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ON THE RECOGNITION OF INCIPIENT TUBERCULOSIS IN
MAN.*

BY

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Ever since the abandonment, not so many years ago, of a hopeless prognosis in the majority of tuberculous affections, and the acceptance of the fact, now abundantly demonstrated, that tuberculosis is a disease, which in its incipient stage at least tends under favouring conditions to subside spontaneously or to become arrested in its evolution, the efforts of the profession have been constantly directed towards the improvement and extension of methods of diagnosis, whereby tuberculation of the human subject might more speedily be detected.

We owe much to the morbid-anatomist and the bacteriologist for this salutary change of opinion. The former, in the dead-house, pointed out the frequency of healed tuberculous processes in the bodies of individuals who had died of other diseases, the latter discovered the specific agent that proved the infective nature of tuberculosis, and in subsequent investigations carried on with the greatest perseverance brought forward a mass of knowledge concerning the chemistry and biology of the bacillus tuberculosis, which has been of the greatest value in the diagnosis, prophylaxis and rational treatment of tuberculous infection in man and the lower animals.

The discovery of the bacillus tuberculosis and of tuberculin are certainly epoch-making in the history of our knowledge of tuberculosis.

With a more hopeful view of tuberculosis is necessarily associated its early recognition, for it can never be too often repeated that the earlier the disease is recognised the greater is the prospect of cure or, at any

* Being a contribution to a discussion on the "Prevention and Cure of Tuberculosis," at the Montreal Medico-Chirurgical Society, 17th April, 1899.

rate, of arrest of the disease. From a broader point of view than that of the individual it is, moreover, important that tuberculous disease be recognised at its very beginning. Every tuberculous person, particularly if suffering from pulmonary tuberculosis, is a source of danger to his neighbour, and it is obvious that it is of advantage to the community that such an individual should, if possible, be cured of his disease as speedily as can be, or, failing this, that such measures be adopted as will protect others from infection. 'Tuberculophobia' is rapidly growing among the public, more rapidly than among the medical profession, who should with the knowledge they possess pay rather more attention to the spread of the disease by infected individuals than they have heretofore done.

The evidences of tuberculous infection may be broadly divided into:—first, presumptive, and secondly, direct. Under the term presumptive evidence are included certain general characteristics which have for a long time been held to point to the possibility, or even probability, that the individuals who possess them are, if not actually tuberculous, at least more liable to become so than such as do not exhibit these peculiarities. Among these may be mentioned hereditary predisposition, certain physical defects, particularly abnormalities in the form of the thorax associated with diminished respiratory capacity, and hypoplasia or imperfect development of the central and peripheral organs of circulation. To these must be added a body weight that is deficient in proportion to the height, a condition upon which insurance men lay considerable stress. In the same general category are included certain social aspects of the individual, such as an insufficient or faulty dietary, bad hygienic environment, addiction to alcoholic or other excesses, and last but not least, what the French very aptly term "*surmenage*"—"overdriving," both physical and mental. In any given case these may individually or collectively afford presumptive evidence of tuberculous infection, but nothing more. Indeed, they are of more value in suggesting prophylactic measures against tuberculosis than in the diagnosis of actual tuberculous disease.

In respect of the diagnosis of incipient tuberculosis more interest attaches to phenomena that have been considered to point to what has been called the "pretuberculous stage" of the disease, i. e., a period in which it is impossible by the most careful physical examination to detect tuberculous disease in any organ, but in which there is obvious deterioration of the general health, associated with some pathological condition which in itself does not bear the stamp of tuberculous origin and might depend on some other cause. The principal pathological conditions that are found in this so-called "pretuberculous stage," are chlorosis, or rather chloro-anæmia, progressive loss of body-weight, slight elevation of the body temperature, disorders of digestion, local-

ised bronchial catarrh, polyuria with or without albuminuria, and undue rapidity of the pulse, particularly in the recumbent posture (cardiac erethism). Are we dealing here merely with various conditions of debility which prepare the ground for the seed of tuberculosis, or are these conditions really induced by the actual presence and multiplication of the bacillus tuberculosis in the tissues? The most recent opinion is that in very many instances the above abnormal conditions are due to the presence in the circulation of toxins elaborated by the bacillus tuberculosis, or, in the case of urinary disturbance, to their elimination by the kidneys. Proof of this will be adduced when we come to discuss the tuberculin test.

It will be impossible for me in the limited time at my disposal to discuss seriatim the direct evidence of tuberculous infection of the various organs. As we are chiefly concerned with pulmonary tuberculosis, which includes the bulk of tuberculous infections, I shall confine myself to the diagnosis of this localisation, referring only incidentally to other localisations as they bear on the question of pulmonary disease.

The means at the disposal of the physician for the early detection of tuberculous lesions in the lungs are:—

- (1) Thorough and methodical physical examination of the lungs.
- (2) Examination of the sputum.
- (3) The tuberculin test.¹

In any given case there may be present one or more of the factors referred to above as constituting presumptive evidence of tuberculous infection, to which due weight must be attached in connection with the direct evidence obtained. Part of the presumptive evidence is to be obtained from the history of the patient, and part from the general examination which should in all cases precede topical physical examination.

(1) *Physical examination of the lungs.*

It might seem a platitude to insist on thorough physical examination, were it not a fact that too often the failure to detect incipient tuberculous disease of the lungs is due to hasty or defective methods of examination. Errors of omission are, I believe, more frequent than errors of commission, and for the former there can hardly be any justification. The thorax should be completely exposed, the patient sitting or standing in a good light, and care should be taken that the position is quite symmetrical, the arms being dropped to the side or lying loosely on the thighs. Inattention to these details is apt to vitiate the results obtained from inspection, mensuration, palpation, percussion, and, to a less de-

¹ Skiagraphy deserves mention, though as yet the results achieved in the detection of tuberculous or other consolidations of the lung are not to be compared with those derived from physical examination.

gree, auscultation. Inspection and palpation seldom afford trustworthy signs of *incipient* tuberculosis. When there is unequal expansion of the apical or infraclavicular areas with increase of fremitus in the area of deficient expansion, it is no longer proper to speak of incipient tuberculosis. The disease is already well advanced in what is commonly called the first stage, and the individual tubercles have coalesced to form more or less consolidation of that portion of the lung. An almost identical statement applies to percussion. To produce even a slight quantitative or qualitative alteration of the percussion note, there must be consolidation, i. e., coalescence of many minute tuberculous foci. There can be no doubt, however, that in experienced hands percussion affords, if not the earliest, at least fairly early evidence of tuberculous infiltration. Much depends on the patient; in thin subjects, young or old, differences are more easily detected than in those who are fat or have well-developed muscles. Particular attention should be paid in percussion to certain regions of the thorax, which overlie those parts of the pulmonary structure most frequently and earliest affected with tubercle. These are the clavicular and subclavicular spaces, (not the extreme apex of the lung), the upper anterior border of the upper lobe, the lingula of the left upper lobe overlying the heart, the supraspinous space behind, the upper interscapular areas (overlying the apex of the lower lobes), and lastly the upper border of the lower lobe behind (corresponding on the surface with the vertebral border of the scapula when the hand is placed on the opposite shoulder with the arm at right-angles to the body). I need hardly mention that corresponding areas should be percussed symmetrically and successively.

It is from auscultation that we obtain the earliest signs of pulmonary tuberculosis in physical examination. Three varieties of alteration of the normal breath sounds have been considered to point with more or less certainty to early tuberculous infiltration; roughness of inspiration with prolonged expiration, enfeeblement of the vesicular murmur, and interrupted, jerky, or as it is sometimes called, cog-wheel respiration. The first two signs are the most reliable. The roughening of inspiration is accompanied by a lowering of the tone, so that inspiration has the same quality as expiration. On the other hand, the expiratory breath-sound, in addition to being prolonged, may be raised in tone up to or above the inspiratory breath-sound. The explanation usually allowed for these changes is that the infiltration of tuberculous material occurs earliest at the point where the terminal bronchiole breaks up into the infundibular and acinous structure of the lung, producing a diminution in the lumen of this portion of the bronchial tree which interferes with normal in- and ex-piration. This explanation seems hardly reasonable when one considers that there is no movement of air beyond the

larger bronchial tubes but merely an exchange of gases. In whatever way produced, these changes in the respiratory sounds do occur very early, and, as the disease progresses, pass insensibly into the broncho-vesicular and, finally, more or less distinctly bronchial breathing. In other instances, enfeeblement of the inspiratory sound, especially the inspiratory sound at the apices, is the earliest change observed. This may be due to tuberculous infiltration of the lobules, to adjacent local emphysema, to pleurisy localised at the apex, or, more rarely, to compression of the bronchus by enlarged glands. Hence it is not so reliable a sound as the roughening of inspiration. Jerky, or cog-wheel, respiration is of value only in connection with other signs, for it is found in other conditions such as hysteria, non-tuberculous affections of the lung, and in nervous persons. It must be noted that normally, especially in women, a slight difference in the auscultatory phenomena may be found between the right and left apices. The breath-sounds at the right apex may be more intense, even a little harsh, expiration a little prolonged and the voice-sounds more distinct than at the left apex. Hence it is chiefly when there is alteration of the respiratory murmur at the left apex that the above noted signs have a real diagnostic value.

The presence of adventitious sounds is the surest indication by physical examination of incipient pulmonary tuberculosis, the crackling *râle* heard over a limited area of the lung being almost pathognomonic of tuberculous infiltration of that region. There may be only a few clicks heard at the end of inspiration, or a shower of crackling sounds may occur with each inspiration, more rarely with expiration. These *râles* have been compared, not inaptly, to the sounds produced by insufflating a dry bladder. They vary much in intensity, volume, tone, and pitch, but their chief characteristic is their persistence in the area over which they have been found. It is important to remember that these sounds may be completely absent during quiet breathing. To produce them a deep inspiration is often necessary. A still better method is to make the patient cough once and then inspire quickly and deeply. They may then be heard either at the end of the cough or during the succeeding inspiratory effort. Too much stress cannot be laid upon this method, which often gives positive evidence of adventitious sounds when other methods have failed.

While the diagnostic value of the crackling *râle* is undoubted, the explanation of its occurrence and the mechanism of its production are still matters of controversy. By some it has been thought to have its origin in the pleural covering of the lungs, by others to be a variety of the crepitant *râle*, due to distension of alveoli adjoining the small areas of tuberculous infiltration,—by still others to be due to the localised bronchial catarrh which accompanies the growth of tubercles in the lung structure.

In the circulatory system the only sign which has any value in the diagnosis of pulmonary tuberculosis is accentuation of the second sound of the heart in the area of the pulmonary semilunar valves. This sign has a real value only when taken in connection with abnormal pulmonary signs indicating tuberculosis and in the absence of any concomitant pulmonary or cardiac lesion that is capable of producing such an alteration.

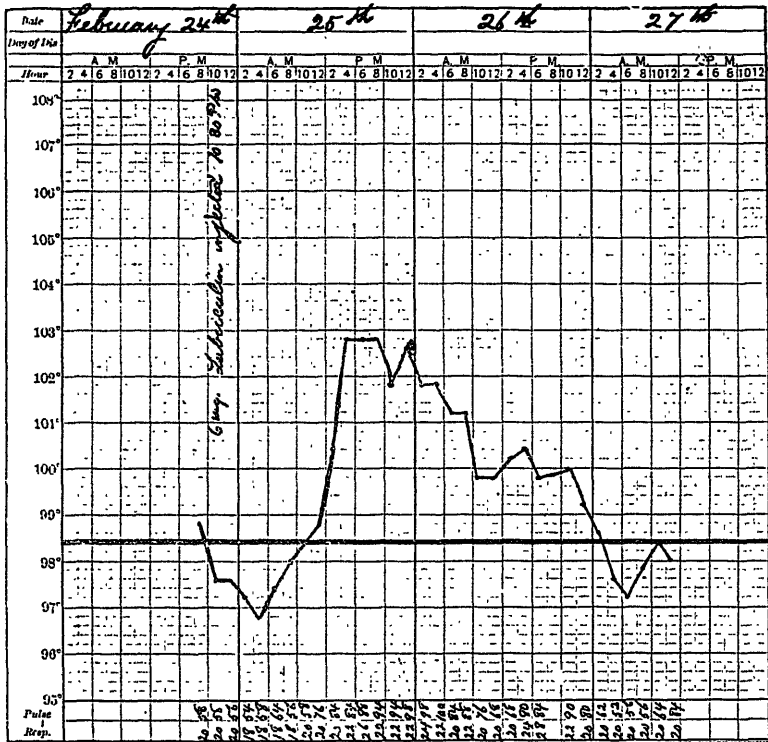
(2) *Examination of the sputa.*

The data obtained by physical examination, however conclusive apparently, should invariably be supplemented by examination of the sputa, if there be any, at the earliest possible opportunity. Patients often say that "the expectoration does not amount to anything, only a little mucus." It may not amount to much in quantity, but bacteriologically it may amount to a great deal. The most innocent-looking mucus, or even a thin fluid which appears to be nothing more than saliva, may fairly teem with tubercle bacilli. The sputum in the earliest period of tuberculous infection of the lungs is usually a homogenous, viscid, greyish, or slightly greenish-grey, mucus, which may or may not contain blood. Even in such mucoid material one may usually find more opaque slightly muco-purulent particles or streaks. These should be picked out and examined with particular care. Repeated and frequent examinations are necessary if one wishes to be reasonably certain that tubercle bacilli are not present, and in doubtful cases centrifugation of the sputum will show bacilli when none have been found by the ordinary methods of examination. The search for elastic tissue fibres does not really belong to the diagnosis of incipient pulmonary tuberculosis. When these are found, softening, however slight, must have taken place. It has even been claimed that the presence of tubercle bacilli in the sputa also necessarily implies breaking down of the lung structure.

(3) *The Tuberculin Test.*

By careful and thorough examination of the lungs and repeated microscopic examination of the sputum, it is usually possible to detect pulmonary tuberculosis at a comparatively early stage, sufficiently early, indeed, to ensure to the majority of the patients a return to health after a more or less prolonged interval, provided that as soon as the diagnosis is made they be placed under the most favourable conditions for recovery.

We have, however, in tuberculin a means of diagnosis which enables the physician not only to make an earlier diagnosis of pulmonary tuberculosis, but to affirm the tuberculous nature of ailments which formerly were not believed to be tuberculous, or, at most, were considered to be the antecedents of a possible or probable tuberculous infection. With



regard to pulmonary disease, tuberculin is especially valuable when the physical examination is inconclusive, and either no sputum whatever can be obtained, or repeated examinations have proved entirely negative, while the suspicion yet remains that the disease may be of tuberculous nature.

Introduced to the medical profession in 1890, by Koch as a remedy for tuberculosis, tuberculin rapidly fell into disfavour as a remedial agent, when it was considered proved that, as used at the time in large doses, it lighted up old tuberculous foci into fresh activity, and tended to disseminate tubercle bacilli into previously healthy parts of the patient's body. In the disappointment that followed this fiasco there were few who remembered that Koch, while speaking of the curative properties of the lymph, had also stated incidentally, that in certain cases tuberculin might prove of value in detecting latent tuberculous foci in various parts of the body. A few of the more sober minded clinicians, however, did remember this statement and put it to practical use. Since that time an ever increasing mass of evidence has accumulated proving the truth of Koch's original observation. In addition to Koch,—Guttman, Ehrlich, Wasserman, Benz, von Jaksch, Landouzy, Trudeau, Penzoldt, Klebs, Beck, Shattuck, and many others both in America and in Europe, have used tuberculin as a diagnostic medium, and all agree in recognising it as harmless and most reliable when used with proper precautions.

The tuberculin reaction consists in an elevation of temperature with a characteristic pyrexial curve, accompanied by more or less malaise, pains in the head, back, and limbs, and sometimes nausea and vomiting. The reaction occurs usually about twelve hours after the injection of a minute dose of tuberculin. It may, however, occur at the end of eight or nine hours, or rarely be delayed to twenty-four hours. The pyrexial curve is quite characteristic; there is a rather abrupt rise to a maximum which is maintained for two or three hours, and then a gradual decline to the normal which is usually reached in from twenty-four to thirty-six hours, and is followed by a subnormal temperature for some time. With the fall of temperature the constitutional symptoms above described subside gradually and the patient returns to his usual state of health. The chart on the opposite page depicts a typical reaction in a tuberculous case.

The method of employing the test is as follows:—For one or two days before the tuberculin is used the patient's temperature is taken at frequent intervals, at least every four hours, and better every two hours, in order that a correct idea of the range of the temperature may be obtained. The injection, with the usual aseptic precautions, is made either early in the morning at six or eight o'clock, or late in the evening at ten or eleven o'clock, so that the reaction may be observed at a con-

venient hour of the day. If it is desired to use tuberculin as a test in febrile cases with intermittent temperatures, the dose should be so timed that the reaction will take place during the period of normal or sub-normal temperature. The site of the injection is immaterial but it is customary to select the space between the scapula and the spinal column. The most important point is really the dosage, and on this there is considerable diversity of opinion. It should be remembered that preparations of tuberculin vary considerably in strength and that individuals react differently to the same dose.

It is a safe rule to begin with a very small dose and, if no reaction occur, to give a larger dose in two or three days. Trudeau advises an initial dose of half a milligram of crude tuberculin. Subsequent doses of 1, 2, and 3 milligrams may be given at appropriate intervals if no reaction occur from the minimum dose. It is not necessary or advisable to exceed a maximum dose of 10 milligrams. Grasset and Vedel gave 2-10 to 3-10 of a milligram for the initial dose and 1-2 a milligram for the second. For children the dose must be proportionately smaller. Hutinel advises 1-20 to 1-10 of a milligram up to 1 milligram.

The tuberculin used must be from a reliable source and the dilution freshly prepared. For purposes of dilution a 1-2 per cent. solution of carbolic acid is used.

In addition to the febrile elevation of temperature and the constitutional disturbance, there is sometimes a little redness and infiltration of the skin at the site of the injection with a little tenderness to touch. This has also been observed at the site of a former negative injection, when a larger dose has subsequently been given and has been followed by a typical reaction. If a patient suspected of pulmonary tuberculosis reacts to tuberculin, a careful examination of the lungs should be made during the period of reaction. It is then sometimes possible to detect some of the early auscultatory phenomena accompanying tuberculous infiltration of the lungs, which were previously absent.

The tuberculin test has been used to detect tuberculous foci—not only in the lungs but in the pleura, pericardium, peritoneum, genito-urinary tract, meninges, glands, bones, skin, and mucous membranes. In 68 cases of pleurisy, Beck found that 50 gave a positive reaction, a percentage of 73.2. Of 17 cases of cervical adenitis, 16 reacted, or 94 per cent.; and of 13 cases of adenoids of the naso-pharynx, no less than 12 gave a reaction, or 93.3 per cent. These few examples sufficiently illustrate the value of tuberculin as a diagnostic agent.

Of still greater interest are those cases in which there are present one or more of those pathological conditions that I have referred to as constituting presumptive evidence of tuberculous infection. For instance, in chlorosis, in which Beck in 36 cases obtained a reaction in 19—a little over 50 per cent.

Fallacies in this test may arise from atypical reaction, and from insufficient dosage or inertness of the preparation used. It is also stated that the subjects of syphilis, actinomycosis, and leprosy, have occasionally reacted to tuberculin, but it has not been possible to exclude in these cases a co-existent tuberculous focus somewhere in the tissues.

In conclusion, it must be remembered that a reaction to tuberculin simply indicates that a tuberculous focus exists in the individual. It does not imply that the symptoms which are present are necessarily due to tuberculous infection and not to some other obvious pathological condition. A negative result with maximal doses of tuberculin is really of more value than a positive one, for one may then with certainty affirm, not only that the patient's illness is not of a tuberculous nature, but that there is absolutely no tuberculous focus, old or recent, in any of his organs.

Tuberculin, then, should not be used indiscriminately, but only where a reasonable suspicion remains, after other means of diagnosis have been employed, that the patient's illhealth or actual illness is due to bacillary invasion. In this way we shall avoid unnecessary disturbance of the patient and his surroundings, and not run the risk, for instance, of sending an over-worked, pale, but otherwise healthy bread-winner, with an encapsulated cheesy nodule the size of a split pea, to kick his heels for a year on the verandah of some mountain sanatorium, when two or three weeks of pure air and sunshine anywhere would have brought back the glow of health to his cheek and renewed energy to his tired brain.

ON THE PREVENTION OF TUBERCULOSIS IN ANIMALS,

WITH SPECIAL REFERENCE TO PREVENTION IN THE DOMINION.¹

BY

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Considering that this paper is but one of several to be read to-night on this all important subject of tuberculosis, I have found it necessary in order to comply with the time allowance to restrict my observations to a few of the most important points bearing on the disease as it affects the domestic animals.

THE DANGERS ARISING FROM TUBERCULOSIS IN ANIMALS.

Without taking up your time in discussing whether the tubercle bacilli of man and the different species of animals are or are not identical we will premise that in the organism of the susceptible food producing animals the tubercle bacillus will live, thrive, and exercise its destructive operations, and will produce the disease in many of the lower animals which in turn become capable of transferring it to others and to man.

Experiments have determined beyond doubt that next to man the most susceptible to this disease are the animals most made use of for the food supply of the human family, viz: cattle, swine and chickens. These contract it in the natural way, but it can be produced in sheep, dogs, cats, rabbits, goats and horses, by inoculation with tuberculous material.

Of these food producing animals, cattle, swine, and chickens, are most exposed to the infection and are susceptible in the above order.

I

DANGER FROM TUBERCULOUS CATTLE.

Fortunately but a small percentage of the cattle affected by tuberculosis are affected in organs from which the bacilli can readily escape so as to become the infecting agents to other animals. There is a widespread, popular error on the subject of infection by this disease, and the question is often asked:—Why is tuberculosis not much more common than it is? The answer is, that only a small proportion of tuberculous people or animals are infective and that all people and animals are not equally susceptible.

¹ Being a contribution to a discussion on the "Prevention and Cure of Tuberculosis," at the Montreal Medico-Chirurgical Society 17th April, 1899.

We can separate affected animals into two classes, viz:—those that are *actively infective*, and those that are *possibly infective*.

The first includes milking cows with tuberculous udders; investigations have shown these to be very virulent. The infective milk from one diseased udder may render the whole milk of a dairy dangerous to people or young animals fed on it unsterilised. The milk from a diseased udder sent to a creamery or cheese factory may render its products, butter and cheese, infective to people consuming them:—and the by-products skim milk and whey may be the means of infecting calves, pigs or poultry which are fed on them. Milk from tuberculous cows with healthy udders is seldom infective.

Of 7 calves fed on the milk of such cows at the Outremont Experiment Station last year, not one contracted the disease as we proved by post-mortem examination—nor was the disease produced in 46 guinea pigs and 42 rabbits inoculated with the milk of these animals, with three exceptions, two being guinea pigs and one a rabbit. Milk from tuberculous animals is, therefore, but slightly infective when the udder is not tuberculous, whereas it is very virulent when it is diseased. Therefore as a preventive of communication of tuberculosis from cattle to man, milk should be obtained from healthy cows only; and should be protected from infection after it has been drawn from the cow.

The same preventive measures will apply to calves and pigs, as they being fed largely on milk and by-products of the dairy are equally exposed to infection from milk.

In animals suffering from thoracic tuberculosis especially when the tubercular masses communicate with the bronchial tubes, or when the laryngeal or peribronchial glands are the seat of the disease, the bacilli are coughed up and ejected in the sputum, dry up and in time are carried about in air currents, and, gaining entrance to the lungs of other animals, by inhalation, reproduce the disease. Such animals are particularly dangerous to other animals housed in the same building and cohabiting with them. They are also dangerous for attendants who necessarily spend a considerable portion of their time in close contact with them, and frequently inhale infective dust during the sweeping of the byre.

Animals suffering from tuberculosis of the intestines, kidneys, or liver, may also be considered actively infective, as the bacilli may be discharged in the effete products of these organs, and, once set free, there are many ways in which they gain access into the bodies of other animals there to work their destructive effects on the invaded tissues and organs of their hosts.

The second class, *possibly infective*, embraces by far the largest proportion of cases, in which, while the disease may be extensive and its

effects severe, yet none of the organs above mentioned are involved and escape of the bacilli cannot directly take place. A large proportion of tuberculous animals which show no clinical symptoms yet give a reaction to tuberculin, are included in this class. In some, the post-mortem lesions are very slight, and the tubercle will have to be carefully looked for. It may be found in a small gland in any part of the body, most frequently in the bronchial, peri-bronchial, or mesenteric, and occasionally in a bone or joint. The tuberculin test, while a valuable aid to diagnosis, will cause as much reaction in these obscure cases as in more pronounced ones, and in animals suffering from advanced disease often no reaction follows injection owing to a superabundance of the toxine in the system already. We may have extensive milia-ry, mesenteric or pleural tuberculosis with pronounced symptoms, yet escape of the bacilli may not occur until an extension of the disease occurs involving the lungs, udder, uterus, intestines, kidneys, or liver, when they immediately become actively infective.

An animal or person may continue for years in the non-infective class, yet the change takes place so suddenly or so insidiously in many cases, that it would be very unwise to deal with any case of tuberculosis as non-infective.

Dr. Sims Woodhead referring to the subject, says (Report of Royal Commission) "A most important point is that the spread of tubercle in the udder goes on with the most alarming rapidity:—this I was able to observe in cows constantly under observation, but also noticed, on several occasions during the interval between fortnightly inspections carried on along with a Veterinary Surgeon, that the disease had become distinctly developed. It may be, of course, that the early evidence had been overlooked at the previous inspection, but whether this was the case or not the spread of the disease was so rapid, as to afford very good ground for alarm."

The very absence of any definite signs in the early stage is one of the greatest dangers of this condition. Both Dr. Martin and Dr. Woodhead insist that no tuberculous animal of any kind should be allowed to remain in a herd.

INGESTION OF FLESH OF TUBERCULOUS ANIMALS.

Of the danger from the consumption of meat from tuberculous animals, I wish to make it clear that the popular estimate of the danger from this source of infection is, on the whole, exaggerated, and as a matter of fact, except in advanced cases of generalised tuberculosis in cattle, it is very slight. Experiments have demonstrated that while intraperitoneal injection of muscle juice will produce tubercle, the ingestion of the same flesh will prove negative in nearly every instance. (Nocard).

It may be taken for granted that if meat from animals suffering only from localised tuberculosis, is carefully handled and no infective matter smeared over it from the hands, knives, or saws of the butcher, is allowed to stand for a few days in a refrigerated chamber, and is thoroughly cooked, it can be eaten with impunity.

As a matter of fact tuberculous meat is frequently foisted on to the public and no bad results seem to follow, at least so far as is known. At the same time there is a certain danger from smearing with tuberculous matter, and from insufficient cooking; consequently it is clearly the duty of sanitarians to limit the sale of meat from tuberculous animals to cases of limited invasion and under very reliable supervision. The same remarks apply to pork in all its forms, but the danger from meat infection in pigs is even greater than in cattle, owing to sausages and hams being more frequently eaten under-cooked.

Tuberculous chickens are still more dangerous owing to the consumption of the giblets in which the tubercle may be concentrated. Fortunately, however, they are usually thoroughly cooked and raised to a temperature which kills the bacilli. Yet, reports show that chickens are not infrequently the means of infection in the human family, and while the chicken tubercle bacillus may not be identical with the human, yet the human bacillus will live and thrive in the organism of the chicken, producing tubercle, which, reintroduced to the human body will produce tuberculosis. The expectoration of tuberculous patients in poultry-runs should be absolutely prevented.

Rabbits. While rabbits contract tuberculosis when exposed to infection, the disease is unknown in them in the feral state, consequently, no apprehension may be felt in using rabbits as food.

While every conceivable precaution should be exercised to prevent the communication of animal tuberculosis from the food-yielding domestic animals to man, equal care should be exercised in preventing the communication of this disease from tuberculous people to these animals. Consumptive people are generally regarded as almost as dangerous to the health of cattle, pigs and poultry as are tuberculous cattle, pigs, and poultry to humanity. Here, however, mention must be made of Theobald Smith's recent observation that the bovine bacilli may be as much as thirty times as virulent towards the animals of the laboratory as are human bacilli.

Tuberculous patients, both human and brute should be isolated, and other people and animals protected against both direct and mediatory infection.

II

IS IT POSSIBLE AND PRACTICABLE TO ERADICATE TUBERCULOSIS?

I have frequently stated my belief that it is both possible and practicable to rid Canadian herds of this disease completely; and that by the

expenditure of an amount of money trifling in itself as compared with the enormous benefits that would accrue to the Live Stock industries of Canada, which are rapidly growing, and even now represent a large proportion of the country's wealth, while yet it is even at the commencement of its development.

Considering that 45 per cent. of the population of Canada is engaged in rural pursuits; that the railroads depend on agriculture for one-fourth of the freight they carry, and the canals one-third; that the shipping interests depend chiefly upon the produce of the farms and ranches, and that more than one half of the total exports are agricultural products—the value of which for 1897 amounted, according to the Year Book, to the sum of \$55,533,592, (of which \$9,937,723 was the amount received for horses, cattle, sheep, swine, other animals and poultry)—surely no reasonable expenditure can be justifiably withheld by the Government to eradicate any disease that interferes with the development of an industry of such importance to the country's prosperity.

We have no statistical information of the number of animals or even of herds affected by this disease, so that it is impossible to estimate accurately what the cost of eradication of tuberculosis might be—but tests have been made during the past year to a considerable extent in every province of the Dominion, numbering over 10,000 head in *suspected* herds, and of these *only 5% have been found tuberculous.*

From the foregoing remarks it will be seen that the proportion of the affected animals which would have to be slaughtered and sacrificed (those only which showed clinical symptoms) is small; probably throughout the entire Dominion 10,000 such could not be found; which even at full value would not exceed \$250,000. Those reacting to tuberculin would, of course, be much more numerous; but of these reacting animals 70 per cent at least could be fed and slaughtered for beef under supervision; certainly that percentage would be found very slightly affected and their meat would be quite fit for food, and this is what should be done with all cattle of no special value for breeding purposes. The remaining 30 per cent. of carcasses should be destroyed by putting them into the rendering vats, indemnity being paid in the manner subsequently recommended.

In the case of highly bred cattle, in which no clinical symptoms are discoverable, they may be kept in isolated buildings and bred from under the system carried out in Denmark, known as "Bang's system;"* as symptoms develop they should be slaughtered. The number that would

* Prof. Bang has these animals isolated in special buildings or closely partitioned-off portions of byres, bred from, their calves removed as soon as dropped to non-infected buildings and fed on milk from tested cows or sterilised milk. They are tested semi-annually, any that react are killed. Over 90 per cent. of the calves can thus be raised healthy.

require to be killed would decrease year by year, and the full compensation, while not amounting to much, would stimulate owners of diseased herds to have them tested and dealt with as found necessary.

Just think what a safeguard to public health as well as health of animals it would be to have every animal showing clinical symptoms—those in fact which are most infective,—removed, and all known to be diseased prevented from being moved about, by quarantine measures.

It may be asked:—Would these measures not be attended by considerable disturbance of trade and general inconvenience? No indeed; it would stimulate the cattle trade. Those who are fortunate enough to possess healthy herds would find ready purchasers in those whose cattle had been killed and paid for; slaughter would immediately be followed by disinfection and restocking, in most cases by better bred, and in all cases by healthy cattle.

It is quite evident that if the above suggestions were carried out, tuberculous animals would be in a few years difficult to find in Canada.

Knowing as we do the intercommunicability of human and animal tuberculosis, we can readily understand that any attempts to eradicate the one must be simultaneous with like action in relation to the other—and here I wish to appeal to the medical profession to do their share of this great work of eradication.

No one nowadays doubts the contagious nature of this disease in either man or animals, yet while the Veterinary Profession, and Agricultural Departments throughout the civilized world have for years been moving strenuously to limit and prevent it in animals, but little has so far been done in this connection by the medical profession in dealing with human beings. Not only have they acted with unaccountable apathy so far as adopting any radical preventive measures among their patients, but little has been done to inform the people of the true state of affairs, or to point out to them the many ways by which the contagion is spread.

Surely, at least, the public should be told of the danger especially to young children, of being fondled and kissed by consumptives. Surely parents should be advised how to prevent the extension of this disease among members of a family by isolation. Surely the owners or tenants of houses occupied by consumptives ought to be compelled to thoroughly disinfect, and so renovate the walls and floors as to remove all danger to subsequent occupiers. Surely it is time that special carriages were provided for consumptives for the conveyance to those health resorts to which medical men send their patients, by the railroad companies over whose lines they travel. Time and again have I witnessed on Western roads leading to Colorado shocking disregard of all preventive precautions in this connection.

We need not go beyond our own city to look for instances of families in which members one after another have fallen victims to this disease through contagion, yet sympathetic friends, often accompanied by little children, are allowed unrestrictedly to visit the poor patients, who, cheered by their visits and delighted to see and fondle the children, in their ignorance impart the infection to their young and susceptible bodies, setting a seal of death which will overtake them at an early age.

It was with more than ordinary satisfaction that I read the admirable address delivered by Sir William Broadbent a short time ago at a meeting convened by H. R. H. the Prince of Wales at Marlborough House to inaugurate the National Association for the Prevention of Consumption, the mission of which is "to carry into every dwelling in the land an elementary knowledge of the modes in which consumption is propagated, and of the means by which its spread may be prevented." "To this end," he says, "the public attention must be captured, the public imagination must be impressed, the defensive instincts of the general public must be aroused."

HEREDITY.

As most of my hearers have no doubt read the address I will make but one other quotation from it which I hope will impress everyone present as an endorsement of expressions which I have repeatedly made on the subject of heredity in this disease :

"It is now definitely known that consumption is a contagious disease, and communicable from animals to man; and that it arises in no other way. It is not an inherited vice in the constitution which declares itself in course of time; but, while some constitutions are more prone to it than others, and while an unhealthy mode of life and unwholesome surroundings predispose to its attacks, every case of consumption is derived from some pre-existing case."

III

THE TUBERCULIN TEST AND ITS RESULTS IN ANIMALS.

Happily in this country but little time was lost in conveying to our agricultural population a true account of tuberculin and its effects on animals; as a consequence, the objections raised against it in other countries as a result of ignorance of what it really is, had not to be combated here, to any large extent at least. The efficacy of tuberculin as a test, is well-known throughout the Dominion.

As previously stated, within the past twelve months over ten thousand cattle have been tested at Government expense from the Atlantic to the Pacific; and of the large number of post-mortem examinations made scarcely a failure to discover the tubercle has been reported; thus, of 100 post-mortems made by Travelling Inspector Dr. A. E. Moore every one was tuberculous; of sixteen killed at the Central Experiment Farm, in only one animal did we fail to find the disease. Of ten cows killed at the

Outremont Expériment Station it was found in every one, although no clinical symptoms were presented during life.

We failed to find tubercle in seven calves from 6 to 9 months old which gave no reaction to tuberculin. Doctor Moore assisted me in making twenty-seven post mortems in a herd in the Eastern Townships and we found tubercle in every single case.

Of 13 animals imported from England tested in the quarantine at Point Levis, tubercle was found in every one. Numerous similar experiences could be given.

I must not be understood, however, to say that there are no objections raised to the use of tuberculin in Canada. It is strongly objected to by owners of tuberculous herds, not on the grounds of being in any way injurious to the cattle, but on account of its remarkable accuracy in diagnosing the disease. It detects the slightest existence of tubercle, but it in no way indicates the extent of it, and where animals are condemned on its evidence alone, it is asserted that many are thus condemned which would have recovered;—but as a matter of fact no animals are condemned without a careful clinical examination.

This argument would have point if slaughter of all reacting animals was made compulsory, but such is not the case, nor is it ever likely to be so. Our experiments with tuberculin conducted at the Experiment Station, Outremont, clearly demonstrated the unreliability of second and subsequent tests. Seven cows when first tested at Ottawa gave a reaction indicative of the disease; when tested thirty days subsequently only one of them reacted. Three months afterwards double doses were injected into two of them without reaction and five days later quadruple doses were given the same cows without result.

Tuberculin and other animal toxins should be placed under Government control as are chemical poisons.

The knowledge of the unreliability of any but the first test led to fraudulent practices by cattle dealers bringing stock into France, and M. Nocard and M. Roux together set to work and discovered a new tuberculin which will cause reaction no matter how recently Koch's fluid has been injected. This however, for obvious reasons is a Government secret which M. Nocard informed me he is not at liberty to make public or even divulge to professional friends.

IV

HOW IT IS DEALT WITH BY THE DOMINION GOVERNMENT.

So far the action taken by the Canadian Government has been confined to efforts made to inform the people of the nature of tuberculosis, how the disease spreads, how to prevent and how to diagnose it, how to deal with a diseased herd, how to disinfect premises and to dispose of

tuberculous carcasses,—by means of bulletins, and itinerant lecturers who address farmers' meetings during the winter months.

Much has been accomplished by free testing by Government Veterinarians, appointed after special examination, who have been authorized to do the testing throughout the Dominion. Dr. A. F. Moore is Traveling Inspector specially for instructing, testing, and investigating.

When an application is made on the prescribed form by an owner of cattle, an inspector is instructed to make the test and transmit the charts to the department for the decision of the Chief Inspector.

When any of the cattle react two degrees, they are pronounced tuberculous, provided that there are no attendant circumstances which account for the rise in temperature, a clinical report having to accompany each chart in which diseased or suspicious animals are indicated.

Diseased animals are forthwith removed from the herd, and placed in an isolated building where they are quarantined and thenceforth cannot be sold or removed, nor their products utilised under the penalties provided in the Animals Contagious Diseases Act, so that the herd is thus placed beyond the possibility of extending the disease.

No provision has so far been made by Parliament for the payment of indemnity for animals slaughtered and under ordinary circumstances no indemnity is paid.

All cattle imported from Europe, in addition to being kept three months in quarantine, must be accompanied by charts and certificates of testing in the country whence exported to Canada immediately prior to exportation, or else be tested in quarantine in Canada; and from the United States, all cattle to be admitted for breeding purposes shall be accompanied by:—

(a) A declaration made by the importer that they are actually for breeding and no other purposes.

(b) A certificate signed by a Government Veterinarian that they have been subjected to the tuberculin test and found free from tuberculosis. Such certificate must show the date of testing and chart of reaction with a description of the animal, giving age and markings. The importer may be required to swear that the certificate refers to the animal represented.

(c) A certificate of inspection signed by a Government Veterinarian showing that the animals are free from contagious disease and that no contagious disease of cattle (excepting Tuberculosis and Actinomyces) exists in the district whence they came.

(d) When not accompanied by such certificates the animal or animals must be detained in quarantine one week and subjected to the tuberculin test.

(e) Should they be found tuberculous they must be returned to the country from which shipped, or slaughtered without compensation.

These regulations being reciprocal, and it being necessary for Canadian breeders who sell to American buyers to have their herds tested, much general good has been accomplished by this testing without cost to the Government.

The result of this method of dealing with it has been a marked lessening of the disease in the country at a minimum of expense. I know that I am within the mark in stating that as compared with five years ago tuberculosis has been reduced in Canada by at least thirty per cent.

This can be illustrated by the following facts.

In November last, owing to the experiments which were being conducted at the Experiment Station at Outremont having been completed so far as the cattle then on hand were concerned, they were slaughtered for post mortem examination.

The Station is now about to be opened, but I have found it impossible notwithstanding the number of Inspectors in the field to find cattle presenting clinical symptoms. I have heard of one man who owns a few, but he, believing that he has a corner in them, holds them at unreasonable figures; and as to diseased udders I have so far failed to find a cow in milk with a tuberculous udder, which we could procure for experimental purposes; some have been met with but not giving milk.

These facts while very gratifying from an economic point of view are far from satisfactory. Having educated the people and got them to realise the importance of the matter, why should energetic action be longer delayed, since delay is attended by so much prospective and continued detriment to the live stock interests of this great agricultural country?

I have been asked to give you my views as to what special action and legislation would be necessary. In complying with this request I wish to state that it is not done in any official capacity but to meet your wishes in your praiseworthy efforts to interest the public.

SUGGESTED ACTION AND LEGISLATION.

The time has surely come when more energetic if more expensive methods should be employed to terminate this menace to the health of men and animals. The Government acted wisely in moving cautiously in this matter, it took time and much patiently acquired experience to arrive at a full knowledge of the disease in all its relations in man and animals, before deciding on radical measures or large expenditure.

Hitherto professional men hesitated to recommend, and politicians refused to assume the responsibility of voting large appropriations for this purpose, and wisely, too.

Now, however, years of investigation and experimentation by scientific men in numerous and independent countries, having resulted in a clear

elucidation of most of the moot points relating to tuberculosis in animals, and there now being no tenable argument for longer permitting this preventable disease to continue in our midst, when it can be shown, as I have endeavoured to do, that for a comparatively small amount, it can be completely stamped out, surely it is the duty of the government to take active measures at once for its eradication.

I trust that this association will endorse these views and will recommend that Parliament be asked to vote the necessary funds to enable us to get rid of at least every immediately infective bovine in Canada.

When we consider the direct bearing this disease in our cattle has on public health and on our agricultural prosperity which influences to such a large extent (as I have shown in my introductory remarks) the railroads, canals, and mercantile marine, we must admit that the stockmen of the country should not be called upon to bear the whole loss incurred in bringing about a more sanitary condition of the food supply of the people.

The country should share the farmers' burden, and when cattle have to be killed and sacrificed, I would strongly recommend that full indemnity up to the health value, not exceeding \$50 for one animal be given as compensation,—*during the first three years*. After three years the compensation should be as provided for in the Animals Contagious Diseases Act, viz:—one third, for actually diseased, not to exceed \$20; three fourths when killed for being in contact, in the case of grade animals not to exceed \$50, and in case of thorough bred animals two thirds, not to exceed \$150.

As already stated, of the reacting animals at least 70 per cent could be fed and killed for beef, under supervision.

The 30 per cent. so killed and sacrificed, in consideration of the cost of keeping and feeding should be compensated for at full value, ascertained by weighing the carcasses.

It might not be expedient to make testing compulsory; nor would it be necessary, as in a very short time no one would buy an animal without a test or guarantee of freedom from tuberculosis,

I have stated above that probably a sum of \$250,000 would be paid out for compensation during the first year; this sum would be greatly lessened each year. The administration would cost about half as much more. Suppose \$400,000 was voted as a special appropriation for this purpose for the first year, it would only be a pittance expended for the benefit of not only the farmers but the whole population.

The number which would have to be slaughtered the following year would be reduced by about 75 per cent. Three or four years of active work ought to come very near complete eradication, provided the owners

of cattle coöperate in the work as I believe they will if just compensation be paid to them.

V

IMPORTED CATTLE SHOULD BE TESTED.

The alarming prevalence of this disease in Great Britain, France, Germany and Denmark, whence breeding cattle are imported for the improvement of Canadian herds, should lead our farmers to be very careful in ascertaining beyond doubt that all importations are free from tuberculosis.

They should not only see that none but the most trustworthy agents are employed to purchase an animal in Britain, but that the agent has personally superintended the tuberculin test, and that he obtains a declaration from the seller that the animal has not been injected with tuberculin for three months previous to the date of purchase.

Our experiences at the Cattle Quarantines, especially at Halifax and Quebec, demonstrate not only the necessity for these precautions but the unreliability of testing done in Britain. One importation of fourteen high class short-horn cattle, which was accompanied by a chart of testing and a certificate of freedom from disease, on being tested in quarantine eight weeks after, showed thirteen to be diseased, one being in such an advanced stage that she died from it in quarantine. The remaining twelve were slaughtered and tubercle found in each; in two it was extensively generalised.

It is impossible to estimate the serious damage and losses that probably would have occurred among the short-horn herds of this country if this herd had not been tested in quarantine but had been allowed to be dispersed one here, one there, in perhaps a dozen healthy herds; or more properly speaking, it would be difficult to compute the saving to Canadian live stock interests by the testing at Point Levis of this one herd. Yet so blind are the breeders to their own interests that we find breeders' associations passing resolutions urging the Government to allow cattle to come in without being tested!

There is no defensible objection to tuberculin testing. Tuberculin as it is prepared contains only the toxine of the bacilli, sterilised by heat, filtered through porcelain. As well might we endeavour to produce barley from alcohol as tuberculosis from tuberculin; in fact it has been demonstrated beyond dispute that it does no harm whatever.

I am pleased to find, however, that the past year's experiences have induced several of the strongest objectors to the tuberculin test, men owning some of the largest and most valuable herds in the country to change their views, and several of them have had their herds tested, and it is to be hoped that before long there will be a voluntary and combined effort among Canadian stockmen to second the efforts and

strengthen the hands of the Minister of Agriculture in his laudable desire to see this disease completely eradicated from our herds.

In conclusion, gentlemen, allow me to congratulate the Society on the interest manifested by you in this important subject—specially important as a matter of public health, very important as affecting the cattle industries of this great agricultural country, and of no less importance as affecting the commercial and trade interests of Canada.

ON SANATORIA:—LOCALITY AND CURE.*

BY

A. J. RICHER, M.D., of Montreal.

Tuberculosis, which has figured prominently in medical history since its earliest days, has been treated in every conceivable way. Climate, however, seems to have met with the greatest favor, but the question of localities has been much disputed throughout centuries.

We are indebted to Brehmer, of Goebersdorf, for having successfully established a systematic treatment, consisting of absolute rest, open air life, and an abundant supply of very nutritious food, which was conducted under his strict supervision in a closed establishment, a sanatorium. Since then, his methods have been modified, both on the continent and in America. Dr. Trudeau, in the Adirondacks, has adapted the sanatorium life of the continent to American ideas, by his cottage plan of habitation, with a central administration building. In Canada, we have a duplicate of the far famed Adirondack Sanatorium, at Gravenhurst, Muskoka, situated at an elevation of somewhat less than 800 feet above sea level, which has for the last two years been doing very excellent work. The Loomis Sanatorium, at Liberty, N. Y., which is situated at an altitude of 2000 feet on the N. Y. O. and W. Ry., at a distance of 119 miles from New York City, on a plateau adjacent to the Catskills, offers similar advantages to our own Laurentian Range. The winters are long, cold and dry, the summers cool, the soil sandy and porous.

The Adirondack Institution, situated at an elevation of some 1500 feet, is so well known that it need not here be described. The Adirondack Mountains, as a part of the Laurentian formation, are very similar to our own Laurentian Mountains, and what may be said of one, applies almost in every way to the other. The Trembling Mountain district of the Laurentian Mountains, offers every advantage for the treatment of incipient tuberculosis. Open air life can be carried out throughout the year. The thermometer registering 30 or 35 degrees below zero, makes one feel as though standing before a blazing fire, so stimulating is this dry and cold atmosphere. But the winters are not constantly so cold. The winter mean temperature, roughly estimated, has been a trifle over 17 degrees above zero during this last winter at Sté. Agathe, near the site of the Laurentian Sanatorium, now nearly completed, and situated

* Being part of a Discussion on the "Prevention and Cure of Tuberculosis" at the Montreal Medico-Chirurgical Society, April 1st, 1899.

at an elevation of 1500 and some odd feet. It is unfortunate that meteorological observations have not yet been systematically made in that particular region, but from enquiries and frequent visits made during the last nine months, little doubt exists in my mind as to the suitability of this district for the treatment of incipient tuberculosis. It is our intention, during the coming year, to make minute observations upon temperature, rainfall, winds, barometric pressure, hygrographic records, &c., &c.

Clinically, one may classify cases more or less easily, but therapeutically, it is a little more difficult, and now, as in days gone by, particular regions, altitudes, climates, latitudes, &c., have their critics, as well as their adherents. The favorite resort of to-day, may be the forgotten one of to-morrow, and this as a result more or less of the agitation of climatologists ever busy, and the general public forever thirsting for new health resorts. We should not, however, lose sight of an important point in connection with the treatment of tuberculosis; that, a cure, in order to be permanent, should as much as possible be obtained or looked for in the climate in which the patient lives or intends to live permanently. Von Leyden, at the International Congress at Moscow, in '97, emphatically laid stress upon this point, quoting verbatim the words of Knopf in his Paris thesis of 1895. This phthisio-therapist (Dr. Knopf) even now inclines to the idea that all other things being equal, altitude is a very negligible quantity. A sanatorium to be opened next month at Suffern, N. Y., at an altitude of less than 400 feet, is to be closely watched as to its results by this observer, and to us, accustomed as we are to look upon altitude as a necessity, it will be extremely interesting to read the first annual report of this institution.

Climatic advantages, with regard to treatment, are more apparent than real. Cases of lymphatic and glandular tuberculosis, however, seem to be an exception in this respect, and sea air undoubtedly appears to exercise marked influence upon this class of cases, acting almost as a specific against this particular form of tuberculosis. Fibroid purulent and hæmorrhagic varieties of the pulmonary form, however, should be treated in a sanatorium, in a climate as nearly similar as possible to that in which the disease developed, or where the patients are likely to live permanently. High altitudes, such as are met with in different parts of Colorado, of course would not be suitable for hæmorrhagic cases, or other forms complicated by heart disease. Kamloops, B. C., at an altitude of 1100 feet, with as dry a climate as Colorado, and a mean temperature of 5 degrees above that of Montréal, with a greater uniformity in temperature, would no doubt offer a very fine site for a sanatorium.

The subject of relative advantages for different classes of patients is an important one. They may be briefly classified as:—

1st. Lymphatic and glandular forms of the disease, which may derive a certain amount of benefit by open air mountain life, but are more likely to improve by a prolonged sea trip.

2nd. Incipient pulmonary forms, and some of the cases where softening is just commencing, which, according to the district in which they live, may be sent either to the Adirondacks, Gravenhurst, or the Laurentians.

3rd. Far advanced cases, where softening is marked in one or both lungs, with more than one cavity, which had better be kept at home under appropriate sanitary regime, as their presence in a sanatorium exercises a demoralizing influence upon the other patients. These latter cases should be specially cared for in a City hospital, conducted upon the same principles as our civic infectious hospitals, and at the expense of the City, or State, or both.

In Montreal, during the year 1897, we had 827 deaths from tuberculosis, i. e., more than 10 per cent. of all deaths which occurred during the year, which are enumerated and classified under more than 100 different forms of disease as causing death, and of which only one other gave a superior number, i. e., gastro-enteritis, 1396 deaths, 1231 of which occurred during the first year of life. This gives about 2.7 deaths from tuberculosis per thousand of population, which is not above the average for cities of its size on this continent. When one considers the fact that this disease is now successfully treated by absolute rest, proper hygiene, open air, and a liberal diet, one cannot help asking why the Government of the Province does not take the matter in hand and treat in this way as many cases among the poorer classes as can conveniently be treated, and they in turn, being restored to health, would, by their systematic life and knowledge acquired during their stay in State institutions, educate others in how to prevent the spread of this dreaded scourge. Our local and provincial Boards of Health should be asked to take active steps in the matter of the prevention of the disease, while our local government should at once attempt to do something for our consumptive poor. With such associated forces, we should within five years reduce the mortality by one-half, and within ten years, be rid of "the plague of the North."

It is strange, but true, that when a physician tells a patient that his lungs are weak, said patient never dreams for a moment that he is sick. His disease to him is not a disease, and often only a pretext for a holiday, and usually he makes the best of it at some fashionable resort. Given the same patient outside of the discipline and watchfulness of an

institution, even though you may at great length describe within well defined limits his mode of life at a health resort, you will invariably discover that the lesson given most minutely, has been just as minutely forgotten in the course of a few weeks. No patient requires more constant supervision, more tactful handling, and more sympathetic treatment, than does a phthisical one.

The experience of the last thirty years in sanatorium treatment, has proved its value beyond the shadow of a doubt. The results obtained by Brehmer, Dettweiler, Driver, Szontagh, Meissen, Trudeau, Sabourin, Daremberg, Théod. Williams and many other phthisio-theraputists, are proof positive of the absolute curability of 25 per cent. at least of all cases treated, and the arrest of the disease, or marked improvement, in 60 per cent. of the remainder. At present it is the only treatment giving uniform results, and until such time as an anti-toxine with rapid and direct action shall have been discovered, it remains our strongest weapon of defense.

But if you want your patients to derive benefit from sanatorium treatment, don't keep them at home until you can do no more for them, send them to an institution as soon as you are satisfied of the nature of the trouble, and the earlier you do so, the better for the patient, as well as yourself.

THE SYMPTOMATOLOGY OF TUMOURS INVOLVING THE HYPOPHYSIS CEREBRI.*

BY

JAMES STEWART, M.D.,

Professor of Medicine and Clinical Medicine, McGill University; Physician to the
Royal Victoria Hospital. Montreal.

It is generally recognized that tumors of or involving the pituitary body may in addition to the results arising from local or general cerebral pressure induce symptoms directly due to destruction or interference of the function of this structure. It is generally admitted that the hypophysis is either enlarged or diseased in every case of acromegaly.

What relation the changes in the pituitary body bear to the acromegalic symptoms is however still a matter of speculation? A number of cases of tumours involving the destruction of the hypophysis have been reported, chiefly by Weir Mitchell, Drs. Anders and Cattell, and Guy Hinsdale, where no symptoms of acromegaly were present.

This paper is chiefly a record of two cases of a similar character, in neither of which were there any symptoms of acromegaly. In one case the symptoms in addition to the direct cerebral pressure signs resembled a mixture of myxedema and pernicious anæmia, while in the other the symptoms were those of a somewhat rapid infiltrating neoplasm of the anterior part of the base of the brain.

CASE I.

Perithelial Angio-Sarcoma of the Pituitary Body—Symptoms—headache, vomiting and temporal hemianopia—Finally infiltration of the growth into the ethmoid and sphenoidal cells causing hæmorrhage from the nares—No symptoms of acromegaly or other forms of nutritional disturbance.

Miss K., aged 35, a miniature painter, was admitted on the 2nd December '98, complaining of headache, dimness of vision, and occasional vomiting. She says that the headache and dimness of vision have been troublesome for upwards of eighteen months. The failure of vision was noticed first in the left eye and she observed that the pupil of this eye was larger than the right. Three months previous to admission the sight of the right eye was found to be also failing, and the pupil of that eye to be becoming larger. The vomiting which occurs about every month, lasting from one to three days, was first noticed on March of 1898.

* Read at the 14th Annual Meeting of the Association of American Physicians, May, 1899.

She was born in Eastern Ontario, and always lived there, except for a period of 6 years, when she resided in the state of Illinois. With the exception of measles and whooping-cough there is no history of any illness. She has four brothers and five sisters living, all in good health. One brother died from pulmonary tuberculosis, and a sister from heart trouble. She was much worried for months previous to the onset of headache and dimness of vision, and had been treated for nervous prostration.

Present Condition. She is a tall and well nourished woman, 35 years of age. She is able to walk about but prefers lying in bed on her back; as in this position she suffers less from headaches. She is more than ordinarily intelligent, her mental state on admission being as far as she herself or others could judge, fully normal.

Headache. Pain in the head is her great complaint. It is referred chiefly to (1) the left temporal and parietal regions; in the left eyeball and over the left brow; (2) to the occiput, just below the occipital protuberance, shooting downwards and often forwards, on both sides often entirely circling the neck.

The pain she says is continuous but it is frequently intensified especially on movement, on percussion and at times spontaneously.

Dimness of vision. Three months before her admission into the hospital, Dr. Stirling had an opportunity of examining her eyes and found the following condition present.

Right Eye. 5-9, outer half of the field gone, light perception reduced 5°; the pupil active to light and accommodation but indirect action from left eye lost.

Left Eye. Light perception reduced 8°. She is able to count fingers at 2 feet in the lower and outer part of the field but nowhere else. Pupil is 7 mm. in diameter, immobile to light and accommodation. There was a slight non paralytic divergence.

There was simple atrophy of both optic nerves, without any diminution in the size of the large vessels.

Three months afterwards, Dr. Buller found a more advanced condition of atrophy there being just perception of light in the left eye, and a marked diminution now all over the right field. He also reported a state of simple atrophy without diminution of the large vessels. The diminution of light perception in the right eye was so marked that he was not able to map out the field.

Her voluntary power is not in any way impaired. Nutrition is good. The knee jerks are much diminished, while the superficial and organic reflexes are normal. There is no disturbance of any form of the muscular sense. The general sensibility is not in any degree impaired and with the exception of the disturbance in the functions of the optic nerves already referred to the special sense nerves are normal.

Menstruation began when she was thirteen years of age and continued one year when it permanently ceased.

The urine had a sp. gr. of 1025 contained $\frac{1}{2}$ per cent. of albumen together with numerous granular and hyaline casts.

The subsequent course was characterised by more or less continuous and severe headache, by occasional vomiting, and gradually increasing stupor. A few days previous to her death on the 7th Jan. '99 there was a discharge of a bloody fluid from both the anterior and posterior nares. The immediate cause of death was hyperpyrexia.

I am indebted to Dr. A. G. Nicholls, assistant pathologist to the Royal Victoria Hospital for the following account of the post mortem.

In addition to the morbid changes met with the brain, the following were found:

There was a subacute diffuse nephritis in both kidneys. The uterus, infantile in type, being only 5.25 c.m. long. The ovaries were small, fusiform in shape and without noticeable scarring, and slightly fibroid.

The Brain. The calvarium was normal. The dura was thin showing the convolutions of the brain through its substance. It was congested and exuded blood. The convolutions were flattened on both sides, chiefly over the vertex and posteriorly. The frontal convolutions appeared to be normal. There was considerable exudation of clear fluid about the base of the brain.

On removing the brain a tumour mass was found at the base, lying in the sella turcica, and occupying the site of the pituitary gland, of which no vestige could be seen. The tumour measured 5 cm. long by 4.75 cm. broad. The upper surface was lobulated, forming grape-like masses of a reddish translucent colour, of soft consistence, and hæmorrhagic appearance. There were two large lateral lobes with 3 smaller ones anteriorly. The under surface of the tumour was very soft and diluent, of the appearance of raspberry-jelly. This was probably due to manipulation. The tumour lay in the median line with a tendency to the left side. There was an oval excavation on the base of the brain in which the mass rested. The sella turcica was greatly enlarged in all directions corresponding to the main mass of the tumour below. The body of the sphenoid was eroded from pressure, the bone being as thin as paper. The sphenoidal and ethmoidal cells contained a jelly-like mass similar to the tumour. The posterior nares contained blood-stained mucus. On the left side in front the tumour passed beneath the dura of the cranial base reaching along the lesser wing of the sphenoid as far as the back of the left orbit. It had not, however, invaded the orbit. The growth had reached the top of the pharynx without causing any perceptible bulging. The tumour pressed directly upon the optic commissure which was flattened. It reached backward to a point 2 cm.

anteriorly to the pons, compressing the left crus. Other cranial nerves seemed not to be directly involved.

The specimen was hardened in Eulk in tormal—Müller.

At closer inspection the mass was found to be bounded, at least above, by a thin fibrous membrane, presumably the pia mater. Several sections were made through its substance, and through the optic chiasm, pons, medulla, left crus and cord.

Microscopically, the tumour was found to be enclosed in the upper surface by a laminated fibrous tissue membrane, presumably the pia mater. The finer structure of the mass varied somewhat in different parts. In the main it consisted of delicate capillary blood-vessels with elongated cells having oat-shaped nuclei. The blood-vessels were composed of basement membranes lined with flat endothelial cells; they were for the most part small but in a few instances formed actual cavernous sinuses. The elongated cells were arranged about the blood-vessels, their long axes being placed radially to the centre of the vessel. This gave the tumour the appearance of being formed of a series of rings. In other places the elongated cells formed long finger-like processes running in various directions and without the same definite relationship to the vessels. On the under surface of the tumour small spicules of bone were seen showing that the new growth had forced its way through the body of the sphenoid. At the margin of the growth two or three very cellular nodules were seen which had a close resemblance to round-celled sarcoma. On the whole as the tumour was composed largely of short spindle cells it had the appearance of a sarcoma, and owing to the relationship to the vessels it must have started from the perithelium. No remains of the pituitary body were seen, nor was colloid present.

Diagnosis. Perithelial angio-sarcoma of the pituitary body.

Sections through the optic chiasm showed that the optic nerves were in a state of extensive degeneration, the myelin sheaths being broken up and reduced to globular masses. The blood-vessels were distended and surrounding them were masses of small round cells.

Sections through the pons, medulla, left crus, and cord, showed nothing abnormal.

The symptoms in this case extended over a period of about twenty months, and were clearly indicative of a cerebral growth in the neighborhood of the optic chiasm. There were no symptoms whatever of acromegaly, myxœdema or pernicious anæmia. I would like, however, to call attention to two changes which have been frequently met in cases of tumours involving the pituitary body.

These are cirrhotic changes in the kidneys, uterus and ovaries. Boyce in his valuable paper on hypophysial growths gives details of at least four cases where the kidneys were found to be granular.

CASE II.

Endothelioma of the base of the brain—Causing pressure on the chiasma and obliterating the pituitary body—Symptoms of a cerebral growth extending over 9 years—Right temporal hemianopia—Profound anæmia—A general appearance not unlike that seen in myxœdema—No changes in the bony tissue.

Mr. W—, a merchant, aged 42, came first under the observation of Dr. Stirling in Feb. 1888, complaining of failing vision, headache and previously and this was I believe the first evidence of any intra-cranial trouble.

He had been for a number of years and up to the time of the appearance of his present complaints a heavy drinker. There was no history or evidence of tuberculosis or syphilis. He complained of a dull frontal headache but neither at this period or any time during the prolonged course of his illness, was headache a prominent symptom. In walking he more or less constantly had what he called a giddy sensation with a tendency to fall forwards. Vomiting of a cerebral character was present for some months during the early period of the disease. Dr. Stirling's examination of the eyes revealed the following changes:

Left Eye. There is no perception of light. The pupil is semidilated and immobile, but reacts on stimulating the right eye with light.

Right Eye. Complete blindness to the outer side of the field. The inner side was amblyopic, vision being reduced to counting fingers at twelve feet. In reading type he is able to pick out a letter of the largest size (No. 16) here and there. In this area the perception of green was found to be very defective, and after looking at green for sometime there was an after image in pink.

Examination of the fundus revealed in the left eye white atrophy of the disc with somewhat contracted vessels. In the right eye the disc was simply pale.

There was no objective disturbance of either sensation or motion. He complained however of numbness in the hands. He had frequent flushings followed by profuse perspirations about the head and neck. The knee jerks were slightly exaggerated but the superficial and organic reflexes were normal.

The further course of this case was very slow, six years elapsing before his death in 1894. His sight entirely failed in August 1889. He became very fat and anæmic. The face and extremities were puffy, but in no part was there pitting on pressure. The puffy, pale skin presented a very striking clinical picture. The pallor of the skin was noticed when he first came under observation in 1888, but it steadily increased. In 1892. he presented the typical appearance of a person suffering from perni-

cious anæmia, the skin having a typical lemon-yellow tint, while the general state of nutrition appeared to be unusually good. In March 1893 Dr. Gunn examined the blood. He found 2,800,000 red cells and the proportion of white to red as 1 to 1500. The red cells were irregular in size, microcytes being abundant, no nucleated red cells were found. Four months later a second examination of the blood was made by Dr. Gunn. He found 2,100,000 red cells, and the proportion of white to red as 1 to 1600. The urine was free from both albumen and sugar.

The anæmia remained up to death but did not present any changes different from the last above recorded examination. His appetite remained good and was even at times voracious. He was annoyed with photopsiæ, and during the last two years of his life he complained more or less constantly of hallucinations of vision, smell, taste and hearing and of general sensibility. He often imagined that burglars were breaking into the house, maintaining that he not only heard but saw them. He kept a revolver under his pillow to punish any burglar that would attempt to come near him.

He frequently made mention of what he called "beasties" crawling over his skin and would stoutly maintain that he not only felt but saw them. This was when he had no perception of light in either eye. Although his general nutrition and strength were fair he spent almost the whole of his last year in bed. When urged to get up, he would make answer that he would do so the following day.

Summary of the symptoms and course :

1. Gradual loss of vision in both eyes, going on to total blindness in the left and temporal hemianopia in the right followed later on by total extinction of the perception of light.
2. There was complaint in the earlier months of his illness of frontal headache and of occasional vomiting.
3. The presence of more or less constant giddiness throughout the course of his disease with a tendency at first to fall forwards and afterwards to one side.
4. Profuse intermittent flushings and perspirations about the face and neck, but the skin of other parts was dry and harsh.
5. Slow cerebration, as evidenced by a slow drawing speech and slowness in answering questions. There was also great apathy and drowsiness and lowered temperature.
6. Hallucinations of sight, smell, hearing and of general sensibility.
7. A very pronounced lemon tint of the skin, resembling in this respect the appearances considered to be characteristic of pernicious anæmia. The blood changes corresponded also to those met with in pernicious anæmia.

8. Edematous-like condition of the hands and feet, but no pitting on pressure.
9. During the last two years of his life, he kept his bed more or less constantly, taking little or no interest in anything but still able to talk and answers questions intelligently. He finally died in a state of coma.

Diagnosis. The general symptoms, headache, vomiting, vertigo and optic atrophy pointed clearly to a cerebral tumour, while the temporal hemianopia localized this to the optic chiasm. Had the visual disturbance been seen earlier it is highly probable the limitation of the field would have been met in both eyes. The absence of the pupillary reflex indicated that the lesion must have been situated between the left eye and the basal optic nuclei. Further, the optic atrophy showed that the lesion could not be further back than the basal nuclei, as in lesions of the optic radiations or cortex, white or essential atrophy is exceedingly rarely if ever visible at the optic disc. The slow growth of the tumour would account for the absence of the choked disc, time being sufficient to allow of the formation of lateral drainage or gradual distention of the sheath.

When the patient was first examined the obtunding of the nasal half of the light field, together with the defective perception of green, pointed to interference with the conduction of the remaining active portion of this nerve. There was a concentric and a fairly equal contraction of the field for white and colours pointing to a slow growth.

Prof. Adami, who performed the post mortem examination found a large cancerous tumour of the pituitary. The bone in the neighborhood was found greatly atrophied and the fossa greatly enlarged.

The growth was not perfectly symmetrical, it extended more to the left than the right side. The right olfactory was pushed to one side, while the growth infiltrated anteriorly above the left olfactory nerve. The thyroid gland was found to be normal.

The portion of the tumour examined was enclosed in a laminated fibrous tissue capsule,—the pia mater. The tumour was composed of rounded or oval masses of cells surrounded by loose connective tissue, the whole at first sight suggesting carcinoma simplex. On examining more closely however, it was seen that the cells did not conform to the carcinoma type. The walls of connective tissue which enclosed the cellular masses were lined with elongated and flattened cells, fusiform when viewed edgewise. At other places when the section was more oblique, these cells could be seen to be irregularly diamond-shaped with large clear oval nuclei—typical endothelial cells. The cells forming the cell-masses were various in shape, being generally elongated with bluntly oval nuclei, others however being irregular in outline with a more rounded nucleus. They had in places a curious tendency to form small whorls, and

in such cases the component cells were considerably flattened. The tumour was not specially vascular, nor did it show any tendency to degeneration. No pituitary structure was seen.

Diagnosis. Endothelioma.

The general symptoms of an intracranial growth, as headache, vomiting, vertigo, optic atrophy, were sufficiently pronounced to allow such a diagnosis and the locality of the growth was clearly indicated by the temporal hemianopia. An especial interest arises in connection with an explanation of the peculiar combination of symptoms, viz: a myxœdematous-like state and the pallor of the skin. How are these conditions to be explained? Have they any connection with the destruction of the pituitary body?

In a recent paper by Pechkranz of Warsaw (*Necrolog. Centblt. vol. 18, page 254*) on a case of sarcoma of the pituitary body, particular mention is made of a myxœdematous-like appearance that was a prominent feature. The author considers it identical with the pachyacia mollis of Arnold, a state in which the dystrophy is confined to the soft tissues in contradistinction to acromegaly to which he applies the term pachyacia ossca. In Pechkranz's case the bony tissues were found normal.

In a few cases of myxœdema changes have been met with in the pituitary body and instances are on record where both diseases have existed together. Dr. Anders (*in Nervous and Mental Diseases, Jan. 1892*) reports a case of hæmorrhagic tumour of the pituitary body and infundibulum in a case of pernicious anæmia in a female, aged 34. The symptoms which developed after typhoid fever were giddiness, headache, nausea, slight loss of consciousness and delirium. I simply place this second case on record without the addition of any hypothesis as to a possible causal connection between the pituitary growth, the anæmia and myxœdematous-like state.

PNEUMONIA FOLLOWING ETHER.—REPORT OF A CASE.*

BY

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In spite of recent additions to the pharmacopœia of new drugs capable of producing general anæsthesia, chloroform and ether are still the ones in practical use to-day and the battle over the relative merits of each is as fiercely waged as ever. Both have their advantages and their disadvantages and during the administration of both, unfortunately, we must admit that deaths occur which are directly attributable to the agents themselves. Besides the immediate dangers attending the administration of an anæsthetic there are a number of after-effects or complications depending upon and caused by the action of the drug upon the various organs of the body, and these complications may occasionally be the cause of a fatal issue. Deaths occurring in this way are rightly to be looked upon as deaths due to the anæsthetic.

The complications following anæsthesia are for the most part inflammations produced by the irritant action of the anæsthetic agent; and the kidneys and lungs are the organs most commonly affected. Thus, it is noted that a certain proportion of cases of ether anæsthesia is followed by pneumœnia, and to the disease found under these conditions the distinctive name of "ether pneumœnia" has been given, and its clinical peculiarities have been described. Whether, however, a pneumœnia following the administration of ether is to be regarded as due to the ether is open to discussion. It is the old question of *post hoc* or *propter hoc*.

Before, however, dealing with the arguments advanced on both sides of the question I will give the following brief report of a case which came under my notice last autumn. The case occurred in the service of Dr. F. A. Lockhart, in the Montreal General Hospital and to him and his House-Surgeon, Dr. R. M. Patterson, I am indebted for permission to publish the same. The report is condensed from the notes taken by Dr. Patterson.

M. R., female, aged 22 years, was admitted to the Montreal General Hospital on October 6th, 1898. She complained of "fits," profuse leucorrhœa, dysmenorrhœa, dull aching in the back, and pain in the right side of the abdomen.

* Read before the Montreal Medico-Chirurgical Society, April 11, 1899.

Personal History. The patient had never had any of the ordinary diseases of childhood and never suffered from any serious illness. She had always been an extremely nervous girl. Menstruation was established at the age of twelve and was regular every four weeks but was very profuse.

Present illness. Three years ago she began to have what she called "fainting spells" and which she described as follows. A peculiar feeling caused her to put her hand up to her face and then to perform various movements which she was unable to describe. About a minute later she became unconscious and remained so for a few minutes, the longest period ever noted being half an hour. She always knew when these attacks were coming on but had no definite aura. There was always time before unconsciousness supervened for her to reach a couch or something on which she could lie down. She stated that during an attack on one occasion she had passed urine involuntarily and several times had bit her tongue. The last attack was on September 24th at eight o'clock in the evening. Dysmenorrhœa and leucorrhœa had been present for four or five years the latter becoming much worse during the last three months. The last "period" began on October 2nd and lasted until October 6th, the day of admission to the Hospital.

Family History. All the members of the patient's family on both sides were noted for "nervousness." Her mother, who was an exceedingly delicate and nervous woman, died at the age of 49 from pneumonia.

Present Condition. The patient was a young woman in a fair state of nutrition but somewhat anæmic. Her extremities were habitually cold. Beyond a cough noted as "suspiciously hysterical" in character, nothing of importance was found in the physical examination of the various systems. The lungs were found normal and the heart sounds were loud and clear. There was a post-nasal catarrh with considerable mucopurulent secretion. The urine was free from albumin. A vaginal examination detected granular degeneration around the external os uteri and considerable tenderness in the right lateral fornix.

On October 10th the patient was anæsthetised with ether given by means of a Clover's inhaler, and the uterus was curetted and a gauze drain inserted. The following day at 10 a. m. the temperature rose suddenly to 101 2-5°F., the pulse to 136 and respirations to 24. The gauze was removed and found clean and free from odour. By 4 p. m. the temperature had reached 103 2-5°F. and the respirations 30, the pulse remaining about the same. An examination of the lungs revealed an area of dulness in the posterior part of the right lung at the level of the fifth or sixth dorsal spines. A small quantity of tenacious sputum

streaked with blood was coughed up. A diagnosis of lobar pneumonia was made.

On October 12th the dulness extended from the level of the spine of the scapula down to the ninth dorsal vertebra and well forward laterally to the posterior axillary line. Blowing breathing and bronchophony were present over the dull area. The patient was freely stimulated the pulse being continuously over 130.

October 13th. I saw the patient for the first time this morning and found the physical signs as already described. On the following day the 14th., the pneumonic process had involved the whole of the lower lobe of the right lung which it was possible to mark out very accurately by the boundaries of the dulness. An examination of the sputum showed the presence in considerable numbers of the diplococcus pneumoniae. From this out to the death of the patient, which occurred on the seventh day of the disease, the pulse and respirations gradually became more rapid and all efforts at keeping up the strength were futile. An autopsy was not allowed. The case resembled in every particular an ordinary lobar pneumonia. There was no chill but the disease was ushered in by severe pain in the side.

Clinically, we meet with two forms of pneumonia after etherisation, the lobar, of which my case is an example, and the lobular. The former, lobar or croupous pneumonia, is now admitted to be an infectious disease invariably due to the diplococcus pneumoniae and hence not due to the ether vapour, except in so far as the ether may be held to act as favouring the growth or invasion of the specific organism.

In discussing the relation of ether to lobar pneumonia we must bear in mind the following facts:—(1) Lobar pneumonia is an extremely common disease. (2) The recognised predisposing causes are those commonly met with in the class of cases requiring an anæsthetic. Among these, traumatism, exposure to cold, and debilitating influences may be mentioned. Is ether a debilitating influence? This is a difficult question to answer; but there seems no reason to doubt that where the ether narcosis is very much prolonged, the resisting power of the lungs is diminished *pari passu* with that of the rest of the body. This point is borne out, too, by the fact that ether pneumonia is relatively more common after gynæcological than after other operations as shown by statistics collected by Anders, of Philadelphia. The prolonged anæsthesia from the greater length of this class of operations and the consequent greater exposure to cold seems the most probable explanation, the general condition of the patient being on the average better than in any other class of cases in which surgical interference is called for. It would seem, then, that there is at most a very slight and indirect relationship between lobar pneumonia and ether anæsthesia.

Lobular or broncho-pneumonia, on the other hand, depending as it does upon an antecedent capillary bronchitis would appear to have a more direct connection with ether narcosis. Granted that the irritation of the ether vapour upon the mucous membrane of the bronchial tree is sufficient to set up a bronchitis or even to produce an abundance of secretion during the actual time of anæsthesia, the other steps in the process are easily understood. The supine position of the patient, commonly rigidly enforced after operation, and the endeavour on the patient's part to stifle all cough, especially in abdominal operations were pain would result from disturbance of the wounded surfaces, tends to allow of the collection of the secretions in the bases of the lungs and hence of the production of areas of broncho-pneumonia. Then, too, the frequency with which aspiration-pneumonia follows tracheotomies and operations upon the mouth, shows us that the drawing in of the buccal secretions through the larynx while its mucous membrane is rendered insensitive and incapable of setting up a warning cough, is a very real danger. We find, however, that this form of pneumonia is rare after ether as compared with the lobar form, the proportion of broncho to lobar pneumonia being as 19 to 7 in a series of 30 cases observed by Anders already alluded to. The frequency of bronchitis after ether seems to depend in great measure on the manner in which the ether is administered. Ether vapour in a concentrated form is a violent irritant, as is evidenced by the choking which invariably results at the beginning of an administration when the ether is given as pure as possible and the larynx has not had time to become partially anæsthetised. It is possible, however, with a little patience and the expenditure of a little more time, to produce full anæsthesia without causing any discomfort to the patient from the irritation of ether vapour. In what degree we are to regard ether as an irritant to the mucous membrane of the respiratory tract is a difficult question to decide. In my own experience, it is never necessary once full anæsthesia has been established, to keep up the strength of the vapour. One-third, or at most one-half, of the concentration required to produce anæsthesia will prolong it indefinitely and this degree of concentration does not cause any suffocative sensation in the average individual before the laryngeal reflex becomes deadened. Thus, with Clover's inhaler, full anæsthesia is usually produced by the time the indicator has reached the figure 2 upon the scale, a point which denotes that one-half of the total strength of vapour possible with this instrument has been reached. To maintain the effect it is then only necessary to keep the indicator at the figure 1 or to give the vapour in one-half the degree of concentration to which it was pushed at the start. Now I have found by experience that most people can breathe through

a Clover's inhaler with the indicator turned to this point without experiencing any sense of choking. One would expect, too, if the irritant effect was as great as many claim, that laryngitis would be a common sequel of ether narcosis, and yet we very rarely meet with it. It is indeed probable that the irritant effect of ether vapour upon the mucous membrane of the respiratory tract has been greatly over rated except in those cases in which it has been given in too concentrated a form.

Again, it has been claimed that a source of infection in these cases lies in the use of closed forms of inhalers, or of forms the parts of which cannot be properly sterilized after each administration. While there is no question but that all precautions of this nature should be faithfully carried out, there is little likelihood that this forms a practical source of danger, and for these reasons. Ether vapour is in itself an antiseptic. Sternberg has pointed out that tubercle bacilli are destroyed by an exposure of ten minutes to it, and a watery solution of chloroform in a strength of only one-half of one per cent., will kill almost immediately cholera, typhoid, and anthrax bacilli. It has been found also that pneumonia is just as frequent after anæsthesia in those institutions where the ether is administered on a sterilized towel as where the closed forms of inhalers are used.

With regard to the frequency of pneumonia after ether, the published statistics are for many reasons unreliable. W. H. Prescott, in 1895, collected statistics of 40,000 etherisations with only 3 pneumonias; Silk 5,000, with 13 pneumonias; and Anders, whose figures are probably the more nearly correct, 12,842 cases with 30 pneumonias, or .23 per cent. Anders' cases were taken from six Philadelphia hospitals,—public and private.

The question arises:—Is there a form of lobar pneumonia induced by ether anæsthesia which can be distinguished by its clinical peculiarities from primary lobar pneumonia? I think not. Pneumonia occurring in the course of any disease is more or less influenced by the disease to which it is secondary, and yet we do not speak of a Bright's pneumonia or of a typhoid pneumonia as a special form of disease. In the case reported, the characters were those of a typical lobar pneumonia going on to a fatal issue by hyperpyrexia and progressive loss of strength. Are we then to consider this case as in any way due to the etherization? Here, again, I think that the answer is: No. There is no evidence to show that the etherization was more than a preceding event. I think, however, that faulty or prolonged anæsthesia may in certain cases be a strong predisposing factor in the production of this form of pneumonia but that the vast majority of lobar pneumonias occurring after ether are in no way to be attributed to the anæsthetic.

With regard to broncho-pneumonia, however, I think that the converse holds true: i. e., that there is in most cases a direct relationship between the etherisation and the broncho-pneumonia,—the relationship of cause and effect. But here again faulty administration must be held largely responsible.

It remains, then, to discuss what means we must adopt to prevent as far as possible the occurrence of such a grave complication.

(1) Ether should not be administered, if possible, to patients with bronchitis, especially if there are physical signs pointing to considerable fluid secretion in the smaller bronchioles.

(2) In every ether administration care should be taken to produce as little of the irritant effects of the vapour as possible, especially at the beginning of the administration. This can be accomplished by graduating the amount of ether vapour the patient is allowed to breathe—commencing with a minimum amount and increasing it as tolerance is established. When this method is faithfully carried out, the relatively small number of cases in which there is a copious secretion of mucous suggests the idea that it is possible to gradually anaesthetise the mucous membrane so that the ether either does not act, or soon ceases to act as an irritant to its glands.

(3) Where cases occur in which in spite of these precautions the mucous is poured out in considerable quantities, it should not be allowed to collect in the back of the throat but should be swabbed out by means of a sponge or a gauze pad. In practice, I have found it of advantage in troublesome cases of this kind to allow the anaesthesia to become less deep and then to induce vomiting. The act of vomiting empties the mouth, and to a certain extent the lungs, as well as the stomach.

(4) During the occurrence of vomiting the patient's head, and if possible the body, should be turned on the side, so as to allow the vomited matter to flow out of the mouth. There is very little danger of the vomited matter getting into the larynx during the act of vomiting. The anaesthesia is not very profound, the glottis is kept closed reflexly, and no attempts at inspiration are made. It is after the vomiting has ceased, and the anaesthesia again become profound that little particles of food remaining in the mouth may be drawn into the larynx and lungs.

(5) Finally, etherization should not be prolonged unnecessarily, and in every case the smallest amount of ether compatible with the production of full anaesthesia should be given.

Case Reports.

TWO CASES OF SEPTIC INFECTION SUCCESSFULLY TREATED BY ANTISTREPTOCOCCIC SERUM.

BY

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At the present time, when the value of antistreptococcic serum and the class of cases in which it should be employed, are being discussed, the following report of the successful treatment of two severe cases of sepsis by this means will be found of interest.

Case I. During the summer of 1897, Dr. S. with his wife and baby, a healthy child of ten months, was staying with friends at a summer cottage on one of the islands of Stony Lake. A number of dogs owned by the party frequently played with the baby. On August 3rd, the doctor noticed a scratch on the calf of the child's leg, and, upon examination and enquiry, came to the conclusion that it had been made by a dog's claw. In the light of subsequent events this was probably correct, and indicated the means by which septic material had been introduced, the dog probably having been eating or digging up some carrion.

Nothing further was noticed until twenty-four hours later when the child became feverish and chilly, and the leg about the scratch inflamed and angry-looking. These symptoms naturally alarmed the father who feared that the condition might be due to poisoning in the way indicated. Calomel and soda were administered and a free evacuation of the bowels obtained but without much benefit, as the alarming symptoms became worse during the night and on the morning of August 4th, (the following day) the child was unconscious and had a temperature of $105\frac{1}{2}^{\circ}\text{F}$. Dr. S. brought the child to town, and when I saw it at 10.30 a.m., the following condition was noted:—

Temperature $105\frac{1}{2}^{\circ}\text{F}$.; pulse very rapid; the face was of an ashen-gray colour with a dusky red flush on the cheeks. Over the whole body there was present that peculiar general tremulous condition,—a constant vibratory movement of the entire system involving even the eyeballs in oscillations,—which showed the profound impression made by the septic poisoning. The child was overwhelmed by toxæmia and seemed to be in imminent danger of convulsions, coma, and death. The spot on the calf of the leg presented an oval swelling about two by three

inches in size, having in its centre the angry, inflamed, scratch, and irregularly discoloured by bluish purple and dusky red patches.

As soon as possible, which was at 12 noon, 6 cc. of antistreptococcic serum was injected in the lumbar region and a cold lotion was applied to the leg. The child was also given sustaining nourishment and soothing internal treatment.

At 12 o'clock at night the temperature had fallen a little,— $104\frac{1}{2}^{\circ}\text{F}$.—and 7 cc. of the serum was again administered. On the morning of the 6th, the temperature was 104°F .; the general symptoms were somewhat relieved; and the danger was considered somewhat less imminent. During the day the child continued to improve. The discolouration of the leg had increased and extended from half way up the thigh to the ankle.

On August 7th, the condition was still further improved. The temperature was 101°F . and the child was quite conscious. The local symptoms subsided, the discolouration disappearing except at the original spot where an abscess formed which was opened at the end of the week and curetted, washed, packed, and dressed daily until well.

A short time before this case occurred I had read the report of a case treated with antistreptococcic serum by Dr. Bowie of Brockville with remarkably good results, and was so impressed by it that I had instructed a druggist to send to Messrs. Parke, Davies & Co, for a supply, in order that I might try it if suitable opportunity presented. When Dr. S. brought his child I telephoned the druggist to know if the serum had arrived, and the answer was 'Yes'. It had just arrived by morning train, a most providential thing, for there can be little doubt it was the means of saving this child, and if there had been a delay of twenty-four hours in procuring it, in all probability it would have been too late.

Case II. On December 17, 1897, I saw in consultation, R. J. McC., aged 32, Canadian. Seven weeks previous to my visit the patient while chopping in the woods had cut his right knee with an axe. The cut was in a longitudinal direction to the inner side of the patella, the deepest part being over the inner tuberosity of the tibia. It had penetrated the bone to some extent. The house in which the patient was living at my visit was a small log one consisting of a kitchen, which also served as a general living room, and two small bedrooms, one of which was occupied by the patient.

On examination, the patient was seen to be a large-boned man, thin, anæmic, and suffering great pain with evening exacerbations. There was a septic type of temperature,—chills and high fever followed by profuse sweating,—a rapid pulse, and great and increasing prostration. The leg from above the middle of the thigh to the ends of the toes was enormously swollen and fluctuation was made out over the thigh and leg. The

wound presented an unhealthy appearance with swollen and gaping edges and was discharging a little pus on the poultices which were being applied to the whole leg.

Here was a patient, in the condition and with the surroundings described, suffering from the effects of a wound which had become infected and was followed by an osteo-periostitis with large dissecting abscesses and general septic infection. He was in the country fifteen or sixteen miles from a hospital, and without the means of securing skilled nursing. There was no way of improving the surroundings so as to make the treatment such as would give any hope of a successful issue, and the prognosis was consequently gloomy. If the patient remained where he was a fatal termination was certain. If he could be removed to a hospital, there was the possibility of saving his life, but no hope of saving his leg. The friends could not make up their minds what to do and the patient seemed to depend on their decision. Snow, however, having fallen during the day and night, they, urged by the attending physician, placed the patient on a sleigh and brought him to the Nicholl's Hospital on Saturday, December 18th. He arrived in a very weak and exhausted condition and his temperature that evening at 8 o'clock was 103 4-5° F.

On Sunday morning, December 19th, the patient, fortified by stimulants and strychnine hypodermically, was anaesthetised, and large incisions were made in the inside and outside of the lower part of the thigh and in the calf of the leg. The discharge of pus, clots, and shreds of tissue was very great,—literally quarts. The abscesses were thoroughly washed out, cleansed, and lightly packed with iodoform gauze, and dressings and bandages applied. The patient, as was expected, was in a very weak condition, so normal saline solution was suffused into the median basilic vein and he was then removed to bed. As he remained very weak, the intravenous saline injection was repeated in the other arm. Through the night a little milk, brandy, and lime-water was administered and strychnine injections were given hypodermically.

On December 20th and for some days following, the condition was precarious; however, as time went on, he was able to take nourishment better and it was well retained. It consisted of bovine, milk, raw eggs, whiskey, etc. The abscesses were dressed daily, irrigated with saline solution, hydrogen peroxide, and again with saline and packing and dressings freshly applied. The temperature varied from 96°-102° F.

On December 21st, a syringe-full (11 cc.) of antistreptococcal serum was injected into the lumbar region and this was repeated on December 22nd. This was all the serum on hand at the time. An ounce of it was obtained and injected in the same quantities, i. e., 11 cc. at a time, on the 25th, 27th, and 29th. of December. These injections had apparently little effect, the temperature ranging from 99° F. a. m. to 101½°

F. p. m. The patient's general condition was not improved. He was delirious a good deal of the time and very restless, the pulse running from 90 to 120. Morphine had to be given hypodermically to relieve pain and procure sleep.

From January 1st to 5th, the patient's condition was even worse. There was greater prostration, more delirium, and occasional involuntary evacuations of urine and faeces. The temperature at this time ranged from 97°—102 2-5°F., and the pulse, which was weak and variable, from 80—132. Secondary abscesses formed, one on the front of the left thigh eight inches long but superficial in the cellular tissue, and one on the left forearm about half that size. They were opened early, curetted, irrigated, packed, and dressed daily.

Antistreptococcic serum was injected on the 5th, 6th, and 7th, 11 cc. each time and from now on we had a marked change for the better. The highest temperature reached on the 5th, was 102°F., on the 6th, 100°F., on the 7th, 100°F., and on the 8th, 99 4-5°F. From this time on the temperature was practically normal, reaching 99 4-5°F. on only two evenings.

The night report for January 5th. was that the patient slept and took nourishment fairly well, had very little delirium, and an involuntary stool (the last). On the night of the 8th there was a good deal of delirium, pain, and restlessness, requiring morphine hypodermically. On the 10th took nourishment well and slept two hours; on the 11th, quieter; on the 12th, took nourishment and slept fairly well. The improvement noted, continued.

A saving feature of this case was that food was so well taken and in such large quantities. Solids were allowed just as soon as the stomach would tolerate them, and bovine, milk, and raw eggs, continued. Necessarily the improvement was slow but steady and satisfactory, and the strength and weight gradually returned.

The patient was discharged on May 9th with the abscesses all healed and a bony ankylosis of the knee-joint. He could walk well with crutches. As there was not any hope of the leg ever being of use, he was advised to go home, keep in the open air, as much as possible, and when strength was fully restored, to return for amputation. This he was obliged to do sooner than expected, as he had the misfortune to fall from one of his crutches and receive an injury to his bad knee. He returned to the hospital on June 14th, and on June 27th the leg was amputated at the lower third of the thigh. He made a good recovery and was discharged on August 15th.

In this case the first injections exhausted the supply of serum on hand. Then an ounce was procured and given in three injections with slight,

if any, result, and again an ounce in three injections with the marked satisfactory results reported.

The patient's condition of great prostration marked by delirium, involuntary evacuations, chills, fever, and perspirations, was such as to suggest the hopelessness of the case without some means which would change the condition of the blood. Antistreptococcic serum proved its power of antidotino the toxic materials which were fast overwhelming the vital forces of the patient, when other remedial measures were powerless to stay his downward course.

A CASE OF ECTOPIC GESTATION—RUPTURE—HEMORRHAGE OPERATION—RECOVERY.

BY

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to the Montreal General Hospital.

At 4 p. m., March 11th, I saw the patient, Mrs. S., who was a strong, full-blooded woman, aged 29 years, and had been 18 months married.

Four months previously, she had given birth to a full term child, which she was nursing. She had menstruated regularly after the first month until six weeks before the present illness, when the menses did not come on as usual, and she had some nausea in the morning. She was again menstruating (slightly) when I saw her, thought she had increased in abdominal girth during the past month.

Present illness.—She was reaching up hanging clothes on a line, when she was suddenly seized with a very severe pain across the lower zone of the abdomen, followed by a faint feeling and persistent vomiting. About an hour before I saw her, Dr. W. Smyth, the nearest physician was called in, and found her in a state of collapse, going from one faint into another and much blanched. He gave strychnia hypodermically, which improved her pulse. He thought her condition might be due to some acute intestinal obstruction. She had three loose, watery stools inside two hours. She had previously taken mustard and water as an emetic, thinking the colicky pain might be due to canned tomatoes eaten the previous evening, although she had been feeling perfectly well before the sudden attack in the forenoon. As I first saw her she presented a typical picture of collapse from hæmorrhage. There was pain on pressure over the left iliac region, no marked abdominal distention, though there was dullness on percussion in both flanks; pulse, 130, small and compressible; temperature, 97°F. I diagnosed a ruptured ectopic gestation, probably left sided,—and advised immediate operation; but as her friends demurred somewhat and as my *confère* thought her condition better than when he had first seen her, we decided to apply an ice bag to the abdomen, give cracked ice by mouth, and wait for a couple of hours. On returning, we found the general condition of the patient worse, though vomiting had ceased, and advised immediate operation, to which she and her friends consented.

The ambulance was sent for, and before her departure for hospital, a hypodermic of morph. sulph. grain $\frac{1}{4}$ with atropia sulph. grain

1-120, was given. I mention this because it afterwards gave us a beautiful instance of the "masking" effect of opium on hæmorrhage. When she reached the Montreal General Hospital at 7.45, she did not look like the same patient I had left at 6 o'clock. Her face was flushed, and were it not for the rapid pulse, her appearance presented none of the typical symptoms of hæmorrhage. In fact, she and her friends thought her condition so much improved that they hoped an operation might be averted. My senior colleague, Dr. Armstrong, who had kindly consented to assist me, saw the patient with me, and concurred in my diagnosis and advice to the patient. A bimanual examination under ether showed the uterus somewhat larger than normal, the cervix soft, and the os patulous. There appeared to be rather more fullness in the left broad ligament than in the right, but no distinct mass could be felt.

On opening the abdominal cavity, blood welled out profusely, and I at once plunged in my hand and secured the left Fallopian tube and ligament, which I clamped near the uterus. This stopped the hæmorrhage, and after removing several clots, we got the dilated tube into view, the small foetal sac presenting at the enlarged fimbriated extremity, through which, during manipulation of the tube, it delivered itself. Conception had taken place about midway along the tube. The left tube and ovary were tied off in the usual way, the abdomen thoroughly washed free from blood clots,—a somewhat tedious procedure,—and after examining the other tube and ovary, which were normal, I proceeded to close the median abdominal incision. Before doing so, at Dr. Armstrong's suggestion, I filled the abdominal cavity with warm normal saline solution, with the result that the patient's pulse, which had been stimulated by subcutaneous saline injections during operation, markedly improved, and the patient never suffered from that great thirst which so often follows laparotomy.

Before operation the patient's pulse was 120, and temperature was 100 2-5° F.; one hour after, her pulse was 112, and temperature 99 4-5° F. On the fourth day after operation, her temperature reached 102.3° F. from some undiscoverable cause, but she slept and ate well and complained of nothing but a feeling of faintness if left more than two hours without food, during the first few days. The rapidity with which she made blood and recovered strength was remarkable. On the fifth day, after having small doses of saline by mouth, she had several copious, watery stools, and the temperature fell to normal, pulse to 95.

Pathologist's Report.

"The specimen shows a large mass of clot, attached to which is a villous mass with typical chorionic papillæ. The ovum is not attached; tube thin and dilated, fimbriated extremity free. Along the attached

border is a depressed injected area, and here it appears puckered as if from the healing of a laceration or ulcer, but no signs of perforation exist at present. In slitting the tube, this corresponds to a sacular dilatation close to the broad ligament, $\frac{3}{4}$ inch in diameter, admitting readily the tip of the thumb. The inner wall is lined with fibrous exudate. Diameter at this point is $2\frac{1}{2}$ inches, at the fimbriated extremity $1\frac{1}{2}$ inches. The distance from nearest point to the sacculatation is 1 inch. The ovary is firm and shows a large corpus luteum, ($\frac{7}{8}$ inch), with firm yellow wall, and in the centre a clear cystic space $\frac{1}{2}$ inch in diameter."

The hæmorrhage was undoubtedly due to a complete or partial detachment of the fetal structure from the inside of the tube, and the missing ovum was doubtless washed out into the abdomen by the first gush of blood, and lost in some of the many blood clots which filled the abdominal cavity.

The unusual feature of this case lies in the fact of its occurring within four months of delivery, and during lactation. With one slight interval, too, the patient had menstruated regularly, and was menstruating at the time of the present illness and operation.

Her after history has been without interest, the wound healed by first intention, and she was conveyed to her home in the ambulance on the 14th day after operation, and gained strength steadily, and at present writing is performing her usual household duties.

FOREIGN BODY IN THE NASO-PHARYNX FOR EIGHTEEN YEARS.

BY

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Two years ago, a young woman, 23 years of age, consulted me in reference to a profuse muco-purulent discharge from both nostrils requiring her to use from six to eight handkerchiefs a day and giving rise to a very disagreeable odour. The odour was so characteristic of a foreign body, that I at once asked her if she had ever introduced anything into her nose, and received the following history:—

When five years old she was asked by her mother to bring a thimble to her and carried it by putting it in her mouth. On her way up stairs the child was seized with a violent fit of coughing, which suddenly ceased on her being thumped on the back. One year later she developed what was called a "catarrh of the nose."

On examination from in front, both nostrils were found filled with muco-purulent discharge; the voice was nasal and resembled that of a person suffering from paralysis of the soft palate. Post-nasal examination revealed a black mass lying close up to the septum and covered with a muco-purulent discharge and giving a grating sensation on being touched with a probe. Efforts at removing it with the finger were ineffectual. Under an anæsthetic the foreign body was removed and proved to be an ordinary tailor's thimble incrustated with concretions, the surface of the thimble being found to be perfectly smooth, all the usual roughness being obliterated. The thimble lay with its broad surface in the transverse diameter of the pharynx and close up to the mouth of the left Eustachian tube.

Besides the symptoms already mentioned there were noises in the ears and diminution of hearing, both of which were relieved by the removal of the thimble.

The subsequent treatment consisted in the use of an antiseptic cleansing solution and of Politzer's air-bag.

It is an interesting fact that the naso-pharynx can tolerate a foreign substance like this for so long a time without doing more damage. The case stands alone in the literature of foreign bodies in the naso-pharynx. A recent examination of the patient proved the absence of any "catarrhal symptoms" and the restoration of the voice to its proper tone and of the hearing to a normal degree.

CLINICAL NOTE
ON THE SO-CALLED STRUMOUS OR PHLYCTENULAR
KERATITIS.

BY

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The out-patient practice of our hospitals affords an opportunity for studying groups of cases that cannot well be obtained in any other way, and the knowledge gained by this kind of study is always more impressive and thorough than any other system of teaching can impart. It is for instance, a startling discovery for the student of ophthalmology to make, when he finds in the course of a few weeks a number of young adults handicapped in the work of earning a living by defective vision which cannot be improved by optical or any other means, always coming with the same history and similar visual defect, though varying in degree. The salient features in this group of cases are a history of a prolonged period of inflammation or repeated attacks of inflammation of the eyes in early childhood. All this has long since passed away but the corneæ, clear or somewhat nebulous to ordinary inspection, show distinct and unalterable opacity of the pupillary are when examined by focal illumination.

Coincidentally with this observation the student will observe a number of young children presenting the very same troubles the others have described as things of the past. The salient features here are inflammation of the eyes, better at times but frequently recurring for past months or years and always characterised during the acute attacks by inability to bear the light of day, that is, photophobia (more or less intense) by lachrymation and other signs of strumous keratitis.

Is the fate of this group to be the same as that of the first? Most assuredly it is, unless some means can be found to promptly cure and to prevent recurrence of the corneal ulceration, which was the origin of the permanent opacities. This, then, is the problem to be solved.

Granting that the designation "strumous keratitis" is well chosen, it must still be admitted that many children known to be of the strumous diathesis do not suffer from this particular form of eye disease. It is also certain that the most approved treatment of this diathesis rarely suffices to prevent the recurrence of the corneal disease and is, together

with the most skillful local treatment of the eyes, often of only temporary benefit.

A careful study of this group shows that they all, or nearly all, suffer from naso-pharyngeal catarrh, with hyperplasia of the tissues in the vault of the pharynx, lesions which tend to disappear with adolescence, the very time when recurrences of strumous keratitis tend to cease. Does not the one fact explain the other? There is abundant evidence accumulating every day to show that it does. Restore the naso-pharynx to a state of health and the chances are the corneal disease will disappear permanently.

The two following cases taken from the Royal Victoria Hospital case-books may serve as illustrations of the principle just stated.

H. F. V., æt. 3½ years, has been unable to open the eyes excepting in a very dim light for the past six months and has apparently derived no benefit from local or constitutional treatment. The right cornea presents a broad vascularised ulcer at the outer margin. There is nasal catarrh and a considerable mass of soft vegetations in the vault of the pharynx.

Treatment:—Galvano-cautery of the ulcer and removal of the pharyngeal growths, followed by a solution of atropin and mercury perchloride for the eye and a mild antiseptic spray for the nasal catarrh, perfectly cured in 15 days.

H. R., æt. 3 years, eyes inflamed almost all the time during past twelve months. Left cornea shows a small ulcer with larger gray infiltration, nearly central, becoming vascularised. Other conditions similar to H. F. V.

Treatment the same, except that the cautery was only used very lightly. Discharged from hospital cured in 10 days.

These two cases, of recent occurrence, are only given as illustrations of the rapid way in which existing lesions may be cured by suitable treatment. Dozens of similar cases managed in the same way in past years have shown that the cure is usually permanent.

Every such case means the rescue of one individual from a lifelong affliction.

AN OBSCURE COMPLICATION OF VARICOCELE*

BY

W. H. SMYTH, M. D.,

On December 4th, 1898, I was called to see F. F., aged 25 years, a fourth year medical student, and found him suffering from a very severe pain in the right side of the scrotum. The history given, was that he had had a moderately large varicocele on that side for a number of years, but had not been greatly inconvenienced thereby.

On the date of the illness, he arose at 9 a. m., breakfasted at 9.30, had a movement of the bowels at 11.15 with no straining and nothing abnormal noticed, immediately after which he took a hot bath and, while drying the scrotum carelessly with a towel, noticed a slight tenderness on the right side and on examining found a nodule in the scrotum just above the testicle, about the size of a couple of pecan nuts and shaped like a knuckle. There was no pain in the inguinal canal or rings and the right side of the scrotum was retracted. He then dressed, and noticing that on walking it became more painful, he lay down.

At about 1.15 p. m., the pain became very much worse so he went to bed and then felt slightly nauseated but did not vomit. He felt a severe dragging pain extending up into the inguinal canal and intense tenderness over the swelling in the scrotum but no tenderness over the inguinal canal. Turpentine stupes were applied but with no relief.

I saw the patient at 2.15 p. m., and found him in agonising pain and lying in the dorsal position with the knees drawn up. Morphia, $\frac{1}{2}$ grain, was given hypodermically. On examination, the testicle was found normal and not painful on handling. The epididymis was also normal but above and behind the testicle was a tense nodular mass which through the scrotum appeared of a dark blue colour. It was bent on itself like a knuckle and the angle appeared more tense than the remainder. It was quite separate and distinct, and could be moved away from the testicle. There was no enlargement in the inguinal ring and the swelling did not reach within an inch of the external ring, nor was there any tenderness in the external ring or canal. There was no impulse on coughing in either the ring, canal, or the mass in the scrotum. The cord coming over the pubic bone was exactly of the same size and consistence as on the other side. The spermatic artery could be felt pulsating in the part of the cord but could not be traced in the midst of the mass.

The vas deferens was also easily felt coming over the pubic ramus in

Read before the Montreal Medico-Chirurgical Society.

the cord, and three-quarters of an inch below the ramus it separated from the cord and passed off to the epididymis, which was quite distinctly separate from the mass. In following the spermatic vein down from the pubes it suddenly became tense about one inch below it and then merged into the nodules two in number, the first in the course of the vein being the larger, and both assuming the position and shape of two pecan nuts joined at an angle, the lower being folded back on the upper. These did not give the impression of being composed of numerous veins but of one distended vein with a constriction. There was nothing to be felt in the ring or canal, and the external ring was normal in size.

As the patient was suffering agonising pain and could not bear manipulation, Dr. Bazin was called in and the patient put under chloroform. Manipulation was then tried for a short time but produced no effect, so aspiration was performed by an ordinary hypodermic syringe and about fifteen minims of very dark blood was obtained, but it did not effect the tension appreciably. It was not possible to aspirate a larger quantity although numerous punctures were made in the mass.

It was then decided to make an incision and the ambulance of the Montreal General Hospital was summoned and on its arrival the house-surgeon in charge made a superficial examination and found the condition as described. During the trip to the hospital the patient felt a sudden relief from the excruciating pain which had persisted in spite of the morphia. On arrival at the hospital in something less than half an hour he was placed on the table and an examination made by Dr. Armstrong and Dr. Elder, when the tenseness of the veins was found to have entirely disappeared. A small soft nodule in the upper part of the scrotum alone remained and this was tender to touch in all probability from the punctures produced by the hypodermic needle. There was nothing in the canal or rings, but on passing the finger downwards over the scrotum the blood could be seen coursing and slightly distending a large vein about $\frac{3}{8}$ of an inch broad. The patient now had a slight attack of nausea and vomited once. Attention was now directed to the abdomen and a small nodule was felt in the abdominal wall one inch above and one and a-half inches internal to the internal ring, and I must acknowledge that I did not recognise this when making the examination at the patient's residence. This mass varied in size, was not tender, and gave no impulse on coughing. It was thought that it might be a Littré hernia, and Drs. Armstrong and Elder on consultation, advised an exploratory incision and the patient was accordingly anæsthetised and an incision made over the nodule in the abdominal wall but nothing abnormal was discovered. The internal ring was examined and found normal, the veins

of the canal were somewhat large but not dilated. Nothing being found, the incision was closed and the patient placed in bed with lead lotion to the scrotum. He made an uninterrupted recovery, leaving the hospital on December 18th., not feeling any pain but having a tenderness still at the original point and another at the lower end of the incision.

As to the diagnosis of the above condition; it seems to me to lie between (1) Testicular pain. (2) Referred pain from a hernia. (3) Pain from an intense venous distension.

(1) *Testicular pain.* In this case the pain was not felt in the testicle but was above and behind; and besides the testicle could be handled and pressed without any inconvenience to the patient.

(2) *Referred pain from a hernia.* This may be excluded from the fact that no hernia was discovered by the incision and that the external rings were quite normal.

(3) The only decision, then, to which I can come is that the pain was caused by an intense venous distention and that it was caused by a strangulation of one vein by another by a loop of it being caught by another or else by a vein being twisted and thus causing the distention. Another explanation might be that it was caused by a thrombus.

I consider that it was probably caused by one vein constricting another and that the jolting of the ambulance on the way to the hospital set it free and brought immediate relief to the patient. I have been unable to discover any reference to a similar case in the literature and would ask if anyone present this evening has ever met with a similar condition to which Dr. Bazin and myself have given the name "strangulated varicocele."

RETROSPECT OF CURRENT LITERATURE.

Medicine.

UNDER THE CHARGE OF JAMES STEWART.

Malignant Endocarditis.

FRANCIS HARBITZ. "Studien ueber Endocarditis." *Deut. Med. Woch.*, 1899, No. 8.

During the past four years Harbitz has examined all the cases of endocarditis coming to section in the Pathological Institute at Christiana. Two main groups may be distinguished by an etiological classification.

(1) Infectious endocarditis, comprising several subdivisions according to the micro-organism present, such as streptococci, staphylococci, gonococci, etc.

(2) Non-infectious endocarditis including cases whose specific infective origin is still unknown. It seems probable that further research may place a number of these cases in the first class.

(1) Of 43 cases belonging to the first group, 17 were induced by streptococci, 5 by pneumococci, 8 by staphylococci, and 3 by other micro-organisms. In each case cultures, cover-glass preparations, sections of the affected parts, and experiments on animals were made. Both the clinical and pathological features in these cases presented such differences that they may be subdivided as follows:—

(a) Cases of acute endocarditis, usually arising from some purulent focus, running a rapidly fatal course with pyæmic symptoms. At autopsy there is usually found a diphtheritic deposit on the valves with ulceration and necrosis, and even abscess formation in the heart muscle at the base of the valves. There are also, as a rule, multiple abscesses of the skin, the spleen, the kidney, and the eye. These cases are usually due to staphylococci and correspond to the well-recognised and classical picture of acute ulcerative endocarditis.

(b) Another group consists in cases where the endocardial changes predominate, and form the primary focus from which the other organs are infected. These cases are mostly due to staphylococcus or pneumococcus infections.

Clinically, the long duration of these cases is remarkable, often lasting for 4, 5, 6, 8, or even 10 months. The symptoms set in gradually often with rheumatic pains, general malaise, slight fever, and later cardiac symptoms such as palpitation, dyspnoea, cough, hæmorrhages in various sites, cyanosis and œdema. The temperature, often trifling, is sometimes high or intermitting, and when accompanied by joint swelling closely resembles acute rheumatism. Rapidly increasing anæmia and emaciation are sometimes the most pronounced features, whilst the renal symptoms are at times so severe as to lead to a diagnosis of acute hæmorrhagic or parenchymatous nephritis.

Anatomically the valves present numerous small verrucose with larger and irregular excrescences, often ragged and polypoid in character. Their infectious character is often indicated by their localization on corresponding portions of two valves. The excrescences are usually moderately consistent and adherent; they are occasionally partly infiltrated with lime salts, and ulceration is usually absent. Microscopically the excrescences are composed chiefly of fibrillary connective tissue, with few nuclei and more or less thrombotic deposit. Valvular aneurisms and thickened or ruptured cordæ tendinæ, are also sometimes present. The whole process is marked by chronicity and a tendency toward healing, with an absence of destructive changes such as ulceration and abscess formation.

Secondary suppurative foci are remarkable by their absence. The usual infarcts in spleen or kidneys and also cerebral emboli do not suppurate and are usually sterile, although an enormous number of micro-organisms are found in the valvular vegetations. The spleen is usually enlarged and firm. The kidneys vary considerably in appearance being sometimes normal, at other times almost like the cyanotic kidney, or again, soft and swollen with punctiform hæmorrhages.

Of 16 cases falling in this class, 9 were due to streptococci, 4 to pneumococci, and 3 to organisms resembling but not positively identified as gonococci. Although acute cases of endocarditis with pyæmic symptoms and abscess formation are sometimes due to streptococci and pneumococci, the author believes that the staphylococci are frequently responsible for such fulminating forms. The more chronic and benign forms now under discussion he regards as usually due to streptococci and pneumococci. Between the two groups of cases, the acute and chronic, are numerous intermediate types forming a gradation both in clinical symptoms and in pathological appearances.

Two cases illustrating the features above referred to, are recorded, both due to streptococci and having a duration of five and two months respectively.

Closely related to this chronic infectious endocarditis is a form in

which micro-organisms are absent. Of ten cases examined the pathological characters were similar to the cases just described; their course was chronic and there was frequently a subacute nephritis. It seems probable that in these cases the micro-organisms have disappeared, and this view is born out by the fact that they have occasionally been found in the blood some time before death, and although cultures from the valves remain sterile, yet the appearances are such as to suggest previous foci of micrococci. It would thus seem probable, as indeed has been stated by Leyden, that some cases of infectious endocarditis may terminate in recovery, leaving more or less severe valvular lesions.

If the writer's views in referring many of the milder and more chronic forms of infectious endocarditis to streptococcus infection are confirmed, it will encourage the further use of anti-streptococcic serum. This remedy is credited with good results in a few instances, and may prove efficacious in favouring the tendency to repair and recovery.

(11) Non infectious endocarditis or endocarditis whose specific virus is not yet discovered.

Six cases of rheumatic endocarditis, varying in duration from 4 to 10 weeks, all proved sterile. In all the cases the macroscopic appearances were similar presenting verrucose excrescences on the borders of the valves, along the lines of contact. Other observers have, however, found micro-organisms in such cases, so that further work is required to establish the origin of these forms. In nine cases of tuberculosis,—7 of which were of the verrucose variety,—and 2 of polypoid excrescences, no organisms were discovered by cultures. In one instance a small collection of tubercle bacilli was found in a coverglass preparation, and in another inoculations of portions of the valve caused death in two guinea pigs from tuberculosis. The writer regards it as very doubtful whether the endocarditis is due to tubercle bacilli, and considers the pyogenic organisms found in ulcerating phthisis as a more likely cause. In certain other chronic diseases, especially morbus Brightii and carcinoma occasionally verrucose excrescences are found. The writer failed to find bacteria, but regards it as an open question whether they are due to infection by bacteria or to the chemical action of abnormal metabolism.

THAYER and LAZEAR. "Gonorrhœal Septicæmia and Ulcerative Endocarditis." *Journal of Experimental Medicine* Vol. IV, I.

Thayer and Lazear publish a fresh case of malignant endocarditis due to gonorrhœal infection and recall the case published by Thayer and Blumer several years ago. In their last case, the patient began to suffer from chilly sensations, fever, and general weakness, several weeks after the onset of an acute gonorrhœa. Violent rigors ensued, disappearing under treatment. Marked anæmia, œdema, swelling and fluctuation of

the left knee joint, splenic tumour, hepatic enlargement, and albuminuria were noticed. Cardiac dilatation and an apex murmur developed towards the end, and still later, pericardial friction and a petechial rash. The blood examined during life showed the presence of gonococci.

The autopsy showed an ulcerative and vegetative endocarditis of the tricuspid valve, (of which an excellent plate is given), splenic tumour, passive congestion of the liver, subacute hæmorrhagic and glomerular nephritis, acute sero-purulent pleurisy, pericarditis due to the gonococci and pulmonary infarct. Dense masses of gonococci were also found in the tricuspid valves.

The two cases recorded are the first instances in which absolute proof of the gonococcal nature of the general infection has been obtained. A table of other cases of gonococcal endocarditis is appended. This paper is by far the most valuable yet published on the subject, and will repay careful perusal.

F. G. Finley.

Surgery.

UNDER THE CHARGE OF GEORGE E. ARMSTRONG.

The Galvanic Current in the Treatment of False Ankylosis.

GWYER. "Observations on the Use of the Galvanic Current in the Treatment of False Ankylosis." *Annals of Surgery*, May, 1899.

Dr. Gwyer is in a position to speak with authority on this method of treatment as he has studied the subject for years, contributing an article to the *Annals of Surgery*, in 1893, and another to the *New York Medical Journal*, in 1895, on the use of galvanism in ankylosis.

He finds the greatest benefit from its use in cases of false ankylosis due to traumatism. He now uses the ordinary Leclanche cell of Vale type. He believes the action of electricity in the class of cases under consideration to be two-fold. First, the electrolytic action. That such dissolving action will take place is, he thinks, undoubted; but it is necessary that the material to be acted on be unorganised, for the amount of current which can be used must be limited to that which will not disintegrate and destroy living tissue, hence one cannot expect action except in the presence of unorganised tissue. It will act until the period of round-celled infiltration is reached, but not after.

The other method is by the heat developed because of the resistance of the tissue to the passage of the current. This resistance varies with the tissues and cannot be estimated very well in ohms; but clinically it is considerable, and is manifested by the sensation of heat which the patient experiences and the reddening of the skin more or less pronounced, and which may be, with enough current, carried to vesication and even to a considerable burn. The heat which is generated immediately upon application of the current extends throughout all the tissue located between the electrodes. The heat so developed increases the quantity and rapidity of the flow of blood both to and from the part, and so, through the dilated lymph channels and veins, carries away and into the general system, and so, to elimination, the disintegrated and liquefied exudate.

Dr. Gwyer believes galvanism to be superior to hot air and free from the danger of the accidental occurrence of burns, which, although perhaps of no great moment, delay treatment.

He finds that all cases of traumatic origin are benefitted more or less by the galvanic current, that the sooner treatment is commenced, the sooner, more rapid, and greater the effect; that the effect is more quickly

produced than by any other method, except, perhaps, by hot air; and that the gain is permanent unless there is unrecognised bony obstruction.

In the case of disease the result is uncertain as to the increase of motion, but pain is alleviated and the swelling, whether due to infiltration of the soft parts or present as an effusion into the joint, is reduced. Ankylosis due to gout is least affected of any.

Ophthalmology.

UNDER THE CHARGE OF FRANK BULLER,

Syphilis of the Eye.

HELBNORN. "Double Chancre of the Lids." *Münch. Med. Wochenschr.*,
May, 1898.

GRUDER. "Bilateral Ulcerating Gumma of the Lids." *Wien. Klin.*
Wochenschr., *September, 1898.*

ANTONELLI. "Initial and Post-Initial Sclerosis of the Eyelid." *Wien.*
Klin. Wochenschr., *October 13th, 1898.*

STRZEMINSKI. "Hereditary Syphilis of the Eye in the Second Generation." *Archives d'Ophthalmologie.* *October, 1898.*

Helborn's case of double chancre of the eyelids is an example of a very rare condition. The patient was a lad of eleven years and the origin was traced to the boy sleeping with an elder sister who had mucous tubercles in her mouth and other evidences of syphilis. The infection of the boy was likely caused by kissing.

On the upper and lower eyelids there was a semicircular, raised ulcer with a yellowish-grey slough. When the lids were closed the two halves formed an almost complete circle. Other symptoms of syphilis soon developed; iritis, keratitis, and an acute optic neuritis. Under inunctions a rapid cure ensued.

Gruder's case was that of a girl aged seventeen years who had an ulcerated swelling in the right lower eyelid and one on both lids of the left eye. The etiology was at first obscure but they rapidly improved under compresses of mercuric chloride.

Gruder's deductions, in the second article referred to, are as follows:—

Next to the lips and fingers the eyes are the most common site for the extra-genital chancre. This latter is most common in Russia, where licking the eye with the tongue or bathing it with urine are favourite methods of ophthalmic treatment. The initial lesion is generally solitary, only seven cases being so far reported in which it was double. Luckily, the cicatrices left are usually small. Enlargement of the pre-auricular glands is of no special import as it is met with in other eye affections.

Antonelli states that many cases of strabismus are due to infections and toxins that are inherited from the parents. Of these infections, syphilis is the most usually found. Fifty per cent. of these patients

strabismus in childhood. Syphilis may cause strabismus in one of three ways. Firstly, there may be trouble in the sensorial portion of the apparatus governing binocular vision, the visual acuity of each eye being, however, up to the standard. Secondly, the cause may be in the motor apparatus or in the connection between this and the sensory organs. Thirdly, there may be pathological conditions of the eye such as astigmatism and rudimentary changes of the fundus oculi. In these, the reflex of direction may be present, but the reflex of convergence is deficient, as the visual impulse from each is different, not being equally good.

Strzeminski reports a very interesting case of a boy ten years old with marked defects in both eyes affecting the retina, choroid, and iris. These were coloboma of the irides, pigmentary degeneration of the retina, and areolar choroiditis. The external recti muscles were apparently absent. There was right sided deafness and paralysis of the right side of the tongue. These conditions had been noted shortly after birth. The boy was defective mentally and stuttered. A short time after the first consultation the boy was brought again suffering from a well-marked interstitial keratitis with iritis.

The grand-father of the boy had well-marked signs of acquired syphilis. There were no signs of acquired syphilis in either the father or mother, nor was there any sign of tuberculosis, but the signs of hereditary syphilis in the father were well-marked. A diagnosis of hereditary syphilis was accordingly arrived at, and a corresponding treatment was forthwith initiated, consisting of active mercurial inunctions for five months followed by a two months course of potassium iodide, and resulting in a complete cure of the corneal disease. The fundus of both eyes improved as did also the vision. A younger brother also showed to a marked degree the same lesions.

The Pupil.

BERNHEIMER. "The Reflex Pathway for the Pupillary Reaction".

Archives für Ophthalmologie, lxxii. 1898.

EICHHORST. "Intermittent Mobility of the Pupil in Tabes." *Deut. Med. Woch.*, June 9th, 1898.

KARPLUS. "Immobility of the Pupils in Hysteria." *Jahrbücher f. Psychiatrie und Neurologie. No. 17, 1898.*

Bernheimer claims, as a result of experiments on monkeys, to have definitely localised the pathway of the pupillary reaction. The optic nerves undergo partial decussation at the chiasma as do also the special fibres which have to do with the pupillary reaction. They proceed thence backwards to the corpus geniculatum externum, interweaving in their course with the other fibres of the optic tract. At the corpus genicula-

tum externum some fibres pass to its inner boundary, partially through its inner wall and then unite into a compact bundle of fibres which pass around and under the corpus geniculatum internum over its convexity against the lateral sulcus of the anterior corpora quadrigemina into whose substance they pass in a fan shape; from here they pass posteriorly upward and then downward and forward under the origin of aqueduct to a small-celled pair of median nuclei, the sphincter nuclei. Thus each sphincter nucleus is connected with both eyes by both crossed and uncrossed fibres. There is also a central connection between them.

Eichhorst states that out of 103 cases of tabes he observed the intermittent mobility of the pupil in two. The first case was a woman 38 years old. In September 1893, the right pupil was larger than the left, but both reacted to light and accommodation. In January 1894 the light reflex was lost. The patient was not seen again for two years when in February 1896 the light reflex had returned but was lost again in June, 1896 for four days, when it returned again for ten days. On December 17, 1896, the light reflex was absent and has remained so ever since.

The second case was a woman 38 years old. In 1891, the pupils were equal and reacted slowly to light and accommodation. In 1892, there were severe lightning pains which were relieved by salicylates; the pupils reacted now more promptly. In 1895, a perforating ulcer of the foot occurred and the patient was generally worse. The left pupil was immobile to light, the right was mobile. In 1897, the general symptoms were worse, the right pupil was larger than the left, and both reacted to light and accommodation.

Karplus, as a result of his studies, does not consider the immobility of the pupils as of diagnostic value in differentiating hysteria from epilepsy. In hysteria major the pupils may present exactly the same phenomena as in epileptic convulsions.

In cases of nonconvulsive hysteria, the patients lie with closed eyes as if dead and with complete immobility of the pupils to light. Similar conditions were seen in hysteria with convulsions and respiratory movements without loss of consciousness and also in milder forms. This variety of pupillary immobility, Karplus thinks, is a cortical phenomenon as he believes that pupillary contraction and dilation have their spheres in the cerebral cortex; if from any reason the cortical impulse be interrupted a state of cramp arises in the iris muscles. He compares the spastic state of the iris to hysterical contractions of the lower limbs.

Metritic Iritis.

MAZET. "Metritic Iritis." *Annales d'Oculistique*, November, 1898.

Mazet's paper is the result of observations on two patients. Both suffered from an endometritis which was greatly aggravated at each men-

strual period. Iritis in each case began a few days after menstruation had set in, and in one case there was pus in the anterior chamber. The patients were both healthy and had no trace of any hereditary infection.

Mazet considers them due to an absorption of toxic agents by the denuded uterine membrane, this situation being the point of least resistance. Cohn claims that the ciliary veins of the eye are congested during menstruation and this would support this hypothesis of Mazet's. Both cases yielded readily to treatment of the uterine and ocular conditions.

The Bacteriology of Phlyctenular Conjunctivitis.

MICHEL. "A Contribution to the Bacteriological Study of Phlyctenular Conjunctivitis." *Annales d'Oculistique*, October, 1898.

As a result of cultures from 18 cases of phlyctenular conjunctivitis, Michel found in 10 cases the staphylococcus pyogenes aureus and 7 times the staphylococcus pyogenes albus. Out of the 10 cases, the germ was found in pure culture in 9, and mixed with a diplobacillus once. Of the 7 cases in which the *S. pyogenes albus* was found, it was in pure culture in 5, mixed with an unknown bacillus once, and once with the *sarcina lutea*. Inoculation of all the germs in the eyes of rabbits set up the disease, although the introduction of numerous sterile irritants under similar conditions did not. His conclusions are:—

(1) Phlyctenular conjunctivitis is essentially a parasitic disease, the cause being a microbe, and the unhealthy condition of the patient merely predisposing.

(2) Planting the contents of the phlyctenulae on various culture media gives rise to colonies of diverse forms of microbes, the staphylococcus being the most frequent by far.

(3) The inoculation of the staphylococcus and of most of the other microbes beneath the corneal epithelium of the rabbit produces lesions analogous in appearance to the phlyctenula of the human subject.

(4) The anatomico-pathological examination of the experimentally produced phlyctenulae shows that in the case of man the lesion is not confined to the subepithelial space but that it is accompanied by a superficial infiltration of the corneal tissue. This superficial infiltration in the case of man as well as of the lower animals should be capable of producing the phlyctenulae.

(5) The phlyctenulae seem to be caused by a reactive lesion of the organ against microbes that have invaded the cornea.

Ocular Therapeutics.

VILLARD. "Aiol in Blennorrhœa Neonatorum." *La Clinique Ophthalmologique*, Nov., 1898.

RISLEY. "Cassaripe, A New Remedy for the Treatment of Corneal Ulcers and other Infectious Diseases of the Eye." *Philadelphia Med. Jour.*, October 29th, 1898.

Villard uses aiol in two to three per cent. ointments, twice or thrice daily. It at first increases secretion and swelling, which lasts for about an hour; there is also some pain lasting fifteen minutes. After an hour a thin, yellowish membrane will be found coating the inner surface of the lid; this membrane is easily removed. After a few days use combined with a permanganate of potassium collyrium, the secretion of pus is arrested and with this the utility of aiol ceases and one must then change to some of the other well-known remedies. Willard claims great success with it.

Cassaripe is the concentrated juice of the well-known cassava plant of the tropics. Risley has used it in ointment form of the strength of ten per cent. in ulcers of the cornea and purulent disease of the conjunctiva. It is applied between the lids twice or thrice daily and the lids massaged so as to spread it thoroughly over the eyeball. It causes no irritation and the improvement in the eye disease is very rapid. Even in a case of blennorrhœa neonatorum its success was very marked. In ulcers, atropin and a boric acid lotion were also used. Cassaripe is a powerful vegetable antiseptic.

J. W. Stirling.

Reviews and Notices of Books.

DISEASES OF THE EYE.—A Handbook of Ophthalmic Practice for Students and Practitioners. By G. E. de SCHWEINITZ, A. M., M. D. With 255 illustrations and two chromo-lithographic plates. Pp. 696. Third Edition, thoroughly revised. Philadelphia, W. B. Saunders, 1899.

Dr. G. E. de Schweinitz's handbook in its third edition is a much more elaborate and extensive work than in the two previous editions. It now passes almost beyond the bounds of the ordinary text-book and becomes really a "system" of ophthalmic surgery.

It is curious how in this work, as in so many others dealing with eye diseases, the subject of orbital affections is very cursorily passed over; the differential diagnosis of tumours of the orbit is decidedly lacking in detail. The article on operations is really good, but in mentioning the possibility of pain during the twenty-four hours after cataract extraction, the retention of tears inside the eyelids is not mentioned as being one of the most frequent causes of severe pain.

The subject of optics and refraction errors is very clearly and well put; that of the light sense and its variations and indications might be much more thoroughly handled. In a book of this extent a chapter on ocular symptoms and diseases in their relation to constitutional and other disease would be a valuable adjunct.

The book itself is a fine specimen of the publisher's work and is profusely illustrated.

J. W. S.

TRANSACTIONS OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY.
Thirty-Fourth Annual Meeting, New London, 1898. Hartford,
Published by the Society, 1898.

The Transactions of the American Society of Ophthalmology forms, as usual, most useful reading material. The report of the committee on resolutions relating to Purulent Ophthalmia in Infancy draws attention to the faultiness of the American statistics on the subject, and the necessity for fuller and more thorough reports in future. Dr. Charles Stedman Bull contributes a valuable article on Some Unusual Tumours of the Orbit, Eyelids, and Vicinity; and Dr. G. E. de Schweinitz reports a series of cases of Growths of the Choroid, Lachrymal Gland and Sac. The surgical treatment of myopia comes in for a share of consideration.

Dr. Wilmer considering that a myopia of 25 diopters is the ideal degree from which to get the best practical results by operative procedure.

Dr. Wheelock Rider's article on Unilateral Winking as a Test of Comparative Visual Acuity is a most elaborate one. His deductions are that the comparative facility with which one or the other eye is separately closed is dependant upon, and may therefore be used as a test of the comparative visual excellence of the two eyes.

It would be impossible here to mention in detail the numerous papers read at the meeting of the society but they are well worthy of a careful perusal.

J. W. S.

TWENTIETH CENTURY PRACTICE OF MODERN MEDICAL SCIENCE. Edited by Thomas L. Stedman, M. D. Volume V., Diseases of the Skin. New York, William Wood & Co., 1896.

This volume of the Twentieth Century Practice is by eleven of the leading dermatologists of Europe and America. There is a short introductory chapter by Charles W. Allen of New York on the anatomy of the skin and its appendages. L. Duncan Bulkley of New York contributes the chapter on parasites, both animal and vegetable. The erythematous affections are well described by H. H. Whitehouse of New-York. Erythema exudativum multiforme is particularly well presented; peliosis rheumatica is included among the erythematous affections. The chapter on eczema and dermatitis is written by James Nevins Hyde, who, besides the usual types of erythematous, papular, vesicular and pustular, designated by him the primary forms, describes papasitic, neurotic, marginate, diabetic, sclerotic and verrucose forms making also a separate class for eczema intertrigo, fissum, and infantile and chronic eczema. The local varieties, too, are taken up separately. The squamous affections by H. Radcliffe Crocker include psoriasis and pityriasis rubra and rosea.

Under papular affections, L. Brocq describes lichen ruber and pityriasis rubra pilaris as distinct diseases, holding that many of the cases of lichen ruber acuminatus of the Vienna school are in reality pityriasis rubra pilaris. Lichen scrofulosorum completes the chapter. The bullous and pustular eruptions are treated by Whitehouse, the phlegmonous and ulcerative by Crocker, the diseases of the sebaceous and sweat glands by Van Harlingen, and of the hair and nails by Douglass W. Montgomery. The book closes with a very complete account of the dermatoneuroses, by H. Leloir, of Lille, a subject to which too little space is devoted in most text-books on skin diseases. Leloir has made a special study of this branch of dermatology and this chapter forms a valuable monograph on the subject. The value of the volume is much

enhanced by very complete biographical references at the close of each chapter.

G. G. C.

TRANSACTIONS OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION FOR
1898.

This volume contains a series of readable papers, devoted almost exclusively to diseases of the chest, of which a perusal of the transactions will convey a number of useful hints on diagnosis and treatment. The Presential Address, by Dr. Edward O. Otis, gives an interesting sketch of Auenbrugger and Lænnec the discoverers of auscultation and percussion. F. H. Williams, in a paper on Clinical uses of Röntgen Light, illustrates the value of this method in the diagnosis of obscure aneurisms, incipient tuberculosis, cedema of the lungs, pericardial effusion, etc. In certain obscure cases, particularly aneurism, this method gives certain information which can be obtained in no other way.

Tuberculosis as might be expected comes in for a fair share of attention. Many things which have been said before are here repeated, and on this well-worn theme no very startling advance is announced. The old stories, however, will bear repetition in their present dress and bear the imprint of matured judgement and observation.

F. G. F.

Society Proceedings.

MONTREAL, MEDICO-CHIRURGICAL SOCIETY.

Stated Meeting, April 10th, 1899.

J. G. ADAMI, M.D. PRESIDENT IN THE CHAIR.

Two Cases of Myomectomy—One During Pregnancy.

DR. LAPHORN SMITH reported two cases of myomectomy, from one of which the tumour removed had been shown at a previous meeting of the society. In this latter case the operation had been performed during pregnancy and the patient had gone on to full term and been delivered of a healthy child. (See page 339 of the May number.)

Gastric Ulcer—Hæmatemesis—Operation.

DR. J. M. ELDER reported this case which will be published later.

DR. H. A. LAFLEUR said that in spite of Dr. Elder's experience, he would be loth to give up the use of morphia in bleeding from a gastric ulcer. In the majority of cases the bleeding did not come from a vessel of the size in the one reported; oozing and capillary bleeding could be controlled by morphia combined with bismuth.

Tuberculous Meningitis—Lumbar Puncture—Tubercle Bacilli Found in the Fluid Obtained.

DR. H. A. LAFLEUR read a report of this case. (See page 219 of the April number.)

DR. JAMES STEWART looked upon lumbar puncture as a very valuable means of diagnosis. Unfortunately it was not always so successful as in this case and often gave a negative result from unknown reasons.

THE PRESIDENT pointed out that the failure of the inoculated animal to succumb to tuberculosis did not by any means necessarily indicate that the fluid extracted was free from bacilli. It is to be remembered that in order to produce tuberculosis, either subcutaneous or intraperitoneal, a certain minimum number of living bacilli are requisite. In the guinea pig, according to Wyssokowitsch, at least 15 must be present for the production of intraperitoneal tuberculosis. Hence, we must be prepared to find that in a certain number of cases of definite tubercular meningitis, the animal inoculated fails to confirm diagnosis.

DR. LAFLEUR, in reply, admitted that lumbar puncture was in no sense curative, as extensive observations on this continent and in Europe had brought out. It was used now simply from a diagnostic point of

view. Even when bacilli were not seen one could draw some deductions from the character of the fluid. In cerebro-spinal meningitis it was turbid and contained pus cells, while in tuberculosis it was almost clear and pus cells were absent. The proportion of cases in which tubercle bacilli had been found was 30 per cent., some observers having had better luck than others. Centrifugalisation of as large a quantity of fluid as possible was most likely to be successful.

Carcinoma of the Larynx.

Dr. A. G. NICHOLLS read for Dr. H. S. BIRKETT, who was unavoidable absent, the report of this case. (See page 343 of the May Number). The pathological specimen was shown by Dr. Nicholls.

Pneumonia after Ether Anæsthesia, with Report of a Case.

Dr. G. GORDON CAMPBELL read a short paper on this subject. (See page 434).

Dr. W. F. HAMILTON had at present under observation a patient aged four years, the subject of pneumonia which in all clinical appearances is lobar pneumonia. The disease set in very suddenly on the day following an operation for adenoids. The period of ether anæsthesia was brief, as it always is in these cases, and there was no exposure of the body to cold. The right lung shows very extensive consolidation and, on examination to-day, signs of acute disease at the left apex were made out.

Dr. G. A. BROWN referred to a case of lobar pneumonia following ether which he had had a year ago and which he attributed to the exposure incidental to the operation. He thought that the method of commencing the anæsthesia with nitrous oxide was a good one as it avoided the irritating effect of the ether upon the mucous membrane of the air passages and so prevented the collection of large quantities of mucus in the mouth and throat, a great advantage. He asked if the post-nasal disease present in the case reported could have had any bearing as a cause of infection of the lungs.

Dr. ARCHIBALD asked how the throat was kept free from mucus. He referred to some observations of his own which showed that the metabolism was diminished while under ether anæsthesia. He had found the rectal temperature was materially reduced by prolonged anæsthesia.

THE PRESIDENT stated that in discussing this subject of ether pneumonia and of pneumonia in general, as indeed in connection with all infective diseases, it was necessary constantly to bear in mind that infection is the result of the interaction of two processes; (1), the virulence of the micro-organism, and (2) the vitality or resisting power of the tissues. Unless we bear this in mind, we cannot comprehend how it is that pneumonia is the exception rather than the rule for, according to the different authorities, from 15 to 50 per cent. of healthy individuals show the diplococcus pneumoniae in cultures taken from the throat.

and, as Sternberg has pointed out, without any sign of disturbance in health, the diplococcus may be present for months in the throat of an individual and then for another series of months may be completely absent.

Consequently in discussing the subject of ether pneumonia we have to take into account (1) the effect of the ether upon the diplococcus which may be present in the throat and air passages and (2), the effect of the ether upon the mucous membranes of the air passages. If the ether lowered vitality of the mucosa to a greater extent than it acted upon or depressed the vitality of the microbes, then pneumonia might be expected to supervene. Judging from the frequency with which the diplococcus was found in the healthy throat and the peculiar rarity of pneumonia after ether administration, we must, he thought, conclude that the ether tells more upon the diplococci than upon the mucous membrane and we must be inclined to regard the supervention of pneumonia as due to some added factor.

With regard to the distinction between lobular and lobar pneumonia, it might perhaps be pointed out that the hard and fast lines drawn by the textbooks, do not represent the true condition of affairs. The distinction seemed to be largely an anatomical one and it depended upon the exact portion of the air passages primarily affected. But etiologically, as shown recently by Horton-Smith and others, it had to be recognised that in the majority of cases of broncho-pneumonia, one had present a diplococcus as a causative agent, just as one has in the majority of cases of lobar or acute crupous pneumonia. And certainly of late years since grippé has been so common, the pure type of lobar pneumonia described in the textbooks, with the homogeneous implication of the whole of a lobe, had been largely wanting. Possibly the influenza bacillus might have modified the course of the disease. It was also possible that the more careful examination of post mortem material might have something to do with this discovery.

The frequency of the occurrence of broncho or lobular pneumonia in these cases which follow upon the administration of ether, might possibly be due to primary irritation of the bronchi by foreign matters, particles of food, etc. As already stated, the rarity of the condition would seem to indicate that some other factor besides the ether must be called upon to explain the development of the condition.

Dr. CAMPBELL, in reply, stated that he had had so little trouble from the collection of mucus when the ether was given slowly and carefully that he had never attempted to use nitrous oxide gas as a preliminary to ether. He had seen the gas used, however, many times and the results were very satisfactory. With regard to the lowering of the body temperature and lessened metabolism, referred to by Dr. Archibald, the

speaker had pointed out some years ago that the amount of urine secreted during ether anæsthesia became less and less in proportion to the time under ether, and the amount of solids contained, also, gradually fell.

Mucus in the throat obstructing the respiration could either be sponged out by means of a gauze sponge on one of the old fashioned sponge-holders, or the patient, in extreme cases, could be allowed to come partially out of the anæsthetic, and then touching the back of the pharynx with the sponge-holder would induce vomiting and empty the lungs to a certain extent as well as the upper parts of the air passages. With regard to the post-nasal disease in the reported case being a possible source of infection for the pneumonia, Dr. Campbell did not believe that lobar pneumonia was ever due to ether. Pneumonia following ether and due to it must necessarily be of the lobular form.

Stated Meeting, April 17th, 1899.

J. G. ADAMI, M.D., PRESIDENT IN THE CHAIR.

The Prevention and Cure of Tuberculosis.

Drs. DUNCAN McEACHRAN, H. A. LAFLEUR, A. D. BLACKADER, A. J. RICHER, W. H. JAMIESON, and H. McL. KINGHORN took part in the discussion, Dr. McEachran's paper being read by the PRESIDENT in the former's absence. The papers by Drs. McEachran, Lafleur, and Richer will be found in the present number of the JOURNAL. The others will be published later.

THE

Montreal Medical Journal.

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

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JUNE, 1899.

No. 6.

EPIDEMIC CEREBRO-SPINAL MENINGITIS.

During the past few months another epidemic of this disease has made its appearance, and numerous cases have been reported from Philadelphia, Washington, and St. Louis. From our exchanges, we note that instances of the disease have occurred in Toronto and its vicinity, and during the past few weeks several undoubted cases have applied for treatment in the Royal Victoria and Montreal General Hospitals. The disease presents many points of interest both to the physician and to the pathologist. Although regarded as endemic in many of the larger cities of America, Councilman cautions us against accepting as instances of the disease, sporadic cases in which the diagnosis was made from the clinical history only. Although in going over the clinical histories of numerous cases one receives an impression of the epidemic form which differs somewhat from the pneumococcus form and the streptococcus form, yet the clinical history alone is not conclusive. Autopsy accounts are only conclusive when accompanied by a careful bacteriological or histological investigation. In the reports it may generally be assumed that the recoveries were from the epidemic form. So far he has not been able to find a case of undoubted pneumococcus meningitis which has recovered; neither has he noted any recoveries from cases of meningitis secondary to thrombosis of the lateral sinuses, or disease of the middle ear. As far as can be ascertained from the records of the Boston City Hospital for the 5 years previous to the epidemic of 1896, no cases of meningitis due to the diplococcus intracellularis occurred within this period. The relation of sporadic cases to the epidemic form is one of much importance, and can only be determined by a careful bacteriological examination in all cases of meningitis of the cerebro-spinal fluid obtained by lumbar puncture. Little is to be learned from mortality tables as to the occurrence of this disease, as many cases are reported as epidemic meningitis which are not so; while in all probability true cases often fail to be recognised.

The mode of infection is not very clear, a few instances of supposed direct propagation from patient to patient have been recorded, but this is by no means the general rule. It does not appear to spread from any centre of origin, either by contiguity, or on special lines of travel but breaks out at diverse and apparently disconnected places. Its development appears to be independent of local peculiarities of soil or situation. It is met with in town and country alike. When once it has appeared in any locality, the contagion appears to remain about that place for some time. Epidemics of cerebro-spinal meningitis, so far as have been noted, differ from epidemics of other infectious diseases in that they do not steadily mount up to a maximum and then decline, but appear to proceed by fits and starts; crops of fresh cases appearing at irregular intervals and in more or less distant foci. The disease is most apt to appear during the late winter and spring, and children and young adults appear to be particularly susceptible. It very rarely attacks infants under one year of age, and is seldom met with in the more advanced periods of life. The point of entrance is probably through the nasal cavities. The organism appears to have feeble vitality, and is with difficulty cultivated artificially.

As to treatment, we have no remedy which can be depended upon to either check the disease or shorten its course. Marked variations in the severity of the symptoms are liable to occur at short intervals, a fact which should render us cautious not to confound apparent therapeutic results with coincident improvements. Little value is to be expected from the mercurial treatment or from the severer methods of counter-irritation recommended by some authors. The important indications appear to be to secure rest, to relieve the depressing influence of pain, and to sustain the strength of the patient. In our experience much benefit has been obtained from the employment of hot baths at a temperature of 100°F. to 102°F.; a method of treatment originally recommended by Aufrecht. Transportation from the bed to the bath should be conducted as carefully as possible. If much pain is present in the spine, the patient may be lifted out of bed by means of the sheet on which he lies, and with it lowered into the bath. After the bath the patient should be wrapped in a woollen blanket, and have another covering thrown over it. No drying or rubbing of the body is to be attempted. While in the bath, an ice bag or iced cloths should be applied to the head; the time in the bath should be from 8 to 10 minutes. Baths at this temperature relieve the pain, promote elimination of the toxins, and generally secure a quiet and restful sleep. In the intervals between the baths, should the temperature run high, Leiter's coil may be applied to the head, neck or spine. The diet must be nourishing, and should, as far as possible be pushed. Should the pulse become weak, in our opinion,

alcohol is not contraindicated. In a recent number of the *Lancet*, Rolleston and Allingham report a case of cerebro-spinal meningitis, treated by laminectomy. The patient was a man 34 years old who was suffering from what appeared to be a severe type of the disease, and in the judgment of the attending physician under simple medical treatment appeared to have little chance of life. Surgical intervention was therefore undertaken; an incision was made over the spines of the lower dorsal vertebræ, and the laminae of the 7th and 8th were excised: the exposed and bulging dura was incised for about an inch in the long axis of the cord; coagulated lymph and cerebro-spinal fluid escaped; a drainage tube was inserted, and the wound dressed antiseptically. Decided improvement at once ensued; for three and a-half weeks the discharge continued; and on any interference with its flow, the symptoms became aggravated. On the thirty-fourth day the temperature remained normal, the discharge greatly diminished, and shortly afterwards disappeared. The tube was removed on the fortieth day, and the wound was completely healed eleven days afterwards. In this case the result appeared to confirm the wisdom of the treatment. Whether a similar result will follow in any large number of cases, experience alone can show.

ON MENINGITIS.

During the past few years, our knowledge of this grave affection has in many directions been extended, and new methods of diagnosis have been afforded us; nevertheless it still is often a matter of much difficulty for the physician to distinguish between the various forms of the disease that may present themselves in practice. Cases of septic meningitis form a considerable proportion of the sporadic cases occurring. These, according to Collins, (*20th Century Med.*, Vol. X) may be grouped into 3 classes:—1st, Those in which the pathogenic bacteria have gained admission to the body through wounds or injuries; 2nd, Those which develop in connection with pathogenic disease in adjacent structures and cavities, such as the mastoid, middle ear, nose, or tonsil; and 3rd, Cases where the inflammation develops in connection with other infectious diseases, such as pneumonia, typhoid fever, influenza, or measles. In the first and second groups the streptococcus is generally the invading micro-organism; in the third group, although the streptococcus may frequently be found, the pneumococcus, staphylococcus, and other pathogenic bacteria are the most important forms. Septic meningitis arising from local mischief is often unilateral. Meningitis arising from pneumonia or any of the so-called specific fevers gives rise to no characteristic symptoms by which it can be distinguished from the symptoms of nerve irritation due to cerebro-spinal congestion induced by the toxæmia of the specific fever. (Osler). Meningitis due primarily to an in-

vasion of the tubercle bacilli is, however, the variety most frequently met with, and the one with which physicians generally are most familiar; it is characterised by a slow insidious onset, and an irregular march of symptoms to so far as we know an invariably fatal termination. In connection with this form of meningitis, however, it is to be remembered that although the existence of tubercular lesions in other parts of the body warrant us in supposing a meningitis to be of tubercular origin, nevertheless such a deduction does not always prove true. At a recent meeting of the American Pediatric Society, Acker reported two cases in which apparently complete recovery had taken place from pronounced symptoms of meningeal inflammation, although in both instances the patients were the subjects of distinct pulmonary tuberculosis. In the discussion on these cases, Holt mentioned the case of a child who had generalised tuberculous deposits, involving the lungs, glands, intestines, spleen, and liver, and who yet died of a non-tuberculous meningitis; the lesions found post-mortem being those of an acute purulent inflammation. In another case that he saw some years previously, a child with double hip joint disease developed meningitis, and got well. Six months later the child died from amyloid disease, and the autopsy showed no trace whatever of tuberculosis of the brain. From these histories he contends that it is not always safe to draw conclusions from lesions which exist in other parts of the body; although when meningitis occurs in patients suffering from tuberculosis of other organs, the diagnosis of tubercular meningitis is a very probable one.

Another form of sporadic meningitis met with occasionally in infancy is that to which the term posterior basic meningitis has been applied. Originally described by Gee and Barlow, it has until recently not attracted the attention which, as an apparently distinct form of meningitis, it would appear to demand. Carmichael, in a paper read before the last meeting of the British Medical Association, and Still, in a recent article (*Brit. Med. Jour.* 1898, No. 1972), have emphasised the constancy of its clinical and pathological features. According to Barlow, the important symptoms of this affection are vomiting, pronounced cervical opisthotonos, which occurs early and is constant and progressive, and the tendency to tonic spasm and rigidity, which is in contrast to the clonic spasms of tubercular meningitis. Regarding the etiology of this form of the disease, Barlow does not think that congenital syphilis bears any important part. In some of his cases traumatism seemed to have some influence; in a few, a history of catarrh preceded the onset of the attack; in many, however, there was a history of preceding good health. Still says that he has never seen a case of posterior basic meningitis in which there was any bone disease, or any evidence whatever of extension of inflammation from the ear, or from the nose. In all the cases examined

he found a diplococcus which, so far as the evidence went, appeared to be the specific exciting agent of the disease. Death in this form is distinctly less inevitable than in the tubercular form, and Still thinks that it is probable that some of the cases of supposed recovery from tubercular meningitis were due to this affection. When recovery occurs, however, it is by no means always complete; frequently a condition of hydrocephalus supervenes; or, with the development of the child, some mental defect makes its appearance.

Epidemic cerebro-spinal meningitis must now be regarded as quite distinct from the preceding affections. It is only recently, owing to the investigations carried on in the pathological laboratory of Harvard Medical College during the epidemic of 1896 and 1897, that we have recognised this affection as a definite disease due to a specific organism first described by Weichselbaum, the diplococcus intracellularis. Cases of meningitis in which this micro-organism is found present a more or less characteristic clinical picture: the distinguishing symptoms are the sudden onset, the severe occipital headache, the painful stiffness and sensitiveness of the muscles, chiefly of those at the nape of the neck and along the spine; at the same time, temperature and pulse are variable and irregular, and run no uniform course; exacerbations and recurrences of fever are common, cutaneous rashes of various kinds may make their appearance: the urine may contain albumen, and, occasionally, sugar. Although the mortality is high, nevertheless a certain percentage of the more protracted cases recover. In such cases wasting is extreme, and convalescence is always slow. Very few escape without some permanent injury. Councilman calls attention to the tendency of the disease to produce permanent impairment of the mind. In distinguishing between these various forms of meningitis, Osler quotes Leichtenstern, as stating that in meningitis accompanying pneumonia, contraction of the muscles of the neck is often absent, delirium and coma is almost invariably present, and a fatal ending rapidly supervenes. In epidemic cerebro-spinal meningitis on the contrary, contraction of the muscles of the neck is invariably present, and even although delirium may occasionally supervene, long intervals of lucidity occur; occasionally the sensorium may be clear throughout the entire course of the disease. According to Councilman the chief diagnostic symptom between pneumococcus meningitis and the epidemic form is the absence or slight development in the former of symptoms pointing to an extensive infection of the meninges of the cord, and of the roots of the spinal and cranial nerves. In all these forms of meningitis the most reliable means of diagnosis is lumbar puncture. In a paper read before the American Pediatric Society, Wentworth emphasised the following facts:—Normal cerebro-spinal fluid contains neither

cells nor fibrin, and is perfectly clear. In cases of meningitis the cerebro-spinal fluid is invariably clouded with fibrin; the degree of cloudiness is, to some extent, proportionate to the amount and character of the exudation in the meninges; it is sometimes so slight that close observation is necessary to detect it. This cloudiness is due to cells, the character of which differs with the form of meningitis. In cases of tubercular meningitis, the cells are chiefly small round cells, with a single nucleus, and very little protoplasm, resembling the lymphocytes found in the blood. Tubercle bacilli can only occasionally be detected. In purulent meningitis, the polynuclear leucocytes are very numerous, and the small round cells comparatively few in number. In epidemic cerebro-spinal meningitis, the specific micro-organism is almost always to be found, especially during the early stages of the disease. Occasionally the fluid withdrawn may be mixed with blood; this condition may be simply accidental, and due to the puncture itself, or it may be due to meningeal or ventricular hemorrhage. The former may be excluded, when repeated punctures bring forth a fluid showing the same quantity of blood. Positive conclusions, however, can only be drawn from positive, and never from negative, results of lumbar puncture. The operation, although a comparatively simple one, requires the strictest antiseptic precautions on the part of the operator; an antitoxin needle is preferable to the ordinary hypodermic syringe, as it is less liable to break and has a larger lumen, but aspiration is never necessary. Should the fluid not run well, a sterile wire may be passed through the needle *in situ*. The puncture is to be made, either between the 2nd and 3rd, or between the 3rd and 4th lumbar vertebra; with the left thumb marking the interval, the needle should be entered either directly in the median line, or about a centimeter to either side of it. At the depth of about $\frac{1}{2}$ cm. in children, and 7 or 8 cm. in adults, the needle passes through the membranes, and the fluid oozes out. The pain given appears to be slight. If the needle does not enter the canal, or if it feels as if the point were not free, the needle should be withdrawn for a short distance, and then reintroduced. Lateral movements of the needle may give rise to a hæmorrhage, which would obscure the character of the fluid. General anæsthesia is quite unnecessary, but the local anæsthesia produced by ethyl chloride may be employed.

ANTIPEPTANIC SERUM IN THE TREATMENT OF TETANUS.

It would seem that serum therapy might almost claim another victory in the treatment of tetanus. This painful and fatal disease, that has for a very long time baffled the long and varied list of therapeutic agents that have been directed against it, must now yield to the steady patient labours of modern scientific medicine. It has been robbed of its terrors

by the discovery of the tetanus bacillus, antitetanic serum, and the researches of Roux and Borrel demonstrating the mode of attack of the bacillus upon the nervous cells.

Fortunately, scientific research and clinical experience in this matter are in harmony. Two points seem to be coming out pretty clearly. One is, that, as the tetanus toxin forms an indissoluble union with the nerve cells, the early exhibition of inhibitory or prevential doses to neutralise these toxins while they are free in the blood stream and before they have united with the nerve cells, is followed by the best results. The anti-tetanic serum is apparently harmless and should be used in the presence of wounds smeared with street dirt, stable dust, etc. By so doing it has been found in one hospital in Paris that this class of injury is much less often than formerly followed by tetanus. This plan is now adopted in the Montreal General Hospital, and although the cases so far treated thus are few in number, in no case up to the present has tetanus developed afterwards.

Another point is that the instillation into the frontal lobes of the brain of a quantity of the antitoxic serum protects the brain and spinal cord and is followed by a larger percentage of recoveries than is the subcutaneous or intravenous introduction of the serum.

THE TREATMENT OF SEPSIS BY ANTISTREPTOCOCCIC SERUM.

Of very great interest are the two cases of septic infection reported on another page by Dr. T. J. S. Halliday, of Peterborough, Ontario. Dr. Halliday may well congratulate himself upon his success. Scientific knowledge, forethought, and tact together can do wonders in these days. The reports of these cases will stimulate others to make use of the anti-streptococcic serum. It was probably helpful in both cases, certainly in the first. In the second it must be noted that the improvement followed almost immediately upon the opening of the superficial abscesses, between the 1st and 5th of January. Doubtless some of our readers will say that the cleaning out of these secondary deposits was the essential factor in the after result. At any rate this case teaches that the use of anti-streptococcic serum does not lessen the necessity of at the same time applying to the treatment of the case ordinary surgical principles.

The serum has been disappointing to many but it is apparently harmless and we think should be given a fair trial in cases of streptococcic infection and also in doubtful cases.

GESTA MEDICORUM.

"QUICQUID AGUNT MEDICI NOSTRI FARRAGÓ LIBELLI."

Dr. Charles Ogilvy, class of '98; has been appointed a resident physician at the Charity Hospital, New York.

At a meeting held on May 9th, Drs. John L. Day and Mackenzie Forbes were appointed Assistant Physicians, and Dr. R. A. Kerry, Assistant Ophthalmologist to the Montreal Dispensary.

Dr. E. M. von Eberts, M. R. C. S., class of '97, has been appointed Medical Superintendent of the Montreal General Hospital in succession to Dr. D. D. MacTaggart, who has resigned to enter private practice.

Dr. F. Montizambert, for so many years the efficient superintendent of the Grosse Isle Quarantine Station, has been transferred to Ottawa as Director-General of Public Health for the Dominion, with the rank of a deputy minister.

Quite a Montreal contingent was present at the recent meeting of the American Association of Physicians at Washington. It consisted of Drs. James Stewart, Wilkins, Adami, Lafleur, and Wyatt Johnston.

Dr. Stewart contributed a paper on "Tumours of the Pituitary Gland," reporting two cases which had come under his observation. Dr. Adami also gave the result of his recent studies on the morphology of the bacillus coli.

In this connection it may be stated that Dr. Wyatt Johnston has been elected a member of this association being one of the very few Canadian members in the society.