms are more general,—a number of joints affected and the general condition of the patient not so bad as in osteomyelitis. The temperature is not so high, nor does the patient pass into the typhoid state. A deep seated abscess rarely gives rise to any difficulty. It does not usually produce the violent constitutional symptoms, especially the typhoid state, of acute osteomyelitis. When the abscess is in the leg, tapping of the foot will not usually increase the pain unless the inflamed part is touched or moved.

According to Wiener in *Klin. Woch.* for 1897:—"Diagnosis is to be made between osteomyelitis in infancy and tubercular or syphilitic disease. He considers the following features as conclusively diagnostic of osteomyelitis:—1. The multiplicity of foci in the bone; 2. The frequency of the separation of the epiphysis; 3. The frequent involvement of the joint; 4. The acute course of the disease.

Necrosis of bone follows acute osteomyelitis and the presence of sequestra may be diagnosed by the following symptoms:—A previous history of acute illness followed by the formation of an abscess in a few days. This may be drained by an incision by a surgeon and subsequently by sinuses which remain open for years. The granulations around the opening are generally prominent. The bone itself at the seat of the necrosis is very much thickened and the tissues are adherent to the periosteum. On introducing the probe one feels bare bone, which may or may not move according to the size and shape of the sequestrum and of the cavity in which it lies.

Whether the dead piece is felt to move or not, if we have the acute history, and if a period of at least six months has elapsed since the onset of the trouble, we may be pretty sure that the dead piece has become separated. Even though we may not be able to find bare bone, it is certain to be there under the circumstances mentioned, and failure

to find it simply means that the sinus is tortuous or that the opening in the new case is too small to admit the probe.

*Treatment.*—The treatment must be considered (1) according to the stage of the disease and the part of the bone which is more especially affected; (2) according to the presence or absence of suppuration in the neighbouring joints; (3) according to whether it has followed an open wound or not, and (4) according to other complications which may coexist.

The treatment of acute osteomyelitis consists in freely opening up the medullary cavity and clearing out all the pus and medullary tissue. As soon as the diagnosis is made out, a free incision should be made down to the bone, the periosteum turned to one side, and with a chisel and hammer the dense shell of the bone cut away till the medullary cavity has been well opened up and all the soft material thoroughly scraped out. The incision in the bone must be extended until the whole affected area of bone has been exposed; but in cases where the whole diaphysis is affected, it may be more convenient to make several openings in the bone, and to scrape out the cavity between them, rather than make one large gutter. Seeing, however, that a large portion of the bone will probably die, there is no particular harm in gouging away a large amount, for one may actually remove the whole of the necrosed portion in this way.

After having thoroughly cleaned out the whole of the medullary cavity it should be sponged with undiluted carbolic acid and a drainage tube inserted. A little cyanide gauze may also be introduced between the edges of the wound and between the drainage-tubes so as to prevent closure of the wound in the first instance. The limb should be placed on a splint. If after three or four days it is found that the wound is aseptic, the stuffing may be left out and only one or two drainage tubes retained at the angles of the wound, the rest being stitched up.

In cases where the whole diaphysis is dead and separated at the epiphyseal line, it may be removed, the periosteum being left intact; and under any circumstances a certain amount of bone formation may occur from the detached periosteum, sufficient sometimes, where there are two parallel bones, to give stability to the limb. If a sufficient amount of bone does not develop, bone-grafting must subsequently be employed, but this cannot be carried out unless the wound is aseptic. In most cases it is best to delay bone-grafting until the wound has quite healed, and then subsequently to open up the parts again with the view of introducing the grafts.

There is a tendency of the neighboring joints, to become stiff as the result of inflammation in the joints themselves leading to adhesions and



obliteration of portions of the synovial capsule, or from inflammatory exudations around the joint, giving rise to fibrous adhesions around it and of adhesions of tendons to the bone. With the view of avoiding these troubles, the splint should not be continued too long, and after two or three weeks, massage and passive motion of the neighbouring joints and muscles should be carried out. In the case of the lower extremity it is well to keep the patient in bed so long as there is a prospect of the wound healing; but if it is evident that a sequestrum is present there is no particular object in keeping him in bed, and his strength will be better maintained by allowing him to get about. As regards the upper extremity, of course, the patient need not be kept in bed at all after the fever subsides.

In the case of acute epiphysitis which especially occurs in children, the epiphyseal cartilage is very apt to be completely destroyed and as a result no further growth of bone takes place, thus very material shortening of the limb may result as the patient grows up. The treatment is the same as other cases of acute osteomyelitis.

Where we have acute suppurative osteomyelitis with suppuration of neighbouring joints we have to deal with a very serious condition and one which often ends fatally. These are usually cases of acute epiphysitis. Under such circumstances the first thing that one thinks of is the advisability of amputation and in most cases if the patient is seen before his condition has become hopeless, amputation through the bone above is the best treatment. In some cases, however, where the symptoms are not so severe one may be content with opening up the medulla as already described and in addition making free incisions into the joint so as to expose thoroughly and evacuate every recess, subsequently drawing the joint for a time, and if necessary employing constant irrigation.

As regards acute suppurative osteomyelitis and periostitis resulting from an open wound, we meet with this at all ages, and the age of the patient is of very great importance in determining the method of treatment. Under these conditions the organisms at once spread into and along the medulla and under the periosteum with great rapidity, and lead almost certainly, in the case of an amputation stump to complete necrosis of the lower end of the stump and very often to the formation of sequestra higher up. This condition is also extremely apt to be accompanied with pyæmia, and in the case of a stump the piece of bone which is left is very often not worth saving, at any rate not worth risking the patient's life to save. Hence the proper procedure in acute necrosis following amputation wounds seems to be early amputation through the joint above.

In case of compound fractures where osteomyelitis has set in, unless the condition is very limited, amputation is usually the best practice; but in some cases where the disease is quite limited and the patient young, one may delay and wait for the separation of sequestra, and in this way get a satisfactory limb.

In the treatment of bone necrosis, during the period which intervenes between the attack of acute illness and the separation of the sequestrum, there is no object in any surgical interference for if one cuts down at that time, it is difficult to be certain how much of the bone is dead and where the point of contact of the dead and the living is. Therefore up to the time when the bone has become separated by natural processes, all that one needs to do is to apply antiseptic ointments to the orifice of the sinuses and see that proper escape of the discharge is provided. When a suitable time for operation has arrived the first point for consideration is how we can get as free access to the dead bone as possible; and if the sinuses are situated in parts where, on account of the presence of nerves, vessels, etc., we cannot make a free enough opening, we should disregard the sinuses altogether and cut down on some other part of the bone where the anatomical arrangements are more favorable. The incision in the skin should be coextensive with the thickening of the bone, because it is absolutely essential that the whole cavity in which the bone lies should be freely opened up both with the view of making certain that the whole fragment is removed and also of providing proper escape of the discharge afterwards and of obtaining proper closure of the cavity. The skin and tissues should be freely divided, the periosteum detached laterally over the thickened area, so as to give free access and then with a chisel and hammer one proceeds to chisel away the bone till one reaches the cavity where the sequestrum is present.

Where the patient is weakly it is in most cases advisable to apply a tourniquet before the operation, both with the view of preventing unnecessary loss of blood and also with the view of being able to disinfect the cavity thoroughly afterwards. Having reached the cavity in the bone it should be opened up completely from end to end and from side to side till the sequestrum can be lifted out without trouble. Having removed the sequestrum and thoroughly scraped out all granulation tissue, one should also dissect out the sinuses which lead to the diseased bone and then proceed to disinfect the parts in the hope of obtaining asepsis. The part should be thoroughly sponged with undiluted carbolic acid and after this has acted for a few minutes the cavity should be tightly packed with gauze sprinkled with iodoform. The tourniquet can then be relaxed and any superficial vessels which

spout can be tied and the rest of the wound filled up with packing. An antiseptic dressing is applied outside and in many cases one in this way succeeds in rendering the wound aseptic.

In the after treatment an important point is to decide what is to be done with the large cavity left behind.

If the septic condition is not eradicated the stuffing can be taken out in two or three days and the best thing to do then is to stitch together the skin incisions with the exception of an opening at one end through which a large drainage tube passes into the cavity. When we find on dressing the wound after three or four days that there is no suppuration whatever, the stuffing should be completely removed and an attempt may be made to fill up the cavity with material which will become organized, either the bloodclot alone, or catgut, or decalcified bonechips.

Of these methods the best is bonegrafting by means of decalcified bone chips. These bone chips are decalcified and kept in a solution of corrosive sublimate in alcohol. The cavity is filled up with bone chips, a little bleeding is induced so that the intervals between the chips become filled with blood-clot and then the periosteum, if possible, is brought together, a stitch or two put in between the muscles, and the skin wound closed. A drainage-tube is not usually required unless excessive bleeding is present, in which case a few strands of catgut brought out at the lower end of the wound will allow the superfluous blood to escape. The wound is then covered with an antiseptic dressing and the part placed at rest on a splint.

*Chronic osteomyelitis* is inflammation of a more chronic type affecting the medulla and adjacent dense bone. This condition may follow the acute, but more usually it is chronic from the first.

In chronic osteomyelitis the result is either softening of the bone, "rarefying osteitis" or condensation of the bone "condensing osteitis" or a localized abscess in the bone "Brodie's Abscess." In some rare cases referred to by Sir James Paget under the name of "quiet necrosis" a sequestrum has been found without any signs of its presence. The diagnosis depends on the symptoms and etiology.

We may have a history of previous injury or some constitutional condition such as rheumatism, or it may occur under circumstances which we do not exactly understand. As regards the symptoms we have a marked thickening of the bone in the region of the disease, some tenderness over the inflamed part, generally acute at certain points. There is often a great deal of pain which is worse when the limb becomes warm and more especially when the patient is in bed at night. The pain is more marked than the tenderness and is of a neuralgic and throbbing character, while the converse is the case in chronic periostitis.

The symptoms may subside at times and again get worse, the course being marked by exacerbations and remissions; sometimes even for months the patient may become comparatively free from pain and then again suffer from a severe attack.

In cases of "Brodie's Abscess" of bone, the disease is generally in the neighborhood of the epiphysis, characterized by marked enlargement of the part with very intense pain especially at night; there is generally a tender spot somewhere or other. Sometimes where the disease has lasted long and the bone become softened, we may also find a soft spot.

The treatment is either palliative or radical.

The former consists in rest to the part, elevation, counter-irritation in the form of either blisters or the actual cautery, especially Corrigan's Cautery, and the administration of drugs internally, of which are potassium iodide and salicin or sodium salicylate. The iodide in large doses seems to relieve the pain in some cases very markedly. The result of this palliative treatment is usually, however, only temporary, and it is but seldom that a cure results even though the treatment be continued for many months. As a rule the patient's condition improves for a time and may keep pretty well while taking large doses of iodide, but if he stops this and begins to walk about, the old symptoms are apt to occur. Hence in cases where a fair trial has been given to palliative measures without much benefit, it is advisable to propose an operation.

The operative procedures consist in cutting down on the inflamed part and removing as far as possible the whole of the thickened and inflamed periosteum, gouging away a large portion of the thickened bone, and looking for the presence of an abscess, sequestrum or other cause. Strict asepsis is imperative. If an abscess cavity is found it should be thoroughly opened up, as described in speaking of sequestra. It is well to sponge out the cavity with undiluted carbolic acid, then suture closely the opening and endeavor to get healing by first intention. With the view of getting a better scar, one should use curved incisions, turning aside a flap, rather than a straight incision over the centre of the inflamed area. Afterwards the limb should be put in a splint for two or three weeks, because the cavity in the bone fills with blood-clot which must become organized. In cases where inflammation is at some distance from a joint, this splint may be continued even longer. When a splint is left off, the patient should still be kept in bed, if it is the lower extremity which is the seat of the disease, for six weeks or a couple of months so as to allow the new tissue to become thoroughly firm. If the patient gets up too early, the young vessels in

the organising blood-clot give way, hæmorrhage takes place, and the process of organization is apt to be arrested. Massage and passive movement should be kept up from an early period after the operation.

Tuberculous osteomyelitis is a condition in which the medullary tissue of the bone becomes infiltrated with tuberculous material. This condition especially affects the shorter long bones such as the phalanges and the metacarpals. In the fingers it is known as "Strumous dactylitis." It is also the most common form of tuberculosis in the small cancellous bones such as the tarsals.

The symptoms are very characteristic. The patient is almost always a child; very often several bones are affected and the enlargement of the bone is of a spindle-shaped character. In the early stage there is no softening or pain and later on the presence of an abscess adds to the certainty of diagnosis. In this case the only difficulty will arise in connection with hereditary syphilis, because in syphilis, one meets with a somewhat similar condition. There, however, the condition arises usually in infancy, other symptoms of syphilis are present, and abscess formation does not occur. In the case of tuberculous osteomyelitis of cancellous bone, such as the tarsal bones, beyond the feeling of uneasiness and aching in the early stages the patient does not usually notice anything till the disease has attacked the neighboring joints.

The treatment of tuberculous osteomyelitis is:—

Careful rest and pressure, and good hygienic conditions should be persevered in for a very considerable time. Operation is hardly necessary in these cases unless there are signs of abscess formation outside the bone. The operation consists in clearing out the disease and thorough disinfection of the cavity by sponging out with undiluted carbolic acid. The wound may then be stitched up without drainage. If, however, there is much oozing it is well to introduce at one angle of the wound for two or three days either a small drainage tube or a few strands of horse-hair or catgut so as to allow the blood to escape. It is well to place the part in a splint.

In the case of tuberculous osteomyelitis of the small cancellous bones, such as tarsals, the best result is obtained by excising the affected bone completely. As a rule if only one bone is taken away, the result is extremely satisfactory as regards the usefulness of the foot. In after years, in the case of the cuneiforms more especially, one is often unable to tell that anything had been removed from the foot.

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