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CARCINOMA OF THE BREAST.

BY

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Mr. President, Ladies and Gentlemen,

Some months ago, in response to an invitation from the Secretary of the American Surgical Association to contribute my experience on the end results of primary operations for carcinoma of the breast, I undertook to trace the cases that I had operated upon. As I happened to be in Germany at the time of the meeting at Washington, and unable to contribute my results there, I have thought that they might make an interesting subject for discussion in this Society.

During the period from 1891 to August, 1907, I removed 90 mammary tumours. Of these 26 were benign, mostly fibro-adenomata; 63 were cases of carcinoma, and 1 a large sarcoma. Sixty-four were malignant. Of the 63 carcinomatous tumours, 46 were removed before September, 1904, and are, therefore, available for consideration of what are called final results. Eighteen cannot be traced. Of the remaining 28, three died within three years of other disease without local recurrence or metastases. Seven died within three years of the disease. In one the cause and date of death have not been determined: I have simply learned the fact that she is not at present living. Four died of metastases within a period of three years after operation. Thirteen were alive three years or more after operation. If we count all of the 18 untraced cases as dead of the disease within three years after operation, we have 13 recoveries out of 46, or 28½ per cent.

That is hardly fair to statistics, and presents an unduly gloomy outlook to a patient suffering from cancer of the breast. In Montreal, with its large foreign and floating population, it is difficult to trace cases after they have left the hospital. I think it only fair to assume

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that some of these untraced cases may have lived three years or more without recurrence. Four died after a period of three years; one of metastases; one of perforation of the stomach seven years and four months after operation; one of some pulmonary condition without evidence of local recurrence or internal metastases, and one seven years after operation without any recurrence locally or any evidence of internal metastases.

Then again, in estimating the cures at 28½ per cent., 3 cases dying within three years of other diseases without local recurrence or metastases have been excluded. It is quite possible that one of these three might not have suffered from recurrence had she lived three years or more afterwards. If we reckon our percentage on those that are traced we have 13 cures out of 28 cases, or 46½ per cent. This is obviously too high. Naturally the mortality among the untraced would be higher than among the traced. Cases should be classified; those operated upon before the glands are involved should give excellent results as compared with those in which the glands are already infiltrated. The patient should have the benefit of the doubt; as Halsted puts it, "Little notion of the value of an operative procedure can be gained unless some attempt be made to exclude or consider apart cancer so far advanced that however radical the operation only a portion of the disease can be removed." Available statistics are of little value in answering the patient's query, "What are my chances of non-recurrence?" They are for the most part made from a run of cases. It is obvious that the early cases should receive more encouragement and a better prognosis than the long standing and advanced. There was no operation mortality in the 90 cases of breast tumour here reported.

All cases that applied during this period were operated upon with the exception of one whose condition did not warrant any major operation. In some of these the disease was of long-standing—seven years in three cases, with an average of forty-seven months. The axillary glands were palpable in 18 cases. The fact that they are not palpable, however, must not be regarded as conclusive evidence that they are not affected. In three cases the supraclavicular glands were palpable, and in one case were palpable on both sides of the neck. In 14 cases in which the enlarged glands were reported upon by the pathologist after removal, the form of disease was scirrhus in 5; medullary in 1, and carcinoma in 2, and in 6 cases they were reported as enlarged, but not infiltrated with cancer cells.

The most frequent age was between forty-six and fifty-five years. The youngest was twenty-seven, and the oldest sixty-nine, with an aver-

age of forty-eight. Three were single and twenty-four married. Two were nullipara. In 11 cases children had been borne, but two of them had not nursed.

The family history was stated in 13 cases and was negative in all but two; in one of these the mother had suffered from carcinoma of the breast, and in the second a sister had carcinoma of the rectum. In one there was a previous history of mammary abscess, and in one mastitis. In four cases there was a history of injury shortly antedating the discovery of the lump.

The site of the disease was stated in 23 cases, 26 per cent. occurring on the right side, and 74 per cent. on the left side. The most common situation being the upper outer quadrant.

The first symptom noted in 12 of these was the lump; in 9 of them pain was the first symptom; in one the pain was in the shoulder, and down the arm in another. Pain was altogether absent in 24 per cent. When present it was described as slight, lancinating or a dull aching pain. Oedema of the arm was noted in one case, and a discharge from the nipple in one.

Considering the class of cases and the late date at which many of them came to operation, these results are encouraging. I believe, however, that it is possible to improve them wonderfully. Improved surgical technique has made it feasible and comparatively safe to remove these growths with a wide margin of healthy tissue together with the lymphatics in the axilla and cervical regions.

The great improvement in the future is to be made by the general diffusion of knowledge among the laity, and the earlier diagnosis of the case by the family physician, who sees nearly all of them in the first instance. The ordinary text-book diagnosis is that of a well-developed tumour associated with lymphatic gland enlargement. The best results are to be obtained in early cases discovered before the glands along the lower border of the pectoralis major, in the axilla, or in the triangles of the neck are involved.

When consulted by a patient as to the presence and nature of a mammary tumour, the physician should not rest satisfied until he has definitely determined whether it is benign or malignant, or that it is impossible for him to say which. Two symptoms well worked out should, in the majority of instances, establish the condition with a very considerable degree of certainty. First, is there a tumour? If so, it should be easily palpable between the fingers and the chest wall. I may be pardoned for alluding to so elementary a method of physical diagnosis, but failure to adopt this practice has led to unpleasantness

and an error in diagnosis on so many occasions, that I think it not inappropriate to allude to it here. In many breasts with thickening of the ducts, if a portion is lifted up between the fingers it will give the impression of a tumour. If now the breast is carefully palpated between the fingers and the chest wall the tumour which was previously felt will be found to have disappeared. If a tumour is present it can be easily felt under the fingers when pressed against the chest wall. A malignant nodule cannot be moved within the gland. It is convenient when making this examination to have the patient in a recumbent position.

Secondly, is the tumour attached to the skin? In other words, are the suspensory ligaments of Cooper involved? The slightest shortening of the trabeculæ, so little as only to be detected on comparison of the two sides is of the greatest significance. There are two delicate tests for determining this point. If the breast is pushed towards the tumour and these suspensory ligaments are shortened a dimple will appear. Another sign due to the same cause has been clearly brought out by Mr. Cheate of London, and that is, a lack of symmetry in the spherical outline of the breast. To obtain this symptom accurately, the eyes of the observer should be on a level with the breast, and if there is any flattening, it is then readily detected. These two signs, the presence of a tumour not movable within the gland, dragging on the skin when the breast is pushed on one side, with flattening over the tumour should, I think, establish with definite certainty the character of malignancy.

Later on, when the growth itself becomes adherent to the skin, the disease is in a much more advanced stage. A symptom always looked for by students is retraction of the nipple. Except in those cases where the disease is immediately beneath the nipple, this is a late sign, and when present, may be due to simple cysts, fibro-adenomata or preceding inflammatory conditions which have passed away. In some women the nipple is always more or less retracted. There is increasing evidence that the cysts developed in certain cases of so-called chronic mastitis should no longer be considered as inflammatory in origin as taught by Virchow and Koenig, but rather as the result of senile retrograde changes. This is the opinion of J. Collins Warren, and at the last meeting of the German Surgical Association, v. Saar of Vienna, took the same view, reporting four cases from Eiselsberg's clinic in support of his opinion. He advocated amputation of these breasts and removal of the axillary glands.

There is sometimes great difficulty in determining even at the operating table whether certain cysts are malignant or not. If they have

lost their lustre or are hæmorrhagic it is better to regard them as malignant.

Only too often the patient does not consult any physician until the growth is well-advanced, perhaps the glands involved and the skin adherent; but in early cases, I see no reason why recovery with permanent cure should not be obtained in 75 to 80 per cent. of cases. The diagnosis, it must be admitted, is not always as simple as this statement would seem to make it, but in cases of reasonable doubt regarding the nature of so lethal a disease as cancer of the breast, an exploratory incision should be advised. A portion of the tumour can be removed through a small incision made to one side which will leave a very small scar in a concealed position, and the diagnosis can then be established by a microscopical examination of the portion removed.

Small tumours are not necessarily early tumours, and it would seem almost criminal to ask a patient to remain under observation when a minor operation performed under local anæsthesia may settle the doubt. It may be said in a general way that multiple nodules in one breast rather favour a diagnosis of cystic change, or chronic mastitis. The same may be said when multiple tumours are palpable in both breasts, but a single nodule in one breast should always be regarded with suspicion, and one tumour in each breast as not necessarily benign.

There is just one other important question that I would like to raise here, and upon which, I would like an expression of opinion. It has happened to me twice to make a clinical diagnosis of malignant tumour of the breast—once in a patient seventy years of age, and once in a patient sixty years of age, which the pathologist did not confirm. In both instances a hard, palpable tumour was present in the breast with retraction of the suspensory ligaments and a loss of the normal contour of the breast over the tumour. In both cases axillary glands were palpable. In both instances the breasts were removed together with the glands in the axilla, and in both cases the pathologist reported that neither the growth nor the glands were malignant. I do not question the correctness of the pathologist's report in these cases, but I ask the question, would a surgeon be justified in leaving a tumour of the breast under these circumstances with the aforementioned clinical evidences of malignancy after an exploratory incision and a rush diagnosis of non-malignancy? Would he be justified in removing the growth and leaving the glands? Personally, to both these questions I should reply in the negative. The presence of palpable glands in both axillæ and in the lower cervical triangles on each side of the neck would rather be evidence against than in favour of malignancy.

The early recognition is by far the most important point in dealing with carcinoma of the breast. Enlargement of the glands is evidence that the disease is already far afield. Union with the overlying skin or with the underlying pectoral fascia is evidence of considerable infiltration, and when the disease becomes fixed and attached to the ribs or perichondrium, as indicated by fixity and immovableness of the tumour in all positions of the arm, it is questionable if sufficient benefit can be expected to justify extensive operative procedure.

The direction and extent of incision in the removal of the breast is determined largely by our knowledge of the spread of the disease. Although it is quite true that cancer cells may be carried by the blood vessels, this method of diffusion would seem to be exceptional. Handley, "In showing that cancer cells in the blood excite thrombosis and that the thrombus as it organizes usually destroys or renders them harmless, Goldham and Schmidt seem to have established a fact of primary importance, and one which is strongly opposed to the embolic theory as applied to carcinoma."

We are concerned chiefly with its spread along the lymphatics. Gerota has proved that the respective halves of the chest have not independent lymphatic systems. There is a free communication between the mammary glands through the lymphatics running in the subcutaneous tissue. This is the probable explanation, in some instances at least, of the appearance of the disease in the opposite breast, and that there is a free communication between the lymphatics of the breast and the anterior mediastinum and through these to the lymphatic glands on the opposite side of the neck. In one instance I removed a carcinomatous gland from the left side of the neck, the primary disease being in the right breast. The lymphatics of the right axilla were infiltrated, but none were found in the right cervical region. Heidenhain & Stiles have shown that carcinomatous emboli may become lodged a considerable distance from the primary focus. It is obviously necessary then to remove a good margin of the healthy tissue surrounding the growth, and from the fact that the lymphatics are more abundant in the subcutaneous tissue than in the skin, it is desirable to remove the subcutaneous tissue more widely than the overlying integument. This, however, should be done freely and without too much thought being given to the difficulties of closing the wound. Skin-grafting adds but little time to the operation, and the wide removal gives greatly increased freedom from danger of recurrence.

I have for some years adopted the suggestion of Willy Meyer and J. Collins Warren to dissect the axilla before removing the breast, and

at the same time, if necessary, to dissect the lower triangles of the neck. I have found this method of procedure to be more expeditious, and possibly it gives increased safety. In this way the distal lymphatics are first removed and clamped or enveloped in gauze. There is thus less danger of expressing the cancer cells to different parts along the lymphatic or blood vessels. For the same reason, in examining the breast, while, of course, it must be sufficiently handled and palpated to make the diagnosis certain, it is not wise to unduly prolong manipulations, which may dislodge cancer cells and start them along to distant parts. A good many die of metastases to distant organs, such as the liver, peritoneum, brain and bones. Are the cancer cells loosened and sent away along the vessels during manipulation of the cancer field before or during operation? If there is such a possibility, we should take every precaution to avoid it. It goes without saying, that during the remainder of the operation the knife should be kept always in healthy tissue. In closing the wound a useful flap may often be shaped from the loose tissue on the side of the chest, but there is something in the suggestion, that the man who is to close the wound should not be allowed to design the preliminary incision. If the growth is small and the skin abundant, so that the wound may be closed without grafting, the patient should be well and able to leave the hospital in ten days. If skin-grafting has been performed, it will be necessary to retain the dressings for ten days longer.

In operating for carcinoma I always remove the sternal portion of the pectoralis major, and the fascia from the anterior surface of the pectoralis minor. I have never seen nor read of recurrence in the pectoralis minor and do not consider its removal necessary, unless in exceptional cases. The neck should be dissected in all cases where there are palpable glands and explored in every case as high as bifurcation of the carotid, by raising the skin over the clavicle and passing the finger up into the triangle.

BACTERIÆMIA—ITS DIAGNOSIS: ITS DIAGNOSTIC AND PROGNOSTIC VALUE.

BY

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That micro-organisms can and do exist in the blood as in other tissues, during disease, is well known. It is, moreover, by no means a very recent nor unusual event to isolate such organisms from the blood either before or after death.

Literature dealing with the presence of bacteria in the blood is voluminous and I will make no effort to analyze it in any way. Let me point out that so long ago as 1885 Fraenkel and Simmonds, in Germany, and soon after Castellani, in Italy, isolated *B. typhosus* from the blood of a patient suffering from typhoid fever. Since then, and, indeed, before that time various workers in many countries have been successful in isolating many different organisms from the blood. Jochmann and Canon, Bertelsmann and Lenhartz, Lesieur and Busquet, and a host of other continental workers have published valuable articles upon technique and results. Of late years many bacteriologists in England and America have seriously taken up this examination as an aid to Clinical Medicine. Horder, Hecktoen, Libman and his associates, Duval and Lewis, are only a few of those who have put their results in print.

Notwithstanding, however, the work of these investigators and their results, the routine examination of the blood as a laboratory aid to clinical medicine, is, perhaps, not sufficiently made use of; or if it be attempted, is disappointing in its results.

When we consider the careful and painstaking manner in which pleuritic, ascitic, pericardiac and other body fluids are withdrawn for purposes of diagnosis, which, unfortunately, so often give negative results, and compare the proportional distress and discomfort of such removal with the safety and lack of distress or pain accompanying a well performed bedside blood culture, we are surprised at the apparent carelessness of the value of such examination. This attitude, I believe, is due largely to an incomplete appreciation on the part of the clinician, of the possibilities of such culture or ignorance of the simplicity of the methods. Perhaps, too, early trial with improper technique or a poorly selected class of cases has disappointed those who would use this aid to diagnosis.

It is essential, if the presence of bacteria in the blood is to be of diagnostic or prognostic value, that their presence be discovered and the nature of the organisms be differentiated. Evidently there is a large class of cases in which the question of micro-organisms is not thought of. There are also cases in which the near approach of an inevitable lethal termination withholds one from attempting such examination, merely for purposes of scientific interest, entailing as it does a small amount of disturbance and distress.

A proper selection of cases being made, namely, those cases in which the infective process is evident but the exact nature or extent is not understood, it is necessary that a technique be adopted which has proved itself of value.

During the past twenty years many methods of detection of bacteria in the blood have been suggested and adopted. Smears have been made in a manner similar to that made use of in searching for malarial and other parasites. In certain cases interesting results have been derived from such examination. McKenzie of Calcutta reported in 1905 a case of supposed sunstroke due to infection from a Gram positive coccus found in the blood in large numbers. The method of culture first adopted was that of carefully cleansing the lobe of the ear and, after pricking it, allowing a drop of blood to fall into the bouillon. Early the method of using a syringe became popular and the blood removed was defibrinated and inoculated in bouillon or agar. During the past few years various changes in the media, and appreciation of the needlessness of defibrination, have led to more constant results.

As some few, at least, of the details made use of by me are not described in the usual text books or monographs on technique, I will mention briefly, the method I am accustomed to employ. If fever be present, and rarely will organisms be isolated in afebrile conditions, the presence of bacteria will most easily be discovered during the periods of greatest elevation, or if in patients having chills, just before the maximum is reached. This appears only natural when we consider that in all probability, in these cases, the fever is merely a reaction induced by the presence of an invader, be it localized in a joint or gland or in the circulating blood.

The materials needed, in addition to culture media, which will be mentioned in some detail subsequently, are: a syringe made of glass having a capacity of 20 cc. to 30 cc., with a short rubber tube connecting the rigid needle with the rigid tube, thus facilitating the introduction of the former and allowing a certain amount of freedom of movement on the part of the patient; an alcohol lamp; materials for an ordinary surgical-wash-up, and a couple of sterile towels.

The media employed will vary with the suspected infection; in the event of such preconception being impossible a variety of media must be used. For general use when the pyogenic cocci are thought to be the exciting factor, six tubes holding about 15 cc. of fluid agar at 40° C., which has been prepared with 19 grams of agar to the litre and varying in acidity from .5 to 1.50 per cent., are used for the plating material. Several flasks of plain bouillon and litmus milk are also employed. A higher temperature than 41° C. for the agar will, in addition to injuring the organisms, cause serious injury to the blood agar as a culture medium. Glucose may be added to the agar and

bouillon with benefit. Litmus milk is of especial value in the growth of pneumococci.

When the question of *B. typhosus* is raised we have found results when using ox bile, modified after the manner of Coleman and Buxton, to be greatly superior to the methods of Castellani, Kühman and others using bouillon.

The formula of the medium as used by them is as follows:

Ox bile	90 parts
Glycerine.	10 parts
Peptone	2 parts

This liquid is placed in flasks 20 to 30 cc. in each and sterilized by intermittent sterilization.

As in the blood of patients suffering from bacterial invasion there are usually present anti-bodies of varying powers, it is important that the dilution of the blood be such that the proportion of the substances be so small as to become inert, otherwise they will kill, or at least interfere with the growth of the organism present. The potency of such properties in blood withdrawn from patients suffering from typhoid fever is still a matter of some dispute, my own results, however, would suggest that the bactericidal powers are definite and that if growth with ordinary methods is to be accomplished the dilution must be large. In a case examined but a few weeks ago one bouillon flask was inoculated with .5 cc. of blood to the 50 cc. in the flask, after the other media were inoculated I attempted to inoculate similarly a second bouillon flask, I found, however, that the blood had clotted and I was only successful in injecting one drop of blood which was on the needle. At the end of twelve hours the later flask was turbid with a growth of typhoid organisms, whereas the other which had received more blood was clear. Bile has the property of withholding clotting of the blood and of destroying the bactericidal properties. We are able to add as much as four or five cc. of blood to every 20 cc. of bile; and, as to a certain extent, our chance of finding the bacilli varies directly with the amount of blood examined the comparative value of this method is obvious.

My own results with this media have been very successful. I have used it in eight cases of suspected typhoid. In order to test its proportionate value I have used six agar seeded plates and two flasks of bouillon, each holding from 50 to 100 cc., in each case, as well as two or three flasks of bile. In these cases a growth of *B. typhosus* was obtained in bile five times, in bouillon twice, and in agar plates only once.

I have also undertaken a series of experiments with this medium making use of several strains of paratyphoid, dysentery, colon and various cocci. My results have shown me that this medium is admirably adapted for growth of the various Gram negative bacilli mentioned and for staphylococci, but not for streptococci nor pneumococci.

Procedure.—A vein at the bend of the elbow is usually chosen as the most favourable site. In stout individuals and children these veins may be used even though not visible. The surrounding area of skin is carefully washed up with soap and water, alcoholic bichloride 1-500 or other antiseptic solution. The operator similarly washed up grasps the patient's arm with his left hand in such a manner that his fingers and thumb meet about the bend of the elbow. An assistant compresses the vein above the elbow while another hyperextends the forearm. The exact site of the distended vein being noted, this spot is fixed by pressure with the finger and thumb while the right hand holding the needle with the opening directed upward plunges it into the steadied portion of the vein. The plunger of the syringe is now slowly withdrawn, and if the lumen has been reached, the blood will flow in. About 8 to 15 cc. are withdrawn.

As the sterilization of the syringe under pressure in an autoclave is detrimental, it is found better to only occasionally make use of this method and to rely on boiling in plain water as a routine measure.

The various tubes and flasks are now inoculated and here it must be constantly borne in mind, that it is better to have one or two organisms in such an environment that they can multiply than large numbers in unsatisfactory surroundings. As a rule, amounts varying from .2 to 1 cc. into each 15 cc. of agar is sufficient, and a similar quantity into each 50 cc. of bouillon or milk. As mentioned above, more may be placed in media containing bile.

The media must be vigorously shaken after inoculation in order to prevent clotting and to insure even distribution of blood. Great care must be taken in the inoculation of the tubes and flasks that neither the media nor the blood flow become contaminated. Again, in the pouring of the plates careful technique is necessary if the results are to be satisfactory—a plate uncontaminated with air organisms, and it is only by the continued absence of such contamination that the development of colonies in the media can be concluded definitely as having come from the blood. The main source of contamination is the outer surface of the tube which is placed under cover of the Petrie dish in pouring. This danger is overcome by carefully rolling the tube through the flame of an alcohol lamp for a distance of 3 or 4 cm. from its open end.

When searching for the gonococcus, meningococcus and other organisms which are known only to grow in surface colonies, several drops of blood are placed upon the surface of the hardened plate and subsequently surface seeded with a platinum needle.

The inoculated media are now placed in the incubator at 37° C. for a varying length of time. *B. typhosus*, *B. coli* and similar organisms if in a favourable medium will have become definitely demonstrable in 12 hours, whereas glanders and some gonococci will require 48 to 72 hours. Anaerobic cultures are best grown in a Novy jar or some similar method. As a rule, twenty-four hours is a favourable incubation period and if colonies are present they may be put through the various tests of staining and cultivation for their identification.

For the identification of typhoid, paratyphoid and other organisms in bile at the end of twelve hours the bile is planted in dextrose semi-solid, lactose, mannit, saccharose and dextrose litmus serum waters and on plain agar. By this means at the end of six or twelve hours more the identification of these organisms is complete. The agglutination test with immune serum may also be used, this is the method made use of by Coleman and Buxton, but I consider the former simpler and more rapid.

Almost all our ordinary pathogenic and pyogenic organisms have been isolated by one observer or another. We find in the literature many reports of *B. paratyphosus* and *B. pyocyanea*, *B. mallei*, *B. anthracis*, *B. mucosus capsulatis*, streptothrix and other more unusual infections. We have been successful in isolating many, either before or after death, in our routine work.

It is impossible in a paper of this length to review carefully all the different diseases which are commonly suggesting difficulty in diagnosis and in which the finding of specific organisms in the blood is of value. Typhoid fever and puerperal infections are, I think, of as great interest as any other, and if I may make mention of cases in detail I will only refer to these two conditions.

For a comprehensive arrangement of experience in general bacterial infections with pneumococci, streptococci, various staphylococci and gonococci, I would commend Libman's article in the *J. H. H. Bul.*, p. 184, 1906. Here, with a basis of about 700 blood cultures, he discusses fully several interesting conditions, especially acute endocarditis and bacteriæmia.

Typhoid fever is not always clear. The agglutination reaction as popularized by Widal usually does not occur till late in the disease, sometimes does not occur at all, and usually persists for a long time

after an attack. The organisms can in almost every case be isolated from the blood, so long as a definite fever continues, as a matter of fact more easily early than late. The presence of the organisms is absolutely undoubted evidence as to the cause. In this way, too, in the case of paracolon or paratyphoid infections the long and laborious course of multiple agglutinations is obviated.

During the past six months I have undertaken 33 bacteriological examinations of the blood of patients in the wards of the Montreal General Hospital. Only in those cases in which there was a reasonable hope that such examination might be of value, has it been attempted. In 13 cases bacteria were recovered. Table 1 describes the cases examined and the positive results with the nature of the organisms isolated.

TABLE 1.

NATURE OF CASES.	Number of cases	Num. of organisms	B. Typhonus	Streptococcus	Pneumococcus	Staphylococcus aureus
Suspected Typhoid.....	14	7	6	1	—	—
Suspected puerperal septicæmia	6	3	1	1	1	—
Acute C. S. meningitis.....	3	0	—	—	—	—
Acute lobar pneumonia.....	2	2	—	—	2	—
Acute endocarditis.....	4	0	—	—	—	—
Fractures osteomyelitis, etc....	4	6	—	—	—	—

*Both ultimately fatal.

In suspected typhoid cases the cultures were usually undertaken early in the disease before the Widal reaction appeared. Out of twelve cases six gave *B. typhosus* and one *Streptococcus pyogenes*, thus altering the diagnosis. Two cases in which the organisms were not found were undoubtedly due to faulty technique, the proper media not being at hand. Two examinations were attempted after the fever had disappeared and were negative. One case later came to autopsy and proved not to be one of typhoid fever, nor apparently to have any septicæmia whatever. The remaining two cases never showed the agglutination reaction, ran short courses and were probably influenzal in origin.

In June, 1907, Coleman and Buxton reviewed and analyzed the literature dealing with the presence of *B. typhosus* in the blood of those suffering from typhoid fever. They report 123 of their own cases, and 1,602 from literature; 75 per cent. of 1,602 cases gave positive results. Many observers got results in 100 per cent. of cases, they too have had like results in 34 cases in which bile was used. They found that the ease with which the bacillus is isolated varies with the time in the disease. During the first week these investigators found them in 89 per cent. of the 1,602 cases. During the succeeding weeks they became

fewer in number till in the fourth week only 34 per cent. gave positive results. Only one observer claims to have isolated the organisms after fever had disappeared.

In 1904 Perquis, basing his conclusions upon his own experiments and the work of Castellani, Courmont, Lesieur, Hewlett and others, states that the organisms are almost always present in the blood in the early stages of typhoid fever and that the number of organisms bears no relationship to the agglutinative power of the blood. Perquis made use of the method of high dilutions in bouillon, claiming that the proportion of positive results varied with the dilution.

The three following cases representing cases showing difficulty of diagnosis in two, and a form of septicæmia, not usually reported in the third, occurred in my series.

Case I.—Mrs. C. G., aged 33, February 20, 1907. Patient sent to Montreal General Hospital ten days post partum. For six days she had high fever continuous in type. Cough before confinement. Temperature 103, pulse 112, regular and dicrotic. Tongue dry and brownish. Spleen easily palpable. No rose spots; white count 5,000. She was admitted to the medical wards under a provisional diagnosis of typhoid fever. A blood culture was at once taken, with the result that within eighteen hours a definite diagnosis was made of streptococcus septicæmia. Patient ran a septic course and developed arthritis of the knee. A blood culture on the 14th March showed streptococci still present in large numbers. A third culture on the 20th April showed organisms absent. Patient has since slowly progressed. This case, apart from the evident diagnostic value of the blood examination presents the commensal relationship between the host and parasite first suggested by Theobald Smith, whereby the latter may persist in spite of the gain in health of the patient.

Case II.—Mrs. T. B., aged 22. Patient admitted four days after a four months abortion under most trying circumstances. Complaints: fever, headache, slight chilliness, some abdominal pain, especially in the lower quadrants; pulse 124, temperature 104. No vomiting, no diarrhœa, no chills, no cough. No rose spots, spleen not palpable, no Widal, no Ehrlich, scant vaginal discharge, uterus enlarged and tender. The patient was curetted and a blood examination made. The result was the isolation of *B. typhosus* and the transfer of the patient to the medical wards.

Case three, though probably not uncommon, is rarely noted, due largely to the difficulty of differentiating the organism.

Case III.—Mrs. A. G., aged 35. Patient admitted three days after onset of symptoms of pelvic disturbance following the attempt to induce

abortion at six weeks by means of a piece of slippery elm bark. Upon admission every evidence of profound toxæmia and pelvic peritonitis. Uterus enlarged and tender, muco-purulent discharge giving a growth of pneumococci producing 2.2 per cent. acid in Inulin from .9 per cent. A blood culture gave practically this same organism producing 2.1 per cent. of acid. Death on the third day. Autopsy showed pneumococcus septicæmia, general peritonitis, septic endometritis, etc., no pulmonary lesion.

In searching for meningococci and gonococci my results have not been surprising. The organisms are occasionally found but their growth is unusual. Osteomyelitis and cases of multiple abscesses or so-called pyæmia, which by their very nature suggest a blood infection, are cases in which it is apparently difficult to detect the infecting organism. In these cases it is only by careful technique and repeated effort that they can be cleared up. In this class of cases, especially examination immediately before the moment of maximum temperature, is imperative if positive results are to be obtained.

Since June, 1906, careful and routine bacteriological examination of the blood from the heart and internal organs of practically all bodies coming to autopsy in the Montreal General Hospital within twenty-four hours of death, has been made. In this way up to August 1, 1907, 168 cases were examined and organisms isolated in 53. Those cases in which *B. coli* or other saprophytic organisms were found in the internal organs but not in the heart's blood are not recorded here.

Of the 168 cases examined, cases such as cardio-renal conditions, tumours, cerebral conditions and tuberculosis comprised 97. Of these only 7 gave positive results, these being mainly streptococci in tuberculous conditions and *B. coli*.

Table 2 roughly classifies the other 77 cases, in which organisms were isolated forty-six times, or in 60 per cent.

TABLE 2.

General peritonitis	14	6	43
Acute C. S. meningitis	13	1	7.5
Acute lobar pneumonia	10	9	90
Typhoid fever	7	7	100
Multiple abscesses	5	5	100
Post partum infections	3	3	100
Appendicitis, mastoiditis, etc.	9	3	33 1-3
Pyogenic infections, bones and soft tissues	13	11	84
Malignant endocarditis	2	1	50
	77	46	60

If cases of cerebro-spinal meningitis be excluded we have 64 cases with 45 organisms, or 70 per cent.

Table 3 gives the organisms found in the 46 positive cases:—

TABLE 3.

Streptococcus	14	In one case of Ac. lobar pneumonia. In puerperal cases and local infections.
Pneumococcus	9	Eight cases of pneumonia; one case of puerperal fever.
B. typhosus	7	In all cases of typhoid fever.
B. Coli	4	In two cases of general peritonitis. In two cases of pyæmia.
Staphylococcus aureus	4	} In cases of so-called pyæmia.
" albus	4	
" citreus	1	
Gonococcus	1	In a case of acute endocarditis isolated from heart valve.
Meningococcus	1	
B. Aerogenes capsulatus.....	1	In a case of puerperal infection.

Since the preparation of this table I have isolated the pneumo bacillus of Friedlander from the blood of a patient dying with broncho-pneumonia.

I leave the results, as far as they go, to speak for themselves. Let me, however, point how, perhaps they may suggest that the knowledge of the presence of micro-organisms in the blood may be of definite prognostic as well as diagnostic value. In the first place the fact that these organisms have been isolated in such a large proportion—70 per cent.—of cases in which bacteria evidently were an important factor in the production of disease and in so few cases in which these agents were not considered instrumental in bringing about a fatal termination, although in both these series of cases alike, the intestinal canal was the habitat of innumerable streptococci and B. coli, suggests that their presence is of necessity rather than accident.

The results of the cases of typhoid fever corroborate statements made above concerning the almost general presence of the bacillus in the blood in this condition. Much discrepancy exists between the results obtained by continental writers and investigators in America regarding the presence of organisms in the blood of patients suffering from acute lobar pneumonia; the former claiming positive results in from 80 to 100 per cent. of cases, the latter, as a rule, being unable to isolate bacteria in more than 22 to 40 per cent. Ewing in 348 cases isolated pneumococci in 160 cases, of which 64 were fatal, whereas Procaska claims to have found them in all of fifty cases. Roscnow in 77 cases out of 83 cases. Pearce even at autopsy found the organism in only half of 118 cases. We find, as a rule, however, that investigators assert that cases which progress to a fatal termination show a bacteriæmia. I have not given any special attention to this disease, but my

results both before and after death, support the view that fatal cases at least, show organisms in the circulatory blood. The results in cases of multiple abscesses calls for greater care in technique if we are to be successful in cultivating the organisms in cases in which the symptoms suggest their presence.

The presence of micro-organisms especially the streptococcus pyogenes in the blood in 84 per cent. of cases in which clinically the cases were cellulitis of various parts, erysipelas, osteomyelitis and infected compound fractures, insinuates that the knowledge of such presence during life would very definitely point to a grave prognosis, and if our technique could be depended upon, the continued failure to isolate organisms would similarly favour the prognosis. Practically the same statements refer to the conditions of puerperal infection although we must bear in mind that some cases do recover even when the virulent streptococcus is in the blood. Tenkhart reports 12 cases out of 190 examined with 8 deaths. Gonnet with a large number of cases reports streptococcus in six, all of which were fatal. Indeed, we have reports of almost every infecting organism being found in the blood of cases which ultimately recovered. Even septicaemia with *B. anthracis* may not be fatal, as in the case reported by Duval and Lewis in 1905.

Let me close this desultory discussion of a large subject by a few conclusions.

1. The isolation of organisms from the blood though simple demands careful technique and proper media.
2. In all cases of indefinite diagnosis in infective diseases blood cultures should be attempted.
3. Blood cultures, though somewhat more complicated than serum reactions, are more definite, and are positive at an earlier date.
4. In many diseases the presence and persistence of bacteria in the blood is of definite prognostic value.

THE IRRITABLE HEART.

BY

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In the pathology of the heart structural changes have not received too much attention in the past, but disturbances of function have been too often disregarded. We know now with reasonable certainty that the heart muscle possesses the various properties of stimulus production, excitability, conductivity, contractility and tonicity. The diagnosis of

a cardiac disorder is scarcely complete until we have considered whether or not each of these properties is normal.

A recognition of structural alteration is of value in proportion as it enables us to estimate the ability of the heart to perform its functions. A valvular lesion is important because it may lead through fatigue to loss of tonicity and ultimately to failure of contractility.

A degeneration of the myocardium is to be considered in its effects on these and other properties of the heart muscle.

Of the properties which characterize heart muscle stimulus production and excitability are so related to each other that they cannot always be separated. If the heart is beating too frequently we cannot always say whether the excitability or the stimulus production is the property which is increased above the normal. In speaking of the irritable heart therefore, we must for the present include not only cases in which the excitability of the heart is too great, but also those in which the heart is being too powerfully stimulated.

The signs and symptoms which are more or less characteristic of the irritable heart, are palpitation, consciousness of the heart's action, frequency or increased amplitude of the heart beat, diffuse apex beat, epigastric pulsation and dilatation the result of fatigue.

In cases where several of the above mentioned symptoms and signs are present, the possible causes should be enquired into. They may all, I think, be included under three heads:

1. Causes acting mechanically to increase the work of the heart, such as, distended stomach, lifting heavy weights, athletic overstrain.

2. Causes which impair the nutrition of the heart, such as, anæmia, too rapid growth, the debility following exhausting fevers.

3. Causes which affect the heart through the nerve paths controlling its rhythm and excitability, or, to use modern phraseology, the chronotropic and bathmotropic nerves. Such causes are, powerful emotions, tobacco poisoning, and abnormalities of the thyroid glands.

The generalizations I propose to make in this paper will be based on a consideration of about forty cases, of which I have in my possession written notes, and as many more which I have seen and examined but have not recorded on paper. Only a few cases, however, can be reported individually on account of space.

During the winter of 1900-1901 I examined candidates for the gymnasium of the city Young Men's Christian Association. The first evening ten candidates presented themselves, of which three showed disorders or abnormalities of the heart, illustrating some of the causes referred to above.

Case I.—A young man who had played hockey for six winters. Apex beat very pronounced; heart dulness to beyond nipple line. Pulse 60. No cause could be discovered for the enlargement of the heart except the excitement and strain attending the game of hockey.

Case II.—Had an attack of typhoid fever the preceding summer; did some hard bicycle riding soon after. The heart lifted a large area of the chest with each beat; dulness was increased, from 1 in. to right of mid-sternal line to nipple line; pulmonary second accentuated. Pulse 85 sitting, 110 standing. The typhoid fever and the hard bicycle riding probably both contributed to the production of his enlarged heart and frequent pulse.

Case III.—Aged 20; height 6 ft. 2 in.; pulse 72. Heart enlarged to nipple line. No cause could be elicited unless it was due to the weakness resulting from too rapid growth.

The following case from private practice seems to have resulted from over-exertion:

Case IV.—Married man, aged 30. Had not felt well since nine months before when he rode seventy miles in one day on a bicycle. He was not in proper training, as he had not ridden at all for a year previously. The fact that he smoked rather much may have had some bearing on the case also. His pulse on two examinations was found to be 100 and 120 per minute. Apex beat diffuse; heart dulness slightly enlarged. In two weeks his pulse came down to 72 and his apex beat and heart dulness became normal. The only treatment was abstinence from tobacco and a mixture containing ammonium bromide and digitalis.

The next case represents a more advanced stage of the so-called athletic heart.

Case V.—Man of 45, unmarried: first seen October 21st, 1900, in the evening. He was sitting up in bed with marked dyspnoea and complained of pain in the epigastrium; he had had similar attacks before but not so severe. He ascribed the present one to fatigue from walking too far during the day. He had been a heavy smoker till a month before when he had given it up; he had felt worse since. He had had rheumatic pains at times, but no definite attack of rheumatic fever. He had been one of the best known local athletes in his youth, his greatest forte being snowshoe racing. His pulse was fluttering, irregular and uncountable. The heart beat could be distinctly seen through the night shirt; apex beat visible and palpable over a large area. Heart estimated to be beating considerably over 150 per minute, but the beat was too frequent to count. Slight oedema of the lower extremities. The more alarming symptoms passed off with a night's rest and the hypodermic injection of 1-50th gr. of atropine.

The next day the following notes were taken: "Feels fairly easy. Arteries sclerosed. Pulse 108, very irregular. Heart dulness vertical from the middle of the 4th rib, transverse six inches from $\frac{1}{2}$ inch outside right sternal border to 1 inch beyond nipple line. Heart sounds sharp in quality; an occasional rough murmur heard."

In a few days he improved sufficiently to get about. Seven months later the transverse dulness was $5\frac{1}{2}$ inches; heart rhythm irregular, rate 108 per minute. Only 65 or 70 beats could be felt at the wrist, the others being too weak to be felt. A year later his heart dulness was sometimes about normal but varied in a very remarkable way from $2\frac{1}{2}$ to $4\frac{1}{2}$ inches, according to the state of fatigue. Heart beat forcible and extensive; no murmurs. Pulse when quiet 75, irregular. He was kept on moderate doses of digitalis, about half an ounce of the infusion a day, for a long time, and required medical attention less and less. His urine was examined at various times and found normal. One note of his urine read: "Clear, acid, 1016, no albumin, no sugar." I have not seen him lately, but hear that he is getting along very well and attending to business. If his heart gets troublesome he takes digitalis or suprarenal extract. It is now about seven years since I first saw him.

I fancy we have here to do with a heart injured by athletic and, perhaps, other excesses. One of his sisters has sclerosed arteries and a moderate degree of cardiac hypertrophy. He probably had similar tendencies which made his heart unable to stand the strain put upon it by his numerous hardly contested races.

Among the most interesting examples of irritable heart are those that declare themselves under the influence of abnormalities of nervous control. The case which made the most lasting impression on my mind as an example of the emotional heart, and which first directed my thoughts to the questions discussed in this paper, is unfortunately one of which I have only a page or two of imperfect notes, although I had her under observation for some years.

Case VI.—Unmarried woman, about 33 years of age, first seen in October, 1905. Complained of swelling of feet and palpitation of heart. Heart first became troublesome after death of mother a couple of years before. Patient grieved deeply and long for her mother and was also much troubled over other family matters. She seemed to possess an unusual capacity for mental anguish. Pulse 80, of small volume. Apex beat exaggerated and a little outside nipple line. No murmurs. Moderate oedema of feet. During the few years succeeding my first visit she continued to worry and grieve over her mother and also over her estrangement from her only brother. She frequently had a feeling

of a lump in her throat and suffered with palpitation of the heart. In the summer she was troubled with burning of the feet. Her condition changed very little and her symptoms did not improve. About six years after I first saw her I was summoned to her house one day and found her unconscious, pulse scarcely palpable, heart sounds very feeble. She did not respond to stimulation and died in a few hours without regaining consciousness. There was no post mortem, so the exact cause of death must remain a mystery. Whatever other causes were at work, however, I felt convinced that the emotional strain had played a prominent part.

Case VII.—A young woman came complaining of numbness in the feet and legs lasting about a year. Symptoms corresponded in time with a period of great mental distress. Patient said she had a trembling feeling in the chest and noticed her heart thumping, especially when lying on left side. Frequent micturition; pulse 108; heart enlarged outwards about two inches; beat weak and rapid.

Case VIII.—Widow, aged 72, complains of dyspnoea in early morning. Has always been emotional; heart easily excited. Has been much upset lately by marriage of daughter and family disagreements. Pulse 144. Heart greatly enlarged; transverse dulness 7 inches. Right ventricle enlarged, as shown by retraction of large area with each systole. Apex beat can be felt, not at lower border of heart, but considerably higher up. No abnormal sounds. Under rest in bed, digitalis and adrenalin, the pulse came down to 70 and the heart dulness nearly to normal in a few weeks.

Case IX.—Medical student, aged 21; family and financial worry for several years. Moderate smoker. No history of over-exertion. Suffers with palpitation, especially in evening; feels heart beating rapidly at night. Digestion good. Pulse regular, low pressure, 105 per min. Patient says he feels his heart drop a beat sometimes. Apex beat diffuse. Heart slightly enlarged; transverse dulness left of sternum to $\frac{1}{2}$ inch inside nipple. Sounds sharp and distinct; pulmonary second exaggerated. Ordered ammonium bromide and digitalis. In two weeks pulse was down to 70 and symptoms were relieved.

In the next case tobacco poisoning seemed the essential cause of the disorder, and in the two succeeding ones it probably played a part.

Case X.—Cabman, aged 30; complained of indigestion; feeling of distension; weak and smothering feelings; palpitation of heart; constipation; frequent micturition. Indigestion had been present for two years. Patient admitted heavy smoking and chewing. Pulse 109, full and hard. Apex beat not pronounced, but epigastric pulsation very

marked. Heart dulness mid-sternum to nipple line; sounds sharp; no murmurs. No dilatation of stomach detected on palpation or percussion. Urine 1005, no albumin or sugar. Ordered 15 minims of laudanum three times daily. A week later the pulse was down from 109 to 75 and the heart dulness was diminished nearly to normal. Very little tobacco had been consumed in the interval. Laudanum discontinued and ammonium bromide and digitalis ordered. Two months later the pulse was 80 and the heart normal in size.

Case XI.—Unmarried man of 28; clerk in china store. Nervous; uneasy feeling about heart since a mental shock ten days before. Has always been muscular and has at times done heavy lifting in connexion with work. Anæmic, costive, a heavy smoker at times. Appetite usually good, but has suffered lately with indigestion. Teeth good; no history of rheumatism. Has had scarlatina. Pulse 85. Apex beat diffuse; dulness to nipple line sounds normal. Ammonium bromide and digitalis. Three weeks later the pulse was 72 and the heart normal. Five months later smoking to excess. Pulse 76, apex beat exaggerated as before, but heart dulness normal. Ordered Fowler's solution, potassium iodide and digitalis. A month later pulse 85; apex beat not visible; dulness normal.

Case XII.—Young man of 19; complains of heavy feeling about heart for about nine months, worse lately. No history of rheumatism or mental distress. Has done some hard bicycling. Smokes a good deal; began smoking cigarettes when 12 or 13, now smokes a pipe, averages 4 or 5 pipefuls of Old Chum daily. Complains of shortness of breath and has the gasping respirations characteristic of tobacco poisoning. Feels as if there was an obstruction to his breathing. Pulse 84 per minute and full in quality. Apex beat not visible but well marked on palpation in nipple line showing some cardiac enlargement; vertical dulness from upper border of sixth rib, transverse from $\frac{1}{2}$ inch to right of sternal border to nipple line. Sounds sharp; no murmurs. Blood pressure 118 to 125 on different estimations. Ordered ammonium bromide and digitalis. In two weeks he was seen for the second and last time and his condition was about the same, there was certainly no definite improvement.

The next few cases illustrate the association of irritable heart with enlarged thyroid.

Case XIII.—Young woman of 24, unmarried; complains of a swelling in neck which has been noticed for about a year. Thyroid found moderately enlarged, especially the right lobe. No tremors or exophthalmos; no history of fright. Heart often palpitates, especially for

past six months. Menstrual flow has diminished recently from four days to two days. The thyroid enlargement is thought to be more noticeable at these times. Hands and feet are sometimes felt to be swollen at time of periods; finger nails sometimes turn blue and extremities get cold. Patient complains of feeling nervous; mother and sister have both had enlarged thyroids. Patient noticed nervousness and palpitation of heart before swelling in neck. Heart beat is so pronounced that it may be distinctly seen and felt through underflannel. Heart not noticeably enlarged; no murmurs; pulmonary second exaggerated.

Two years later; patient married and pregnant about six months. Apex beat exaggerated; heart dulness increased outwards about two inches; no murmurs; pulmonary second exaggerated. She was confined in due time in a country town and I was told she made an excellent recovery from her puerperium.

Case XIV.—Young man of 24; has had several weeks of severe financial worry; feeling weak and short of breath for about three weeks; occasional headaches; bowels costive. Pulse 96; heart slightly enlarged. Heart beat visible and shows systolic retraction of precordium one inch outside outer limit of dulness. Heart sounds clear; pulmonary second exaggerated; no murmurs. Vessels of neck show undue throbbing. Both lobes of thyroid moderately enlarged.

Case XV.—Young woman of 21, unmarried; complains of burning pains in feet, palpitation of heart, swelling of neck. History of worry about love affair, commencing a little before symptoms complained of and continuing up to present. Feels nervous; pulse 132; no tremor, exophthalmos, or von Grafe. Apex beat exaggerated, heart dulness normal; no epigastric pulsation; thyroid gland moderately enlarged. Prescribed medicine which patient did not take, but shortly afterwards a reconciliation took place between her and her lover and the symptoms soon began to subside. Two months later, however, the thyroid was still a little enlarged and her pulse was 96, but the subjective symptoms were gone.

A critical review recently published by Cheinisse¹ in *La Semaine Médicale*, deals with some of the problems under discussion. He draws attention to the fact that there has recently been a three-fold increase in the number of candidates for the Swiss Army rejected on account of heart affections. This fact has been ascribed to the wave of athleticism which has spread over Continental countries in recent years. He quotes a number of authors who have pointed out the deleterious effects on the heart of injudicious indulgence in athletics during the period of

growth. He considers it well established that excessive muscular work can produce chronic affections of the heart, but believes that the possibility of acute dilatation of the heart being produced in this way is open to question. He quotes authorities for and against. Those who have used the old methods of inspection and percussion as criteria, believe that acute dilatation may be brought about by physical strain, but the majority of those who have made use of X-Rays to determine the size of the heart will not admit that this is the case. The author of the review seems to favour the conclusions of the latter group, but to the present writer their subjects seem to have been poorly chosen, being trained athletes in whom the heart would naturally be able to adapt itself to sudden strain. Moreover, the use of the X-Rays itself may not be as free from practical fallacies as it is sound theoretically.

In any case the reviewer tells us that there is no reasonable doubt as to emotional causes being able to bring about acute dilatation. One case is given of a young man in whom acute heart symptoms with dilatation were caused on several separate occasions when he attempted to fight a student's duel. Two cases are given of acute dilatation of the heart among those who had to witness the horrors of the recent massacres of Jews at Odessa. In all these cases the dilatation was of short duration, lasting only a few hours.

A valuable storehouse of suggestion on the subject of emotional disturbances of the heart is to be found in one of our great English classics, Burton's "Anatomy of Melancholy." He describes the symptoms, for instance, of "Maids', Nuns' and Widows' Melancholy," as follows: "The most ordinary symptoms be these, pulsatio juxta dorsum, a beating about the back which is almost perpetual, the skin is many times rough, squalid, especially as Arctæus observes, about the arms, knees and knuckles. The midriff and heartstrings do burn and beat fearfully and when this vapour or fume is stirred flieth upward, the heart itself beats, is sore grieved and faints. . . . They complain, many times, says Mercatus, of a great pain in their heads, about their hearts and hypochondries, and so likewise in their breasts, which are often sore." Among the cures of this complaint Burton recommends: "Sparing diet, plebotomy and physic, but the best and surest remedy of all is to see them well placed and married to good husbands in due time."²

I can recall at least one case in my own practice where enforced continence in a married woman seemed to be the chief cause of severe palpitation, and I heard later that the continence and the palpitation came to an end about the same time.

A recognition of the cause of an irritable heart may usually be attained after a careful consideration of the history, the habits, the physical signs and the symptoms. The athletic proclivities of the individual must be carefully enquired into. Cardiac pain and flatulence should excite suspicion of tobacco poisoning, although the cause will frequently be found to be unsound teeth. The presence of sighing or gasping respiration in a man is almost pathognomonic of tobacco poisoning, as pointed out by the writer elsewhere.³ This is especially true if there be a subjective complaint that the air cannot be drawn into the chest. A history of emotional shock and enlargement of the thyroid gland are frequently found together. It is sometimes difficult to decide which is the primary cause and which secondary. An interesting point I have noticed in cases of enlarged thyroid is that in the jugular pulse the systolic wave is usually higher than normal, rising above the auricular wave. I fancy this is to be explained by the arterial pulse being transmitted through the dilated capillaries of the gland to the veins.

With regard to treatment it is of first importance to remove the cause whatever it may be, if it can be determined. Rest to the heart is desirable, and to attain this we may have to order physical rest, or we may have to devise some plan for promoting mental and emotional rest, which is not so easy. Of direct medication I have had excellent results in the athletic heart from ammonium bromide and digitalis. In the tobacco heart I have been led by theoretical considerations to employ preparations of opium, and I think I have seen decided benefit result. I have used both laudanum and codeine for this purpose, but for obvious reasons these drugs must only be used after due consideration and must not be continued too long, especially the former. In the emotional and thyroid hearts I have had the best results in relieving symptoms from thyroid gland tablets. The administration of iodothyryn is said by Cyon⁴ to slow the heart and lower the blood pressure. Numerous authors claim to have seen benefit from it in certain forms of goitre, although in other forms it seems to do harm. The best way is to try it carefully and observe the effect. I have been much impressed by the testimony of patients that it has a marvellous effect in calming their nervous feelings. In some cases I have seen the heart improve during its administration, and in some cases I have been disappointed.

To slow the heart and improve its tone in these cases I have used both digitalis and suprarenal tablets. I have seen some excellent results from suprarenals and also some failures. My personal conviction

is that we have not yet learned the proper dose of suprarenal by the mouth. I fancy an effective dose will be found to be twelve or fifteen two-grain tablets a day or a couple of drams of the 1.1000 solution of the active principle. If the administration be hypodermic 10 minims of the 1.1000 solution every two hours is probably about the maximum dosage.

These cases of irritable heart offer many interesting questions for consideration and in some cases for experiment. Can we have a diffuse apex beat without dilatation of the heart? How are we to explain its presence when the heart dulness is not increased? What is the meaning of epigastric pulsation? Can we always distinguish that due to the right ventricle from that due to the abdominal aorta by systolic retraction in the former case? Why do we sometimes get systolic retraction of the precordium without epigastric pulsation? What is the meaning of marked throbbing in the neck without corresponding fulness of the radial pulse? Does it indicate dilatation of special vascular areas in the neck, perhaps the vessels of the thyroid gland? Is not the pulsation observed in the neck venous more frequently than is usually supposed? Where the neck has been throbbing violently and I have taken a tracing I have sometimes obtained the tracing characteristic of the venous pulse when I expected it to be arterial.

Many of these questions I must leave unanswered from lack of a sufficiency of observations to settle them to my satisfaction. I shall be grateful for any light that may be thrown upon them and on some future occasion I may return to some of them again.

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HYPERTROPHY OF THE PROSTATE.—SUPRAPUBIC PROSTATECTOMY, WITH REPORT OF A CASE.

BY

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In order to appreciate the details of an operation for removal of an hypertrophied prostate by enucleation it is necessary to be familiar with the anatomical structures immediately concerned in it and their rela-

* Read before the Hants-Colchester Counties Medical Societies at a meeting in Windsor, N.S., on 20th August, 1907.

tions. You will therefore pardon me if I briefly review these, before taking up the subject proper of my paper.

The prostatic gland is situated at the neck of the bladder. It has above it the symphysis and it rests on the rectum in front of the second and third segments of that viscus. In front of it is the triangular ligaments against which its apex rests: its base is directed upwards and backwards towards the bladder. In shape it resembles a horse chestnut and measures $1\frac{1}{2}$ inches across its widest part; $1\frac{1}{4}$ inches from before backwards, and $\frac{3}{4}$ inch in thickness.

Text books on anatomy teach us that it is a single organ with the urethra traversing it from behind forwards. Embryologists tell us that until the fourth month of foetal life the gland is formed of two distinct organs, and that at this period the two separate masses become agglutinated, except in the region of the urethra which it embraces; and that these two sections, although welded together, remain functionally separate and distinct in after life. Each mass has its gland ducts—12 or 20 in number—which discharge into the urethra on either side of the verumontanum. In function the two sections are as separate and distinct as are the two testes. In operating by the suprapubic route advantage is taken of these anatomical conditions by removing each section separately, so as to preserve the prostatic urethra uninjured and avoid subsequent stricture. It is very desirable that this part of the canal should be maintained intact if at all possible, although Moynihan of Leeds, and Freyer of London, remove the prostatic urethra without hesitation and no serious results follow.

The ejaculatory ducts should also receive attention. Their destruction may lead to impotence. They enter the two lateral masses from behind in their course to the urethra, where they end. These ducts should be preserved uninjured if at all possible, and so lessen the likelihood of the production of impotence.

The gland itself is formed histologically of glandular substance and a stroma of muscular (unstripped) and fibrous tissues. The glandular element is composed of follicular pouches and ducts. The enlarged prostate has two distinct capsules, viz. (1) inner or true capsule, (2) an outer or external capsule or sheath. The inner capsule or sheath is composed of unstripped muscular tissues intermingled with some fibrous tissues, this sheath sends numerous processes into the substance of the gland, which connect with a central collection of unstripped muscle which surrounds the urethra. The inner sheath is therefore firmly adherent to the substance proper of the gland. The external capsule is formed of the recto-vesical fascia. It does not cover the gland above.

These two capsules are held together loosely by a few bands of fibrous connective tissue. Imbedded in this loose tissue is the vesico-prostatic plexus of veins which sometimes gives rise to troublesome bleeding. There is therefore a line of cleavage between these two sheaths, and advantage is taken of this anatomical condition in the operation for complete enucleation of the gland.

An orange constitutes a rough illustration of the structure of the prostate, if we are to suppose that the edible part of the orange is formed of two vertical sections joined in the middle line. The strong fibrous tissue which joins and holds the two segments of the orange together, and which is closely connected with the pulp, represents the true capsule of the hypertrophied prostate, the two segments of the orange being represented by the two lobes. The rind of the orange represents the outer capsule known as the recto-vesical fascia.

In enlargement of the gland confined to the lateral lobes it is plain from these anatomical conditions that each lobe may be removed separately without inflicting any serious injury on the prostatic urethra. The enucleating finger may be inserted on either side of the urethra and shell the hypertrophied lobes out of their beds. When the outgrowth is in the centre of the organ the urethra is likely to be torn in the operation.

The condition known as "hypertrophy of the prostate" is incidental to old age. It is rarely met with under the age of 55, and it is said that 33 per cent. of the men who arrive at that age suffer from it, although in only 5 per cent. of cases it gives rise to any serious inconvenience.

The gland increases in size in the direction of least resistance, and that is upwards and backwards into the bladder. The external capsule is absent here. The tumour does not grow downwards and forwards to any appreciable extent because of the resistance offered by the external capsule and the triangular ligament. The effect of this upward tendency of the growth is to raise the internal meatus of the urethra on a level above the base of the bladder, and form a sac or pouch in that viscus behind the prostate, in which "residual urine" is retained. The amount of "residual urine" will depend on the size of the pouch. The prostatic urethra is at the same time greatly elongated and rendered very tortuous.

Type of tumours.—There are three types of tumours recognizable. (1) The large, soft prostate, (2) the small, hard prostate, and (3) the mixed variety. The type present depends upon which tissue is in excess. When the glandular elements predominate the growth is of

the large, soft variety, and when fibrous tissues are largely in excess, it is of the small, hard type. The enlarged, soft prostate is the one most favourable for prostatectomy, and the small, hard one the least. The reason of this is the line of cleavage between the two capsules is well defined and loose in the former, and hence the growth is easily shelled out from its bed, while in the latter the cleavage line is ill formed and the capsules are glued tightly together, so that enucleation is both dangerous and difficult.

Shape of tumour.—The gland may enlarge uniformly, or the growth may be limited to one of the lateral lobes, or the lateral lobes may be affected but very little, the enlargement being confined chiefly to the so-called middle lobe, which is merely an outgrowth from the centre of the prostate. Then again, there may be irregular outgrowths from the lobes.

The external capsule (recto-vesical fascia) does not meet above the gland and hence the tumour grows upwards in the space left between the reflections of this fascia, and insinuates itself between the vesical sphincter and the internal meatus of the urethra, and pushes aside the muscular fibres of the bladder, and produces a certain amount of atrophy of them, so that nothing is left to cover the outgrowth at this point except the mucous membrane of the bladder. In removing a prostatic tumour by the suprapubic route advantage is taken of these pathological conditions, as will be seen by the description of the operation.

Causation.—This is unknown, as in the case of other tumours. French surgeons hold that the condition is a local manifestation of a general or constitutional affection, which begins with a general arterial sclerosis, in which all the genito-urinary organs share. The result is a fibroid degeneration of the prostate (Guyon). This is very improbable.

Other eminent surgeons claim that it is inflammatory in origin and is always secondary to, and results from, posterior urethritis (Hunter, Virchow). It may be urged against this theory that the disease develops when the sexual function is on the wane and at a period when posterior urethritis is less likely to be present.

Then again, some surgeons maintain that these tumours are similar to uterine fibroids, and that both occur when sexual activity is on the wane (Virchow, Thompson, White). It is urged in support of this view that the utricle of the prostate is the analogue of the uterus; that in structure the prostate and uterus are alike; that there is a great similarity in structure, position, and mode of growth between the fibromyomata of the uterus and the hypertrophied prostate, and that the disease occurs in both cases when sexual function is on the wane.

In opposition to these views it is contended that the utricule, which is the analogue of the uterus, does not take any part in the prostatic growth, and that uterine tumours begin as fibro-myomata, whereas prostatic tumours originate as adenomata.

It is now generally admitted that the so-called "senile hypertrophy of the prostate" is chiefly if not wholly adenomatous in character.

The effect of enlargement of the prostate is obstructive dysuria. The amount of impediment to the flow of urine depends to some extent on the part of the gland involved, but it chiefly depends on the size of the tumour. In an outgrowth from the centre of the gland the amount of obstruction may be very serious, even when the lateral lobes are not markedly enlarged and when no very serious enlargement of the gland can be determined per rectum. The symptoms due to hypertrophy of the prostate are familiar to you all, and the pathological changes to which it gives rise in the bladder, ureters and kidneys are similar to those resulting from organic stricture of the urethra. They are cystitis, hypertrophy of bladder, distention of the bladder with atony, ureteritis with hypertrophy and distention of this canal, hydronephrosis, pyonephrosis and pyelonephritis.

The complications to be feared after prostatectomy, apart from septic infection are, stricture, orchitis and epididymitis, impotence, incontinence, and fistulæ—suprapubic, perineal and recto-urethral.

Stricture.—In the operation of prostatectomy a portion of the prostatic urethra is generally torn away and a scar forms in healing, and this scar may subsequently contract and give rise to an organic stricture. However, a stricture rarely follows if due care is exercised in the performance of the operation, and in conducting the after-treatment of the case. It is not a very common complication. This has been the experience of Moynihan of Leeds, and Freyer of London.

Epididymitis and Orchitis.—This occurs sometimes from infection transmitted from the prostatic site. The passing of a sound after removal of the drainage tube may bring on an attack. It is usually slight in degree, although in a few instances it has ended in the formation of an abscess.

Fistulæ.—These are not of frequent occurrence, especially the perineal and suprapubic varieties. Usually they arise from contraction of the anterior portion of the urethra (stricture). To guard against their occurrence the urethra must be kept well dilated in the after-treatment of the case. The recto-vesical fistula may result from a tear made in the rectal wall during the operation, or from subsequent sloughing of the parts, or from the pressure of a drainage tube or a tampon. It is

met with most frequently after the perineal prostatectomy, and especially in cases in which inflammatory or fibrotic changes have taken place in perineal structures.

Impotence.—This is a rare complication. It is supposed to be due to laceration and stricture of the ejaculatory ducts. It is more apt to follow operations for outgrowths from the centre of the gland, because here the danger of tearing the ejaculatory ducts is much greater than in operations upon the lateral lobes. Then again, it is more likely to result from operations on the small, hard prostate than on any of the other varieties. To guard against the complication care should be exercised in performing a suprapubic prostatectomy to preserve intact the ejaculatory ducts and the segment of the prostatic urethra in which they enter. This is not easily done when the tumour is situated in the middle of the gland or in the small, hard prostate. Horwitz says, that impotence may occur in cases in which the ejaculatory ducts are not injured, that it arises often from injury to the nerves supplying the parts. This complication is more likely to ensue in persons whose sexual vigor is on the wane or in abeyance. In such cases an operation may bring about sexual exhaustion. In operating on individuals whose sexual function is fairly vigorous, the surgeon should exercise care not to damage these ducts.

Urinary Incontinence.—An examination of 530 cases showed that incontinence occurred in $3\frac{1}{2}$ cases. It may be present for two or three months after the operation and continue until the structures about the neck of the bladder regain their normal tone and vigor, after which the patient has complete control over micturition. Urinary incontinence may be due to various causes, *e.g.*, (1) hardened cicatrix of urethral wall leaving a patent tube, (2) damage to vesical neck and sphincter, (3) laceration of prostatic urethra and defective healing of same, (4) injury of external sphincter or compress or urethral muscle, (5) damage to nerves supplying the parts.

In a small proportion of cases some leakage persists indefinitely. It is, however, an infirmity of very little moment in comparison to the malady for which it has been substituted.

Treatment.—The treatment of enlargement of the prostate has heretofore been very unsatisfactory. As an evidence of this I need only mention the various make-shifts that have been resorted to in the vain hope of overcoming obstruction to the free flow of urine incidental to this disease. They were all operative in nature and were intended to reduce the size of the tumour and so remove the impediment to free micturition. In some instances the gland was attacked directly, as, for

instance, in Bottini's operation. This consisted in dividing the obstruction at the neck of the bladder by a concealed galvano-caustic knife or snaring it when pedunculated. Such proceedings are uncertain and not free from serious risks, and happily are not resorted to to-day. In other instances the gland was attacked indirectly, *e.g.*, castration and vasectomy. These abominations need only be mentioned to be condemned. They are fortunately not often resorted to now-a-day.

At the present moment the treatment of hypertrophy of the prostate is practically reduced to the use of the catheter and prostatectomy, which means enucleation of the whole gland.

Prostatectomy may be performed by one of two routes, viz. (a) The suprapubic route, (b) the perineal route. Then the perineal operation may be done by either a limited longitudinal median incision carried down to the capsule of the prostate, or through a free transversely curved incision through which the organ is fully exposed. The advantages claimed for the transverse incision is that enucleation is done largely under the guidance of the eye, whereas in the other two methods enucleation is effected by finger dissection unaided by the eye. I am not so sure that enucleation can be better performed under the guidance of the eye in these cases, than by finger dissection aided by the sense of touch only.

Each route has its advocates. The selection of methods and routes should not be a matter of indifference, or chance, or prejudice. That method should be selected which, in the opinion of the operator, is most likely to re-establish the ability of the individual to readily, fully and painlessly empty his bladder, and which at the same time is least dangerous to life.

In these operations we must expect a death rate of from 5 to 10 per cent. Permanent cure is obtained in about 68 per cent.; and in a large proportion of the remaining cases marked improvement has resulted to the obstructive symptoms,—the residual urine is lessened, the cystitis improves, the frequency of catheterization diminishes, and the passing of the catheter is much easier.

Prostatic dysuria once declared the question of contraindications to an operation of this magnitude has next to be considered. Under certain circumstances age contraindicates the operation, but age is a relative time. One person at eighty may stand an operation better than another at seventy. Septuagenarians and octogenarians often stand operations well. Advanced kidney disease and profound general prostration from prolonged suffering and loss of sleep are the chief contraindications to the operation. In these cases the surgeon should be

satisfied with palliative measures, such as the use of the catheter, drainage (perineal or suprapubic), bladder irrigation, urinary antiseptics, the removal of a stone, if one is present, and sedatives and general hygiene.

Prostatectomy is not an operation of emergency. This being so, measures should first be used to ensure the best state of bodily vigor. Sleep should be secured by sedatives, if necessary; the bowels should be regulated by suitable aperients and diet; the kidneys should be flushed by copious draughts of water; the skin should be acted upon by hot baths; the urine should be made antiseptic by giving urotropine grs. 10. or salol four times a day; and the mucous membrane of the bladder should be rendered aseptic by irrigation with mild antiseptics.

Suprapubic prostatectomy.—I perform the operation in the following manner:—The patient is prepared in the usual way, and the parts in the neighbourhood of the operation are sterilized thoroughly. The bladder is washed with a warm boracic lotion at a temperature of 103° F., until the return fluid is clean and clear and then ten or twelve ounces of the lotion is allowed to remain in.

An incision is now made in the median line immediately above the pubes $2\frac{1}{2}$ inches to $3\frac{1}{2}$ inches in length—in a thin subject $2\frac{1}{2}$ inches; in a stout person, $3\frac{1}{2}$ inches. The incision is at once carried down between the recti and pyromidalis muscles (linea alba), and through the transversalis fascia into the prevesical space, known as Retzius' space, which is filled up with fat. Care must here be exercised not to wound the fold of peritoneum which extends above from the fundus of the bladder to the parietal wall in front. This fold is seen in the upper angle of the wound. On inserting the finger in the lower angle of the wound the tense distended bladder is easily felt. The prevesical fat is now removed from the anterior surface of the bladder with the finger nail and it, together with the peritoneal reflexion already referred to, is drawn upwards out of the field of operation. This is easily done as the connexion between the bladder and peritoneum is quite loose. In doing this, however, care should be taken not to wound the plexus of veins which covers the anterior surface of the bladder in this region and so avoid troublesome hæmorrhage. The distended viscus will now be seen at the bottom of the wound, glistening and pale-white in colour. Two traction cords of silk are then inserted into the bladder wall, one on each side of the wound, to hold the viscus forward against the abdominal wall and steady it, and a vertical incision is made into it, an inch in length, between the two traction cords. If necessary this wound may be enlarged by inserting two fingers into it and tearing it apart, or by a knife or a pair of forceps. As the solution is flowing

out of the wound the index finger of the left hand is quickly inserted into it and the bladder is explored, if stones are present they are removed by forceps or scoop.

At this stage a rubber catheter is inserted in the bladder per urethram so as to determine the position of the internal urethral meatus and it is left *in situ*. This forms a landmark for the position of the prostatic urethra which should not, if possible, be torn in the operation. The gloved index and middle fingers of the left hand are now inserted into the rectum so as to steady the tumour and push it upwards and forwards against the index finger of the right hand, which does the enucleation. With the finger nail the mucous membrane covering the most prominent part of the hypertrophied prostate is scratched through until the internal capsule is reached (Figs. 1, 4), and the tip of the finger is then gently insinuated in the cleavage line between the internal and external prostatic capsules already referred to, and the growths is thus shelled out of its bed. In conducting this part of the operation the pulp of the finger should be kept closely against the gland in every position of the enucleating finger—in front, behind, underneath, and to the sides of the gland. By attending to these precautions the finger rarely leaves the cleavage line during the entire procedure, and the danger of injuring adjacent structures—the external capsule, rectum and urethra—and of subsequent extravasation of the urine, cellulitis, and other complications, is thus reduced to a minimum.

Normally, the sphincter is situated between the prostate and vesical mucosa. Sometimes this relation continues undisturbed, in which case the tumour is extra-vesical. More frequently, however, the gland as it enlarges insinuates itself between the sphincter and the internal meatus of the urethra, and projects into the bladder, constituting an intra-vesical enlargement (Fig. 2), this latter condition is especially suitable for the suprapubic operation. The prostatic tumour is removed in this operation through the space at the neck of the bladder which is uncovered by the recto-vesical fascia, and situated between the internal meatus of the urethra on the one hand and the sphincter vesicæ, and the muscular fibres of the bladder pushed aside and atrophied by the growth, on the other. The muscular fibres of the bladder and the sphincter grasp the finger tightly during the enucleation procedure. The enucleation being completed, the tumour is lifted up from its sac and removed from the bladder by a pair of forceps. The bladder is now irrigated with a hot saline solution at a temperature of 110° F., to rid it of blood clots, and at the same time check bleeding, which is sometimes quite free. However, irrigation should not be continued

longer than one or two minutes, as any longer time tends to encourage, rather than arrest hæmorrhage, by distending the prostatic sac and re-opening the sealed mouths of the vessels.

The bladder having thus been freed of blood clots a drainage tube of rubber is inserted in the suprapubic wound, extending about an inch inside the cavity of that viscus but no further. The tube should not rest on the base of the bladder, because if it does, it gives rise to pain and vesical tenesmus, and neither should the end of it enter the prostatic sac, as it would prevent it (sac) from contracting and so encourage bleeding and give rise to other complications, *e.g.*, recto-vesical and perineal fistulæ, and pelvic cellulitis. The lumen of the drainage tube should measure about $\frac{5}{8}$ of an inch in diameter and have two openings in the vesical end of it, one on each side, and these openings should be entirely intra-vesical when the tube is in position. The reason the tube should be so large is to provide ample room for the free escape of blood clots.

Under proper treatment the prostatic cavity disappears very rapidly. This is due to the inherent elasticity of the recto-vesical fascia and to the contractibility of the surrounding muscles, and also to the pressure exerted by the pelvic structures generally. Its obliteration may be aided by gently manipulating the two opposing surfaces between the fingers in the bladder and rectum. For similar reasons extravasation of urine rarely occurs.

A few stitches of catgut may now be inserted in the angles of the vesical wound, but these are not always necessary as the bladder often contracts upon the tube without them. It is very desirable that all the urine should escape through the tube. To prevent blood and urine from accumulating in the prevesical space a strip of iodoform gauze should be packed loosely into it for twenty-four or forty-eight hours. This packing ought to be changed two or three times in the twenty-four hours. These precautions are necessary in order to prevent extravasation of urine and cellulitis. In my experience urine does not infiltrate into the tissues to any serious extent unless it is held under pressure. A few sutures of silk worm gut, deep enough to embrace the recti muscles, are then inserted in the upper and lower angles of the wound, which is afterwards covered with a dressing of double cyanide of zinc and plain, sterilized gauze, and the patient, to keep him dry, is enveloped—front, side and back—in a deep dressing of some absorbent material, *e.g.*, cotton wool or wood wool. Before withdrawing the catheter and applying the dressing, the bladder should be once more irrigated in order to remove all blood clots and to see that drainage is

free. The whole dressing is held in place by a many tailed bandage loosely applied.

The dressing should be changed when saturated with urine, every four or five hours, according to the amount of urine secreted. During the first twenty-four hours after the operation clots of blood usually form in the tube. These should be removed by a pair of long forceps at each dressing and thus secure free drainage and prevent over-distention of the bladder from backward pressure. That drainage should be free the first few days is very important, because the prostatic sac must be kept at rest and the blood clots which seal the mouths of the vessels must be left undisturbed, and thus obviate bleeding and facilitate healing.

In irrigating the bladder the lotion should flow into it and out again with little or no force, and so guard against increasing intra-vesical pressure and its evil effects upon the progress of the case. To accomplish this the irrigating pan is placed or held on a table on a level, a little above the patient's abdomen, so that the lotion may flow in and out of the patient's bladder without force. Irrigation should be done only once a day, unless the urine is foul, when it must be done twice a day. The surgeon himself should attend to this the first few days after the operation, as it is too important a matter to be entrusted to a nurse or even a house surgeon. Irrigation may be effected either through the abdominal wound or through a catheter in the urethra. This is a matter of choice. When done through the abdominal wound the nozzle of the syringe is inserted in the wound and the lotion returns on either side of the nozzle, and no increase in the intra-vesical pressure ensues. When the opening is so small that lotion cannot return in this way, the nozzle is withdrawn, and the lotion is allowed to escape before any serious increase in the intra-vesical pressure shall occur. The same precautions should be used as regards pressure when irrigation is performed per urethram.

Patients should not be allowed to void urine per urethram under ten or twelve days, as those who are not permitted to do so generally do better. They have better control over the act of the micturition and are less likely to be troubled with urinary incontinence.

The drainage tube should be left in for from three to five days. In thin subjects it may be removed in three days, but in stout persons it had better be left in for five days. By this time the track along the tube is usually covered with granulation tissues which prevent extravasation of urine and subsequent cellulitis occurring in the prevesical space. The suprapubic wound is now allowed to heal as fast as nature can do it by granulations, which will usually be in two or three weeks.

In connexion with the after-treatment of prostatectomy this important question arises: Should a catheter be retained in the bladder to maintain continuous drainage and to prevent the formation of an urethral stricture? This is one of the complications to be feared. Some surgeons favour the retention of the catheter. Its retention is, however, not necessary or desirable, even in cases in which the prostatic urethra has been badly lacerated, much less in those whose urethrae have not been much damaged. The catheter does not drain well, and it is not necessary to prevent stricture formation. Moynihan of Leeds, and Freyer of London, found no serious complications follow cases of severe laceration of this canal when treated without a catheter. For my own part, however, I see no objections to the passing of a catheter occasionally, with proper precautions, to irrigate the bladder and to ascertain the condition of the urethra, whether it is threatened with stricture or not.

The following case I have had in my practice in the autumn of 1906:—

R. D. F., age 67, was admitted to the Victoria General Hospital on 25th September, 1906, for hæmorrhoids. He always enjoyed good health until his present illness began and looked fairly well when he was admitted; appetite good; bowels inclined to be loose. He had suffered from bleeding piles off and on since ten years. His water bothered him for the last two or three years. He had to get up four or five times in the night to void urine, and had to strain a good deal in the act, and then he was able to void only a small quantity each time. He was unable to completely empty his bladder. In the mornings he could not urinate till he moved about some, and then the urine came away suddenly and he was unable to control it. Each morning he felt a swelling in the mesial line above the pelves, which disappeared after micturition. He had to strain hard to start and at urination, which brought the piles down. He came to the hospital to be treated for hæmorrhoids and not for bladder affection. The prostate gland was greatly enlarged and soft.

I removed the hæmorrhoids on the 9th of October with a ligature. While he was confined to bed after the operation, he suffered intensely with his water, so much so, that he had to be catheterized all the time, and, despite precautions, the urine became foul, which necessitated irrigation of the bladder twice a day.

I recommended an operation, to which he agreed. Prostatectomy was accordingly performed on the 22nd of October, 1906, by the suprapubic route. The operation was done and the after-treatment carried

out as already detailed. The bleeding did not amount to much during the operation, but there was a good deal of oozing from the bladder on the afternoon and night immediately following the operation. The bladder filled up with clots, which were removed by irrigation, and to stop the oozing, the prostatic sac was packed for ten or twelve hours with a strip of gauze saturated with adrenaline. The after-progress of the case was uneventful, and he was discharged well on the 29th day of November, five weeks after the operation.

He is now well and has complete control over his bladder, and can void urine without any discomfort, and does not have to get up at night to micturate.

Prostatic surgery has not been developed to any very great extent in this province. Up to the time of writing only two prostatectomies were performed in Nova Scotia, both recovered; but whether they were both successful I do not know. This depends on the operator's idea of success. My own case was the second one.

Since my return from London in August, 1904, I have been watching, in hospital and private practice, for cases suitable for operation, and, strange to say, I have met with only three or four, and of these only one submitted to an operation. In one case the attending physicians warned the patient, who was a clergyman, not to submit to an operation (prostatectomy) under any circumstances. It is needless to say he took his physician's advice. It was an excellent case for operation. I removed an outgrowth from the centre of the gland suprapubically, with a pair of forceps; it helped his condition a good deal. This was all he would agree to have done.

From what I have witnessed in prostatic surgery in the London hospitals, I am in favour of the suprapubic route, especially in the large, soft tumour, which is situated generally intra-vesical, and the case I had myself seems to confirm the opinion I then formed.

The perineal operation may be resorted to with advantage in the small, hard prostate, which is situated usually extra-vesical, and the whole proceedings may be conducted extra-vesically. Operations by this route are more apt to be followed by fistulae—rectal and urethral—because of the close proximity of the rectum and urethra to the track of the operation (Fig. 3).

What symptoms call for operation? This is a large question which I do not propose to answer in this paper, which is far too long already. It seems to me, however, that an operation is impracticable on the first serious interference with the passage of urine. First, because the patient will not submit to it, and, secondly, he has no time to lie up.

This is the case, especially if catheterization does not give rise to any discomfort. However, the dangers of delay and of the use of the catheter—cystitis, ureteritis and nephritis—should always be impressed upon him. In my opinion an operation is indicated and should be recommended whenever obstruction is present to a degree which materially interferes with the comfort of the individual or entails marked disability.

THE VALUE OF BACTERIOLOGICAL EXAMINATION IN TREATING CONJUNCTIVITIS.

BY

HANFORD MCKEE, B.A., M.D.

The vast majority of cases of conjunctivitis are due to bacteria. These infections, caused in one case by comparatively mild micro-organisms run a short, mild course. In others, the course may be a chronic, mild one, while still in others, permanent damage to the eye may be the result.

While the majority of cases of conjunctivitis are caused by micro-organisms, there is, nevertheless, quite a percentage in which no pathogenic micro-organisms can be found.

We divide conjunctivitis then into two great classes:

(I.) Where there is no bacterial cause.

(II.) Where there is a definite bacteriological factor.

In class I. we place those cases due to foreign bodies, smoke, rhinitis, gouty diathesis, errors of refraction, and as yet, trachoma, follicular conjunctivitis and spring catarrh.

In Class II. we have conjunctivitis due to the gonococcus, streptococcus, pneumococcus, Koch-Weeks bacillus, the diplo-bacillus of Morax-Axenfeld, the bacillus coli communis, the bacillus diphtheriæ, bacillus influenzae, the micrococcus catarrhalis, the meningococcus, bacillus ozaenæ, Friedlander's bacillus, bacillus mucosus capsulatus.

This second group is a large one, and while conjunctivitis may be caused by any one of these bacteria, the common forms and those likely to be met with by us may be formed into a much smaller group.

In Axenfeld's clinic in Freiburg, in 900 cases of conjunctivitis examined with positive results

519 cases were due to the Morax-Axenfeld diplo-bacillus.

41 cases were due to the Koch-Weeks bacillus.

34 cases were due to the pneumococcus.

12 cases were due to the gonococcus.

In Gonin's clinic in Lausanne, of 310 cases.

185 were due to the diplo-bacillus of Morax-Axenfeld.

10 cases were due to the pneumococcus.

10 were due to the Koch-Weeks bacillus.

5 were due to the streptococcus.

83 were due to the staphylococcus.

Pollock in Aberdeen, in 361 cases found

189 due to the Koch-Weeks bacillus.

62 due to the Morax-Axenfeld diplobacillus.

9 due to the pneumococcus.

21 due to the gonococcus.

Meyerhoff in Egypt, in 304 cases found

157 due to the Koch-Weeks bacillus.

80 due to the gonococcus.

37 due to the diplo-bacillus of Morax-Axenfeld.

10 due to the pneumococcus.

Of 500 cases examined at the Montreal General Hospital

250 were due to the diplo-bacillus of Morax-Axenfeld.

13 were due to pneumococcus.

7 were due to the Koch-Weeks bacillus.

10 were due to the gonococcus.

3 were due to the bacillus influenzae.

The chief factors then in causing conjunctivitis are the Morax-Axenfeld diplo-bacillus, the pneumococcus, the Koch-Weeks bacillus, and the gonococcus. These different forms, whilst in cases they have definite characteristic clinical features, in other cases the clinical signs may be very similar. To tell which of these forms we are dealing with, bacteriological methods are necessary. The technique of this examination is easy, and can be readily pursued in one's office. For routine work, the examination of a smear on a glass slide will give you satisfactory results. In Morax-Axenfeld and Koch-Weeks conjunctivitis the smear preparation will give you a positive diagnosis. In pneumococcus, gonococcus, and diphtheritic conjunctivitis, and where negative results are obtained, the inoculation of media is necessary.

Of the 365 cases examined by Gonin the prepared smear gave a positive diagnosis in 245. These figures show us of what real value the smear preparation is. In many cases you will find the pathogenic organism much more easily this way than by inoculating media. The pathogenic bacteria of the conjunctival sac are not easy to cultivate, and unless you have special media, at the proper reaction much of your bacteriological examination from cultures will be negative. With your smear preparation it is different. If the micro-organisms are present in the conjunctival sac, by smearing some of the discharge well over a glass slide and staining it, you will find the micro-organisms in quantity.

Of the different forms, the most common is the Morax-Axenfeld, which varies in its clinical picture, from a mild catarrhal to a severe purulent conjunctivitis, so that diagnosis must depend upon finding the bacteriological cause—the diplo-bacillus of Morax-Axenfeld. In many cases this form shows a characteristic clinical picture. It is a chronic form of conjunctivitis, and with proper treatment will last at least four weeks. That the diplo-bacillus may be a source of danger has been better recognized of late. In the past year many cases of severe ulceration of the cornea, due to the diplo-bacillus, have been reported.

In Koch-Weeks conjunctivitis we have our most contagious disease. We have a form of conjunctivitis which begins with one member of a family as a mild, acute conjunctivitis, and goes from one member to another, increasing in severity as it goes. It is a form which seems especially prone to occur in the spring and fall, and generally in epidemics.

The course of Koch-Weeks conjunctivitis varies, may be of three to four weeks duration. It seems to be more persistent in children than in adults.

Pneumococcus conjunctivitis is a form which favours northern climes, appears at the coldest seasons of the year, and is often associated with coryza. The clinical picture, as pointed out by Axenfeld varies greatly in severity. The inflammation may be slight and the disease run its course in a few days, or it may increase in severity, simulating a blennorrhœa. Slight, red rose œdema with purulent discharge, and intense swelling of the lids give this form of conjunctivitis a clinical picture differentiating it from any other form. A pseudo-membrane may develop. Blair, of Pittsburg, told me recently of a case of severe membranous conjunctivitis which he saw in consultation. Differentiation from diphtheritic conjunctivitis was made only by a bacteriological examination, which showed the cause to be pneumococcus infection.

In this more than in the other forms is the inoculation of media necessary. Pneumococci, although not found on your smear, may be found on the media.

About gonococcus conjunctivitis I have not much to say, except that, where a purulent conjunctivitis, or blennorrhœa neonatorum is due to the gonococcus, you have an infection which requires your best efforts to successfully combat.

But many cases of purulent ophthalmia and blennorrhœa neonatorum attributed to gonococcus infection, it is my belief are not due to that micro-organism, but to an organism which cannot be distinguished from it, except by careful examination, *i.e.*, the micrococcus

catarrhalis, or the pseudo-gonococcus. I reported last spring six cases of purulent ophthalmia in the adult and infant, where the clinical picture and examination of the pus on a glass slide showed what was taken to be the gonococcus. The cases all ran a mild course of two or three days. Although the micro-organisms on the slides could not be distinguished from the gonococcus, on media it was easily seen that the organism was the micrococcus catarrhalis.

Why does one case of supposed gonorrhoeal ophthalmia run such a mild course and the next such a severe one, when from the conjunctival discharge of each are found Gram-negative diplococci? Why? Because we have been dealing with different micro-organisms.

When you have conjunctivitis from such various causes, where the course and results are apt to be so varied and, perhaps so serious, to know what form you are about to treat must certainly precede treatment. Whether in acute epidemic conjunctivitis we have to deal with the Koch-Weeks bacillus, the cause of our most contagious disease, or with the pneumococcus or the bacillus influenzae.

In catarrhal conjunctivitis, the examination will tell you whether the etiological factor is an organism or not. When the cause is the diplobacillus of Morax-Axenfeld, you are put in possession of valuable knowledge as regards treatment and duration of the disease.

When the finding is staphylococcus conjunctivitis we know we have a simple, non-contagious form. Negative findings have here a special value. They tell us to look to other remedial measures, such as refraction, treatment of the nose and throat, and systemic treatment.

In purulent conjunctivitis, bacteriological methods are, perhaps, of most value, for here are met virulent organisms.

The value of knowing whether your purulent discharge is due to the gonococcus, micrococcus catarrhalis, the Koch-Weeks bacillus, the diplobacillus, the bacillus coli communis, pneumococcus, bacillus subtilis, streptococcus, or staphylococcus, will readily be understood.

It is not enough to-day to put all the blennorrhœas due to the gonococcus. Of the 165 cases of blennorrhœa neonatorum examined by Morax, only 70 were due to the gonococcus.

In membranous conjunctivitis too, your treatment, especially anti-toxine treatment must depend entirely upon the micro-organism present, whether it be the bacillus of diphtheria, the pneumococcus, or the streptococcus.

The clinical value of bacteriological methods consists in telling us to what micro-organism, if any, the conjunctivitis is due. To say no knowledge as regards the etiological factor is obtained from the clinical

picture goes too far. Morax-Axenfeld has often the clinical signs of angular and blepharo conjunctivitis. Koch-Weeks has, in the extreme pink hue, and pneumococcus conjunctivitis, with its red rose œdema and swelling of the lids, very definite characteristic clinical signs, while gonococcus conjunctivitis, with its well marked clinical picture needs no comment in this respect. As bacteriological methods give a definite diagnosis to the form of conjunctivitis and tell whether we have to deal with mild, or virulent micro-organisms, so they suggest the therapeutic measures necessary in each case. In cases of acute epidemic conjunctivitis if the etiological factor is found to be the Koch-Weeks bacillus, isolation of the patient may be necessary. And if the outbreak has occurred in schools, or where large numbers of persons are brought together, the closing of such institutions may be necessary. Koch-Weeks conjunctivitis is treated best by the application of weak solution of silver nitrate and cold compresses. Serious complications in this form are rare.

If the epidemic is due to the pneumococcus we have to deal with a more virulent micro-organism. Pneumococci in the conjunctival sac, unless energetically combated, may lead to serious ulceration of the cornea, or toxic iritis. When the epidemic is due to the bacillus influenzae, the course will be a mild one.

In catarrhal conjunctivitis the most common bacteriological cause is the Morax-Axenfeld diplo-bacillus. This form of conjunctivitis may last for years. It is now recognized that diplo-bacilli may give rise to ulceration of the cornea, as serious in nature as the pneumococcus ulcus serpens. Morax-Axenfeld conjunctivitis is best treated with weak solutions of the sulphate of zinc. The way this agent acts on this infection is a nice feature in ophthalmic therapeutics.

When the catarrhal conjunctivitis is found to be due to other than bacterial causes, other measures are indicated. In membranous conjunctivitis, where the cause is the bacillus of diphtheria, serum therapy is the first indication. When due to the pneumococcus or the streptococcus, other methods are called for.

The picture of purulent ophthalmia from virulent and mild micro-organisms may be identically the same. Where the infection is caused by the gonococcus, treatment must be energetically and carefully carried out. If the streptococcus, or pneumococcus be the cause, similar energetic measures are necessary. When the micrococcus catarrhalis is the cause, ordinary methods only are indicated. If the staphylococcus, the bacillus coli communis, the bacillus subtilis, or any other comparatively mild micro-organisms are the factors at work, ordinary irrigation will

terminate a short, mild course. When the Koch-Wecks bacillus, or the diplo-bacillus of Morax-Axenfeld is the cause, measures already described will bring about satisfactory results. Bacteriological methods then tell us the cause of our conjunctivitis whether that be a bacteriological one or not. Bacteriological methods tell us what course the affection is likely to take, and what complications are liable to occur. They tell us what prophylaxis is necessary, what therapeutic measures are needed, and give us valuable knowledge to prognose with. The value of the bacteriological examination in treating conjunctivitis is, that it tells us exactly with what we have to deal and how to deal exactly with it.

The public health of Manitoba shows a marked improvement over recent years, especially in Winnipeg, where the general death rate has fallen from 21 per thousand of population in 1905 to 15.09 per thousand. Particularly gratifying is the change in the disgraceful figures for typhoid fever, the death rate in this disease having fallen in the last three years from 24.85 to 4.5 per 10,000 of population.

At a recent meeting of the Provincial Board of Health of Quebec it was decided to inaugurate in this province an annual conference of sanitary officers, in which all municipal boards of health are invited to take part. The first conference will be held at Three Rivers in June next.

Dr. John Considine of Port Dalhousie, Ont., died November 11th. last at the age of 88. He was born in Ireland, graduated at Trinity College, Dublin, and came to Canada nearly sixty years ago.

Twenty-two out of thirty-three candidates for admission to practice medicine in British Columbia successfully passed the provincial examinations last month.

THE

Montreal Medical Journal.

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

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No. 12.

PROTECTION FROM INFECTIOUS DISEASES.

From certain facts which have come to our notice lately, we are enabled to assure the public of Montreal, so careful is our Health Department, that there is scarcely any danger of their taking scarlatina—provided they have already had the disease. Not long ago a man arrived from Barre, Vermont, with a boy of sixteen years, who was actively desquamating after scarlet fever; he travelled hither by train and presented himself at one of the hospitals to have the boy taken in for the treatment of a corneal ulcer. Two competent physicians declared that the case was one of recent scarlet fever. The man was told what the disease was, and that the boy could be admitted to the Alexandra Hospital. He refused to go there, and was about to depart, when the physician said to him that he could not go freely into the city with an infectious disease, but must wait until the City Board of Health

was notified. The Health Office was called up by telephone, and the case explained to the man who answered the telephone. He listened to the statement, and said, "Let him go." "But," persisted the physician, "it is scarlet fever." And the answer came back, "He does not belong to Montreal. Let him go!" He was thereupon allowed to depart.

Doubtless these two people went straight to the nearest car-line and got on a car, and mingled with people who had no idea that they were elbow to elbow with an actively infectious case of scarlet fever. If it were not so dangerous, the whole affair is rather like a plot in a comic opera of the "Pinafore" type: Enter the hero, to be met by the doctor (Solo, "I see you are about to lose your skin!"); to which the father and son reply, (Duet, "For we had no means of knowing."). Presently, enter the officers of the law, and they are in this case just like stage-policemen: To the doctors recitative, "Seize that man!" they answer, in a rousing chorus, "We will not touch the scarlet boy, for he don't belong to us!"

Speaking perfectly seriously, we pay that official who answered the telephone for our protection, and he miserably fails in his duty. We do not know who answered the telephone, and we do not care; the Health Officer is responsible for that answer, as much as if he gave it himself. If he states that the man had no authority to speak in that way, then he should see that the man is discharged for assuming the authority. If he replies, on the other hand, that it is not legal to report cases of infectious disease by telephone, we shall know that he is merely playing with the facts of the case. There is no excuse; we fail to even foresee that there can be an explanation.

If any one wishes to know the further facts of this case, we shall be glad to supply them; we hope the first person to apply for them will be the City Health Officer.

HOSPITALS FOR CONTAGIOUS DISEASES.

A deputation from the Alexandra and St. Paul's Contagious Diseases Hospitals waited on the Finance Committee, on October 28th, to urge that the hospitals be given increased grants by the city.

The following is the new agreement which the Council is asked to approve:—

"That the present contracts be modified, so that a supplementary subsidy of \$5,000, be granted for the current year to each of the Alexandra and St. Paul Hospitals;

"That from the 1st of January, 1908, the annual subsidy to be paid to each of the said Alexandra and St. Paul Hospitals shall be increased by \$10,000 for the next three years;

"The said hospitals agree to treat all patients without regard to religious denomination, who may be sent to them by the city, in such numbers as the said hospitals can accommodate, each accommodation nevertheless, not to be for less than one hundred patients a day;

"In case of an epidemic and when the city shall consider it necessary, it reserves the right to the exclusive use of all the pavilions for the treatment of cases of one contagious disease only;

"The city reserves the right to exercise an absolute control from the point of view of hygiene;

"The said hospitals shall agree to carry out the ambulance service at their own expense."

"The hospitals shall place twenty-five free beds at the city's disposal, instead of twenty beds as now."

The fact which stands out clearly is that the hospitals cannot be conducted on the present grant of \$15,000 each, and that at least double this amount is required. This is the proper business of the city. The hospitals are merely acting as trustees, and should be relieved of financial cares at least.

A DEGREE IN ARTS.

At a meeting of physicians in the western district of Toronto, the following notice of motion was submitted: "That, in the opinion of this meeting it would be in the interests of the public; of those now in practice; and of all those who, in the future intend entering the profession of medicine, to have the standard of matriculation, a degree in arts." The question will come up for discussion in January. In Toronto University alone there are 630 students, and there is some probability that another medical school will be established in connexion with the Macmaster University. We have already pointed out the lack of sense which there is in duplicating the work already done in Toronto, especially in giving to medical education a denominational tinge. The modern movement is all in the direction of non-sectarianism, a higher standard, and a limitation of numbers. At McGill the course has been extended to five years, and with some diminution in numbers as a result. Next year Toronto will establish the five years' curriculum, and Laval has the question under advisement. A degree of preliminary education, such as indicated by a degree in Arts, is the next attainment to which medical schools must strive.

INCREASED FEES.

A meeting of physicians was held October 28th in Victoria Hospital, London, Ontario, when it was agreed by a unanimous vote to increase the fees. The resolution passed was as follows: "Resolved, that this representative meeting of the medical practitioners of the city of London find it necessary to increase the fees for professional services by an advance of the present current rates proportionate to the increased cost of living. It is felt that the public will recognize the reasonableness of this action, in view of the fact that the cost of living has been materially increasing for years."

As far as can be learned this means that visits will be two dollars instead of one dollar, as formerly. This resolution will not affect those poor who do not, under any circumstances, pay fees. In this respect the action of the physicians differs from the conduct of other bodies, who are as anxious for the dollar of the poor man as they are for the dollar of the rich. It is merely an effort on the part of the physicians to get back a part of what they pay.

It appears from the *Victoria Daily Colonist* of October 31st that there is, at least, one place in the world where a doctor is needed. The name of the place is Chilcote. A despatch from Ashcroft says: "The condition at present is very hard indeed. When a doctor is urgently needed it is hardly worth while to face the 150 mile trip to get him. The distance is without telephone and telegraph communication, and even if it were so provided, there is a long journey for the doctor to make." It should not be hard to remedy this unusual condition of affairs.

There is a clause in the present Pharmacy Act which permits all druggists to demand an analysis of any sample or medicine put on the market, and this clause might well be put in operation. In Toronto a man of some sense was taken so violently ill immediately after eating a small yellow tablet which had been sent as a "sample" of medicine through the mails, that he required treatment in the hospital. Most of these samples are useless; some of them are dangerous.

An epidemic of typhoid is reported from Charlottetown, where thirty-five cases are now under treatment. The water supply appears to be above reproach. Indeed, a local paper describes it as "the best

in the world." Accordingly, suspicion has fallen upon the milk, and an additional sanitary officer has been appointed to investigate it.

Reviews and Notices of Books.

THE PRINCIPLES AND PRACTICE OF MODERN SURGERY. By ROSWELL PARK, M.D., Professor of Surgery in the University of Buffalo, N.Y. In one very handsome imperial octavo volume of 1,072 pages, with 722 engravings and 60 full-page plates in colours and monochrome. Cloth, \$9.00, net; leather, \$8.00, net. Lea Brothers & Co., Philadelphia and New York, 1907.

This new individual book is the successor of the "Surgery by American Authors," edited by Professor Park, which ran through three editions. His collaborators therein have most willingly placed their work and accompanying illustrations at his service. A perusal of the present book gives abundant evidence that the author has brought to bear the experience of many years as a teacher and surgeon in the presentation of his subject, and the result has been a book which is well balanced, as complete as space permits, and with all its information well interrelated and brought thoroughly up-to-date. Surgical pathology and the underlying principles of surgery are dealt with clearly and concisely, and at sufficient length to give one a good working knowledge of this important branch of the subject; while in describing surgical diseases in general and special or regional surgery, the desire has evidently been to give as complete a description as possible of the various conditions, while regarding treatment, he has confined himself to those procedures, operative and non-operative, which, in his opinion, have given the best results. We are thoroughly in accord with the plea of the author that the physician, surgeon, and pathologist should come into more intimate contact than at present, and that no better place for this union could be found than the public wards of a hospital. We believe such a union, properly constituted, would be of great benefit to one another and to mankind.

W. L. B.

FRACTURES AND DISLOCATIONS. By LEWIS A. STIMSON, B.A., M.D., LL.D. Lea Brothers and Company, Philadelphia. 5th Edition.

The fifth edition of Stimson's well known book represents a certain improvement over former ones, especially in the addition of a considerable number of fine plates and skiagrams. The book, as a whole, is one of the best practical treatises on the subject in the English language.

It is difficult to particularize in a volume of this size, but one may refer to a few salient points. Stimson objects strongly to the modern tendency towards routine operation in simple fractures, which he characterizes as "uncritical." In a fracture involving a joint, if there is great deformity, he is in favour of open incision. If, after careful consideration, operation be undertaken, he advises waiting for subsidence of the swelling. He is against the early movements of joints in the neighbourhood of fractures. These should be left until union is complete. "Forcible passible motion is always harmful before the second month; even after that it is far more likely to do harm than good." He is possibly too conservative in some points, *e.g.*, in fracture of the calcaneum operative treatment is merely mentioned as a possibility. The pull of the tendo Achilles in producing deformity in this injury is hardly mentioned, nor is the tendency to pes planus. Treatment directed to obviate these possibilities is not discussed. The volume is evenly divided between fractures and dislocations; and the latter are excellently well handled, particularly from an anatomical standpoint. In addition to the classical Bigelow illustrations one finds a considerable number of very good ones original with the author. In a general way the book is valuable as being written in the *ex cathedra* style, and the magisterial tone is fully justified by the author's very large experience at the Hudson Street Hospital (House of Relief), and the New York Hospital. This enables him to speak from experience concerning the rare cases in this branch of medicine. The bibliographical portion is full, including not only the English, but also the foreign literature. The book is well balanced and is thoroughly to be recommended.

E. A.

KIRKE'S HANDBOOK OF PHYSIOLOGY: Revised and Rewritten. By CHARLES WILSON GREENE, A.M., Ph.D., Professor of Physiology and Pharmacology, University of Missouri. Sixth American Edition. William Wood & Co., New York.

Kirke's Handbook of Physiology has always been a great favourite with students, and the present edition compares very favourably with its predecessors. We do not notice any great change in the general arrangement, but several chapters have been rewritten and the whole has been brought more or less up-to-date. We say more or less advisedly, because we could not help remarking serious omissions here and there. Reference is made to the internal secretion of the pancreas in a very indefinite way as having something to do with carbohydrate metabolism, but no mention is made of Cohnheim's well known theory that it increases the glycolytic ferment of the tissues. There is a similar haziness

about the account of the thyroid gland. The motor area of the brain is dismissed without reference to the recent work of Sherrington and Grünbaum limiting it to the parts in front of the fissure of Rolando. Where new work is incorporated into the book it is in some cases only partially assimilated. For instance, mucin is somewhat equivocally mentioned in its proper place as a glycoprotein and on the same page it is included among the albumoid substances where it has no business at all. The conductivity of heart muscle is referred to in connexion with the myogenic theory, but it is not included as it should be with rhythmicity, tonicity and irritability among the fundamental properties of the heart muscle. Even contractility is not categorically mentioned as one of these, although it is the most important of all. In spite of these peccadillos the work of revision has been well done, and "Kirke" will, no doubt, continue to be one of the popular text-books of physiology for a long time to come.

W. S. M.

MANUAL OF DISEASE OF THE EYE. By CHARLES H. MAY. Fifth Edition, Revised; with 362 original illustrations, 22 plates, and 63 coloured figures. Price, \$2.00. Wm. Wood & Co., New York, 1907.

The appearance of the fifth edition of this work within seven years of the publication of the first shows that it has filled a want. The first edition we found fault with, but this one shows most marked improvement. It is really a very useful book on diseases of the eye for the general student. The very good illustrations which abound will be of great help to the beginner. The coloured plates are especially to be commended for their clearness. Each section is preceded by a clear and concise description of the anatomy and physiology of the special tissues under consideration. The bacteriology of the eye, however, receives scant attention, the importance of which in conjunctivitis and ulcers of the cornea is but touched on. The book is to be commended to the beginner in the study of ophthalmology.

J. W. S.

A TEXT-BOOK OF PATHOLOGY. By FRANCIS DELAFIELD, M.A., LL.D., Columbia University, New York; and T. MITCHELL PRUDDEN, M.D., LL.D., Columbia University, New York. English Edition, with thirteen full page plates and six hundred and fifty illustrations in the text, in black and colours. New York: William Wood and Company, 1907.

It is only three years since we had the pleasure of reviewing the seventh edition of this valuable book; and the fact that the eighth edition has now appeared is an excellent commentary upon the popularity

of the work. This, like the last edition, is in the hands of Professor Prudden alone, who has introduced considerable change in many ways. Some of the old illustrations are removed, and others substituted, and a hundred or more new ones are added; the freer use of colour in the ordinary illustrations is a distinct advance. We need not do more than say that the present edition of this valuable work seems to be an improvement on the last, which will be sufficient recommendation to any one who knows the book, or is interested in pathological text-books in the English language.

MERCK'S 1907 INDEX. (Third Edition). An Encyclopædia for the Chemist, Pharmacist and Physician of the Chemicals and Drugs used in Chemistry Medicine and the Arts. Merck & Co., New York, 15 University Place.

The third edition of this useful book of reference, like its predecessors, is a compend of all that one wants to know about any drug. Its 472 pages really contain an astonishing amount of information, which is necessarily abbreviated to the utmost; it gives the names, synonyms, sources and origins of drugs; all their most important physical and chemical qualities, their uses, doses, and modes of application, incompatibles, antidotes, etc., and finally an estimate of their relative values, which is not in any sense a price list, but enables one to see at a glance the approximate cost of the chemical product he desires. The index does credit to the reliability of this well-known firm.

DISORDERS OF RESPIRATION AND CIRCULATION; SYMPTOMATOLOGY AND DIAGNOSIS. A Series of Monographs by PROF. DR. EDMUND VON NEUSSER, Professor of the Second Medical Clinic, Vienna. Authorized English Translation, by ANDREW MACFARLANE, M.D. Part I, Dyspnoea and Cyanosis. E. B. Treat & Company, New York, 1907.

This series of monographs is of much the same nature as those by von Noorden upon Disorders of Metabolism and Nutrition, published also by E. B. Treat & Company. These monographs emphasize the value of the study of symptoms as observed at the bedside of the patient. When they are observed, studied, and recorded by so accomplished a clinician as von Neusser the product is especially valuable. The condition of dyspnoea has probably never before received so adequate treatment.

PAPERS AND ADDRESSES. By ROBERT CRAIK, M.D., LL.D.

The papers and addresses of the late Dr. Robert Craik, Dean of the Medical Faculty of the McGill University, have been collected and

printed in a volume of 222 pages. The preface is written fitly by Dr. Shepherd, one of Dr. Craik's oldest friends. The paper with which the volume opens was written in 1854 as a graduating thesis, when the author was a student of medicine. Within the half century which has elapsed probably no student has written so good a one. It would be a profitable subject of enquiry why the men of those days could write so well, and the men of these days cannot. One can easily imagine the joy which there would be in the Faculty if a student presented a thesis with so fine a style and so much sense. Nine years later Dr. Craik addressed the students, by way of valedictory. The address as printed is marked by the good taste with which Dr. Craik always spoke or wrote. In 1889, he paid a fine tribute to Dr. Howard at Convocation, and on recurring occasions he always spoke fitly. There are few men left who could write as well as Dr. Craik. These random papers are a valuable record and commentary.

ANÆSTHETICS AND THEIR ADMINISTRATION; A Text-book for Medical and Dental Practitioners and Students. By FREDERIC W. HEWITT, M.V.O., M.A., M.D. Cantab. Third Edition. The Macmillan Company, London and New York, 1907.

The third edition of Dr. Hewitt's book is a most valuable addition to the literature of this subject. The work deals fully with the nature of the anæsthetics in general use, injurious after-treatment effects, the dangers to be met with and how to meet them, and the preparation of the patient. All this is set forth simply and clearly, in a book of modest proportions, well illustrated. It seems to us, however, that in a work on anæsthetics the absence of any mention of local anæsthetics, or the much-discussed morphine-scopolamine combination shows a lack of completeness in an otherwise complete work.

AIDS TO MEDICAL DIAGNOSIS. By ARTHUR WHITING, M.D. William Wood & Company, New York.

This little book bears the address of its author, 142 Harley Street, which is something in its favour; it has the imprint of William Wood & Co., which is also in its favour. The book in itself is a good book.

AIDS TO THE DIAGNOSIS AND TREATMENT OF DISEASES OF CHILDREN. By JOHN McCaw, M.D., Belfast. Third Edition. William Wood & Company, New York.

This volume in Wood's "Students' Aids Series" is not so little as it looks. It contains nearly 400 pages, and is more valuable than many a more pretentious one.

Medical News.

MONTREAL GENERAL HOSPITAL.

The Quarterly Meeting of the Montreal General Hospital was held November 19th.

The report of the medical superintendent, Dr. F. S. Patch, stated that during this quarter 850 patients were treated to a conclusion as compared with 932 for the corresponding quarter of last year. There were 78 deaths, of which 38 occurred within three days of admission, making the mortality rate for ordinary hospital cases 4.7 per cent. The aggregate number of hospital days was 16,281, an average detention per patient of 19.5 days; the average number of patients per day was 190. In the patient department there were 13,197 consultations, as compared with 11,927 for the corresponding quarter of last year. During the quarter the ambulance responded to 545 calls, compared with 440 for the corresponding quarter of last year. While the number of patients treated in the indoor department shows a slight decrease, the work done has been up to the capacity of the hospital. In the out-patient department the same marked increase shown in the previous quarters of this year continues to be seen.

The president read the committee's report, which stated that the revenue for the past quarter, ending 30th September, amounted to \$18,565, and the expenditure to \$31,703, leaving a deficit of \$13,038.

In connexion with the increasing amount of expenditure, the committee have issued circulars to the present governors, urging them to assist the committee in increasing the present number of governors, which is about 600.

ROYAL VICTORIA HOSPITAL.

Monthly report for October: Patients admitted during month, 268; patients discharged during month, 254; patients died during month, 14. Medical, 81; surgical, 103; ophthalmological, 27; gynæcological, 37; laryngological, 20. Out-Door Department—medical, 420; surgical, 533; eye and ear, 129; diseases of women, 91; nose and throat, 186; total, 1,360. Number of ambulance calls, 81.

Hon. D. McN. Parker, M.D., died, in Halifax, November 4th. Dr. Parker was born of United Empire Loyalist stock at Windsor, in 1822. He graduated in medicine at Edinburgh in 1845. In 1867 he was made

a member of the Legislative Council of Nova Scotia, from which, on account of ill-health, he retired in 1899. During his long term of practice in Halifax, besides being president of the Medical Societies of Nova Scotia and of Canada, he filled a large number of other offices—commissioner of schools, Governor of Acadia College for twenty-five years, president of the Baptist Convention, a member of the boards governing the hospitals of the city.

The Town Clerk of Almonte has forwarded to Dr. Hodgetts, Secretary of the Provincial Board of Health, details of an outbreak of typhoid fever in the town, and the request to the Council that an officer be sent to make an investigation. There are now forty patients suffering from the disease. The local authorities believe the outbreak is attributable to the drinking of well water, and a number of wells in the particular district affected have been closed, pending the report of analysis by Dr. Amyot, the Provincial Bacteriologist, of samples taken from them.

In the year ending October 31st, 1907, in the city of Fredericton, there were 28 cases of diphtheria, 93 of typhoid, and 22 of scarlet fever. Last year there were 53 cases of typhoid fever, 59 of diphtheria, 2 of scarlet fever, and 22 of measles.

During the same period in Brantford the statistics were, typhoid fever, 41 cases; diphtheria, 54 cases; scarlet fever, 25 cases; smallpox, 2 cases; measles and whooping cough, 20 cases; total city cases, 133; total outside, 9.

Thirty-three candidates for admission to the practice of medicine in British Columbia wrote upon the examination papers set by the provincial board of examiners, October 28th. The board of examiners consists of Drs. Fagan, Jones, Proctor, McKecknie, McGuigan, and Walker.

Retrospect of Current Literature.

SURGERY.

UNDER THE CHARGE OF GEORGE E. ARMSTRONG.

H. KÜMMELL. "The Operative Treatment of Suppurative Meningitis."
Archiv. für Klin. Chirurg., Bd. 77, Heft 4.

Kümmell, after a short review of the various attempts to treat diffuse meningitis by operation, a review which reveals the fact that the major-

ity of such cases have been of otogenic origin and usually not generalized, relates a case of his own. A man suffering from a basal fracture, with considerable loss of cerebro-spinal fluid from the nose in the first day or two, developed symptoms of meningitis on the sixth day, which during the succeeding three days became absolutely generalized throughout the cranial and spinal cavities, as proved by lumbar puncture. By the ninth day after the accident, the patient seemed moribund; he was in deep coma, breathing was stertorous; there was intense rigidity of the neck; temperature was high; the pulse slow, yet small and thready; there was general flaccidity of the muscles, otherwise no focal signs. Kümmell trephined on both sides low down in the occipito-parietal junction, taking out bone to the size of a five-mark piece and incising the dura which was under great tension. Only a small amount of purulent fluid was evacuated. A gauze drain was pushed down deep in the occipital fossa. Next day there was marked improvement, though the patient was still comatose; but, subsequently, convalescence was rapid. On the second day lumbar puncture showed the fluid still purulent, but on the sixth day it was clear. It is evident that the operation was life saving. It is evident also that the result was due to decompression rather than to the means of escape afforded to pus. Of the latter but very little was evacuated. One may theorize in such a case and believe that the severe compression was probably due to the development of an internal hydrocephalus; and that the small amount of relief given by the bilateral trephining was sufficient just to relieve the internal hydrocephalus rather than to give any wide way of escape for the brain substance itself. Kümmell does not mention the development of any hernia cerebri. The case, as a whole, is extremely important in that it shows the possibility of cure by operative means in a meningitis which was absolutely generalized. Once such a possibility is established, the right to intervene early must be allowed. Then, with that right, we may expect that a certain number of cases may be saved in this otherwise hopeless condition, even though the majority of patients must always die.

E. A.

C. A. PORTER, M.D., AND C. J. WHITE, M.D. "Multiple Carcinomata following Chronic X-ray Dermatitis." *Annals of Surgery*, November, 1907.

Since the first publication of the injurious effects of the X-ray by Marcuse in 1896, the literature of this subject has grown year by year. The earlier articles dealt with the immediate effect of the X-ray, the dermatitis and burns. It soon became recognized that these lesions

were excruciatingly painful and extremely slow to heal; further experience showed these lesions very apt to break down again and again, finally forming chronic ulcers. Following these reports came the first case of cancer developing in a chronic ulcer, and finally the first death from metastatic carcinoma. This paper presents a *résumé* of ten cases of undoubted X-ray cancer occurring in X-ray operations, a very complete report of a case which has been under observation and treatment for ten years, and a second case of chronic dermatitis of less severe degree. Out of these eleven cases no less than six have been fatal. We would infer from this that the mortality of X-ray cancer is much higher than in malignancy from other causes, but it is reasonable to assume that this represents the full number of deaths, while no record has been published of the much larger number of sufferers who, after excisions and minor operations, have as yet shown no evidence of recurrence. For a full consideration of the cases here reported the reader is referred to the article, which is additionally instructive by reason of its photographs and microscopic specimens and descriptions. In brief, it may be said that X-ray work with a large static machine was begun in March, 1896. Five months later a powerful twelve-inch coil was used. Exposure with this machine lasted for several hours every day, at a very short distance from a low vacuum tube. Besides this he developed his own plates. One month later a severe dermatitis occurred followed by the characteristic hardening and longitudinal striation of the nails, multiple teleangiectases, keratoses, and finally chronic fissures and ulcers. Malignancy was first diagnosed five years from the beginning of symptoms, and during the next five years no less than ten different epitheliomas developed in this one case.

Notwithstanding ten years of treatment and twenty-five operations under ether, we have the following conditions. Left hand thumb sound and serviceable, forefinger stiff, but no lesions, third and fourth fingers have been amputated, little finger lacks the terminal phalanx, back of hand presents a few keratoses but no ulcerations. Right hand, thumb useful but ulcer at base and whole ulnar side covered with thickened epithelium, forefinger has a malignant ulcer over its middle, middle finger stiff, fourth finger is lacking as well as tip of little finger, numerous keratoses but no ulcerations. It would appear that those workers who develop their own plates are the more liable to severe ulcerations, that the condition is one of almost complete vaso-motor paralysis, that the clinical appearances of the chronic X-ray dermatoses suggest a precocious and extreme senility of the skin, while microscopic examinations shows the most extraordinary changes, always of a degenerative

character, unequalled in severity and chronicity by the effects of any other agent. For the atrophic condition of the skin, and the telangiectases nothing can be done. Hypertrophic changes, keratoses and warts may with safety be treated in the usual manner. If such treatment fails, excision, with or without skin grafting, will probably relieve the pain and result in a cure. Excision and skin-grafting will be the best treatment for recurrent fissures. All ulcerations, which, under ordinary treatment, remain open after three months, should be thoroughly excised and carefully examined, and appropriate treatment instituted.

JOHN D. MALCOLM, F.R.C.S., Edin. "A Case of Injury and one of Exposure of the Bladder in Operations for Femoral Herniæ; Recovery in both cases." *Lancet*, November 2, 1907.

The first case was operated upon in 1900. A few months previous to the time of the operation, Moynihan had collected 171 cases in which the bladder was found in a hernial sac, but this paper had not been read by the author at the time. Statistics are quoted showing that the bladder had been so noticed in 1 per cent. of all operations for hernia. Out of 171 cases, 58 had bladder injury which was recognized immediately, with a mortality of 17 per cent.; there were 22 cases of cystocele, first recognized after operation as a result of injury to the bladder, but the mortality is not given; while in 19 cases a cystocele was found post mortem.

When its situation was stated, the bladder in men was found in the crural canal twice, and in the inguinal 128 times; whereas in women it was found 27 times in the crural canal, and 11 times in the inguinal. In the first case the hernia was quite distinct previous to operation, and went back when the patient lay down. At operation, though the canal was wide, no sac could be made out, something intervened, which seemed to be an unusually thick layer of subperitoneal fat. As a matter of fact there was the bladder, which, though cut into, gave no escape of urine or any indication of a viscus having been opened. The sac was eventually secured, and the usual radical operation performed. Some five hours afterwards the patient complained of pain suggesting a distended bladder, and on the catheter being passed about half a pint of bright red fluid was withdrawn, when the true condition of affairs was at once recognized. The abdominal cavity was opened through a median incision and the peritoneal cavity found to be completely shut off from the groin wound. While arranging for drainage, and as a result of manipulation, the ligature of the sac became detached, thus opening up the peritoneal cavity. Through the median incision a wound

in the bladder of over one inch long was found. This was repaired by suturing in layers, the abdominal cavity was washed out, and the median wound closed without drainage, while the groin wound was drained by tube and gauze. Although the bladder was drained by catheter an escape of urine occurred on the third day and lasted for four weeks. The patient left the hospital with a small sinus from which a silk ligature was extruded three months later, when prompt healing took place.

The second case, also a woman, presented an irregular oval swelling, occupying the position of a femoral hernia. It was positively asserted that its appearance was only of a fortnight's duration. At operation, a mass was found to be intimately connected with the femoral ring and adherent to the inner side of the sac. To better determine the nature and connexions of the mass, the abdomen was opened in the middle line, when a strip of omentum was found running down to the femoral ring. Traction on this caused the tumour to be pulled outward, and on a sound being passed, the mass was found to be the bladder. The bladder wall was very thin and firmly adherent to the inner wall of the hernial sac, which was greatly thickened. The operation consisted of separating these structures, and the usual radical procedure. The patient made an uninterrupted recovery.

W. L. B.

MEDICINE

UNDER THE CHARGE OF F. G. YINLEY, H. A. LAFLEUR AND W. F. HAMILTON.

RETROSPECT OF TROPICAL DISEASES.

Plague.—This pest is probably slowly abating, but it will probably account for one and one-quarter millions of deaths in Asia for the year 1907. The Indian plague-deaths for three years are as follows:—1904, 1,023,815; 1905, 946,558; 1906, 316,550, and for the first two and one-half months of 1907, at the rate of 1,220,000.

In 1903 the only serious accident in connexion with the protective inoculation occurred. This was an outbreak of 19 cases of Tetanus at Mulkowal; the cases were people who were inoculated at the same time with the same needle: the commission, whose report is recently published, has gone very carefully into the facts, and finds that the Bombay stock, which supplied the material, was not at fault; the dropping of a vaseline-covered cork on the ground by a native helper, and insufficient consequent sterilization appeared to be responsible for the

contamination. There is nothing strikingly new in the scientific knowledge or treatment of plague. It is well recognized that certain biting fleas and rats, and nearly all forms of domestic animals and fowl carry the infection.

Malaria.—It is a curious fact, noted by Gillot (Soc. de Biol., November 17, 1906), that the malarial parasite was found with motile granules twenty-four hours after the death of the patient in whose blood it was.

Malta Fever.—Investigation of this disease has been fruitful; the work of the Mediterranean Fever Commission has resulted in the discovery that the organism, micrococcus melitensis, known for a long time, infects people from the milk of the Maltese goats.

Bassett Smith, in the course of a long series of observations, concluded that in the acute stages of the disease, artificially prepared toxins acted detrimentally; but in chronic cases, with mild relapses, see-saw temperature, and no hectic, it does well; he uses an opsonic index rising after injection, as the signal for continuance.

Kala Azar, caused by the Leishman-Donovan organism, has been very prevalent in Assam; one-third of the cases are under ten years of age, and one-quarter make a permanent recovery. It has been recently discovered, that in the matter of carrying, the bedbug is guilty; the mosquito, the tick and the louse innocent. Patton was able to find the parasite in development in the stomachs of bedbugs fed on patients.

Beri-Beri.—We are here in about the same position as a year ago, but Braddon finds that stale, white rice contains a poison capable of producing beri-beri, and states that the beri-beric poison is a stable, non-volatile alkaloid like atropine or muscarine. The diet changes lately proved successful, have been repeatedly verified as prophylactic measures.

Black Water Fever.—Buchanan (B. M. J., April 27, 1907), puts forward the idea that to malaria and quinine a third factor must be added—renal incompetency; so that a discovery of this condition in malaria ought to suggest treatment other than the specific—a view that we predict will not find universal favour.

Eosinophilia and its causes.—It is not found in infections by vegetable parasites, such as tinea or by animal parasites, as scabies, pediculi or demodex. It is not found in mild intestinal parasitic infections, such as ascaris, oxyuris or trichocephalus, nor in malaria. It is found in tænia, and a moderate grade 6 to 10 per cent., may be looked for in infection by bilharzia, ankylostomum and trichina.

"Tropical" Abscess of the Liver.—A case which was drained, and became subsequently infected by staphylococcus, was cured by bacterial injection. Leonard Rogers cited (Royal Med.-Chir. Soc., April 9,

1907) 15 cases of fever with acute hepatitis and leucocytosis. He thinks this a pre-suppurative stage of amœbic abscess, and though bowel symptoms were absent or poorly marked, he gave large doses of Ipécacuanha with complete success. Five of these had had the liver explored surgically without result. He considers the leucocytosis with the hepatic signs the chief signal for the adoption of the treatment.

TUBERCULOSIS.

Bloch. *Berlin. Klin., Woch. No. 17, 1907*, advises this procedure for the detection of tubercle bacilli in urine, as a quicker one than ordinary inoculation. The urine is drawn by catheter, centrifugated, the sediment shaken up with 3 cc. of sterile salt solution, and of this 1 cc. is injected under the skin of the groin of the guinea-pig. Ordinarily the inguinal glands can just be detected by the fingers; in nine or ten days, he says, they may attain the size of a hazel-nut, may be easily palpated, and he has demonstrated the bacilli from them in smears and sections.

Several years ago we were under the impression that bacteriological technique would enable us to differentiate tubercle bacilli from smegma, because smegma were acid-fast but were not alcohol-fast, and by the use of alcohol, could be decolourized, whereas tubercle could not. This appears not to be the case. In conversation with colleagues of experience in this regard, and from his own experience, the writer is of the opinion that mistakes can and do occur, even with great care in bacteriological technique; those of whom inquiry was made cited several cases where apparently undoubted tubercle bacilli were found, and yet subsequent operation or autopsy proved the contrary. Young, of Baltimore, has enquired carefully into the subject and considers that a slavish care of technique in drawing the urine is necessary, as no other method can be depended upon; animal experiment seems to be the safest final method.

Tatuschescu gives one or two refined methods of determining apical tuberculosis. The first is pressure with the fingers behind the sternomastoid in its lower third, equally on both sides; there may be greater pain on the affected side, due, he says, to a neuritis of the plexus; the second, much like this, consists of rolling the cubital nerve equally on the two sides against the epicondyle of the ulna. Greater pain again may indicate the diseased side. The method sounds as if it might be valuable in but few instances.

Oppenheim reports two cases of tuberculous peritonitis much improved by "sun-baths" of the abdomen. Rabinowitsch (*B. Klin. Woch. No. 2, 1907*), took calcified nodules of so-called healed tuberculosis, in the

bronchial and mesenteric glands, injected them in guinea-pigs, and got tuberculosis in them in periods varying from three weeks to five months. The virulence appeared unaltered. These disquieting observations have been made in several instances during the last few years; they certainly point to the apparent fact that healing is a slower process than it seems.

An explanation of Williams' Sign is offered.—The sign consists in a lessened excursion of the diaphragm as seen by the fluoroscope; on the side of which the apex is affected, de la Camp and Mohr say the phrenic is entangled as it crosses the dome of the pleura. It may be compression or an infective neuritis.

In a series of two years ago, H. P. Loomis, in 500 cases of pulmonary tuberculosis, found antecedent pleurisy in 16 per cent.—average interval three and one-half years.

J. McC.

PATHOLOGY.

UNDER THE CHARGE OF J. G. ADAMI.

VARIOUS AUTHORS. "Fœtal Bone Diseases." References, see below.

It is now recognized that the new born infant may be the subject of bone diseases of different characters. It is not so many years ago that the differentiation of these bone diseases was unrecognizable, and, in consequence, they were classified under a single heading of foetal rickets. The recognition of the so-called foetal rickets rested with the external appearances of the infant. There have been since then, a number of more minute examinations of this disease, which have demonstrated it to include different forms of bone lesions. This recognition lies mainly in the study of the microscopical appearances of the bones.

With the first evidence, of the non identity of this large class of foetal rickets, the nomenclature of the bone diseases became quite confusing; thus, Urtel designated a case studied by him as "chondritis foetalis," Kirchberg and Marchand suggested for another, "micromelia pseudorachitica," and Virchow named another "foetal cretinism." These terms are all the development of a closer study of the bone conditions in young infants. However, up to this time, no attempt was made to classify the diseases under various systematic headings according to the faulty structures.

Parrot was among the first to collect a certain type of lesion under a definite head; the cases he studied were those which showed a faulty structure in the growing cartilage, and whose secondary results led to improperly constructed bone. This class of disease he described as

"achondroplasia," or "micromelia chondromalacia." These terms, too, lacked in definiteness, and, although segregating those diseases, which had their origin in the faulty development of cartilage, from other bone diseases, it did not properly classify the diseases of this type. Subsequently, Kaufmann made an improvement by classifying the same type of disease under the term "chondrodystrophia foetalis," which he then subdivided into the hypoplastic, malacic, and hyperplastic types.

The chondrodystrophies include all of those lesions which have their origin in the mal-development of the cartilage, regardless of the nature of the external appearances. It will be seen from this that no attempt at classification is made which considers the etiological factor.

The syphilitic bone lesions which can be diagnosed by their character and by the changes in other organs, are put in a class by themselves.

Some confusion has arisen in designating certain cases of foetal rickets, as foetal cretinism. This was, in consequence of observing the outward appearances of the infants. The facial expression, with the sunken nose and thick lips is common to different forms of foetal bone disease, and simulates very closely the appearance noted in cretins. Virchow and Kaufmann were the first to point out that this facial expression was the result of certain bone changes in the base of the skull, and Kaufmann, in particular, showed that it was not alone to be found in cretinism. Virchow has recorded several cases of foetal cretinism in the literature, and his diagnosis of the disease rested, to a great extent, on the history of the cases. The facial expression, he found, was due to an early synostosis of the bones of the base of the skull, thus inhibiting the growth in length of this portion, with a consequent flat face. A similar early bony union of the basal skull bones is found in cretinoid calves. Kaufmann, however, has demonstrated that other conditions than synostosis may lead to the facial defect. Thus, in general, diseases of the cartilaginous structures is found to affect, also, the cartilage between the sphenoid bone and the basilar process of the occipital bone. An inhibition of growth, at this point, leads to similar deformities, as synostosis.

Another characteristic, which is so common to the so-called foetal rickets, and which is not suggestive of any one particular disease, is the large head and short limbs of the infant. These characters, which are present at the time of birth, and which may have various underlying causes, are the result of faulty development of the bone or cartilage.

At the present time, the term foetal rickets is used as a general one covering the foetal bone diseases of various kinds. By the use of this term, we do not interpret any one definite condition. According to

the histological findings present in foetal rickets, we can classify the disease under, (1) foetal cretinism, (2) true rickets, (3) chondrodystrophia, (4) osteogenesis imperfecta. For all conditions in which an abnormal fragility of the bone is present, the term osteopsathyrosis has been given, and this has been applied in congenital bone diseases, mainly to osteogenesis imperfecta. Similarly, too, the use of the term congenital osteomalacia, must be a wide one, not referring to any one disease, but to all forms of softened bones.

Since Virchow's first description of the new-born with cretinism, there has been much discussion as to the proper identity of the disease. It is questioned by many whether true foetal cretinism is met with, and, according to these writers, the appearances of cretinism are due to other causes, and the bone lesions are those of another category. It must be admitted, however, that the faulty bone construction simulates in the post-natal cases of cretinism, those of the hypoplastic chondrodystrophies; that is, there is an under production of cartilage at the epiphyseal lines.

Similarly, it is doubted by many that true rickets ever occurs in the new-born. It is enough to say that certain forms of the chondrodystrophies resemble the changes found with rickets, for, in some cases, the diseases are almost inseparable. The cases of true rickets in the new-born have been greatly reduced in their numbers by later investigation. The histological changes in true rickets are to be looked for at the epiphyseal junction. Here it is found that the blood vessels develop large and irregular lacunæ in the margin of the cartilage, giving the epiphyseal line an irregular and indented outline. The vascular supply at this margin is much greater than is present normally, and there appears to be a very active process of erosion of the primary calcified area. The cartilage tissue in itself is little altered, save for an increased power of growth. The bone corpuscles are not able to keep pace with the activity at the epiphyseal line, and hence the trabeculæ are poor in structure.

There are some features in connexion with the chondrodystrophies, which are fairly constant. The fault of the improper growth of the bones lies with cellular changes in the cartilage. In some instances, the cartilage proliferates at a very rapid pace, increasing the size of the epiphyses to several times that of the normal (the hyperplastic type). It has, also, been frequently noted that the periosteum dips in between the epiphysis and diaphysis, thus inhibiting the formation of new bone at the epiphyseal line. Nothing is known of a causative factor bringing about this hyperplasia of the cartilage. This type of chondrodystrophia.

occurs the most frequently, while the opposite condition of a minimal production of cartilage is not so often seen. In the chondrodystrophies, the ossification, both of periosteal and epiphyseal origin, takes place normally. There appears to be no lack in the function of the osteoblasts in laying down the bone. There is, however, the improper preparation of the framework on to which the bone is to be built. Ossification in the chondrodystrophies is not retarded, but may in some cases occur very early.

The majority of the children born with chondrodystrophies die shortly after birth. The literature contains only few observations of cases extending over several years. Nevertheless, several adults have been described having the peculiar development common in this disease (Schmidt). Hecker reports a case of dwarfism in a person of twenty-three years. On account of its similarity with Müller's description of congenital rickets in calves, he lists it under this class. Several other such cases have been reported by Parrot and Friedenheim.

In osteogenesis imperfecta we have to deal with a disease which has its main characters in a lack of production of true bone. In these cases the cartilage is not at fault, and little or no change is to be noted in this tissue. The want of bone production falls entirely on the lack of osteoblasts derived from the periosteum. The periosteum in the long bones is the result of a metaplasia of the former perichondrium. It appears in these cases of osteogenesis imperfecta that a proper transformation of the latter has not taken place. Therefore, we find, as has been pointed out by Looser, that the enveloping tissue of the diaphysis continues to form cartilage. There is a tendency in this periosteal cartilage to transform itself into a form of bone. This bone is laid down in thin lamellæ, whose cells are more like those of the cartilage than of bone corpuscles. The lack of growth in length of the bones in this disease is due to the want of ossification at the time of junction with the cartilage.

We have, therefore, in the four types of foetal bone disease the following characters:—In foetal cretinism there occurs a premature synostosis. True rickets shows a hyperœmia and over-activity at the epiphyseal line. The chondrodystrophies present organic changes in the cartilage tissue, mainly in the appearance and arrangement of the individual cells, while in osteogenesis imperfecta the proper laying down of bone is inhibited by the want of osteoblastic function.

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O. K.

DR. F. SUTER, Privatdozent für Urologie, Basel. "On the Etiology of Bladder Infections." *Zeitschrift f. Urologie*, Bd. I., Hfs. 2, 3, and 4.

Material for this article was obtained from the clinic of the late Dr. Emil Burckhardt in Basel, the investigations being spread over four years, while the number of investigated cases is the largest it has been our privilege to see brought together by one investigator. The results should go far to settling some doubtful points respecting the bacteriology of the urinary tract.

The method employed was to take smears and cultures from the urine, after preliminary precautions to avoid urethral contamination. Control experiments showed these precautions to be sufficient.

The cases embrace 78 cases of tuberculosis; 58 cases of infection with *B. coli*; 38 cases from various cocci and *B. proteus*; 22 cases from cocci and *B. coli*, and 15 miscellaneous cases, including gonorrhoeal infection.

The 78 cases of tuberculosis and 35 of the colon cases and 1 case of streptococcus, he considers to be endogenous, which is, perhaps, the same as hæmatogenous, the remainder were all secondary to instrumentation or eogenous. Some points in these various divisions are not without interest.

Of the 78 cases of tuberculosis, 40 affected males and 38 females. In 12 cases the kidney alone was affected; in 51 the bladder and kidney; in 15 the bladder and probably some other organ.

Seventy of the 78 cases remained sterile to ordinary media; 8 showed various growths, 7 of these, however, were secondary to instrumentation, and 1 was *B. coli* infection. These findings, the author thinks, support Rovsing rather than Pousson, Albarran, Halle and others, who maintain

that tuberculosis in this region is generally accompanied by a mixed infection.

Tubercle bacilli were found in 62 instances, and not in 16.

From investigations into the 35 cases of endogenous colon infection he finds that in 10 cases it originated in the pelvis of the kidney, in 6 in the bladder, while in 14 cases both bladder and kidney were involved.

Tuberculosis and *B. coli* infection have much in common. Of the exogenous or instrumental infections colon was the commonest. He quotes 23 cases, where the infection was due to a catheter or other instrument, and in which pure cultures of *B. coli* were obtained. In all these cases, however, with four exceptions, in addition to instrumentation, residual urine, stricture, tumour or trauma were also present. The prognosis was bad, but 3 out of the 23 being cured.

In 38 cases the infection was due to various cocci and to proteus. Here also, in addition to instrumentation, tumour, stone, stricture and residual urine played a part.

Cocci decomposing urea were isolated 28 times, and cocci which did not decompose urea 11 times. Some streptococci decomposed urea, others did not. The same was true for staphylococci. All cocci, however, which decompose urea, are not necessarily accompanied by alkaline urine, as this would necessarily depend on the original degree of acidity, the number of bacilli present, and the length of time the urine remains in the bladder. Out of 39 instances where cocci, which decomposed urea, were present, 23 showed alkaline and 16 acid urine.

The prognosis for cocci infections is good; of 38, 18 were cured and the remainder all possessed some irremediable cause, such as tumour.

In 22 instances cocci and *B. coli* were associated, the cocci being generally staphylococci. The same predisposing causes were present. *B. coli* seemed to have a firmer hold on the organs than the cocci, and in the majority of cases gradually expelled these, and eventually appeared in pure cultures. The reverse, however, occurred in three instances.

In 15 cases of gonococcus and hæmaturia the cultures were negative, showing that these conditions did not predispose to further infections. His conclusions we venture to give at some length.

In tuberculosis of the urinary tract the urine is generally sterile to ordinary media, and, except as a result of instrumentation, it remains so. The urine is acid. The sexes are equally affected. The infection is apparently hæmatogenous and starts in the kidney.

In endogenous colon infection the kidney is also frequently the primary and chief seat of the infection. The urine is acid and the sexes equally liable.

In the exogenous infections the presence of some predisposing cause, such as tumour, stone, stricture, etc., is generally necessary in addition to the use of instruments. Men are much more liable than women.

In 23 cases of infection with *B. coli* the urine was acid, the pus small in quantity, the cystitis of mild grade but most difficult to cure. Bacteruria is generally due to *B. coli*.

In 38 cases of infection by cocci (48 separate tests) a single infection was found 39 times, mixed infection 9 times. Staphylococcus or diplococci were isolated 47 times, streptococcus 7 times, and proteus twice. The urea was not decomposed 11 times, and decomposed 39 times; of these latter 23 were alkaline, and 16 acid.

In 22 cases of mixed infection with *B. coli* and cocci, the presence of *B. coli* seemed to keep the urine acid in reaction. Out of 15, 9 were acid, 1 neutral, and 5 alkaline.

Out of 217 observations, 187 showed acid urine, 29 alkaline, and 1 neutral. In the 30 non-acid cases the urine in each instance contained cocci which decomposed urea.

TH. ROVSING, Copenhagen. "The Significance of Tuberculosis of the Bladder and Curability of the Same." *Archiv. f. Klin. Chir.*, Bd. 82, 1907.

Tuberculosis of the bladder was formerly considered incurable. This, according to Rovsing, was because we considered it primary in the bladder. On the contrary, it is rarely if ever primary in the bladder, but is generally primary in the kidney.

His conclusions, drawn from 56 cases, extending over a period of sixteen years are:—

1st. That tuberculosis of the bladder is generally a transplantation from one or other kidney.

2nd. That the genital variety rarely affects the bladder.

3rd. The bladder is very rarely affected primarily.

4th. It is hopeless to treat the bladder before removing the affected kidney.

5th. In examination of suspected kidneys, cystoscope and segregation of the urines do not suffice, but ureteral catheterization is necessary.

6th. Even if bacilli and pus are found in both sides, it does not necessarily mean that both kidneys are affected, as it may be that the disease which has descended one ureter has begun to ascend the other, and the kidney may still be free.

7th. In such cases and in cases where catheterization of the ureters is impossible, a bilateral lumbar incision is justifiable.

8th. Where the affected kidney is removed the bladder frequently heals of itself.

9th. If not, treatment with 6 per cent. karbolwasser will generally be successful.

TH. ROVSING, Copenhagen. "Total Extirpation of the Urinary Bladder." *Archiv. f. Klin. Chir.*, 82, Bd. 4. Hf., 1907.

Up to the present this operation has been performed 29 times, in 18 males with 11 deaths, and in 11 females with 4 deaths. The mortality was generally due to infection of the wound secondary to urinary contamination, or to infection of the kidney from an ascending infection. Till the present the surgeon has placed the ureter either in the wound, in the rectum or sigmoid, or in females in the vagina. The latter gave by far the best result.

In the case in point Rovsing brings out the ureters through Petit's triangle, one in each loin, where he allows them to form a small papilla, and, subsequently affixes an apparatus which drains down to a urinal carried over the pubis. He expresses himself as pleased with the result.

The two criticisms which naturally arise are, first, the danger of infection of the renal pelvis, and, secondly, the difficulty in fitting a suitable urinal which will prevent leakage and subsequent skin excoriations. Certainly, however, there is less danger of infection in the new situation than in either the wound or rectum, and Roosing claims to have procured by the formation of the aforementioned papilla the necessary adjunct for a successful artificial bladder.

PROF. ALF. POUSSON, Bordeaux. "Unilateral Nephritis." *Zeitschrift f. Urologie*, Bd. I, Hf. 10.

Carcinoma, tuberculosis, calculus, hydro and pyonephrosis and pyelitis are often unilateral. The possibility that non-surgical lesions of the kidney may also be so has been advanced. This possibility Prof. Poussin's possibility of a unilateral nephritis?

Acute nephritis is generally bilateral. If, however, bacteria can filter through the kidney, as we know to be the case, without causing a lesion—except, perhaps where stone or obstruction or injury adds a predisposing cause—is not this sufficient to cause us to admit the possibility of a unilateral nephritis?

Frossner found experimentally that by causing a streptococcic septicæmia in rabbits, by taking cultures from the renal veins and repeating his inoculations, after two or three passages he got infection of the kidney alone, the other organs remaining free. That is, he established

an elective virulence. While in the majority of cases the resulting lesion was bilateral, in a number it was unilateral. Castaigne and Rathery have confirmed this.

Post mortem in 130 cases of pyelonephritis, Goodhart found 19, or 14.5 per cent. one sided, and Robert Weis in 71 found 12, or 17 per cent.

Clinically, Israel, Lennander, Castaigne and Rathery have asserted their belief in unilateral disease, and the author, who has collected 40 cases which were operated upon for acute nephritis, finds that in 29 of these but one side was operated upon, and 25 recovered. He therefore concludes, we think too readily, that these 25 were unilateral, otherwise the surgeon would not have confined his operations to one side, and, if he had and disease existed, they would not have recovered.

In chronic nephritis the post mortem records are against a one sided manifestation, nevertheless, Israel, Smator and Klemperer, among others, support the occurrence. Castaigne and Rathery out of an unquoted number of cases have never found a strictly unilateral instance, but have discovered numerous cases where one side was much further advanced than the other. They therefore conclude that it may occur. An instance is that of a woman, æt. 33, who died from pneumonia. The left kidney was small and shrunken, with an adherent capsule, and weighed 25 grams. The right was large, white, and weighed 125 grams.

Edebohl out of 72 cases treated surgically, considered 11 unilateral. The author, out of 14, considers 2 to be such, while from the literature he collects 155 cases, 32 of which are said to be one sided.

He is inclined to consider pelvic peritonitis in women and appendicitis in both sexes as probable agents in causing one side rather than the other to be affected.

KRETSCHANER, Chicago. "Essential Renal Hæmaturia." *Zeitschrift f. Urologie*, Bd. I, Hf. 6:

Material and stimulus for this article were alike supplied through Prof. Zuckerkandl, of Vienna, and it is under his direction that the author puts forward his findings in this little understood lesion. Cases of essential renal hæmaturia were formerly more common than at present, largely on account of a more careful pathological examination in the recent cases, with the result that many cases so-called, have been accounted for by definite microscopical findings. The diagnosis can be made only by excluding all other causes of hæmaturia, and while it is easy, pathologically, at least, to exclude such causes as stone, tuberculosis and new growths, it is not so easy to exclude various grades of nephritis.

In support of a definite pathological change being present in such kidneys, the author cites a case of hæmaturia which was determined to originate in the left kidney. Operation was undertaken for its relief and the kidney found to be large and congested. The organ was stripped of its capsule and a snipping taken for pathological examination. The hæmaturia was arrested, but recurred eighteen months later, necessitating a nephrectomy, when all symptoms ceased.

Examination of the section taken at the first operation showed nothing abnormal, except an occasional cast in situ and the presence of blood-filling Bowman's capsule and the neighbouring tubules. The number of nuclei in the glomerulus also seemed greatly increased. A diagnosis of glomerulitis proliferans and nephritis hæmorrhagica was made. The second section showed a definite subacute nephritis.

From the literature he collects 129 cases of essential renal hæmaturia. Only 61 had been examined microscopically. Of these 61, 52 showed nephritis, 9 did not. Of those 9 however, in 4 but a small piece of tissue had been examined, so that disease elsewhere might have been overlooked, and in 4 others a general hæmophilia or such existed, so that with one exception all could be excluded. In one case, however, the term essential seemed to be the only one which would denote the condition present. He nevertheless concludes that it is unjustifiable to assume that blood may come from a totally unchanged kidney; that the lesion may be extremely slight, and that it is probably of the nature of a degeneration (hyaline) of the capillary walls in many cases, but that the pathological findings may vary greatly.

R. P. C.

OPHTHALMOLOGY.

UNDER THE CHARGE OF J. W. STIRLING.

CASEY WOOD, "On some Ocular Symptoms Common To, or Produced By Affections of the Nose and Accessory Cavities." *Ophthalmology*, January, 1907.

The symptoms taken up in this paper are headache, vertigo, and lachrimation. Much has been written upon the first symptom, headache, but as yet the differential diagnosis between headache due entirely to neighbouring cavity affections and that due to diseases of the eye alone, has not been satisfactorily established. The result is that frontal headaches due to sinus disease have been treated by prescribing glasses and *vice-versa*, headaches due to errors of refraction have been treated by

nasal correction. In differentiating between these two forms clinical evidence is of much importance. The author gives the following clinical picture: "Ocular headache from eye strain is almost invariably bilateral. It is rarely severe or accompanied by nausea or vomiting, and it is practically always a daylight headache. It does not keep the patient awake at night, because when the lights are turned out there is no use made of the eyes. There is no eye strain, and, consequently, no reflex pains. Head pains from eye defects are almost invariably frontal, temporal, or occipito-frontal. Vertical or general headache or pains confined to one side of the head or to the occipit or nuchal region alone, or very severe acute pain in any part of the head is probably not of ocular origin. True eye headache generally follows or is, at least, associated with other eye signs and symptoms. Headaches from eye-strain generally follow prolonged and continuous use of the eyes for near work, such as reading, sewing, writing, china painting, etc."

Headaches of ocular origin often follow extensive "shopping," railway journeys, and are often accompanied by pain in the eyes, redness of the conjunctival, and other signs of ocular involvement.

It is to be borne in mind, too, that headache primarily set up by an uncorrected astigmatism may be aggravated or precipitated by a nasal "cold," or by the nervous irritation of an infected sinus.

The second symptom, vertigo, has been extensively discussed, but differential diagnosis has been avoided. Ocular vertigo is generally due to heterophorias and heterotropias of a parietic character.

Vertigo at times may be readily referred to paralysis or paresis of the extraocular muscles, but the etiology of the dizziness which accompanies unbalance between heterophoria and heterotropia is not easily referred to its proper origin, and may be regarded as a nasal reflex, or attributed to other causes.

Ocular vertigo follows upon extensive use of the eyes and is relieved by rest. Other eye symptoms are generally present, which are relieved by correction.

Of laceration, the third symptom, the author says, "probably an increased flow of tears is more often a sign of nasal than ophthalmic infection, or the ocular irritation that results in the over-production of tears, or their insufficient drainage, or both, quite commonly originates in nasal disease."

After remarking upon the impossibility of taking up the organic lesions, due to nasal and accessory sinus disease, the author mentions diseases of the conjunctiva, eyelids, lacrimal apparatus, cornea, orbital

muscles and choroid due to nasal disease and orbital abscesses, and of the atrophy due to infection from the ethmoidal cells, or to abscesses originating in the frontal or maxillary cells. Paresis and paralysis of the extraocular muscles following sinus infections are the most interesting, he believes, of all the ophthalmic sequels. The nose and neighbouring parts should be examined before a paresis is marked "rheumatic," "syphilitic," or "idiopathic."

The cause of ocular paresis in nasal cases, Wood believes, to be a peripheral infection of the nerve filaments supplied to the muscles involved.

Finally, asthenopia of nasal origin is not to be neglected. When all errors of refraction and muscle unbalance have been corrected without relief, it is to be remembered that nasal and neighbouring sinus disease are often factors that must not be ignored.

PATERSON. "Ocular Diseases of Nasal Origin." *Ophthalmology*, July, 1907.

The author discusses generally, at first, the relation between ophthalmology and rhinology, and says that even now when we know the relation between nasal and lacrimal disease, the nose is very often neglected.

A case is reported of a boy of fourteen years who came to consult the author about a conjunctivitis of the left eye. The presence of a foreign body was suspected, but search gave negative results. Questioning brought out the fact that the boy had had pain for a number of days, limited to the left brow and temple. There was also present a rhinitis of a week's standing. Examination of the nose revealed pus coming from the left ostium naturale of the antrum. Drainage and irrigation soon cured pain, conjunctivitis, and catarrhal conditions.

The relation of keratitis to diseases of the nose is then taken up, and the relation of phlyctenular keratitis to the presence of hypertrophied tonsils and adenoids.

The author advises in all recurring keratitis, a thorough nasal exploration, and also that in cases of unilateral ocular maladies, the nose may be able to furnish evidences of the cause of the disease.

The case is cited of an adult male, a railway section boss, who was seen in June, 1905. He had been treated for neuralgia of the head. The pain was most intense in the right temple, and so severe as to prevent sleep. Eventually, proptosis and diplopia developed. Later examination showed the tension which had been increased to be normal. There was also a mild papillitis of the nerve of the right side. He was unable to move the right eye beyond the middle line, and movement inwards was possibly slightly restricted.

Under cocain the ethmoid cells were corrected, seemingly as far back as they extended. Pain speedily lessened and the proptosis subsided.

Five days later the papillitis was subsiding and the media was much clearer. On August the fifteenth the eye grounds and vision were normal, and diplopia was present only on looking to the extreme right.

The author cites, too, a case of a boy of fourteen years, who suffered with pain in the left eye, the entire frontal region and the left temple. Prolonged examination of the nose revealed pus in the anterior ethmoidal cells. With clearing up of this condition all pain ceased, photophobia and lachrimation disappeared.

JOHNSTON. "Functional Eye Disturbance caused by Disease of the Antrum of Highmore." *Ophthalmology*, July, 1907.

"During the past two years much has been written concerning the relation between diseases of the eyes and affections of the accessory cavities of the nose. Some observers claim that many serious intra-ocular lesions are caused directly by catarrhal or purulent conditions in the various sinuses." He goes on to say, some would have us believe "that the frontal sinus is a Pandora's box which may give rise to such serious diseases as optic neuritis, chorio-remittis and glaucoma."

Johnston believes these views too radical, but is convinced that some obscure defects of vision and asthenopic symptoms are to be explained by the presence of pus in one or more of the sinuses.

Johnston wishes, however, to call attention particularly to those patients who complain of various painful symptoms on use of the eyes, but who are not benefited by correction of muscular and visual defects. These patients constitute a most troublesome class which the ophthalmologist has to treat.

The author reports a case showing the direct connexion between antrum disease and functional eye disturbance.

M. R., aged 43, came to consultation for nasal catarrh of long standing. For some years the right eye had given him much trouble. On prolonged use the right eye would blur. Numerous examinations of the eyes found no cause for the condition. The patient suffered, too, from temporary double vision. The vision of the right eye was one-half of normal, the muscles and fundi were normal.

Examination of the nose revealed empyema of the right antrum. This was subsequently treated, and, as improvement in the antrum condition took place, so the right eye grew gradually better, until the vision in it was better than that in the left.

Johnston concludes: "We must strive to find a happy means between the specialist who would have us believe that all serious eye lesions are

caused by nasal disease, and the too conservative specialist who believes that there can be no connexion between the two organs pathologically."

S. H. M.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The second monthly meeting of the Society was held October 18th, 1907, Prof. Wesley Mills, President, in the Chair.

A MACHINE FOR THE FORCIBLE CORRECTION OF DEFORMED FEET.

J. APPLETON NUTTER, M.D., demonstrated this apparatus.

J. M. ELDER, M.D.—I was much interested in seeing this contrivance which Dr. Nutter has demonstrated, and many of the orthopedic surgeons present at the meeting of the Canadian Medical Association were very much struck with it. It seems to me an excellent contrivance for the deformities which Dr. Nutter has enumerated. Any one who has done any of these operations knows how difficult it is to get the right amount of force necessary without undue traumatism, and, I think, this device ought to produce most, if not all, of the results which the inventor hopes for, and I trust we may have a chance to view its practical application.

WESLEY MILLS, M.D.—I think the society is to be congratulated on the fact that this communication has been furnished by one of its youngest members: at all events, I congratulate myself, as President, that one of the earliest communications of the season has been made by one of the youngest members of the society. I have often wished that the junior members of our profession in the early years of their practice, when they have some time to devote to it, would endeavour to make some new piece of apparatus, or carry out some research which might be of permanent value to the profession. There are in each period of one's life, its own special opportunities, and I simply wish to emphasize this now, in the hope that other members may emulate Dr. Nutter in this respect. I remember one man invented and constructed a piece of apparatus which was of considerable importance before he was a graduate at all, when he was yet a third year student; I have also a recollection of independent work done by Dr. Nutter when he was still an undergraduate.

GONOCOCCUS ISOLATED FROM THE KNEE JOINT.

W. S. LYMAN, M.D., demonstrated the organisms.

F. G. FINLEY, M.D.—One point of interest was that the pathological examination was really the first clue to the recognition of the disease.

The man had no urethral discharge when he was under my care, and there was absolutely no pus in the urine. The urethra was subsequently very carefully examined in the surgical ward, and still no gonococci were found, and it was only on the finding of the organism from the joint that the nature of the trouble was apparent. It is probable that the gonorrhoea was an old one; this again is of interest, illustrating the long period which may elapse between the primary disease and its metastases. This feature was pronounced in two cases of malignant gonorrhoeal endocarditis which have come under my notice. In one recently reported by Dr. Ridley Mackenzie there was an interval of two years, and in another reported by Dr. McCrae and myself, an interval of nine months between the infection and the development of endocarditis.

C. P. HOWARD, M.D.—This case very well illustrates the importance of a bacteriological examination in all joint cases, especially those of a doubtful nature. For over a year of my assistantship in Baltimore it was my privilege to do the routine bacteriological examinations in the medical wards, during which I found abundant evidence to convince me of the truth of this statement.

Cases which clinically were considered of purely "rheumatic" origin, were shown by bacteriological methods to be gonorrhoeal; again, cases exhibiting the stigmata of gonorrhoeal arthritis, were in two instances proved to be due to the streptococcus pyogenes. The working clinical classification of arthritis is not an entirely satisfactory one, and the bacteriologist is frequently called upon to determine in an obscure case to which of the various groups a certain case belongs.

C. W. DUVAL, M.D.—This case is very interesting in that the organism was isolated from the aspirated fluid. As a rule, the gonococcus is recovered from the joint only after careful curetting or scraping. The aspirated fluid, in my experience, seldom gives positive results. This case is not only remarkable in that it contains the organism in the aspirated fluid, and in enormous numbers, but also from the fact that the patient is at present free from urethral discharge. Though he denies urethritis, the isolation, however, of the gonococcus from the joint is positive evidence of some former infection elsewhere, and it is more than likely that it occurred at the usual site.

TABES DORSALIS AND ITS RE-EDUCATIVE TREATMENT.

COLIN K. RUSSEL, M.D.—Dr. Russel illustrated his paper by the exhibition of two patients who performed the exercises laid down, with suitable apparatus. The warning note throughout the paper was that in no way must the patient be allowed to tire himself. This should

be carefully watched by the physician, the patient being unable to observe fatigue in himself.

JOHN McCRAE, M.D.—It seems to me that we have here an illustration of a most striking fact in favour of the theory of nervous exhaustion. One of the patients to-night had attained to comparative well-being through suitable treatment, but had the misfortune to lose two of his children in the Hochelaga School fire. The following morning it was found that he was completely ataxic, and it may be said that one hour of shock had worked in this man a result which years of the hardest labour could hardly have brought about. Dr. Russel's re-education from that point has been merely a recapitulation of the progress which the patient had made up to the time of the calamity.

II. A. LAFLEUR, M.D.—I would like to ask Dr. Russel if it would be considered safe to give a patient verbal instructions or a written *résumé* of the movements to be carried out, let us say at home. Some years ago I mentioned to a patient that the only thing that would help him would be this same re-educative treatment, and mentioned the work of Fraenkel, who had written out some exercises for this condition. The patient procured an English translation and carried out the treatment with a great deal of success, and from being extremely tabetic he could get along remarkably well. He kept the exercises up till he died three years later of cerebral hæmorrhage.

WESLEY MILLS, M.D.—This paper seems to me of unusual interest, because it shows how theory and practice or application may be closely connected. Dr. Russel has brought before us a theory of tabes which is eminently physiological, and one after hearing it expounded and thinking the subject over a little wonders that some such view as this was not urged before. That it has not been just shows how dull we are. Two or three things I should like to point out in this connexion: We have been slow to learn how movements, whether reflex or voluntary, are absolutely dependent upon the incoming afferent impulses. You may say that a tabetic subject is one that lacks the usual share of the incoming information; secondly, the executive is defective from lack of physiological knowledge; and the theory of training presented is based largely on the desirability of increasing stimulus through the parts that remain intact; for example, through the eye, which plays a very prominent part; that is, the eye is called upon to make up for the sensory regions that are shut off by the disease. This condition illustrates Hughlings Jackson's dictum that disease is a retrogression to a more primitive state. These tabetics again become children in a way, and the man struggles to perform a movement just as the child does to take its first steps. The question of exhaustion is of exceeding

interest, as is also that of fatigue. Two points of special interest are these: 1, That what is ordinarily termed fatigue is protective; 2, that exhaustion is the extreme limit of fatigue and is dangerous.

Dr. McCrae has shown what shock may do for a subject in a brief period of time. Shock may be referred to a sort of summation of stimuli so sudden that the result is the overthrow of the entire molecular mechanism to a certain extent. The whole subject is most suggestive, and I would conclude by calling attention again to the complexity of the process by which any coordinated muscular movement is brought about. Another point of practical interest is that it is very important to make these movements slowly. It seems that these movements to be coordinated must be made slowly, and the time occupied in this 'only gradually decreased if real advance is to be made.

COLIN D. RUSSEL, M.D.—With regard to the man who had such a complete relapse from shock, I may say that he was incapable of movement for practically a week, and was brought to the hospital, where, after about five weeks, he was very much improved. With regard to giving these patients a free hand in carrying out their own treatment, I would say that it is not at all desirable, on account of this very fact, that they are incapable of a sense of fatigue, and they will go on doing these exercises as long as their interest keeps up, and may bring about a more complete exhaustion than that which we are trying to combat. Of course, with an intelligent patient, who is not able to come to the hospital or to get personal instruction regularly, something may be done, but it is far from advisable. With regard to the treatment of the paralyzed bladder in tabetics certainly this method is of most use from a prophylactic point of view. The patient is told to empty the bladder every three hours, and he gets into the habit of it and it soon becomes established. With retention it is a more difficult matter, and the only thing is the catheter, but, after this passes away, it usually goes on to incontinence. Syphilis is probably the cause of 90 per cent. of these tabetic cases. There has been, however, many cases in which there is certainly no syphilis.

I would like to emphasize the fact that this is a re-educative treatment; the patient is not altogether dependent on his eyes except at first. The condition seems to be an education of other neurones to take on the functions of those which are damaged. After the first course of treatment in this first patient, A. S., there was no Romberg's sign; the patient walked with his eyes at the level of the horizon perfectly. The great thing is to keep the patient interested on the movements so as to get the cortex to work: as Dr. Mills has pointed out, this is a great item in the treatment.

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