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INTRODUCTION TO
THE DISCUSSION ON THE RELATION OF RHEUMATOID
ARTHRITIS TO DISEASES OF THE NERVOUS
SYSTEM, TUBERCULOSIS, AND RHEUMATISM.

BY

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Rheumatism in its acute and sub-acute arthritic and general manifestations, is a very common disease in this country; while rheumatoid arthritis is comparatively rare. I have been unable to collect any evidence as to its comparative frequency in Canada and the United States, and it is doubtful whether our more vigorous Canadian climate especially predisposes to it or not. It is well known that both in the United States and Canada, gouty arthritis is extremely rare. Of the few cases that I have met with, the great majority were in people who had previously lived in England, and who had suffered before coming to this country, or had a very strong gouty predisposition.

Owing to the kindness of many of my fellow practitioners in this city and the surrounding country, I have had an opportunity of studying during the past three and a half years in the wards of the Royal Victoria Hospital upwards of 40 cases of rheumatoid arthritis. An analysis of these cases is the chief foundation for the remarks that follow.

The number is small as compared with the experience of many physicians in England and the continent of Europe, but as far as I know it is the largest number that has been reported on from any one hospital on this continent.

Of the 40 cases, twenty were males and twenty females. Usually the proportion between males and females is about five to one.

There was a family history of some form of rheumatic affection in eight cases, of tuberculosis in five, and of a neuropathic tendency in four cases. Unfortunately, little stress for useful medical work can be laid on the family history obtained from hospital patients. Even well to do and educated people often give, although unconsciously, misleading information on such matters.

As to the exciting causes of rheumatoid arthritis the following were noted. There was a history of gonorrhœa in more than 30 per cent. of all cases occurring in males, and in three of the male cases there was a history of 2 or more attacks of gonorrhœa. In the female patients, however, there was with the exception of one case an entire absence of symptoms pointing to a past genito-urinary disturbance. For a long time it has been taught that there is an intimate connection between uterine disease and rheumatoid arthritis. In fact a very ingenious theory as to the nature of the disease has been built upon this alleged connection. But next to gonorrhœa, exposure to cold was considered as the most likely exciting cause. It appeared to be the sole or chief cause in five of the forty cases, which may account for the fact that in Canada the disease is rather frequently met with in lumbermen. The next most frequent cause was worry. It was said to have been present in four cases. In all four cases the worry was of an unusually severe and prolonged character. In three cases alcoholism was at least a predisposing factor. Three patients had had subcutaneous abscesses, two had had double otitis media, two influenza and two tonsillitis. Typhoid fever, whooping cough and diphtheria were each in one case considered as being the chief cause.

In several cases two or more of the above mentioned causes were present, while in about 15 per cent. no cause could be ascertained. It will be noticed that in fully 50 per cent. of the cases the patient had previously had some infectious trouble, the most frequent being gonorrhœa, but only in two of the gonorrhœal cases was there a history pointing to gonorrhœal rheumatism. In both cases the gonorrhœal arthritis was confined to a single joint, but there afterwards developed a polyarticular rheumatoid arthritis. It appears as if the infection of one joint predisposed to a general joint affection. It is worthy of note that three patients had recently had subcutaneous abscesses and two a double otitis media.

I will now take up the consideration of the more immediate object of this paper viz., a discussion of the relations existing between nervous disease, tuberculosis, rheumatism and rheumatoid arthritis.

I. The *relation between rheumatoid arthritis and nervous disease.*

The peculiar joint affection met with in cases of *tabes dorsalis* first fully described by Charcot, presents many features both clinical and anatomical similar to those of rheumatoid arthritis. It was, I believe Remak who first, in 1863, drew attention to this striking resemblance, and who suggested the possible spinal origin of rheumatoid arthritis. Much has been written lately on the similarity. In the great majority of standard medical works of the present day, the favourite theory for the explanation of the disease is that it is brought about by changes in the spinal cord. But when the whole subject is carefully considered it is difficult to understand why such a view has become so popular. It certainly has no sufficient ground work to entitle it to be generally accepted as a full and true explanation of the nature of rheumatoid arthritis. The reasons usually advanced for adopting the nervous origin of rheumatoid arthritis, are these :

1. The fact, that in certain diseases of the spinal cord, as *tabes*, *syringomyelia*, *progressive muscular atrophy*, joint changes of a somewhat similar character are met with.

2. The very frequent early and pronounced muscular atrophy observed in cases of rheumatoid arthritis.

3. The history frequently obtained of causes, having a marked effect in lowering the resisting power of the central nervous system to disease.

4. The frequent onset of rheumatoid arthritis with symptoms of a nervous character, symptoms pointing to a central or peripheral nerve disturbance, and there can be no question that in a certain proportion of cases about the first symptoms complained of are tingling and numbness in the extremities. In 10 of my 40 cases such an onset was described, and simultaneously with this perverted sensory disturbance or soon subsequent to it, stiffness of the joints supervened.

The *neuropathic arthropathies*. In a number of well recognised lesions of the central nervous system marked joint changes are occasionally met with. They are probably more frequently seen in *syringomyelia* than in *tabes dorsalis*. They are rare in *progressive muscular atrophy*, *hemiplegia* and *ataxic paraplegia*.

The joint changes in *tabes* may take the form of atrophy or hypertrophy of the structures entering into its formation, or there may be atrophy of some parts and hypertrophy of others. Usually the onset is very sudden and painless, and a characteristic feature is sudden distension of one of the larger joints, the knee generally, from fluid effused in the synovial sac. This effusion may disappear after a time without permanently damaging the functions of the joint.

More frequently signs of disorganization become apparent. The cartilage is destroyed. The heads of the bones waste and sometimes bony overgrowths spring from the ends and they are also met with in the peri-articular structures.

Occasionally the limb becomes enormously enlarged from the excessive growth of bone, and as soon as the changes in the bones set in there is no tendency to repair. Clinically there is little or no difference between the joint affections of tabes and syringomyelia. Anatomically they also correspond. In a few cases of tabes the joints have been opened early in the disease, and in several cases of syringomyelia, where surgical interference was considered necessary early in the disease, good opportunities were presented of ascertaining the exact changes present in the joint before the destructive process had made much progress. The cartilage is found to be more or less destroyed and covered here and there with polypoid growths. In several cases the ends of the bones were diseased, there being usually a considerable increase in the cortical substance and a wasting of the spongy structure. The capsule is found greatly expanded from the accumulation of the polypoid growths which vary much in size, the smaller ones being soft and vascular and the larger ones hard in consistence and containing but little blood. Bony plates are also to be met with on the internal surface of the capsule. The above intracapsular changes are precisely like those met with in cases of rheumatoid arthritis that have been operated on early in this disease. There has been for some time a difference of opinion as to the structures first involved in rheumatoid arthritis, some contending that it first shows itself in the cartilage, while others think that it arises primarily in the synovial membrane. Early changes, however, are met with in both structures, which are indistinguishable from those seen in syringomyelia and in tabes. In nervous arthropathies effusion into the joints is more common and reaches a greater degree than it does in rheumatoid arthritis. The destructive process reaches a greater degree and runs a much more rapid course in the former than it does in the latter. The clinical difference between the two is much greater than the anatomical. Rheumatoid arthritis is attended by great pain, while the nervous arthropathies usually run a painless course. The limbs in the latter can be bent in all directions without causing any pain, the extreme flexibility of the joints being due to the stretching of the ligaments and other structures by the copious effusion into the joint.

Two different views are at present held as to the nature of the nervous arthropathies, one being that they are brought or by inter-

ference with the function of the so-called trophic centres for the joints in the spinal cord. It is claimed that the degenerative process in tabes and syringomyelia involves such parts in the spinal cord. The other view, and one that is steadily gaining ground, is that owing to the lessened or disturbed sensation so frequently met with in both tabes and syringomyelia, traumatic influences have much to do with setting up the inflammatory action, and according to this view it is not necessary to assume the presence in the cord of centres having a trophic influence over the joints, the destruction of which brings about the changes. In the great majority of cases of both tabetic and syringomyelic arthritis, a history of a fall or injury is obtainable. There is nothing special in the joint changes that could not be explained by an inflammatory action excited by an injury. The clinical difference is accounted for by the sensory disturbance in the joints, and all things considered, it appears more consistent with observed fact to explain the arthritis on the assumption of an injury than that it is brought about by the involvement of certain definite parts of the spinal cord.

The question of the cause and nature of the joint changes in tabes, syringomyelia, etc., is still a matter of doubt. It is unwise to speak too positively on this matter. There is, however, very strong ground for taking the view that the joint changes in rheumatoid arthritis are not due to disease of the spinal cord. Should such changes be brought about in that way, it is hardly conceivable that they should not present evidence of not only microscopic, but macroscopic changes in the spinal cord. In several cases the spinal cord has been examined in rheumatoid arthritis after death, and no abnormal appearances have been discovered. Folli in two cases saw some wasting of the cells of the anterior cornua, but elsewhere nothing. Changes in the peripheral nerves have also been met with in a few cases, but neither the slight changes described by Folli or the nerve changes are constant, and, therefore, cannot be considered as sufficient causes of the joint changes in rheumatoid arthritis.

It is difficult to explain the marked and comparatively early atrophy of the muscles that occurs in rheumatoid arthritis. It does not correspond clinically to that met with in anterior poliomyelitis for we do not meet with any marked reaction of degeneration. The electric reaction is often normal, and is rarely more than slightly lowered. The view commonly held at present is that the wasting is brought about in a reflex manner. This theory receives support from the experiment of Raymond that division of the posterior spinal roots prevents wasting from taking place in joint disease. It must

be remembered that atrophy of the muscles takes place in all forms of chronic arthritis, and even in subacute cases; syphilitic and tuberculous and hæmophilic arthritis are frequently attended by atrophy. No matter what the cause is then, it must be due in the first place to some change in the joint, and not to any supposed changes in the spinal cord. It is in the first place an arthritic affection.

The fact that causes that are well known to bring about a lowered resisting power of the nervous system are often prominent in rheumatoid arthritis does not directly prove the involvement of the nervous system. Such causes act as well on the general nutrition as on the joints.

The not infrequent perverted sensory disturbance preceding the onset of rheumatoid arthritis has been advanced as tending to prove the nervous origin of the disease. I have never been able to ascertain that there was an objective disturbance of sensation in rheumatoid arthritis. No matter how extreme the muscular atrophy, it is not attended with any loss of sensation. Subjective disturbance of sensation is a frequent symptom of many general conditions, due generally to auto-intoxication from the intestinal canal, and its frequent presence in rheumatoid arthritis does not, as far as I can judge, lend much support to the neuropathic origin of this disease.

On the whole it must be considered that the evidence pointing to a nervous origin of rheumatoid arthritis is very meagre.

II. *The Relation of Rheumatoid Arthritis to Tuberculosis.*—Pulmonary and other forms of tuberculosis appear to be more frequent in the families of sufferers from rheumatoid arthritis than they are in other non-tuberculosis diseases. In the series of 40 reported cases such a history was only obtained in three cases, a proportion not greater, if as great as, in people in good health. Fuller, in a report on 119 cases of rheumatoid arthritis, found a history of phthisis in 23 cases. Charcot and several other observers have found tuberculosis of the lungs and lymphatic glands not infrequent antecedents in their experience. A few cases have been published where both diseases were apparently present at the same time, one joint being tuberculous, while others resembled the joint lesions of rheumatoid arthritis. There is, however, nothing in common between the two diseases, although in some respects there is a similarity between them. Tuberculosis is an infectious disease, prone to attack those who have an inherited predisposition to it. There is every reason to believe that rheumatoid arthritis is also of an infectious nature, nor is there any doubt that there is an inheritance of what we call an arthritic diathesis; that is an inheritance which involves a tendency to inflam-

mation of joints and fibrous structures. Indirectly, a tuberculous tendency may, by lowering the resistance, tend to bring about a rheumatoid arthritis, and it is only in this sense, as I understand it, that there is a connection between the two diseases.

III. *The Relation of Rheumatoid Arthritis to Acute, Subacute and Chronic Rheumatism.*—Is rheumatoid arthritis a frequent or an occasional continuation or result of an attack of acute, subacute or chronic rheumatism? This question is constantly being forced on every physician who sees much of this disease. In a very considerable proportion of all cases a history of acute or subacute rheumatism is forthcoming, but the vagueness with which the word rheumatism is generally employed, renders the clinical history of such cases far from exact. Making a certain allowance for this, there can be no question that a certain, even a very considerable number of cases that are indistinguishable in the beginning from acute rheumatism develop afterwards, it may be gradually or more or less suddenly, into rheumatoid arthritis. In four of my 40 cases of rheumatoid arthritis there was a very clear history of acute rheumatism. In two of the four cases, there were found the physical signs of organic disease of the heart. In one, a female, aged 35, there was both mitral and aortic disease. She was said to have had rheumatic fever at 10, and several subacute rheumatic attacks subsequently. When under observation in 1894, she presented all the marked symptoms of a poly-articular rheumatoid arthritis. In a second, a female, aged 70, was under observation during the early stage of her illness, which clinically was not to be distinguished from an ordinary attack of acute rheumatism. Early the physical signs of mitral disease were discovered, and after several relapses of the arthritis, the signs and symptoms of rheumatoid arthritis gradually developed. There can, I think, be no question that in both of these cases we have a rheumatoid arthritis gradually developing as the result of repeated acute rheumatic attacks. In neither case was there a history pointing to an hereditary tendency to rheumatism.

In thirteen cases, the onset resembled that of an ordinary subacute rheumatism, pain and swelling of the joints being the first and only prominent features of the early stage. The rule in such cases being that after lasting a few days the intensity of the symptoms subside, but only for a short time. Repeated attacks occur, till finally we have a fully established case of rheumatoid arthritis. In twelve cases the onset was very slow, with stiffness and swelling of one or more joints, coming and going till finally the condition was one of undoubted rheumatoid arthritis. In the great majority of the cases of chronic

onset some time passed before the characteristic changes of rheumatoid arthritis were developed.

It will be observed that in a very large proportion of the cases the beginnings of the disease were the same as in ordinary rheumatism. In at least 30 per cent. the onset was either that of acute or subacute rheumatism—the unavoidable inference being that a very intimate connection exists between rheumatoid arthritis and acute and subacute rheumatism. How is it that the great majority of cases of both acute and subacute rheumatism recover perfectly and that a few cases do not, but eventually go on to destructive changes in the joints. It is a well recognized fact that irrespective of the cardiac changes neither acute nor subacute rheumatism are followed by any permanent damage of the structures involved.

There is no recognised well marked dividing line between chronic rheumatism and rheumatoid arthritis.

We meet with all possible grades of difference from paroxysmal, slight pain and stiffness of one or more joints, up to cases in which nearly all the joints of the body are practically useless from destruction of their tissues and the formation of new bony tissue. We characterize the cases at one end of this scale as chronic rheumatism, and at the other end as rheumatoid arthritis. But the naming of the cases that we meet in the borderland between these two extremes is a difficult matter. One and the same case may be called by competent observers, chronic rheumatism or rheumatoid arthritis. This goes to show that there is nothing distinctive about the clinical features of these cases. It is only in marked types of rheumatoid arthritis that a diagnosis is easily made, and one that would be accepted universally.

In Germany and France it is the custom to call cases chronic rheumatism which in England would be called rheumatoid arthritis. There are no anatomical differences between borderland cases of chronic rheumatism and rheumatoid arthritis. In both we find distension of the capsule from polypoid growths and the accumulation of serum.

There are grounds for hoping that the bacteriological examination of the joints may help to clear up the difficulties surrounding the nature of chronic rheumatism and rheumatoid arthritis.

As yet we have no absolute proof of acute rheumatism being due to a micro-organism; there are strong reasons, however, for believing that such is the case. Riva, of Parma, in a recent paper has made a very important contribution tending to prove the infectious nature of this disease. Until comparatively recently there was no evi-

dence pointing to the microbial origin of rheumatoid arthritis, but from the bacteriological researches of Schüller of Berlin, Bannatyne and Blaxall, and of Chaufford and Ramond, it is highly probable that we have here to do with an infectious disease. The acute and subacute poly-articular forms of rheumatoid arthritis have all the clinical characters of an infection. Schüller, who has practised arthrectomy in many cases of rheumatoid arthritis, has examined the tissues for micro-organisms and has constantly found a small bacillus present and occasionally an agglomeration of micrococci. He has also made cultures from the fluid in the joints removed by tapping. He found bacilli develop on various media. The best stain is carbolised fuchsin. Inoculation into the knee of a rabbit produced an arthritis resembling that of chronic rheumatism, but without any changes in the cartilages or bones.

Drs. Bannatyne and Wohlmann, of Bath, working with Dr. Blaxall, of London, have demonstrated the presence of an organism which is said to be constant in its characteristics. It is a very small bacillus, presenting marked polar staining. It was found present in the synovial fluid in 24 out of 25 cases examined. It was also found in the blood in three out of five cases. A bacteriological examination was made of the synovial fluid from joints diseased from other causes with a negative result as far as the special bacillus is concerned. The observers have not succeeded by re-inoculation as yet in producing the original disease in animals.

Chaufford and Ramond have still more recently found in the synovial fluid in cases of rheumatoid arthritis a diplo-bacillus. They also found the same organism in the swollen lymphatic glands in the neighbourhood of the diseased joints, but did not succeed in cultivating the bacillus.

Much work yet requires to be done in the bacteriology of this disease before a true estimate can be made of the value of the researches referred to. In some points they all lack in the extreme care that such work demands, and before they can be accepted the work must be repeated by different observers.

Prof. Bäumlér, of Freiburg, the most recent writer on this subject, considers that it is highly probable that the disease is of an infectious nature. At the recent meeting in Berlin of the Congress for Internal Medicine, he read a very able paper on the subject.

I will conclude with the following summary of the chief points in this discussion.

1. Rheumatoid arthritis is a disease prone to occur in people of a rheumatic tendency, and who have suffered from sub-acute rheumatic

attacks. The presence of infectious disease of any kind tends to increase this tendency, as does also the operation of all causes having a depressing influence on the resisting power of the nervous system (worry, exposure to cold, and traumatism.)

2. There is no sharp dividing line between certain cases of chronic rheumatism and the earlier stages of rheumatoid arthritis.

3. There is not sufficient evidence to support the views commonly held, as to the nervous origin of rheumatoid arthritis.

4. There is no direct relationship between tuberculosis and rheumatoid arthritis.

5. The polyarticular forms of rheumatoid arthritis have clinically the features of an infectious disease.

6. The result of recent investigations points very strongly to its infectious nature.

I have only a few words to say on the treatment of the disease, especially on the treatment by super-heated air baths.

It is universally recognized that the medicinal treatment is very unsatisfactory. Whether surgical interference will ever become practically applicable is difficult to say. There appears to be a field for surgery in these cases. Schüller, of Berlin, and other German surgeons have published results which certainly tend to make one think that much may be accomplished in this way. Something also may be accomplished by the injection into the diseased joints of various antiseptic agents. Reports by Schüller and others on this way of dealing with the disease are more or less satisfactory.

At the present time the most universally applicable and successful method of dealing with early rheumatoid arthritis is by means of baths of various kinds.

The Scotch douche is in certain cases a very valuable means. It consists in the direct application of an alternating stream of hot and cold water. It promotes the absorption of the exudations into the joint, and it also relieves pain.

Dry baths are, however, generally more effective than moist ones. The dry sand bath has for a long time been used with more or less success. But in my opinion the most valuable of all methods of treatment is the use of baths of super-heated dry air, after the Tallerman method. It has been used in 20 cases of rheumatoid arthritis in the Royal Victoria Hospital during the past nine months with gratifying results.

The apparatus consists of a copper cylinder, of various shapes and sizes. The usually employed model is sufficiently long to admit a lower limb to some inches above the knee. By means of valve taps the

moisture from the limb is expelled, so that the air in the chamber is kept dry. The temperature in the chamber is kept usually from 240° to 300°. The first marked effect is copious perspiration all over the body. The pulse is increased from 15 to 30 beats, and the temperature is usually elevated from 1° to 2°.

In all we have treated twenty cases with the hot air bath. In fourteen of the twenty cases pain in the affected joints was present and of a severe character. In the great majority of the cases the relief was marked even after the first bath, and after several baths the patient, except on movement, was practically free from pain. As a result of this relief, sleep, which usually before was greatly disturbed, becomes possible. In addition there was some apparent change for the better in nutrition. In spite of losing daily more than a pound in weight from the loss of fluid by perspiration, the patient usually steadily gains in weight. Gains of from three to four pounds weekly have been quite common. As regards the effect on the affected joint it is various, depending on the amount of effusion and the degree of *anchylosis*.

Generally a considerable increase in the mobility follows after the use of a few baths.

It cannot be expected that restitution can take place in advanced cases, but before much actual destruction takes place, there is every reason to look for a decided check to the progressive character of the disease.

Dr. SHINGLETON SMITH (Bristol) questioned whether the term rheumatism should ever be used in connection with the disease, and he preferred the term rheumatoid arthritis to that now advocated in Germany by Dr. Bumler, chronic polyarticular rheumatism. He believed that the ordinary theories of the disease failed to give a satisfactory explanation of its phenomena, that it had no connection with tubercle, syphilis or nerve disease, and that probably it had little connection with ordinary acute and chronic rheumatism. One fact mentioned by Dr. Stewart, that 30 per cent. of the male cases had a history of gonorrhœa, gives us a clue to a more satisfactory view of the nature of the malady; it has been abundantly shown that gonorrhœal rheumatism is due to infection from the urethra, and is a form of pyæmic infection due to the gonococcus. Is it not probable that rheumatoid arthritis is also due to some microbic infection, and that the coccus described by Drs. Bannantyne and Wohlman, of Bath, and cultivated by Dr. Blaxall, may be the real cause of the polyarthrititis in its early stages, whereas the subsequent phenomena are only the sequelæ of the arthritis itself? This theory gives us a more hopeful

view of the possibility of a more successful treatment before the incurable deformities and other sequelæ have occurred.

Dr. LINDSAY (Belfast) would base his remarks on twelve or thirteen years of hospital practice in Belfast, where the disease was frequent. He had seen nothing to justify the theory of any special connection between rheumatoid arthritis and tuberculosis. He had been much struck with the nervous symptoms present in rheumatoid arthritis, especially the atrophy of muscles. He was inclined to suspect that these symptoms were due to changes in the peripheral nerves, possibly due to some toxic influence. He thought there was a real and frequent connection between rheumatoid arthritis and chronic articular rheumatism. He had seen many cases where the former had supervened upon the latter, and had seen other cases in which he found it quite impossible to draw the line between the two diseases. He thought the two conditions presented considerable analogy as regards their etiology. As regards treatment, he had not found much advantage from the ordinary anti-rheumatic remedies. He thought cod-liver oil and a general tonic line of treatment offered the greatest prospect of benefit.

Dr. A. JACOBI (New York), said: In his very concise and comprehensive paper Dr. Stewart had omitted one thing—namely, to tell us what he meant or we are to mean by arthritis deformans or rheumatoid arthritis. We have been told about boundary lines and gradual transitions, but I have been unable to learn his opinion of the pathological anatomy. One thing is certain: it is not acute articular rheumatism and not a sequela of it. The latter is an affection (anatomically speaking) of the synovial membranes, never of the cartilage. Arthritis deformans is an affection (again anatomically speaking) of the cartilage, which, while first exhibiting proliferation, terminates in atrophy and absolute loss, and finally in circular hypertrophy and eburnation round the atrophic cartilage. From gout it differs by the absence of uratic deposits. I cannot tell what arthritis deformans is: the presence of cocci in a few cases does not prove the latter to be the cause. It may be that in the future it will be best to study the cases of arthritis deformans in childhood, where it may be expected to be primary and uncomplicated. Two such cases in girls of 10 and of 6 years were published here in Montreal by Dr. Nicholls; one was published by Dr. Koplík (girl of 7). In none was there acute rheumatism or any rheumatism previously. As far as the latter is concerned, we should not use the term except in acute rheumatism. The best treatment had been in his hands arsenic in increasing doses, continued months and months with occasional interruptions, and the galvanic current.

Dr. J. C. WILSON said: The use of the term rheumatism is a stumbling block in the way of our knowledge of diseases of the joints. It should be restricted to the disease known as acute rheumatism, or better, as rheumatic fever. Such a restriction would clear the way for a better understanding of the medical arthropathies. There are various forms of joint diseases, very different in their clinical manifestations, which must be regarded as arthritis deformans. Many cases in their early course progress by attacks resembling those of subacute rheumatic fever. These cases suggest a resemblance to that disease which is only superficial, but lend support to the view that the disease may be of microbic origin.

Dr. FREDERICK C. SHATTUCK (Boston) said: I rise with some diffidence, having unfortunately been prevented from hearing Dr. Stewart, but venture to touch briefly on several points. In the first place, I cordially concur in the opinion which seems to be generally held that our ignorance with regard to this disease is lamentable. Pathologically and therapeutically alike it is one of the opprobria of medicine. Since the appearance of the observations of Smith and Lindsay, Dr. J. E. Goldthwaite, of Boston, has been carefully studying the fluid obtained from joints affected with arthritic deformans where such could be had. Thus far he has not confirmed Smith and Lindsay's observations, having found no organisms of any kind. Some eight years ago my attention was forcibly arrested by an article in the *American Journal of Medical Sciences* by Blake. He relates several cases which seem to conclusively show that suppuration, especially if concealed, may have the most intimate relation with arthritic disease, non-rheumatic, similar to arthritis deformans in some respects. One of these cases was that of a clergyman of middle age who became the subject of severe, intractable, advancing arthritic disease. Blake found a nasty condition of things beneath a tooth plate, careful attention to which was followed by complete recovery. Since then I have carefully sought for concealed suppuration in all cases of chronic and obstinate arthritis which have come under my observation. I have failed to find such save in one case—one of advanced and severe arthritis deformans and psoriasis. In this patient I found a neglected Riggs's disease. The teeth were thoroughly treated by a competent dentist, and a very sharp acute exacerbation of the arthritis promptly followed. There would seem to be an analogy between Blake's cases and those of gonorrhoeal synovitis. I trust that any gentleman whose attention may have been called to this point will speak of it.

Dr. MOORHOUSE said: I believe that there is an intimate relationship between arthritis deformans and ordinary rheumatism, but that

the disease has advanced a step farther in attacking the substance of the synovial membranes and cartilages. I am quite in accord with Dr. Lindsay (Belfast) both as to cause and treatment, believing that tonic treatment is the better plan, never having seen any benefit from the ordinary antirheumatic treatment, tonics such as iron, quinine, arsenic, cod liver oil, etc. I do not think that any microscopical germ has yet been discovered.

Dr. J. E. GRAHAM (Toronto) said: The diagnosis between gout and chronic rheumatic arthritis has given me the greatest difficulty. This, I suppose, was not referred to by Dr. Stewart, because the differentiation between chronic rheumatism and arthritis deformans is quite sufficiently extensive for one discussion. I agree with Dr. Jacobi that we should have a clear idea of the pathology of the disease; the hyperplasia and destruction of cartilage, and the eburnation of the ends of bones are marked characteristics which differentiate this disease from those affections of joints which are usually placed under the head of chronic rheumatism. It is unfortunate that the term "rheumatism" should be given to a number of joint affections arising from causes altogether distinct from those of acute and sub-acute rheumatism. I have found arsenic one of the most valuable remedies in the treatment of this very obstinate disease.

Dr. GIBNEY (New York) expressed his inability to contribute to the differential diagnosis between arthritis deformans and rheumatism, or even to the etiology and pathology. He failed to hear Dr. Stewart's paper, but learning that this paper included a discussion of the treatment by superheated dry air, believed that he might contribute his experience which was in general terms satisfactory. He had found the hot-air treatment specially valuable immediately after surgical means, such as breaking up adhesions or improving the position of the limb. He called attention to the importance of protecting the joint in examination by absolute immobilization, and of affording a limited amount of protection on the subsidence of the exacerbation, especially in the management of the knee, the ankle, and the elbow. This he does by an appliance limiting the range of motion to that allowed by Nature herself. He found valuable assistance in arsenic and cod-liver oil.

Dr. TYSON (Philadelphia) thought the subject thoroughly covered by what had been said. Personally he inclined to the view that in a certain number of cases the true rheumatic condition, or that generally conceded to be it, had at least a predisposing, and possibly through its specific cause a direct causal relation to rheumatoid arthritis. However this may be, he considered that an infectious nature must

be conceded in other cases, as attested by the large proportion (30 per cent.) in which there was previous presence of an infectious disease reported by Dr. Stewart. As to treatment, his experience, like that of others, had been most unsatisfactory; no cures, but simply palliation, followed in most cases by relapse. His method of treatment has invariably been by general restorative measures, among which he included especially cod-liver oil, arsenic, the best of food, and hygiene. Massage, too, he thought was sometimes an efficient palliative.

The PRESIDENT (Dr. Stephen Mackenzie) commenced by paying a tribute of respect to Dr. Stewart for his very able handling of such a difficult subject as arthritis deformans. He indicated that in his experience arthritis deformans was a disease distinct from rheumatism, acute and chronic, and had nothing whatever to do with gout. He especially drew attention to the class in which the primary arthritic attack could not be distinguished from rheumatic fever, and recovery took place without any appreciable deformity of the joints, but which subsequently came under observation in an attack of ordinary and undoubted subacute or chronic arthritis deformans. The late Dr. H. G. Sutton drew attention to the association of osteo-arthritis, rheumatism, and insanity in families. He also pointed out that though in a considerable proportion of cases of arthritis deformans there was a history of rheumatic fever, yet in not 1 per cent. of cases of arthritis was heart disease found on *post-mortem* examination. He quite agreed with some previous speakers, especially Dr. J. C. Wilson, that under the term arthritis deformans there was probably a number of groups of cases which would ultimately be separated as clinical entities.

A DISCUSSION ON CHOLELITHIASIS: CAUSATION, SYMPTOMS, DIAGNOSIS, AND TREATMENT.

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ON CAUSATION AND TREATMENT OF CHOLELITHIASIS.

The subject of cholelithiasis, which it is my privilege to bring before this Section, is one well fitted for discussion, a common disease affecting no fewer than 7 to 10 per cent. of cases, and yet in its mode of origin still exceedingly obscure, running a very varying clinical course, sometimes without symptoms, at other times the cause of the most intense suffering, presenting in its course problems in diagnosis and treatment baffling at times physician and surgeon alike. No portion of the subject presents greater difficulties than that of causation. And it is with this portion I propose especially to deal.

What are the conditions, general or local, that determine the formation of biliary concretions within the bile passages? At the outset I would remark how slowly our knowledge of this subject has advanced; how limited it still is; how little, except in one or two particulars, presently to be noted, it differs from that possessed 50 or 150 years ago.

Stagnation and inspissation of bile contributed to by advancing age, sedentary habits, inactive life, slowing of circulation, interference with movements of chest and abdomen by such causes as lacing and pregnancy, consequent greater liability of women to suffer than men (five times greater)—all these were recognized and pointed out so long ago as 1757 by Thomas Coe.¹ In great part they represent the amount of the knowledge we have till recently possessed. Yet the inadequacy of these various factors to account for the formation of gall stones was then, as now, fully recognised, the presence of gall stones in the young and active, their absence in the old and inactive.

Did this represent all the knowledge we at present possess regarding the causation of cholelithiasis I confess I should have little satisfaction in discharging my present task. Fortunately it does not, thanks to observations of the last few years which have introduced to our notice a new class of facts. Up to the present these observations are chiefly interesting from their extreme suggestiveness rather than from their conclusiveness. They are only conclusive in one direction,

¹ Brookbank, On Gall Stones, London, 1896.

namely, in pointing to local conditions within the bile passages and gall bladder as the immediate cause of gall stone formation.

The general result is to show that in cholelithiasis we have to do with a local disease affecting the bile passages or gall bladder, or both, and not with any general constitutional disturbance affecting nutrition or metabolism.

The result of the observations to which I refer has thus been to confirm in the amplest way the view held by Budd (1857). The relation of events in the formation of gall stones Budd held to be, diseased condition of mucous membrane, increase of cholesterin in solid form, deposit of this around any small particle of inspissated bile that may be present. A similar view was held by Bristowe. But the observer, to whom more than any other we are indebted for establishing this on a basis of facts, is Professor Naunyn of Strassburg, whose elaborate and valuable monograph on *Cholelithiasis*, published in 1892, gives the fullest and clearest account of the subject we possess.

PHYSIOLOGICAL CONSIDERATIONS.

Before passing to consider what these local conditions are, let me preface with a few remarks as to the bile itself and the conditions which in health determine its quantity, quality, and secretion.

We have to do with a watery secretion of low specific gravity, excreted in quantity of about two to three pints daily, containing some 1 to 2 per cent. of solids; these consisting of certain specific constituents—the bile pigments and bile acids—formed by the liver cell itself; certain inorganic salts, the most important of which in the present relation is calcium; a constant percentage of the insoluble body, cholesterin, held in solution by the salts of the bile acids and by the traces of fats and fatty acids present; and, lastly, a considerable amount of mucoid material formerly regarded as mucin, now shown to be of more complex character—a mucoid nucleo-albumin—which is added to the bile during its passage along the bile passages, and especially during its sojourn in the gall bladder.

This fluid is secreted constantly, more abundantly four or five hours after food under the direct stimulus of the food products conveyed to the liver during digestion, less actively and more concentrated during the night when digestion is in abeyance. During active digestion and secretion it flows into the duodenum, expelled in a series of jerks by peristaltic action of the muscular fibres in the walls of the larger bile ducts. In the intervals between digestion its passage is temporarily arrested by the sphincter-like contraction of the wall of the duodenum through which the common bile duct obliquely passes, and

it then collects in the gall bladder, where it lies till the next period of active digestion to be again expelled, partly by the peristaltic movements of the intestines pressing upon it, but probably in great part by peristaltic movements in its own walls.

The pressure at which the bile is secreted is very low, so that the rapidity with which it flows is greatly influenced by outside influences, notably two:—1. The amount of resistance it meets with in the long line of narrow bile passages through which it passes. So that an increase of mucus hardly appreciable in itself may nevertheless considerably retard the flow of bile. 2. The freedom of movement of the diaphragm. Free movement of the diaphragm by compressing the liver is probably one of the most important factors in promoting expulsion of bile from the bile passages and from the gall bladder, and any cause which interferes with such movement, for example, tight lacing, pregnancy, sluggish habits of life, will correspondingly tend to retard proper expulsion of bile from the gall bladder.

GENERAL ETIOLOGY.

Age.—The most recent information is that given by Schröder of Strassburg, 1,150 cases examined, of which 141 (12.25 per cent.) showed gall stones, and Brockbank of Manchester, 742 cases, 49 of which (6.6 per cent.) showed gall stones.

Age.	Schröder.	Brockbank.
0—20	2.4	2.9
21—30	3.2	5.3
31—40	11.5	3.3
41—50	11.1	7.4
51—60	9.9	9.3
61 and over	25.2	13.6

The increase with advancing years, especially after the age of 60 is well seen in both tables, especially those of Schröder (over 25 per cent. of cases).

The relatively larger percentage of cases (over 8 per cent.) observed by Brockbank below the age of 30 is probably connected with the fact noted by him that all his cases below 30 were the subject of heart disease; in which condition there seems to be a special tendency to the formation of gall stones.

Sex.—The female sex is about five times more subject than the male. for example, 4.4 per cent. in men, 20.6 per cent. in women (Schroëder),

Pregnancy.—Out of 115 women in whom gall stones were found, no fewer than 90 per cent. had borne children (Schröder).

Tight-lacing.—The same observer found gall stones in more than one-half of women whose livers showed any evidence of tight-lacing transverse furrows.

Laxity of Abdominal Walls.—By allowing the liver to fall down, so that the fundus of the gall bladder is considerably below the level of the junction of the cystic duct with the hepatic duct, favours the retention of bile in the gall-bladder.

Diminished Movements of Diaphragm.—The expulsion of bile is at all times greatly influenced by movements of the diaphragm, and any restriction in the range of its movements correspondingly favours its retention. This is probably the way in which pregnancy operates in favouring the production of gall stones; as also tight-lacing, and sedentary habits.

Sedentary Habits.—It is this factor which probably induces the liability to gall stones seen with advancing age, also seen in inmates of lunatic asylums.

Heredity is regarded as a factor by some; on insufficient evidence, however, I consider. Out of 165 cases, Bouchard found a parental history of gall stones in 36.

Gout is also regarded as favouring cholelithiasis. In 95, out of 166 cases Senac found a history of hereditary or acquired gout (1895). On the other hand Bouchard only found it in 13 out of 165 cases.

Influence of Food.—Habits of life as regards character of food and water have been regarded as factors in producing gall stones; also as serving to explain the greater frequency of cholelithiasis in different countries and in different parts of the same country. On this point no definite data are, I consider, forthcoming. We are dealing with impressions rather than with facts. As a matter of fact cholelithiasis occurs in every rank and class of society; in the poor and sparsely nourished as much as in the obese and over-fed.

INFLUENCE OF DISEASE.

Insanity.—Inmates of asylums are prone to gall stones; doubtless in consequence of the sluggish, apathetic habit so characteristic of many forms of insanity.

Heart Disease seems to favour occurrence of gall stones. Out of 49 cases, no fewer than 27 were found to suffer from cardiac lesions (Brockbank).

Chronic Rheumatism.—29 out of 165 cases.

Diabetes.—16 out of 165 cases observed by Bouchard.

Renal Lithiasis.—A relation has been said to exist between the occurrence of gall stones and renal calculi. Thus Kraus found the two associated in 42 cases. On the other hand the statistics of others lend no support to this view. Thus Naumyn has only observed the association once.

CONCLUSION.

General etiology thus throws but little light on the causes underlying the disease. It only brings out one fact—that anything which favours stagnation of bile in the gall bladder favours the occurrence of cholelithiasis.

SPECIAL ETIOLOGY.

Biliary Concretion.—In cholelithiasis we have to do with a precipitation of certain of the biliary constituents in insoluble form. (1) Cholesterin; normally held in solution in normal bile by the bile salts and the traces of fats and fatty acids present in the bile. (2) Bile pigment; normally in solution, now thrown down as an insoluble compound in combination with another normal constituent of the bile, calcium.

The problem of the causation of cholelithiasis thus narrows itself to the question—What are the conditions, general or local, that determine the formation and precipitation of these normal biliary constituents in the same mass, and in the form they are met with in gall stones?

CHARACTERS OF GALL STONES.

On the characters of these gall stones I need not dwell; their variation in shape, number, and size; their peculiarities in shape from pressure against each other; their amorphous or crystalline character.

They have been variously classified according as one or other constituent—cholesterin, bilirubin calcium, carbonate of lime—predominates; according to the relation of the constituents to each other, the cholesterin surrounding a nucleus of bilirubin calcium, or itself forming a nucleus, or both intermixed; or, according to the crystalline or amorphous character of the cholesterin present.

The following classification of Naumyn will illustrate the various forms met with:

VARIETIES OF GALL STONES.

1. *Pure Cholesterin.*—Oval or round, rarely faceted, crystalline, consisting of almost pure cholesterin.

2. *Laminated Cholesterin*, resembling the foregoing in form and size, but more often faceted, on section more or less distinctly lami-

nated ; outer layers amorphous, becoming more and more crystalline towards the centre, consisting chiefly (90 per cent. or more) of cholesterin with a constant trace of bilirubin calcium and calcium carbonate.

3. *Common Gall Stones* from gall bladder, comprising the great bulk of gall stones of the most varying size, shape, and colour, usually faceted with a central nucleus of bilirubin calcium, surrounded by amorphous cholesterin and bilirubin calcium in varying proportions.

4. *Mixed Bilirubin Calcium*.—Size of a cherry or larger, met with singly or at most two or three in number, in gall bladder or larger bile ducts, dark in colour, the great mass formed of layers of a dark or rusty brown colour, made up in great part (75 per cent. or more) of bilirubin calcium, the remainder cholesterin.

5. *Pure Bilirubin Calcium*.—Small, black, irregular, size of a pea, non-faceted, found in gall bladder, but frequently also in intrahepatic bile ducts, consisting almost entirely of bilirubin calcium with a constant trace of humin substances.

6. *Rarer Forms*.—(a) Amorphous and imperfectly crystalline stones of cholesterin, often of pearl-like color, seldom laminated, with a central nucleus of bilirubin calcium ; with this exception consisting of pure cholesterin.

(b) Chalk stones, composed of calcium carbonate recognizable by their extreme hardness.

(c) Conglomerate stones, the body consisting of mixed bilirubin calcium stone, the nucleus of pure cholesterin, in many cases two or more nuclei surrounded by a common body ; or the nucleus formed by a foreign body—for example, a needle, plum stone, piece of round worm, of a distoma, or cast of intrahepatic bile duct.

(d) Stones having the shape of the larger bile ducts, consisting of bilirubin calcium, not seldom in cattle, very rare in man.

From the point of view of causation, I prefer a classification simpler. From that point of view, it appears to me to be of relatively little importance in what proportions the constituents are present, or in what form, crystalline or amorphous, or the degree and character of the lamination or classification.

What impresses me is—

1. In the vast proportion of gall stones the two chief constituents are cholesterin and bilirubin calcium.

2. While in exceptional cases cholesterin may form the nucleus of the stone, in the vast majority the nucleus is made up of bilirubin calcium. This latter must therefore have been the earlier formed, and around this the cholesterin is deposited pure, or intermixed with more bilirubin calcium, as the case may be.

3. Almost equal in frequency to this mixed gall stone is the biliary concretion formed of bilirubin calcium alone, without any cholesterin ; the small dark brittle concretions one so frequently finds, not only in the gall bladder, but also not infrequently within the intrahepatic bile ducts themselves. These characters I can demonstrate to you in the lantern slides I now show.

These two facts—the frequency of concretions of pure bilirubin calcium without any cholesterin, and of nuclei formed of this material, denote that the conditions underlying the formation of gall stones are, in the large majority of cases, primarily such as favour the precipitation of bilirubin with calcium.

SEAT OF FORMATION OF GALL STONES.

In this connection there appear to me to be three outstanding facts :

1. Within the intrahepatic bile ducts the concretions have nearly always the character of pure bilirubin calcium. The conditions, whatever they may be, which lead to the precipitations of bile pigment and calcium in insoluble form, must thus occasionally exist high up within the liver, and be entirely independent of anything prevailing in the gall bladder, or common bile duct. We can conceive of such small concretions, for they are all of small size, being carried down with the bile into the hepatic duct, and thence into the gall bladder (and this is probably the source in many cases when present in the gall bladder) ; but we cannot conceive the reverse, such concretions having been formed low-down and carried up in the absence of obstruction into the liver against the direction of the bile flow.

2. In the common bile duct and hepatic duct the stones usually met with have a special character of their own—such as I now show you. They are usually large, round, or oval, dark in colour, and either single or at most in groups of two or three. They are found in cases of obstruction of the common duct, in which the duct becomes widely dilated, its walls thickened and inflamed. On section the bilirubin calcium element is found to predominate. It forms the nucleus and the greater mass of the stone, only a small proportion of cholesterin surrounding the central mass. The original source of this kind of gall stone is doubtless in most cases the gall bladder, a smaller stone derived from the gall bladder having become impacted on its way down. But there can be hardly any doubt that the large size which such stones attain to is due to further formation and deposition of its constituents within the walls of the inflamed common duct. And it is interesting to note that just as in the case of the concretions formed higher up within the intrahepatic ducts, the bilirubin calcium element

is here the prevailing constituent. Cholesterin is in relatively small quantity.

3. It is, however, the gall bladder that is the chief seat of formation of gall stones, and it is in this situation a sort of *cul-de-sac* or back eddy where the bile can lie for varying periods of time undisturbed that the chief conditions are to be sought favouring the formation of gall stones. The stones here formed have in general this distinction; that, differing from the two classes just considered, the chief constituent is cholesterin, albeit that, as I have already pointed out, in the vast majority of cases there is a darker central nucleus of bilirubin calcium.

SOURCE OF THE CONSTITUENTS OF GALL STONES.

We are now in a position to approach more closely the problem which cholelithiasis presents us, namely, what is the source and mode of origin of the cholesterin and bilirubin calcium which make up the great bulk of gall stones? And, first, with regard to cholesterin. Is it formed *in situ*, the product of a diseased mucous membrane of the gall bladder or bile passages, or is it precipitated from the bile by deficiency of its chief solvent agent, the bile salts, or, lastly, is it due to an increased excretion by the liver?

The evidence on this point although not conclusive is, I think, all in one direction, namely, in favour of it being entirely of local origin—a product of secretion or disintegration of the epithelium of the mucous membrane and glands of gall bladder, and of the larger bile ducts. It is a product widely distributed throughout the body. It occurs not only in bile, but also in nervous tissues, blood corpuscles, spleen, seminal fluid, testes, ovary, yolk of egg. Hence it has been thought that its presence in the bile is solely due to its excretion by the liver from the blood. There is, however, no actual evidence, in my own opinion, that such is the case.

On the other hand, there is conclusive evidence that it is a frequent product of degenerative conditions, being found in atheromatous, cancerous, and tuberculous products; in ovarian and less frequently in ascitic and pleuritic fluids; in pus; in thyroid cysts, and more especially in the secretions of mucous membranes, for example, sputum of bronchitis, phthisis, etc. This latter fact appears to me to be one of great significance in relation to our present subject—strongly suggesting that if it can be formed in quantity by mucous membranes elsewhere, it probably has a similar origin in cholelithiasis. In bile it is present in the small proportion of about 0.7 per 1,000; in the bile from gall bladder in much higher amount, $3\frac{1}{2}$ -11 per 1,000.

In the sputum of catarrhal bronchitis it has been found in propor-

tion of 0.9 per 1,000 ; in sputum of bronchiectasis in even higher proportion—1.5 per 1,000 (Naunyn)—2.2 and 2 per cent. of the solid constituents respectively. Cholesterin then appears to be pre-eminently a product of cellular degeneration, especially of epithelium degeneration. And such appears to be its source in the bile. The evidence appears to me to point to its local origin in the bile passages, both in health and disease.

Naunyn indeed has been able to trace the origin of this product from the degenerating epithelium. It is formed as viscous myelin globules within the degenerating epithelial cell. It escapes in this viscous condition and can be seen floating about, and on the addition of a few drops of acetic acid it can be seen solidifying into a mass of cholesterin crystals. Conversely, similar myelin masses can be produced by the action of a solution of soap on cholesterin as described by Brockbank. The formation of viscous masses by the mucous membrane of gall bladder, consisting almost solely of pure cholesterin, I have also been able to observe ; these viscous masses on pressure against one another and adjacent gall stones already assuming the characteristic shape of gall stones. The important conclusion is thus led up to, that the cholesterin which goes to form gall stones has never really been in solution in the bile, but has been in a more or less solid viscous form from the beginning, formed as a product of degeneration of the epithelium of bile passages.

With regard to the insoluble compound, bilirubin calcium. In normal bile these two constituents are not combined. Nor can they be made to combine by any mere concentration of bile. Bilirubin itself may deposit under such circumstances, but not in combination with calcium. Nor can the two be made to combine by any mere excess of lime, at least in the first instance. But if further excess be added a deposit of bilirubin calcium finally takes place, till finally the whole of the bilirubin is thus precipitated. There appear then to be substances in the bile which prevent the precipitation of bilirubin calcium even when the amount of lime is considerably increased (Naunyn). The bile salts seem to exercise some such function. Thus it only requires the addition of a few drops of limewater to a weak ammoniacal solution of bilirubin to precipitate the whole of the latter as bilirubin calcium (Naunyn). But if such a solution contains $2\frac{1}{2}$ per cent. of glycocholate of soda, precipitation only begins when five times the quantity of limewater is added. The lime is seized upon by the bile acid. It is probable then that a certain reaction of bile is necessary for the formation of this bilirubin calcium compound.

Apart from mere reaction, or proportion of bile salts present, there

is another observation of interest in this relation, namely, that just as egg albumen favours the precipitation of calcium carbonate from solutions of bile salts, so also egg albumen favours the precipitation of bilirubin calcium (Naunyn). This suggests, then, that the presence of albumen in the bile passages and gall bladder may favour the formation of bilirubin calcium concretions. Albumen derived from the disintegration of epithelium, that is, catarrh, which promotes such disintegration, is thus in all probability the factor which determines the precipitation of bilirubin calcium within the bile passages and gall bladder.

CATARRH OF GALL BLADDER AND BILE DUCTS AS THE IMMEDIATE CAUSE OF CHOLELITHIASIS.

It thus appears that the conditions leading to increased formation and deposition of cholesterin in solid form, and to the precipitation of the insoluble body—bilirubin calcium—are essentially local, and are of the kind—increased epithelial degeneration and presence of albumen—that prevail in a special degree in catarrhal and inflammatory conditions of the lining membrane of gall the bladder and bile ducts. I have now to consider what it is that sets up this catarrh.

Among the various factors which have been held responsible for the formation of gall stones—the influence of age, sex, heredity, gout, rheumatism, etc., the only one whose influence is undoubted is stagnation of bile. In the list of conditions I have noted under “general etiology” it will be seen that the degree to which any one of them favours the incidence of cholelithiasis may safely be regarded, as in direct proportion to their liability to favour stagnation of bile in the gall bladder. Hence the greater frequency of the condition in advancing age, in women, especially in pregnant women; in those of inactive habits of body from gout, rheumatism, etc.

Frerichs taught that stagnation of bile alone might of itself in time excite a catarrhal condition of the mucous membrane by favouring decomposition of the bile itself. With the knowledge we now possess this view cannot be accepted. It may, I think, be taken as certain that such a decomposition does not occur in the absence of micro-organisms. Stagnant bile, if kept sterile, does not deposit bilirubin calcium, or cholesterin. Normal bile is aseptic, as shown by Netter, for rabbits (1884); by Naunyn, for dogs and rabbits. Human bile is also sterile. Gilbert and Girode found it so in 6 out of 8 cases even as long as twenty-four hours after death; Naunyn in 2 cases examined one, and five hours after death, and in 2 cases punctured during life; and myself in 2 cases examined fourteen hours after death. In

a third case examined by me twenty-two hours after death, *post-mortem* infection had already occurred, the bile contained a gelatine liquifying organism. As causes of catarrh there are, I consider, two possible factors to be considered.

Infection as a Cause of Catarrh.—As one of the commonest causes of catarrh of inflammatory conditions of gall bladder and bile ducts we have now to recognise infection of the bile and bile passages with organisms; and in favouring such infection no single factor is more important than stagnation of bile. This is very well brought out by certain experiments made by Naunyn. In five cases of gall stones he obtained the bacillus coli communis by puncture of the gall bladder during life. The injection of this organism into the gall bladder of the dog excited no trouble; but if the common bile duct were previously ligatured so as to bring about a stagnation of bile, then the injection set up the most violent inflammation (cholecystitis and cholangitis).

The organisms which have been found as causes of inflammation of the gall bladder in individual cases include the pyogenic organisms—staphylococcus and streptococcus—the common bacillus of the intestine, *B. coli communis*, and the typhoid bacillus.

The observations in this relation are so far but few. But they are likely to be rapidly added to now that attention has been drawn to the subject, and especially now that opportunities are afforded by the surgeon for more frequent examination of the gall bladder. For the present chief interest attaches to *B. coli communis* and the *B. typhosus*. The former is the organism that has been found in the majority of cases of cholecystitis and cholangitis. The connection between the latter organism and inflammatory conditions of gall bladder is of peculiar interest. Dufort (1893) has described a case of cholecystitis and gall stone following at a few months' interval an attack of typhoid fever, and he found the typhoid bacillus in the gall bladder. Up to 1876, 18 such cases were collected by Hagenmüller from the literature. In a recent case I found a marked inflammatory condition of the whole mucous membrane of the gall bladder in a case of typhoid fever. On microscopic examination the mucous membrane showed thickening and small-celled infiltration.

The question as to the connection between such an infection and cholelithiasis is of still more interest. In a certain number of cases the first attack of gall stones has followed at an interval of two or three months an attack of enteric fever, as in Dufort's case above noted. A similar case has been described by Gilbert and Girode (1893). In no fewer than 19 out of 22 cases of enteric fever the presence of

the typhoid organism has been demonstrated in the contents of the gall bladder by Chiari (1893); in 15 of these cases in pure culture. In all these cases the common bile duct and cystic duct suggest themselves as the channel of infection that the organism has of finding its way upward from the duodenum. This would be in accordance with Sherrington's results. Sherrington has shown for a large number of organisms investigated by him that it is the exception for them to pass into the bile after their injection into the general circulation. So that this source of infection may, in general, be excluded. And yet certain interesting observations made by Professor Welch, of Baltimore, and published in the *Bulletin* of the Johns Hopkins Hospital in 1891, would indicate not only that infection of the gall bladder with the typhoid organism may occur from the blood, but that this infection may persist there after it has disappeared from every other organ of the body. He found the typhoid bacillus in the gall bladder of rabbits as long as three or four months after its intravenous injection, at a time when it could not be found in any other organ of the body, even in the spleen and intestine. Such, briefly, are the chief facts. Here I must caution against any too hasty generalisation from them as to the frequency of the connection between cholelithiasis and typhoid fever. That remains a problem still to be worked out.

At the present time the facts are, I think, chiefly interesting from their suggestiveness. In whatever way the infection occurs, whether through the bile passages, as is probably the most common, or through the blood, the important fact I wish to bring out is that infection of the bile and gall bladder with organisms is of no infrequent occurrence; that under favourable circumstances, the chief of which is stagnation of bile, such infection can set up catarrhal and subacute inflammatory conditions of the lining membrane of gall bladder and bile ducts, in certain cases even intense suppurative conditions.

In the etiology of gall stones, where, as I have shown, catarrhal inflammation plays such an important part, infection thus comes to rank as a possible and most important factor. I do not speak here of the part it plays in producing the symptoms of acute attacks—the fever, the swelling, and tenderness over the gall bladder, possibly the ague-like attacks—from which the subjects of gall stones suffer, or the suppurative conditions of gall bladder and bile ducts met with in severer cases. I am only concerned with the earlier and gentler rôle played by infection as a catarrh-producing factor, setting up a catarrhal inflammation sufficient to lead to a largely increased formation of cholesterin and to the precipitation of bilirubin calcium.

A temporary infection of this kind, whether the organism be the

colon bacillus, or the bacillus of typhoid fever, or other organism extending over a few months, may, without causing any symptoms, excite a catarrhal inflammation of the gall bladder, sufficient to produce a crop of gall stones, and then pass off completely, leaving the latter as a permanent heritage to the patient. It is probably in this way that gall stones usually arise and why they are met in such numbers. If the infection passes off the stones may remain quiescent for years without causing any symptoms, probably undergoing but little increase in size. But even so they are always liable to excite trouble. Their mere presence may serve mechanically to keep a certain moderate degree of congestion of the mucous membrane of the gall bladder. But a more important danger is that a subsequent infection may occur and induce a cholangitis or a cholecystitis, or one of the stones may pass down and become impacted.

Excretion through the Liver as a Cause of Catarrh.—So far the only factor I have spoken of as a possible catarrh-producing agent has been infection. And in speaking of it, I have had specially in mind the gall bladder as the chief seat of formation of gall stones. In general it may be stated that what applies to the gall bladder in this relation applies also to the cystic and common bile ducts. Stones found in the latter situation have originally come from the gall bladder, although they attain the large size so commonly met with in stones in this situation by subsequent increase. I have, however, now to refer to another class of stone, the seat of whose formation is not necessarily the gall bladder or the common bile duct, but higher up within the intrahepatic ducts. In speaking of the possible seats of formation of gall stones, I pointed out that small dark calculi consisting of bilirubin calcium are not infrequently met with high up within the liver, lying within the smaller intrahepatic ducts. The presence of these calculi in this situation appears to me to be of particular interest. They consist usually of bilirubin calcium—an insoluble body for whose formation a catarrh of the bile passages is as important as for that of cholesterin itself.

How is this intrahepatic catarrh set up? Infection may, I consider, be set aside. It is highly improbable that an infection may travel up along the bile duct and excite catarrh in the higher intrahepatic ducts without affecting the lower. The more probable cause of such intrahepatic catarrh appears to me to be one, pointed to by certain observations of my own, namely, the excretion of products through the bile, exerting an irritant action on the bile passages.

That the bile has an excretory function for substances injected into the blood or administered by the mouth or intestine has been shown

for quite a number of drugs and medicinal substances, for example, ferrocyanide of potassium (Claude Bernard); iodide of potassium, cane and grape sugar, sulphate of copper, oil of turpentine (Mosler); iodide of potassium, bromide of potassium, iron, lead, nickel, arsenic, silver, bismuth, and antimony (Wichert); iodide of potassium, salicylate of soda, carbonic acid (Peiper); oil of turpentine, salicylic acid (also after administration of salol) bromide of potassium, iodide of potassium, chlorate of potash, arsenic, iron, lead, mercury (Prevost and Binet).

The excretion through the bile may begin very early; for example, salicylate of soda being detected in the course of half an hour after administration, iodide of potassium after some six to eight hours (Peiper).

In the case of the above substances there is no evidence that in the course of their excretion they exert any injurious action. On the contrary, the action of some of them is beneficial, causing an increased secretion and flow of bile.

Very different is the result with another class of substances, of which toluylenediamine may be taken as a type. This body has the power of producing intense jaundice in dogs, the jaundice being obstructive and caused by intense concentration and viscosity of the bile.

When the jaundice is at its height, the smaller bile ducts are found plugged with thick viscid bile, while lower down in the common duct only thick viscid colourless mucus is found.

The particular observation of my own I have referred to is that the change in the character and viscosity of bile is due to inflammatory catarrh of the whole system of bile ducts extending from above downwards, set up by the excretion of the poison itself (or derivatives of it) through the bile. I found the drug in the bile as early as half an hour after its injection into the blood. In large doses it exerted an intense irritant action, not only on the bile passages, but also on the duodenum in cases.

From the opening of the bile duct downward the most intense inflammatory condition was produced, the mucous membrane, as determined by actual measurement being swollen to $3\frac{1}{2}$ times its normal thickness, reddened and inflamed, and covered with tenacious colourless, inflammatory mucus, and similar mucus was seen exuding from the opening of the common bile duct.

This duodenal condition, I would ask you to note, is secondary to the intrahepatic catarrh. The latter is produced even when the common bile duct is ligatured, and the bile is allowed to flow out through a fistula.

It is thus no question of a catarrh of bile ducts secondary to a duodenal catarrh. The relation is the other way: the catarrh has spread down the bile ducts from their origin.

The significance of these observations in relation to the pathology of jaundice caused by poisons, and in relation to catarrh of the intrahepatic bile ducts, I have discussed in full elsewhere.² They establish to my mind the great importance of this excretory function of the liver in relation to intrahepatic catarrh. The liver is constantly being called on to deal with products more or less harmful carried to it in the portal blood from the intestines. It deals with them in two ways, either by destroying them, or by excreting them—most usually by both.

If these products possess any irritant qualities, this continuous excretion will tend to set up and maintain a certain degree of intrahepatic catarrh in direct proportion to any irritant qualities they possess.

And this is precisely the state of things favoured in the chronic dyspeptic, in those who lead a sedentary life, in the "bilious" subject generally.

I consider it possible, then, that under the conditions just referred to, a state of intrahepatic catarrh of excretory origin may be induced, and that in certain cases this may suffice to lead to the precipitation of the bile pigment and line of the bile in the form of the insoluble bilirubin calcium compound.

In this way small biliary concretions may, I think, be produced independent altogether of infection. It is conceivable even that in certain cases, such intrahepatic concretions, carried downwards and lodging in the gall bladder, may form the starting-point of a moderate and non-effective stone formation in the gall bladder itself.

Such, I conceive, may well be the mode of origin of the gall stones so often met with in the gall bladder of old people, that have never caused any symptoms. Such also I consider to be the nature of the cholelithiasis met with in the subjects of heart disease. Here the catarrh of bile passages and gall bladder is set up and maintained by the passive congestion prevailing in the liver generally. In a recent case of this kind I found the mucous membrane of gall bladder chronically congested and thickened, producing thick viscous clumps of material which lay between the individual stones, many of the clumps already showing the shape of stones. On the addition of a few drops of acetic acid they threw down cholesterin crystals in abundance. I regard them as gall stones in their earliest stages.

² Allbutt's System of Medicine, Vol. 4.

II.—J. E. GRAHAM, M.D., Toronto.

THE SYMPTOMS AND DIAGNOSIS OF CHOLELITHIASIS.

The success of surgical interference in gall stone disease renders it incumbent upon the practising physician to make an early diagnosis, so that calculi may be removed before serious damage is done by their presence either in the gall bladder or in the large bile ducts, and before the system is irreparably injured by poisons circulating in the blood, the result of obstructive jaundice, or of the absorption of toxins produced, and by microbes.

Cases of gall stone disease are often divided into two classes, those without and those with jaundice. Although this classification has been of great use clinically it is at best an artificial one, since bile pigment may be found in the urine when the calculi are situated in any part of the gall bladder or bile ducts, although its presence is of course much more marked when they are arrested in the hepatic or common bile ducts.

It is impossible in the time allotted to me to give all the symptoms of biliary calculi. My intention is to describe briefly the course of the disease and to dwell more particularly upon symptoms which are of diagnostic importance as well as those which have been of special interest to me in practice. The symptoms of cholelithiasis are influenced to a greater degree perhaps than we suppose by the length of time required for the formation of the calculi. It is generally thought that they grow very slowly, but Naunym is of the opinion that ordinary gall stones of the soft variety may form in a few days, even in a few hours. Biliary concretions may exist in the gall bladder a number of years without producing any symptoms, at least any sufficient to lead the patient to consult a physician.

The frequent discovery of gall stones in *post-mortem* examinations of patients in whom they had not been suspected is a proof of this. They have been found in one-tenth of all cases and in one-fourth of all elderly women.

A number of indefinite symptoms have, however, been noticed, for instance, frequent bilious headache, bilious attacks without headache, and a feeling of pressure over the stomach after certain articles of food. I am strongly of opinion that if a frequent and careful examination of the urine was made bile pigment would be found in a number of these cases, especially when catarrhal cholecystitis is present. This latter condition in the chronic form may end in contraction and atrophy of the gall bladder. Courvoisier has collected sixty-three such cases, in seven of which the biliary passages were not in any way obstructed.

I had for a number of years a patient under observation who had xanthomata of the eye-lids and who suffered from frequent attacks of biliousness but with no local sign. She died of intestinal hæmorrhage and the gall-bladder was found filled with calculi. Fremitus has occasionally been noticed, and the stones have been detected by sounding. This is not a safe procedure especially if cholecystitis is present. When in addition to the presence of calculi there is an invasion of pyogenic organisms a series of symptoms of very grave character rapidly supervene. Pain and tenderness over the region of the bladder often set in suddenly. The pain is not of the nature of colic unless the cystic duct has been entered. Symptoms of localised peritonitis and irregular night temperature together with marked disturbance of the digestive functions, anorexia, nausea and vomiting are present.

I saw a very interesting case of this kind some years ago. The patient, a man of full habit, was in ordinary health, when while walking on the street he felt a pain in the right hypochondrium, which was accompanied by much tenderness in the hepatic region and by tension of the right rectus muscle. Symptoms of a remitting fever following with irregular exacerbations sometimes amounting to rigor. Death took place about six weeks after the commencement of the attack. At the *post-mortem* examination the gall bladder was found filled with calculi and the whole mucous surface was separated by ulceration. Pyæmic abscesses existed in the liver and kidneys. In some cases of suppurative cholecystitis the infective agent is the typhoid bacillus, and death may result from rupture and infective peritonitis. Several cases of the kind have been reported. Dr. Anderson, of Toronto, has described one in which at the *post-mortem* examination suppurative cholecystitis and typhoid lesions of the bowels were found. The amount of ectasia of the gall bladder varies in different cases. When there is an occlusion of the cystic duct from thickening of the lining membrane the distension may be very great. Biliary calculi may find their way out of the gall bladder either through the cystic into the common bile duct or through the walls of the viscus into surrounding connective tissue into the liver or into the peritoneal cavity.

Cases have been reported in which during a paroxysm the gall stones have been driven through the thin and tense wall of the gall bladder into the peritoneal cavity. Death from hæmorrhage followed in one case, and in another the bile flowed into the abdominal cavity and was removed by successive tapplings. The aseptic bile did not produce any inflammatory action and the patient recovered. In such cases it is difficult to understand how a sufficient amount of force is

generated thus to expel a gall stone. The force is generally supposed to be produced by spasmodic contraction of the muscular fibres of the gall bladder and of the muscles of the abdominal walls. When the cystic duct is obstructed it is probable that the accumulation of fluid acts also as an expelling power. In the great majority of cases of rupture there has been a previous ulceration of the gall bladder wall and the calculi find their way into surrounding connective tissue.

When the gall bladder contains a number of calculi, diverticula are frequently formed. These are really herniæ in which the serous membrane alone remains. If suppuration takes place under these circumstances, abscesses are formed containing gall stones, and having direct communication with the cavity. Hour glass contraction of the gall bladder existed in 15 cases collected by Courvoisier. Cicatrices of the wall of the gall bladder have been found by Schloth in 14 out of 343 gall stone cases. With the exception just mentioned, calculi do not give rise to any special symptoms until they pass into the cystic duct when the well known symptoms of biliary colic supervene. Biliary colic occurs in less than half of all gall stone cases. An attack may be brought on by error in diet, emotional disturbance, or by active movements of the body. They occur during menstruation, during or after confinement, and after the removal of abdominal tumours. They also supervene after marked intestinal irritation in typhoid and other fevers.

Hayem has collected 18 cases occurring during the course of typhoid fever. The seat of the pain which is usually in the gall bladder region may also exist in the epigastrium, the left hypochondrium, or in the right shoulder. It is sometimes referred to the right inguinal region, and in one case I have mistaken gall stone for appendicitis. An elongated appendix may extend upwards towards the liver. The severity of the pain does not depend so much upon the size of the stone as upon its shape. The angular projections produce greater irritation to the sensitive mucous membrane, and cause more severe pain.

The ordinary symptoms of biliary colic need not be mentioned as they are all so familiar to us. I would like to refer to some of the less frequent phenomena. Death has occurred during an attack. Two or three cases have been reported by French authors in which symptoms of shock were shortly followed by death. Potain is of opinion that acute dilatation of the right ventricle may take place as evidenced by *bruit de galop*, and by pulsation in the epigastrium. This he thinks is due to a spasmodic contraction of the pulmonary capillaries, and consequent obstruction of the circulation. Convul-

sions have supervened in neurotic subjects. A case of paraplegia has been reported by Trousseau, and another by St. Cyr. Hepatic cough has been mentioned by the older writers, and functional troubles of the heart, as palpitation and irregular action, have also been reported. The diagnosis of biliary colic without jaundice is often not easily made. Many of the conditions resembling it may be excluded by careful examination and by attention to the history of the case.

Here I would like to refer to one condition—the differentiation of which has given me more trouble than any other, that is, spasmodic closure, of the pylorus accompanied by painful distention of the stomach. If the patient is seen during an attack the gastric distention may be made out. The presence of an increased amount of free hydrochloric acid in the gastric juice would lead one to believe that the stomach is the seat of the pain. An elevation of temperature is present in a greater number of cases of biliary colic than one would suppose from medical literature. Rigors with high fever and perspiration have been occasionally observed. These symptoms have been especially referred to by Dr. Osler under the head of “hepatic intermittent fever.” This condition resembles urethral fever, and probably results from the absorption of toxines. It is important to remember that it may exist without the presence of suppuration.

Cases of biliary colic and spasmodic contraction of the gall bladder have been described in which calculi were not found. This is not uncommon. In some of these the calculus has already passed through. On the other hand, calculi sometimes pass through the cystic duct without pain or spasm. Jaundice does not take place in more than half the cases of biliary colic. Trousseau mentions a case in which jaundice did not occur until after four years, during which the patient had a great number of attacks of colic. Murchison has also reported a case in which daily attacks occurred for four months without the appearance of jaundice. Another case is given in which jaundice did not appear until after eight years had passed.

In many cases the calculus becomes engaged in the entrance of the cystic duct, and again falls back into the gall bladder. It is also probable that in some the stone remains in the same situation and only at times sets up a spasmodic contraction. The passage of the calculus is no doubt assisted by peristaltic action of the duct itself. The solution or breaking down of calculi does not often take place. Naunyn has in some cases observed evidences of the solution of concretions. It is quite probable, as has been mentioned by Dr. Adler (New York) that although marked jaundice is not present, in cases of occlusion of the cystic duct, a small amount of bile pigment may be

detected in careful examination of the urine. This I am convinced is a valuable diagnostic sign. The urine should be examined not once but on several successive days, and if bile pigment is frequently found, the hepatic origin of the trouble is made more obvious. In such cases the bile is probably absorbed through ulcerated surfaces, the result of the presence of calculi.

When the stone is arrested in the cystic duct, the completeness of the obstruction will sometimes depend on the direction of the axis of the stone. The change of axis may produce a decided change of symptoms. The question of the possibility of the formation of calculi in the cystic duct might be here referred to. Cases have been reported in which the concretions have increased in size after they passed into the duct, but none which would prove the origin of stones in that situation.

When the calculus becomes lodged in the cystic duct, a distention of the gall bladder takes place. If the obstruction is complete so that there is neither entrance nor egress for the bile, the viscus becomes distended with mucus and the bile staining gradually disappears. In some cases the calculus forms a ball valve and allows the entrance but not the exit of bile. According to Courvoisier's statistics, in 91 cases of distension of the gall bladder, due to calculary obstruction of the cystic duct, bile was found in 12 cases and watery fluid in 72. The distended gall bladder may reach the size of a child's head. A case is mentioned from which ten pints of fluid were removed. It is often larger than the kidney, and of a somewhat similar shape. In other cases it is narrow and tense, somewhat sausage-shaped, but very rigid. A few years ago a case of this kind came under my observation, in which the extremity of the gall bladder pressed against the abdominal walls producing a tumour not unlike a hernia. A cholecystotomy was done by Dr. Ross, a calculus removed, and the patient recovered.

It might be mentioned here that distension of the gall bladder sometimes takes place from atony of the walls when there is little or no obstruction. When from any cause ectasia of the gall bladder is present, an invasion of pyogenic organisms will produce a suppurative cholecystitis, and this may end in rupture or in general pyæmia. Again a simple catarrhal inflammation may take place, followed by contraction and atrophy. Atrophy occurs more frequently in calculous obstruction and distention in cases of carcinomata. In some such cases when pigment and bile salts are absent, cholesterine has been found, and the contents vary in consistence, being sometimes serous, mucous, or even of a cheesy character. Degenerated blood has also been found.

The diagnosis between a distended gall bladder and a displaced right kidney is often a matter of some difficulty. The points usually given are :

1. The history of biliary colic.
2. The movement of the tumour with respiration.
3. That the lower extremity is movable, whereas the upper is fixed.
4. That the kidney may be felt behind the distended gall bladder.
5. That the colon lies in front of the kidney and behind the gall bladder.
6. In pyonephrosis the urine may contain pus, and in distended gall bladder bile pigment may be present.

I shall now take the liberty of relating briefly two cases illustrating this difficulty of differentiation.

1. The patient, a married woman, 52 years of age, had suffered during the summer from occasional attacks of pain together with general malaise. In October a tumour was discovered below the liver, extending downwards nearly to the crest of the ilium. It was large, smooth, elastic and tender. The right kidney was displaced, as shown by absence of kidney dulness.

The patient was examined under chloroform, when the kidney could not be found separate from the tumour. The latter did not move with respiration, nor was the lower extremity any more movable than the upper. The urine was free from pus, and contained a small quantity of bile pigment. Symptoms of suppurative fever were present.

Dr. Temple operated, and found a distended suppurative gall bladder and a stone in the cystic duct. The patient made a good recovery.

2. A second case was seen by me last winter. The patient, a female, complained of severe pain in the gall bladder region, which was accompanied by a swelling immediately below the margin of the ninth and tenth ribs on the right side. The pain occurred irregularly at intervals of weeks or months, and was nearly always relieved by pressure over the region of tumefaction. The tumour, which was thought to be an enlarged gall bladder, was found to be a distended cystic kidney. The urine did not contain bile pigment nor any abnormal deposit. The length of time—eight years—during which the patient suffered from the pains should have decided against distended gall bladder. The patient was operated on by Dr. Ross, and recovery followed.

When the calculus has passed through the cystic duct, it usually finds its way through the larger bile duct without difficulty until it is obstructed by the narrow duodenal outlet. In many cases, however,

owing to the narrowing of the duct, the calculus is found in different parts of the canal.

Courvoisier has collected 123 cases in which the situation of the gall stone was noted. In the part near the liver, 17 cases; in the middle part, 19 cases: near the duodenum, 20 cases; close to the outlet, 41 cases; the whole tube obstructed, 26 cases.

The symptoms caused by the passage of calculi through the common bile ducts are similar to those already described in connection with the cystic duct. Obstructive jaundice is the marked differential sign between the two conditions. The severity of the pain is equally great. Mayo Robson has reported a case in which death took place at the height of a paroxysm. A calculus was found partly extruded into the duodenum surrounded by some tense fibres of the sphincter.

On the other hand, calculi may pass through the natural channels without producing any special symptoms. Many such cases have been reported. It is probable that in some the ducts were dilated by the previous passage of a gall stone.

In cases of complete obstruction, the biliary ducts and gall bladder become very much distended with bile. The colouring matter is taken up by the lymphatics and jaundice supervenes. Harley has in recent years demonstrated that in such cases of obstruction the bile always finds its way into the blood vessels through the lymphatics. After a time the contents of the distended bile ducts lose the bile stain and become watery. The stagnation of bile often results in the precipitation of the bile pigment and the formation of pigmentary calculi.

The gall bladder is not so frequently distended in calculous obstruction of the common bile duct. In 87 cases collected by Courvoisier, ectasia of the gall bladder was present in 17, and contraction in 70. This is partly explained by the changes already described, which take place in chronic cases. In recent cases, however, the bile does not always flow back into the gall bladder, owing to a peculiar formation of Heister's valve. It is therefore quite possible to have a case of recent calculous obstruction of the choledoch ducts without enlargement of the gall bladder.

Cholelithiasis is now given as one of the causes of cirrhosis. Hanot in his classification gives two subdivisions of biliary cirrhosis—hypertrophic and calculous.

In many cases in which cirrhosis is found with cholelithiasis the increase of fibrous tissue may be due to other causes—alcohol, for instance. It has, however, been demonstrated that cirrhosis may be produced by cholelithiasis alone. The pressure of the bile in the dis-

tended ducts, as well as the irritation due to calculi in the extra and intrahepatic ducts, are probably the principal agents. In many cases the microbes and their products are an additional source of irritation.

Calculi are sometimes carried back from the choledoch ducts into the hepatic duct, when we may have obstructive jaundice without distension of the gall bladder.

The writer has noticed that in some cases the cystic and common hepatic ducts lie close together for the distance of one-half to one inch. In such patients, a calculus in one duct might cause obstruction of the other. Calculi may form in the intrahepatic biliary passages. These are usually of pigmentary character. Tait was of opinion that these pigmentary calculi passed down into the gall bladder and formed the nuclei of the ordinary gall stone. The symptoms of intrahepatic calculi are indefinite. In 22 cases (Courvoisier) out of 87 pain was present. Disturbances of the digestive functions were present in almost all cases, and in 26 there was an enlargement of the liver. In 6 jaundice was well marked, and in 35 it was present, but not intense.

In all cases of biliary obstruction from calculi there is a danger of the introduction and growth of pathogenic germs, leading to suppurative cholangitis and cholecystitis with the accompanying symptoms. Schroeder found purulent hepatitis in 9 out of 144 gall stone cases.

The pain in this condition is usually not severe, and although an abscess may form, it is not so large that it can be made out during life. Intrahepatic calculi are often found in large numbers in the abscess cavity. The abscesses may be small and multiple. There may be one large cavity, alone, or surrounded by smaller deposits of pus.

The bacteria most frequently found in such cases are the bacillus coli communis, streptococcus, the staphylococcus aureus, and the diplococcus pneumoniae.

Naunyn gives the following ways in which abscesses of the liver are formed as a result of cholelithiasis :

1. An empyema of the gall bladder may rupture into the liver.
2. In purulent cholangitis an ulceration of the walls of the ducts may perforate and spread into the surrounding hepatic tissue leading to abscess formation.
3. In Schüppel's hepatitis sequestris, a necrosis of hepatic cells takes place at the periphery of a lobule followed by suppuration at the edge of the necrosed portion.
4. The abscess may be of a metastatic or embolic character.

The diagnosis of calculous abscesses of the liver is always a matter of difficulty. The presence of rigours, with perspiration and sudden elevation of temperature, are not sufficient, as these may occur in

gall stone cases when there is no suppuration, or they may be caused by suppurative cholangitis when there is no collection of pus. Loss of strength is usually more rapid, and the enlargement of the spleen is more marked when abscess is present. The hepatic tenderness, pain, and swelling are usually not sufficiently marked to differentiate abscess from cholangitis. Although all forms of suppurative disease of the liver are dangerous, when the process is confined to the bile ducts a complete recovery may take place after the removal of the obstruction.

The development of jaundice after biliary obstruction takes place in two or three days, and often the pigment may be found in the urine when there is no discoloration of the skin. Is there any method whereby the jaundice of cholelithiasis may be distinguished from that due to other forms of obstruction ?

Nannyn gives the following points in cholelithiasis :

1. In the continuous or occasional presence of bile in the *fræces*.
2. Distinct remissions in the intensity of the jaundice.
3. Normal size or only slight enlargement of the liver.
4. Absence of distension of the gall bladder.
5. Presence of febrile disturbance.
6. Duration of jaundice for more than a year.

The presence of fever is not always a differentiating sign between cholelithiasis and carcinoma. I had a case under observation a little more than a year ago in which rigours came on irregularly every few days, followed by hot and sweating stages. The patient, a man over 60 years of age, had suffered from malaria when young. The *piasmodium* was sought for and not found. No cause for the fever could be discovered. A few months later a carcinoma of the *pylorus* became apparent. Calculi in the common bile duct may give rise to many symptoms apart from those of obstruction. A *perihepatitis* may be produced, which, if pus germs are present, may end in a *perihepatic abscess*. Bands of adhesion may surround and occlude the *pylorus* and result in *gastrectasis*. A peculiar case of *gastrectasis* and gastric ulcer resulting from abscess came under my observation last winter.

The patient, a woman of 50, had had several attacks of biliary colic, from which she made a good recovery. In the month of May she had one which lasted longer, and from which she did not recover so completely. In August of the same year, after more than usual exertion, she was seized with obstinate vomiting, which continued until the time of her death in November. The vomited matter sometimes contained blood. During the last few weeks she was unable to

retain a teaspoonful of milk, and toxic symptoms occurred shortly before her death.

At the *post-mortem* examination a calculus was found in the ampulla Vateri, which partially obstructed the flow of bile and to some extent lessened the calibre of the duodenum. A duodenitis was produced, which extended through the pylorus, involving the left third of the mucous membrane of the stomach. An ulcer about the size of a large penny existed in the inflamed portion, not far from the pyloric opening.

Calculi in the gall bladder and biliary canals are often the cause of carcinoma. The very large proportion of cases of cancer of the gall bladder in which calculi are found is an evidence of this. Courvoisier found them present in 74, out of 84 cases, and Brodowski in every one of 40 cases.

In the bile ducts the most common seat of carcinoma is the duodenal end of the choledoch duct, which is also the part most frequently obstructed by gall stones. It is, therefore, not surprising that symptoms of cancer of the gall bladder and biliary ducts are often preceded by those of cholelithiasis. The frequency of the combination of cholelithiasis with diabetes has been referred to by Ord. Sometimes sugar in the urine follows an attack of biliary colic. This latter circumstance has given rise to the theory that cholelithiasis is a cause of diabetes. It is, however, more probable that the pathological conditions which give rise to diabetes may also tend to the development of biliary concretions. Naunyn observes that the absence of glycosuria previous to the attack has not been proved in any of the cases in which sugar was found after an attack. It is, therefore, quite possible that these have been really cases of diabetes.

Pernicious anæmia has been known to follow biliary obstruction in a number of instances. This may arise from bile circulating in the blood or more likely from the presence of toxins, the result of microbes in the biliary passages. It is also probable that the function of the liver as a guard against the introduction of intestinal poisons is much impaired, and that the presence of these in the general circulation results in a destruction of red corpuscles.

Hintze has mentioned a case of cholelithiasis in which gas was found in the liver. This may have resulted from the presence of *bacillus coli communis* or from the *bacillus aërogenis capsulatus*. Gall stones are occasionally the cause of gastric and intestinal obstruction. Cases of pyloric obstruction have been reported by Pepper, Fiedler, and others. In most of these a diagnosis of carcinoma had been made.

In 1889 Schreiber of Königsberg, operated on a case of pyloric stenosis in which a calculus was found at the base of an ulcer. A complete recovery followed.

Biliary concretions which pass through the common duct are usually too small to produce obstruction unless they remain in the intestine and become increased in size by additional deposit. Calculi may exist in the intestine a number of years before producing symptoms. A case is recorded in which in all probability a gall stone passed into the bowel fifteen years before signs of obstruction appeared. Calculi which pass through fistulous openings are often large enough to cause obstruction at once. On the other hand, very large stones may pass through the bowel without producing any marked symptoms. A case is given by Naunyn (Blackburn's) in which the calculus measured $3\frac{1}{16}$ by $1\frac{1}{8}$ inches. In some cases either because the ulceration into the intestine takes place without pain or the stone has remained for a time in the intestine, an attack of acute intestinal obstruction takes place when a patient is in good health. Dr. Draper of New York has reported two such cases. The patients were seized with acute abdominal pain when in the enjoyment of good health. The diagnosis was made in both cases. In one an early operation saved the patient. In the other surgical interference was delayed at the solicitation of friends until it was too late to effect a cure.

Gall stones in the ileum is five times more frequent in women than in men. In Lobstein's 66 cases 46 were women, and 74 per cent. were women in Schiller's cases. In Schiller's 108 cases, 4 were under 20 years, 5 between 20 and 40, 99 were over 40.

The seat of obstruction in 10 out of 75 cases has been the ileo caecal valve or a little above it. In 43 it was within an inch of the valve, whereas in 6 it was found in the large intestine either at the sigmoid flexure or below it. In the small intestine the stone may first obstruct the circulation and then ulcerate through, either producing a fatal inflammation, an abscess, or an appendicitis. A small calculus has been known to find its way into the appendix producing fatal inflammation. In most cases the symptoms of obstruction are of an acute character, but in some the development is chronic. The diagnosis from other forms of obstruction is made from close attention to the history of the case. Flatus more often passes this than other forms of obstruction. The situation in the small intestine may be diagnosed by the more persistent vomiting and by the presence of an excess of indican in the urine. The presence of a tumour near the caecal valve is often noticed. The mortality of gall stone ileus is very great, about 40 per cent.

Having described the passage of gall stones through the ordinary

channels, I shall now refer to the various kinds of fistula which are sometimes produced. (Page 144 Naanyn).

	Roth.	Schröder.	Schloth.	Total.
Total of Necropsies.....	5403	1150	4313	10866
Gall stones present in.....	535	150	343	1029
Perforations into the peritoneum.....	..	1	2	3
(a) of gall bladder.....	..	—	2	3
(b) of cystic duct (rupture).....	..	1	—	1
Fistulae:				
(a) between the several bile ducts.....	..	—	1	1
(b) between gall bladder and liver.....	..	—	1	1
(c) between gall bladder and stomach.....	..	1	—	1
(d) between gall bladder and duodenum.....	12	1	6	19
(e) between gall bladder and colon.....	8	5	3	16
(f) between common duct and duodenum.....	5	—	—	5

The calculus usually passes through the walls of the gall bladder by ulceration. Adhesive inflammation precedes the exit, so that the stone when it leaves the viscus is surrounded by connective tissue. An abscess may form or the process may be accompanied by little suppuration. When abscesses occur the symptoms are similar to those of suppuration elsewhere, for instance, to those following appendicitis.

Biliary fistulae may extend upwards, perforate the diaphragm into the pleural cavity or into the lung, forming in the latter case a broncho-biliary fistula. Bile may then be coughed up in large quantities, and in some instances calculi have been expelled in this way. These fistulae may connect directly with the gall bladder or may arise from the abscess in the liver itself connected with dilated bile ducts.

A case has been recorded of perforation into the left pleura, into the mediastinum, and then into the pericardium. Perforation may take place into the stomach, when the calculi may be expelled by vomiting. In most cases when calculi are vomited they are regurgitated into the stomach from the duodenum. Fistulous openings into the duodenum and colon are comparatively frequent. These may originate in the intrahepatic and extrahepatic ducts and in the gall bladder, generally in the latter. The entrance may take place in any part of the intestine, and occasionally there are two openings communicating with one sinus. An opening into the portal vein occasionally takes place, resulting in fatal hæmorrhage.

Biliary fistulae perforating the abdominal walls usually originate in the gall bladder, and are the result of a suppurative cholecystitis. When the cystic duct is obstructed a mucous or purulent discharge takes place from the opening. When the cystic duct is open and the common bile duct obstructed large quantities of bile may pass through the fistulae. These passages are usually tortuous, and may open in

the right hypochondriac region, but more frequently in the vicinity of the umbilicus. Richet has described an umbilical channel commencing at the entrance of the obliterated umbilical vein into the liver and ending in the navel. It is from $1\frac{1}{4}$ inch to $2\frac{3}{8}$ inches in length, Fistulae often follow this course.

Calculi are often discharged in large numbers. The fistulae may last for years, but in the majority of cases a deterioration of health or tuberculosis supervenes. It was formerly thought that this debility was due to absence of bile in the intestines. It has, however, been found that animals with external biliary fistulae thrive well, and cases have been recorded of patients living many years after their formation. In Harley's case the patient died at 74, and during the last eight years an external biliary fistula had existed. The deterioration of health is probably due to the absorption of toxins from the fistulous surface. Fistulous communication may exist between the gall bladder and the pelvis of the kidney, so that a gall stone may give rise to renal colic. Openings into the uterus and vagina have also been reported.

When a gall stone is arrested for a long time in the duct, ulceration of the mucous surface may take place, which, after the stone has passed out, may produce a permanent stricture. When the hepatic and common bile ducts are involved chronic, obstructive jaundice may result.

III.—HENRY HANDFORD, M.D.

Physician, Nottingham General Hospital.

Dr. Handford was much interested to hear of the observations which had been related as to the causal relation of typhoid fever to cholelithiasis. In Nottingham typhoid fever was very prevalent, but out of 300 hospital cases of which the speaker had notes no single case of jaundice was recorded, nor any instance of biliary colic sufficient to attract the notice of the attending physician. Dr. Hunter's description of the method of formation of gall stones explained their not infrequent occurrence in young people, a matter which had caused much surprise. A few months ago a case of perforated gastric ulcer in a girl of sixteen was operated upon by a surgical colleague and died at the end of a month. *Post mortem*, a single gall stone the size of a small walnut occupied the contracted gall bladder. There had been no symptom whatever of the presence of gall stones. A point which had not been alluded to was the occurrence, in some cases of persistent jaundice, of intense toxæmia leading to hæmorrhages, unusual susceptibility to morphine, and death; whereas in other instances jaundice

might continue for years without any such blood disorganisation. As an illustration the speaker mentioned the case of a lady, 60 years of age, who had suffered from deep jaundice without intermission for four and a-half years, and at the end of that time was in better health than at the beginning, and able to walk and drive about, the jaundice notwithstanding. The rarity with which gall stones are found in the evacuations of the alimentary canal, even when properly searched for in well managed hospitals, compared with the frequency of hepatic colic had convinced the speaker that many cases of colic could not be due to gall stones, but to some simpler form of mechanical obstruction. The only other explanation was that the stones disintegrated in the alimentary canal and of that we had little or no evidence.

IV.—JOHN A. MULLIN, M.D., Hamilton Ont.

Dr. Mullin expressed regret that the part of Dr. Graham's paper referring to the early diagnosis of gall stones had not been read at an earlier part of the paper as we need not expect light from surgery in the early stages. Two cases were referred to where surgeons in operating had failed to find gall stones which *post-mortem* examinations made soon afterwards disclosed. Reference was also made to his clinical experience which did not show any case of cholelithiasis occurring in patients who had suffered from typhoid fever, and expressed doubt respecting the propriety of tracing pathological conditions to the typhoid bacillus even though that organism was present.

V.—GUSTAVE BAUMGARTEN, M.D., St. Louis.

I did not intend to take part in this discussion, for which I am unprepared. I shall refer only to two points. The connection between malignant disease and cholelithiasis has not been alluded to. While it is granted that the presence of gall stones may become the proximate cause of cancer of the gall bladder or ducts, there are also cases which, by clinical evidence, give the impression that the carcinoma may be the primary condition, that is, may be one of the causes of the formation of gall stones. The second point refers to rupture of the gall bladder in cholelithiasis; this occurs from distension of the cystic walls, or from ulceration at the site of the calculus. But I have observed a case in which neither of these conditions was present to account for the rupture. A gentleman, aged 55, careless of his health, had had many most violent attacks of gall stone colic. He died of acute general peritonitis two days from its sudden incipency in the midst of health. The diagnosis of peritonitis from perforation

was verified at the *post mortem*, and its cause was found to be a perforation of the gall bladder by a pin-point opening. The gall bladder showed no marks of undue extension, nor of any inflammation or ulceration whatever. In a spot, the size of a pea, of which the perforation was the centre, the muscular coat of the gall bladder was absent, but the parts around the opening were not roughened, nor thickened, and showed histological evidence of neither inflammation nor rupture. The common duct was thickened, dilated in parts, and at the distal side of the largest dilatation was a stricture due to previous ulcerations. In the dilated portions of the duct and in the cystic duct were found several gall stones.

VI.—ANGUS MACKINNON, M.D., Guelph, Ontario.

Dr. Mackinnon expressed a great interest in the discussion of this subject, and felt pleased that attention was drawn to the relation of typhoid fever to cholelithiasis. During the past year two cases of suppurative inflammation of the gall bladder occurred in his practice, one a woman, aged 27, six weeks after recovery from typhoid. The second, in a woman, aged 40, and within four months of an attack of typhoid. In both there were a number of calculi in the gall bladder. It was only within the past few years that this relation of typhoid fever to gall stone had been observed. We had all had more or less experience with typhoid, but until recently no cases of gall stone were known to follow it.

VII.—W. PASTEUR, M.D., F.R.C.P.,
Assistant Physician, Middlesex Hospital.

Dr. Pasteur wished to illustrate the great difficulty attending the diagnosis of some cases by referring to a patient recently under his care. He felt convinced that the greater frequency and safety of exploratory operations of the abdomen would largely increase our accuracy of diagnosis in cases of this nature. The patient in question was a man of 50 years of age, with good antecedents, who had lived a fairly active, sober life. Of late years there had been a decided tendency to obesity. He was seized some four months ago with acute pain in the region of the gall bladder with vomiting of a considerable quantity of blood. The attack passed off in a few hours, and was not followed by jaundice. In the course of the next six weeks the patient suffered from many attacks of a similar nature, gradually increasing in frequency and in severity. He lost weight rapidly, and was unable to take any solid food without determining an attack of colic.

There was never any jaundice. When seen by the writer some weeks after the onset no enlargement of liver, gall bladder, or spleen could be made out. The history of the attacks seemed to leave no doubt that the trouble lay in or near the gall bladder. An exploratory incision made by Mr. Pearce Gould revealed the following conditions: The liver was small and drawn up behind the ribs so that it was only reached with much difficulty. There was some thickening at the site of the gall bladder, but no calculi could be felt, nor could the viscus be made out. The pylorus was surrounded by adhesions and fixed to the under surface of the liver. These were divided with much difficulty and the pylorus relieved. The patient made an excellent recovery and was in perfect health and gaining weight steadily more than two months after the operation.

VIII.—EDMOND ROGERS, M.D., Denver.

Dr. Rogers mentioned a case (already reported) of an operation on a woman, aged 35, who suffered over a long period from attacks generally of a suppurative cholecystitis. These attacks were frequent and terrible in their severity—repeated chills, very high fever, local pains, tenderness, jaundice, etc. The gall bladder was found empty and contracted to about one-third its ordinary size; the liver was small and high up, but no stone was present. Cholecystoduodenostomy was performed with a Murphy button. The patient died a few days after in an acute attack, when the *post mortem* showed a local atrophy, but no stone. There was, however, a stricture of the ileum, which caused incomplete obstruction. There was no peritonitis, and the condition at the seat of operation was surgically satisfactory.

IX.—GEORGE ACHESON, M.B., Galt, Ont.

Dr. Acheson said that as regards etiology, he thought that the presence of lime salts in the drinking water had an important bearing. He asked Dr. Hunter whether he had noticed this connection.

X.—W. J. CAMPEAU, M.D., Harrow, Ont.

Dr. Campeau emphasised the difficulty of diagnosis in many cases and the necessity of calling in the aid of a surgeon.

XI.—STEPHEN MACKENZIE, M.D., F.R.C.P.,

Physician to the London Hospital, President of the Section.

The President alluded to the great value of the papers of the introducers of the discussion. To Dr. William Hunter the section was greatly indebted for an exceedingly able exposition of the chemico-

pathology of gall stones, largely the results of his own original work. To Dr. Graham they were indebted for a most complete and valuable consideration of the causes and effects, clinical and pathological, of gall stones. One of the most interesting points brought out by the discussion was the relation of enteric fever to jaundice and suppurative inflammations of the biliary passages, which, he thought would prove, now attention was drawn to it, more common than appeared at present. He thought there was a danger in assuming biliary colic may occur without calculus or other mechanical obstruction, and he narrated a case in which cholecystotomy had been performed for repeated attacks of biliary colic, but no calculus was discovered. Later the patient had another and equally severe attack of biliary colic and jaundice. She came some months after in triumph with a calculus she had passed.

A CASE OF TYPHOIDAL CHOLECYSTITIS WITH CHOLELITHIASIS.¹

BY

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AND

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Cases of typhoidal infection of the gall-bladder are, on the whole, not so very uncommon, and during the present year not a little attention has been paid to them in the recent papers of Dr. Osler and Dr. Mason at the last annual meeting of the Association of American Physicians. So far as we are aware, however, no cases of the kind have been brought to the notice of this Society, and the present communication is presented, inasmuch as its clinical interest is certainly worthy of some attention. The following are the notable features :

1. A suppurative cholecystitis in the course of typhoid fever and originating from the presence of typhoid bacilli in pure culture in the gall-bladder.

3. The difficulties and special features of diagnosis of an infected gall-bladder complicating typhoid fever.

3. The mode in which the complication affects the course of the malady.

4. The means of treatment and the effects of the complication.

The patient concerned was a female, aged 35, a typewriter by occupation. She was admitted to the Royal Victoria Hospital on the 21st of September, having been treated previously for nearly three weeks by Dr. Deeks. Her symptoms during that time had been not unlike those of enteric fever, viz., general malaise, insomnia, remittent fever, enlarged spleen and gastro-intestinal disturbances.

On the day previous to admission, however, diarrhœa set in with clay-coloured stools. There was severe pain in the abdomen, referred to the right side near the umbilicus, the temperature within a very few hours dropped from 102° to 98°, and the pinched facies expressed great anxiety. The pulse, however, was good and not notably increased in rapidity.

¹ The present case occurred while the Retrospect on similar conditions which appears in this number was being written.

Professor Stewart, who saw the case in consultation, advised her removal to the hospital, and described the condition then somewhat as follows :

The temperature was $98\frac{2}{3}^{\circ}$, pulse 90, and the respirations 24 per minute. She was poorly nourished, evidently suffered intermittent pain, had a grayish coated tongue, anorexia, and the diarrhoea above described. There was no jaundice. Examination of the abdomen revealed slight redness over the right hypochondrium and a scarcely perceptible œdema. Pressure on the ribs induced tenderness, but no friction rub could be felt on palpation. Immediately below the ribs, a large mass was detected continuous with the liver and extending down as far as 2 to 3 cm. below the umbilicus, situated towards the median line and its right border slightly external to the right rectus muscle. Percussion over this area produced a modified dullness with some slight tympany. From above downwards the hepatic dulness began at the 6th rib. Pressure behind gave slight tenderness in the right line, but elsewhere there was no evidence of disease. The urine showed a trace of albumen, but no bile. The blood on examination for the Pfeiffer test, both at the laboratory of the Royal Victoria Hospital and at the General Hospital gave a positive reaction for typhoid. For the next three days the condition remained comparatively unaltered, except slightly increased rigidity and distension : surgical interference being deemed advisable. Doctors Garrow, Bell and Roddick were consulted, and the questions of diagnosis and treatment considered. While it was comparatively easy to exclude impaction of fæces, affections of the kidney and perforation from typhoid, the question of subcutaneous phlegmon, appendicitis and infection of the bile passages gave rise to considerable hesitation in the diagnosis. That cellulitis was present seemed more than likely from the marked œdema which had gradually developed in the abdominal wall ; while, at the same time, some more deeply-seated condition was also judged to be present. The mass itself, apart from the presence of what seemed a tongue of liver tissue coming down in the right hypochondrium, could not be definitely defined, and no distinct fluctuation was apparent. The symptoms, with the clinical history, pointed rather to some infection of the gall bladder than to appendicitis. The ultimate diagnosis was that of cholecystitis and cholelithiasis and operation was urged.

An incision was made in the right semi-lunar line, and the distended gall-bladder exposed lying amid a quantity of lymph due to a local plastic peritonitis. Adhesions of the gall-bladder were observed on all sides, but as yet no perforation of the organ had taken place.

Upon tapping, turbid grayish-green fluid was removed, and subsequently the gall-bladder itself was incised, and 150 small faceted cholesterin calculi were removed. The margin of the artificial opening in the gall-bladder was next stitched to the peritoneum and the usual surgical toilet performed.

The patient, however, failed to recover well from the operation, and at the end of the second day succumbed to the disease. Only a partial autopsy was permitted, but sufficient to show the typical lesions of typhoid fever in the intestines and the subacute inflammation of the gall-bladder itself with the more or less subacute pericholecystitis.

Cultures were obtained at operation from the gall-bladder and micro-organisms obtained which responded to all the tests for the *B. typhosus*. The fluid itself when examined in the fresh state revealed actively motile bacilli which agglutinated and became stationary when brought into contact with the blood serum of a patient affected with typhoid fever. The bacilli when later cultivated gave the same reaction of Pfeiffer, thus establishing beyond a doubt the identity of the microbe present in the gall-bladder. In addition to our own investigations, Dr. J. G. Macdougall made entirely independent tests and likewise identified the bacteria as those of enteric fever in pure culture.

In orienting ourselves again as to the special features in the diagnosis, there are several which in a way were seemingly characteristic.

The sudden alteration in the course of the disease, with development of a subnormal temperature, and sudden pain in the abdomen might have suggested perforation of the intestine, but the pulse remaining quiet and strong this was practically excluded. The symptoms, too, were intermittent, with periods of comparative freedom from pain and anxiety, which too has been a feature prominent in many similar cases of typhoidal cholecystitis. Add to this the tongue of liver pulled down by the gall-bladder, as first shown by Riedl, and we have a series of suggestive symptoms for the diagnosis. Jaundice was, of course, not to be expected as the bile passages elsewhere remained free.

The question of operation, while always a grave matter in cases of typhoid fever, was here a positive necessity, and from the thinned condition of the gall-bladder wall had undoubtedly anticipated an impending perforation. While the case recorded by Mason of successful tapping of the gall-bladder in a somewhat similar instance is of remarkable interest, yet the presence of calculi in our own case necessitated a more radical means of treatment.

ORGANIC HEART DISEASE.

BY

SIR JAMES GRANT, M.D., F.R.C.P., (Lond.),

Consulting Physician, General Hospital, Ottawa.

I thank you for the opportunity of making a few observations on the heart and organic cardiac disease this evening. Foster says the heart is a *valvular pump*, which works on mechanical principles, the motive power of which is supplied by the contraction of its muscular fibres. The frequency, force and character of the beat, with a given quantity of blood ejected at each beat, are the problems involved in mechanical action. The vital problems are chiefly associated with the correlation of the forces controlling the frequency, force and character of the beat. Cardiac impulse is found to be synchronous with the systole of the ventricle, and is felt in the normal state on the fifth costal interspace, about an inch below and a little to the median side of the left nipple. To trace out the entire list of organic cardiac diseases I feel confident is not the task assigned to me this evening, but rather to confine my observations to a few lines of thought, as far as the generalities of cardiac diseases are concerned. This centre of circulating vital force, charmed into action during the stage of utero-gestation and continuing into the seventies, eighties and nineties, uninterrupted, is a subject attractive beyond expression, and wrapped in the self-same mysterious agency, which guides and directs the processes of vitality as a whole. The chief line of thought for this evening's remarks will be as to the bearings of chronic heart disease on the parturient system. The effect of two hearts operating at one and the same time, in the same system, is a subject calculated to attract attention, and chiefly on account of the exceedingly important issues at stake. The physician in every day practice and the physician accoucheur, rarely in our larger centres, have an opportunity of following up consecutively, the entire manifestations of such abnormal cardiac conditions. Such, however, is not the case in smaller centres, where the entire rationale of such manifestations can be followed out consecutively. First, then, what are the normal changes occurring in the heart during pregnancy? The first great question in cardiac disease during the parturient period, was raised by the French school. Whether the left ventricle of the heart does or does not normally

¹ Read before the Medical Society of Ottawa, Nov. 10th, 1897.

hypertrophy during pregnancy. Larcher in 1825 and 1826, while serving as *interne* in the Paris Maternity Hospital, first directed attention to the fact that the left ventricle of the heart normally becomes hypertrophied during pregnancy. He examined during three years fully 130 hearts of patients who died at the hospital, the majority of them of child-bed fever. The ages of the patients varied from 18 to 35 years. From his observations he concluded that the heart in the human species is normally enlarged during the period of gestation; that the enlargement affects almost exclusively the left ventricle; the left auricle; the right side of the heart being little if at all changed, and lastly that it varies in amount, from a minimum of one-quarter of the normal thickness of the ventricle to a maximum of one-third of it; that it constantly occurs and that it disappears but slowly during the period of lactation. Larcher also inclined to the belief, that repeated pregnancies, within short periods, particularly if at the same time they suckled their children, might give rise, even in a perfectly sound heart, in all its openings, to permanent hypertrophy. It is now a well recognized fact, that the pregnant condition modifies and affects the conditions of the collective blood vascular system in a most important manner, influencing thus very materially diseases of the lungs, kidneys, etc., existing at one and the same time. Larcher's views were first published in 1828, and a full record was addressed to the Academy of Science, Paris, April 6th, 1857. This subject attracted very considerable attention and investigation, at the hands of Drs. Beau, Ducrest and Bizot, who fully endorsed the views of Dr. Larcher and give the mean thickness of the left ventricle as averaging from 1.0 per cent. to 1.5 per cent. and $1\frac{1}{2}$ per cent. Dr. Blot did not confine his observations to measurements of thickness alone of the walls, but by an examination of 12 hearts of women who died during pregnancy, in the lying-in-period, he found the average weight to be 9 ounces 38 grains troy weight, whereas the average weight of the healthy heart of young women is about 7 ounces 120 grains troy weight. It would thus appear, according to Mr. Blot, that the heart of the pregnant female gains in weight fully $\frac{1}{2}$ during pregnancy, and that the hypertrophy is confined almost entirely to the left ventricle. Dr. Fritsch the great German authority (*Archives of Gynecology*) is inclined to doubt the statements of the French authorities and to explain a considerable amount of the increased dullness, by upward and forward displacement of the heart, from the pushing of the diaphragm, and also inclines to the belief, that the statements of the French authorities as to increased muscular tissue, in the left ventricle during pregnancy, are considerably overdrawn. Fritsch although

adhering partially to the view that there is normally some enlargement during pregnancy, is somewhat skeptical as to eccentric hypertrophy of the muscular tissue of the left heart, and inclines to the belief that a passive dilatation of the organ, of a slight amount, is sufficient to account for the necessities of the case. This same authority makes a statement somewhat contradictory, that in general the hearts of lying-in-women, on post-mortem examination, appear larger, yet one would require to take accurate weights and measurements of them. In my humble opinion, conclusions accurate in character, cannot be arrived at, without both weight and measurement, such as the French authorities have most carefully performed. Herman Lobléin meets Blot's deductions from the increased weights of hearts of pregnant women, by the results of an examination of the hearts of 9 women who had died in the Gynæcological Clinique at Berlin, during the previous year. Death in these cases was due to rupture of the uterus, or some other acute cause, terminating life within a few days after delivery. The average weight of these hearts, he found to be 247 grms; while according to Blot, the weight of the heart of the pregnant female, is to that of the non-pregnant female, as 290.95 to 220 23 grms. He argued that the average weight of the hearts of pregnant females would be found not greater than the average weight of hearts of non-pregnant females. He argues that authors in maintaining the existence of hypertrophy of the left heart, have clinically bestowed too exclusive attention to the cardiac dullness, which from the upward displacement of the heart in the course of the pregnancy is specially liable to mislead, and have not noticed whether the cardiac impulse was found to be intensified, the first sound at the apex specially loud, the second aortic sound accentuated, the radial pulse hard and difficult to compress, or whether the open beat was thrown outwards and downwards, from its normal situation. Doubtless (says Lobléin) the absence of all clinical symptoms, by which we recognize the hypertrophy of the cardiac muscle, is the rule at the end of the normal pregnancy; its occurrence on the other hand he considers the exception. Still notwithstanding the strong negative statements of Lobléin, Professor Angus Macdonald of Edinburgh says he cannot help feeling convinced that in the latter months of pregnancy in the case of women with normally sized hearts, there is a certain amount of such hypertrophy. Peacock in his tables of the weight of the healthy hearts of females dying between the ages of 20 and 55 years, favours the doctrine of there being a certain degree of hypertrophy in the hearts of parturient females. Considering the entire circumstances, a certain amount of cardiac hypertrophy, is very likely, by

the existence of greater work for the heart to perform during pregnancy, and more particularly as there is an undoubted arterial tension in the latter months of pregnancy, as has been ably demonstrated by the sphygmograph in the hands of Mahomed, Meyburg, Marey, and Blot (*Archives of Gynecology*). What stronger evidence could we desire as proof of exalted venous tension, than the various varicosities during pregnancy, which point to abnormally high tension during the parturient period. The abnormal demand for blood at that time, and the circulation in the heart in a given period, gives rise to a demand for increased cardiac force, as the result of which, an hypertrophic cardiac condition, such as ably defined, might very naturally follow. After careful analysis of the literature on this subject I am disposed to accept the opinion, that we have reason to believe, that in the left ventricle during pregnancy, there is a certain degree of increase in its capacity, associated with a variable amount of muscular hypertrophy in its walls. The parturient state is one marked by well defined systemic changes, and in the development and progress of such it is well to note the part played by cardiac action, when any abnormality is known to exist. The successful issue in a case of pregnancy depends much on watchfulness through the entire period of uterogestation, and it becomes even much more so if any line of diseased action is known to exist. The correlation of the forces as to the mutual bearings of cardiac disease and pregnancy are all important. Hecker (*Leipzig Clinic* 1860) states, that the danger to women who suffer from valvular lesions, determined by pregnancy and parturition, is capable of developing itself in two directions. First, during the latter months of pregnancy, the thoracic space is narrowed, and the lungs, embarrassed by cardiac lesion, frequently become functionally unable through serous effusion, and life's activity closed; or the heart becomes so used up by the exertions of labour, that its disturbed mechanism comes to an end. Hecker, Dohrn and Fabius (of Leipzig) incline to the belief, that while the perpendicular axis of the thoracic cavity is diminished during the latter months of pregnancy, and likewise its antero-posterior axis, at the lower part of the cavity, the transverse diameter is at the same time much increased, so that as a whole, the cavity is not at all or very triflingly diminished, except some pathological condition is present, such as abdominal or chest dropsy. The important fact is that the general belief of the profession inclines to the idea that the diminution in vital capacity of the lung's condition by normal pregnancy is very immaterial indeed.

Of the many authors who have written on this subject by far the most original and important observations have been made by Prof.

Spiegelberg in 1871-72 (*Medical Union*—Lecture by Peter, Hospital de la Charité, Nov. 1871). "I wish to speak to-day of facts of which the authors of treatises on diseases of the heart, have left in the shade, and which authors of treatises of obstetrics seem to me to have entirely forgotten; those facts are the pulmonary accidents to which pregnancy exposes women affected with diseases of the heart." He recommends the greatest care as to movements and exposure, supposing a patient with heart disease becomes pregnant, the avoidance of pregnancy in future, and avoidance of lactation in all cases as well to escape any abnormal strain on the heart. Fritsch denies the correctness of Spiegelberg's views relative to diminished aortic tension. He is of opinion that the sudden accidents that arise from heart disease during child-bed, are due to defective cardiac compensation, being unable to meet the conditions introduced by the suddenly altered relative pressure, although he disagrees with Spiegelberg as to the manner in which it acts. The healthy heart can meet these extra requirements but the diseased organ suffers from imperfect power of accommodation to the demands upon it. Valvular lesions are very apt to be altered for the worse during pregnancy, of which we have evidence in the readiness with which pregnant women with unsound hearts, suffer from puerperal endocarditis. An important conclusion arrived at by Spiegelberg is, that the placental circulation is capable of giving little obstruction to the general circulation, but may operate injuriously with other evil influences, such as compression of the chest, bronchitis, pneumonia or pleurisy, in aggravating the evil effects of even a slightly dilated right ventricle. Of fifteen cases of labour, complicated with heart disease which he treated, only one of the patients died during delivery from pulmonary oedema. He comes to the conclusion that in most cases of heart disease death does not take place during delivery. From all the facts I have been able to bring before you this evening it is evident that pregnancy is likely to introduce serious complications in the condition of a patient suffering from chronic heart disease, except the lesion is not of very recent origin, which is a very extenuating circumstance.

Professor J. H. Musser of the University of Pennsylvania, in his recent address before the British Medical Association, Montreal, called attention to one of the most interesting and attractive points in cardiac disease, namely the disappearance of endocardial murmurs of organic origin. It is the permanency usually of organic heart disease which serves to distinguish between the murmurs of anæmia, or of incompetency from dilatation. It has however become a well recognized fact, that organic murmurs often appear and disappear from various circumstances, such as change of position and rest.

Even temporary disappearance of the murmur is believed to be due to the extreme dilatation, and consequent debility of the heart muscle. Aortic murmurs rarely disappear under such circumstances.

It is to this class of cases of heart disease, without murmur, that Fagge applied the term "Sandy desert of cardiac pathology." That the murmur of mitral obstruction may be temporary or permanent, the chief authorities on cardiac disease favour this view, and Osler adverts to the disappearance of murmur with rupture of compensation. Dr. Gee favours the idea that even in aortic regurgitation in which organic murmur is the most persistent, the sound producing power may disappear when the heart falls into a state of systole. There are also various pathological conditions which govern valvular hæmatic action, all of which render the subject most attractive. The sound produced by even mitral regurgitation, has been known to be wanting, disappearing suddenly in the most unexpected manner. Such murmurs disappearing are usually inorganic. Walsh has pointed out the disappearance of this murmur in chorea. The irregularities in mitral regurgitation so far noted, are connected with some organic heart condition, and modified or otherwise by the peculiar circumstances of the case.

The disappearance of endocardial murmurs cannot be observed too cautiously, in forming an opinion as to the existence or non-existence of organic disease. Sansom (British Medical Journal, Oct. 16, 1897) states that the signs of structural disease of the heart have borne no proportion to the degree of cardiac tumult, and that in every such case there should be a careful investigation of the nervous system, more especially in its relation with the cardiac reflex. The most frequent form thought to be almost entirely nervous is tachycardia, which I have found usually paroxysmal in character. I wish to refer briefly to the mountain cure of heart disease. In March, 1887, at Leeds, Dr. Clifford Allbutt called attention to the growing practice of recommending exercise rather than perfect rest, in some cases of heart disease, and described the German plan of graduated exercise by ascending hills, known as the mountain cure. Dr. Allbutt remarked that cases for this treatment must be very carefully selected, as such treatment should be avoided in cases of aortic regurgitation or atrophic conditions of the heart.

In conclusion let me say, there is an impression with the public, that disease of the heart usually means sudden death, to the person so afflicted. Such however, has not been my experience, and the following case, I now cite as an illustration of that fact.

J. S., aged 36 years, of robust habit of body, active, energetic and

able to endure almost any degree of physical exertion, being known as an expert skinner, of healthy parentage, and no tendency in family to hereditary disease. Thirty-four years ago the late Dr. Campbell of Montreal, diagnosed cardiac disease in this case. From 1880 to 1892, he had periodic attacks of acute rheumatism and erysipelas, chiefly of the scalp and legs. When first examined, I found well defined mitral stenosis with cardiac murmurs audible in almost any part of the chest, but most acutely in the pericardial region. To have lived such a length of time, and performed his usual official duties, as an architect, was to me a subject of much interest, and the conclusion arrived at, is, that in cardiac disease caution should be exercised in giving a positive opinion, as to the inability of the individual under such circumstances. In the present case, it is evident the abnormal changes, giving rise to the murmurs were very slow and progressive in character, having taken fully 30 years to compromise seriously the integrity or function of the mitral valves.

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ON CLIMATOLOGY.

AN ADDRESS BEFORE THE POST GRADUATE CLASS IN THE MEDICAL
FACULTY OF MCGILL UNIVERSITY, MONTREAL.

BY

S. EDWIN SOLLY, M.D., M.R.C.S.

Late President of the American Climatological Association.

It is with the greatest pleasure, that I accept the invitation to address you, in this eminent seat of learning, upon the subject of the influence of change of climate upon the progress of phthisis. This pleasure comes not only through my appreciation of the honour thus conferred, but more especially because of your recognition of the importance of medical climatology, that belated sister of the sciences, who through her dallying with empiricism has been so long shut out, like a foolish virgin, from the halls of light and learning.

The exclusion from the medical schools of the systematic and adequate study of climatology has doubtless been somewhat justified; for the reason that reports based upon essential facts and scientific observations were so few and so overwhelmed by a farrago of interested and unreasonable assertions, and poetic and one-sided descriptions, that the placing of instruction in medical climatology upon a scientific basis has seemed in the past a task well-nigh impossible. Now, however, the number of facts, both meteorological and clinical, recorded by eminent and honest climatologists, and by government weather bureaus, is such that scientific principles can be deduced, and the student and practitioner of medicine be taught to decide upon change of air for an invalid upon rational instead of empirical grounds.

Meteorological data are the first essentials upon which to base knowledge of a climate. Next in importance come the soil, the water, drainage, aspect and exposure to sun and wind, relation to seas and lakes, mountains and plains, and last, but not least, the resources for good board and lodging, exercise, amusement and occupation. Further: when these facts are obtainable for a given report, they must be compared with similar facts concerning other places. In the majority of reports, there is a lack of facts upon which to base a reasonable comparison, and so much likeness of description, that the physician is puzzled, and, in despair, is almost tempted to toss up for a choice.

It is ridiculous when you consider it, that, year after year, the profession and the laity will allow themselves to be allured into patronis-

ing health resorts where the inhabitants are too ignorant, or too lazy, or too much fear exposure of some of their pretensions, to gather and publish the essential facts concerning their localities. Such places deserve to be boycotted; but, alas, when looking at the number of much frequented resorts to which I refer in my work on Climatology, which are barren of such information, I feel that, in this respect, our climatic armanentarium resembles the shop of the poor apothecary in its beggarly account of empty shelves, and that the boycott would, therefore, be a failure.

Each one of us can, in our separate sphere, do something for this cause; and also by insisting on the importance of the recording of weather observations by the local and the government officials, and of the taking, digesting and publishing of notes concerning their patients by physicians who send patients to the resorts, and by the physicians who treat them when there, we may, by our combined efforts, lead climatology out of the darkness of ignorance into the light of knowledge.

To require of a physician to issue upon some unfortunate victim of a chronic disease a decree of banishment from home, from occupation, and often from family, without first providing him as judge with the requisite knowledge by which he can arrive at a right decision, savours of the injustice of demanding the making of bricks without straw.

I think that we, as a profession, do not sufficiently realise the tragedies that frequently occur in the lives and the fortunes of many invalids and their families whom we condemn to travel. Many an invalid is launched without adequate advice, and we find him drifting hither and thither on the sea of climates like a derelict, without guide or helm. The tragedy resulting from an ill-chosen operation, or from wrong treatment in an acute disease, is quickly over; but mistakes in chronic cases are often farther-reaching, and more lasting in their evil consequences, and none the less serious because more prolonged, and obscure. Enough time, thought, and knowledge is seldom bestowed, not alone on the subject of Climatology, and on the disease, but also on the individual himself and his tendencies and circumstances. Climatic change does not necessarily imply travelling afar. Change of climate, like charity, often begins at home, and occasionally may stop there; and whether at home or abroad, climate without hygiene is but a delusion and a snare, and climatology without facts is but as sounding brass and a tinkling cymbal.

Geographical and historical pathology, and the relation of weather to morbidity, as well as to mortality, is too little studied. An excel-

lent effort was made by the United States Weather Bureau to elucidate the latter subject by means of a publication in which weekly reports of sickness were gathered from physicians in all parts of the country, and arranged for comparison with the reports of the meteorological conditions prevailing at the same periods. Unfortunately, Congress has neglected to vote the funds necessary to carry on this good work. It is quite conceivable that in course of time, the accumulated experiences might have allowed warnings to be given to the invalid and he be thus guarded against the coming changes of the weather, as are the farmer and the mariner. Moreover, if the changes not only of the passing weather, but of special climates and seasons, were made more plain, much needless suffering to the sick, or disaster to the healthy, would be averted. If the dictum, "*Salus populi suprema lex*" be true, it follows that the protecting of the health of the people in this regard, is as much an obligation of the government as the saving of the people's wealth by land and sea.

Time does not permit a full discussion of what is known of the specific effects of the various meteorological factors or their combined effects in special climates, upon the development and progress of phthisis. Hermann Weber's "*Climatotherapy*," which was published as a volume of Ziemssen's *System of Therapeutics*, Hirsch's "*Handbook of Historical and Geographical Pathology*," Wilson Fox's *Treatise on Diseases of the Lungs*, and the Williams' works on *Consumption* and upon *Aero-therapeutics*, contain the chief and most valuable information upon this subject.

From these and other sources of knowledge, the following deductions appear reasonable; speaking broadly, in their effects upon phthisis,

- a. Cold is better than heat,
- b. Dryness than dampness,
- c. Sunshine than cloudiness,
- d. High ground than low.
- e. Wind in moderation is healthfully stimulating, unless it be damp, in which case it is depressing.
- f. Variability of temperature with dryness is generally beneficial, and with dampness the reverse.

For most cases of phthisis the ideal condition of the atmosphere is one in which cool, dry air can be taken into the lungs while the surface of the body is pleasantly stimulated by the warmth and light of bright sunshine, and in which at night, the chamber-windows may safely be left open, so that the patient may breathe cold, dry air while sleeping under a warm cover.

The first essential of the air is plentifulness. For this reason it is better to be outside the house than inside. Within the air often changes too slowly.

The next essential quality of the air is purity.

Hirsch, in inquiring into the relative prevalence of phthisis in the different varieties of climates, collected a mass of evidence which showed clearly that phthisis was far less prevalent on high ground than on low; and this, irrespective of sanitary or of other conditions, although these conditions had certain modifying effects. While confessing his inability to account for this fact, he concludes that it is due to the more highly developed, and more active heart and vascular system, as well as to the better exercise of the respiratory function.

Since Hirsch wrote these opinions, much work has been done by numerous experimenters upon the blood-changes induced by altitude, and this research has demonstrated that the diminished barometric pressure and lessened oxygen tension existing in high altitudes, causes a marked increase of the red blood corpuscles, and of the hæmoglobin. It is, therefore, a fair inference that the resisting or germicidal power of the blood is thereby increased; so that the lodgment or development of tubercle bacilli is greatly hindered in high climates.

I have for some time been endeavouring to obtain the co-operation of the physiologists in settling this question, by their conducting a series of parallel experiments at sea level and at a high altitude, so as to ascertain the differences, if any, in the germicidal power of the blood in these extremes of climate.

I have lately been encouraged to believe that this will shortly be accomplished, and when this is done we shall at last be able to speak from actual knowledge and not only from inference.

In working upon my *Handbook of Medical Climatology* I sought far and wide to obtain all the clinical evidence that has been published concerning the influence of the several varieties of climate upon phthisis. I collected in all about 9,000 cases, of which 7,995 allowed of tabulation, the remainder being too imperfect for that purpose, but their inclusion in the tables would not have altered the results obtained. A summary of each of these reports is given in the foot notes.

The various climates used were then grouped together under the following heads, namely:

Home Climates: These were the cases that remained in the country in which the disease developed, England being, however, the only country from which such records could be gathered.

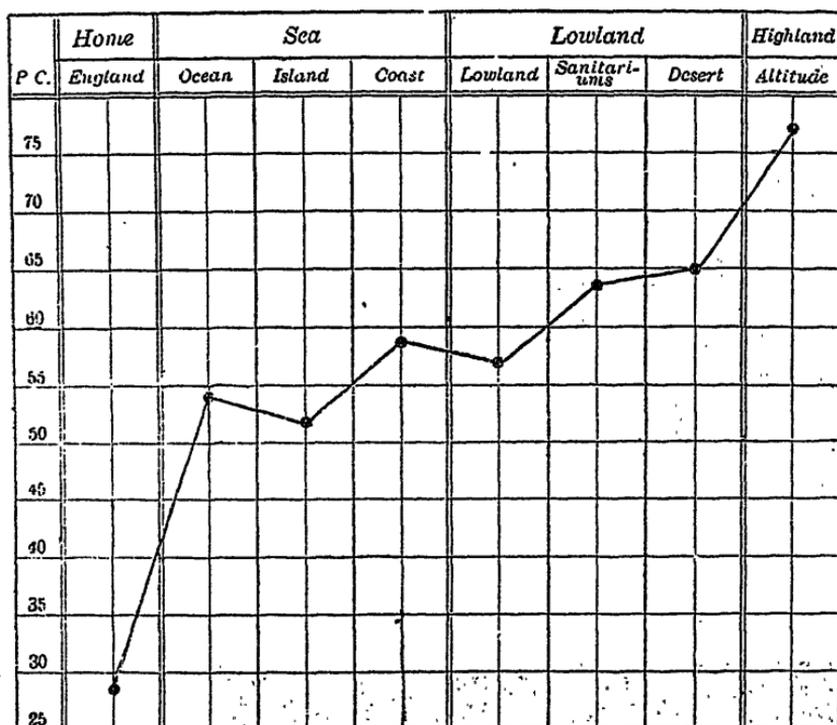
Sea Climates: Under which was placed the reports of cases that went on ocean voyages, or sojourned on ocean islands, or sea-coasts.

Low-land Climates: Inland, inland sanitariums,¹ and desert climates.

High Altitudes: The fourth group which was composed mainly of reports from the high Alps and Colorado.

The percentage of improvement of all the cases reported under these heads was obtained and the accompanying chart constructed and while the percentages may not be absolutely correct for all countries they probably represent the relative proportion of benefit derived from these several classes of climate. It was impossible to obtain a sufficiently broad comparison, and at the same time to divide the cases by the stage of the disease, or by the stated amount of benefit, on account of the lack of such information in many of the reports; so that this chart simply shows what proportion of all sorts of phthisical patients were influenced by residence in the various climates. In my book from which the chart is taken there are further analyses of the reports, but to-night, I wish merely to bring before you the broad results obtained from an analysis of all the clinical information at present available, concerning the comparative benefit conferred by the various classes of climates upon phthisis.

Analysis of 7795 Cases of Phthisis.



¹ These being reports of selected cases who had especial good care taken of them show a relatively higher percentage of improvement over the other cases residing in low-land places.

This chart very clearly demonstrates two facts: That, as a general principle, the phthisical improve the further they remove from the sea towards the interior of the continent, as shown in the chart by the ascending scale of benefit in proceeding from the ocean to the desert; thus proving that dryness is better than dampness. While the still greater percentage of improvement exhibited in the high climates, even over the dry climates of the desert, proves the second fact, viz.: That diminished barometric pressure is even more powerful than dryness in arresting the progress of phthisis. So it may be said that while desert air is good, mountain air is better.

There are, of course, many exceptions, to the rules laid down; because tuberculosis in man is not like that produced by a laboratory experiment, in which tuberculous matter is injected into a healthy animal whose vital resistance is as yet unimpaired. For it is probable that the absorption of tuberculous material by man very rarely takes place unless there is some lesion of the respiratory or digestive tract; and that it very seldom spreads beyond the point of entrance, or results in phthisis, unless there is a lowered vitality, or a peculiar vulnerability of the tissues in the individual affected. From this it follows, that in choosing the climatic remedy for a case of phthisis, we must take into consideration not only the tuberculosis, but the preceding condition of ill health, and the peculiarities of the individual. While these conditions exist in varying degrees in almost all phthisical patients, yet, as factors in the onward march of the disease, especially in its earlier stages, they are often of very different importance. For these reasons, I have found in endeavouring to distinguish between the forms of phthisis suitable for climatic treatment that it is most satisfactory to group them as tuberculous, catarrhal and pneumonic, remembering, of course, that all are tuberculous and usually catarrhal.

The first or tubercular group, would embrace those in whom the tuberculosis pure and simple appears to overshadow the other conditions and they are usually those with the vulnerability of tissue referred to, who have a congenital and perhaps an hereditary predisposition towards tuberculosis and phthisis. In such cases anæmia and imperfect development of the heart and lungs is common.

The second group, catarrhal, consists of cases who are subject to frequent catarrhs and whose history shows tuberculosis following a catarrhal attack, and in whom exacerbations usually appear preceded by recurrent cold-catching. These are generally cases in which more or less obstruction of the upper passages exists and in which attacks of bronchitis are frequent. They are usually persons of feeble reac-

tion; who, therefore, are apt to develop chronic congestions rather than inflammations.

The third group, the pneumonic, includes those patients whose tuberculosis is usually preceded by an inflammatory process, and in whom the disease advances by leaps and bounds, following recurrent pneumonias, the intervals being often marked by improvement which it may be decided is generally only temporary. These patients are of the erethistic type, and are peculiarly subject to high fevers and great nervous irritability.

In thus seeking to distinguish the chief differences in phthisical cases, it must not be forgotten that the type sometimes varies with the stage of the disease, and a climate which has been most beneficial at one period is not so at another; moreover, even when the patient is in the climate best suited for his prolonged residence, yet, mere change of air is occasionally necessary for chronic invalids as much as for well people.

It may be said as a general rule that cases of phthisis, especially the tuberculous type, do best in high climates, more particularly in those in which, while there is an abundance of sunshine, the air is cold and dry.

The catarrhal form is also usually benefited by a high climate, but such cases do best where the air is warm and dry, and in winter especially where the elevation is not extreme.

The pneumonic cases are usually best suited to a climate very moderately elevated, in which the air is warm and comparatively moist.

The chief contra-indications to the use of high climates are disease of the heart without good compensation, arterio-sclerosis, a limited area of healthy lung, advanced fibrosis, marked erethistic tendencies, and old age. A weak cardiac muscle present in the young is not necessarily a bar to the use of a high altitude; on the contrary, if the patient is put on a more or less complete rest-cure for the first few weeks of his residence, his heart will usually be permanently strengthened, but after middle life such a condition is apt to be made worse by change to an elevated climate.

To conclude with a brief consideration of what cases of phthisis are suitable for climatic change, I shall quote the following epitome from my article upon tuberculosis, in the last volume of Hare's System of Therapeutics: "In order to lay down a rational and systematic plan of treatment the tuberculous individual and his circumstances must be duly considered as well as the type and stage of his disease. This is especially true when the matter of change of climate is under consideration. There are many patients to whom, on account of their circumstances, leaving home is a real hardship, and these should not

be forced to do so unless home treatment is not succeeding. Of such cases those in which the disease has arisen under peculiarly unfavourable conditions of life may often be safely allowed to remain for a time, at least, until the tendencies of the case are clearly indicated, if such conditions can be removed and the environment made hygienic. Some of those in whom the tuberculosis is not advanced or active and whose ill health appears to be due not so much to this infection as to indigestion or other cause which can be treated at home, may remain if they are carefully watched. Occasionally a change of house, soil, or conditions physical or social, will put the patient on the road to recovery if the accompanying treatment is judicious. Hereditary cases should always be sent away, and as a rule the change must be permanent. Cases resulting from pneumonia, pleurisy, or bronchial catarrh, which are slow in clearing up should have climatic change, and, where the patient can afford it and domestic ties do not interfere, it is always safer to advise an appropriate change. In doing this the habits and requirements of the patient must be considered, as well as the climate of the resort to which he is to be sent. Before selecting a climate the physician should first acquaint himself with the principles of medical climatology as well as with the details of the resorts.

SUCCESSFUL REMOVAL OF AN ENORMOUS MESENTERIC TUMOUR AND NEARLY EIGHT FEET OF INTESTINE.

BY

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The successful cases of removal of large sections of intestine are by no means uncommon; in 1881 Koeberlé, of Strassburg, removed six and a half feet successfully, and this amount has not been often exceeded since that time. When in addition to intestine a large tumour also has to be removed, the condition becomes more complicated, and the number of cases of resection of a large extent of gut with a tumour are not very numerous. My case is as follows:

C. S., aged 28, a healthy looking young man, with a florid complexion, was sent to me January 18th, by Dr. H. A. Lafleur, for opinion as to advisability of operation. On examination, the patient's abdomen appeared very prominent, and, on palpating it was seen that a smooth hard tumour filled the whole abdomen from the ensiform cartilage to the pubes. It was quite movable, and its upper edge immediately below the ribs could be felt sharp and hard. Over the anterior part of the abdomen percussion was dull, but in the flanks a resonant note was easily elicited. One got the impression from examination that the tumour was a solid one. Patient did not complain of pain, and said he had never had any; he had never been ill. A year ago noticed that his dress clothes, which he only occasionally wore, seemed too small for him, and he thought it was because he was growing stout. Three or four months ago remarked that his abdomen was swollen, and on feeling it noticed a tumour which was quite movable. The tumour had gradually grown to its present size. Bowels have always been most regular; urine has always been normal. On consultation, operation was advised. The tumour was thought to be probably a retro-peritoneal lipoma on account of its size, smoothness, and gradual growth. Dr. Armstrong, who saw the case with me and assisted at the operation, agreed as to necessity of operation.

Operation, January 18th, 1897.—The patient having been etherised, an incision was made into the abdominal cavity above the umbilicus and the tumour was immediately reached. It had a bluish look, seemed elastic, and apparently free from adhesions. The incision was enlarged upwards, and on introducing my hand, I found a perfectly smooth tumour unattached above and, as far as I could reach, on the flanks, but having many adhesions below and in front.

The tumour filled the whole cavity of the abdomen, and the sides overlapped so much that it could not be explored postero-laterally or posteriorly. Removal was thought feasible, so the incision was extended for some distance below the umbilicus. There were firm adhesions both over the anterior and lateral surfaces of the growth. After separating these rapidly, with some hæmorrhage, the tumour was quickly delivered from the abdomen, and then it became plain that it grew from the mesentery, and had some three feet of small intestine closely adherent to it on its lower and posterior aspect. Above, the tumour was closely attached to the transverse colon. Beneath the colic attachment a great number of large mesenteric vessels entered it. It was now seen that at least 3 feet of intestine would have to be removed, and perhaps more, owing to ligature of mesenteric vessels, would be

deprived of nutrition, and removal would be necessary. There was nothing to do but to go on with the operation, for, certainly, the tumour could not be returned. The tumour seemed so intimately blended with its covering of mesentery, that, owing to excessive hæmorrhage which resulted from the attempt, enucleation had to be abandoned. First, the transverse colon was separated from the upper end of the tumour to which it was attached by fibrous tissue; then the mesenteric vessels were ligatured one by one, as close to the tumour as possible, and the mesentery cut as tied. After some time and the tying of numberless ligatures, the tumour was freed, the intestines involved in its lower part cut away, and the mass with the 3 feet of ileum lifted out of the abdomen. Previously to cutting away the bowel which was attached to the tumour, rubber tubing was tied around it. Now, after removing the tumour, two ends of bowel remained, each end having over 2 feet absolutely without any mesenteric blood supply. There was nothing to be done but to remove these portions of bowel. The ends were brought together in the way I usually adopt in resection, namely, a continuous suture of fine silk through the mucous membrane and afterwards a continuous Lembert suture through the peritoneum and subperitoneal tissue. Afterwards the rent in the mesentery was closed with continuous Lembert sutures. During the time these procedures were being carried out, the patient had been getting very weak from loss of blood, and the long continuance of the operation, so, whilst I was suturing the bowel my assistants introduced into the basilic vein of right arm two quarts of sterilised saline solution, which had the effect of bringing up the pulse very satisfactorily. In fact, without this aid, I do not believe the patient would have left the table alive. On examining the bowel it was found that the lower end, after the removal of the portion deprived of its blood supply, was only about six inches from the ileo-cæcal valve, and that all the portion removed was ileum.

After swabbing out the abdomen, which now seemed to have little intestine in it, and clearing the pelvis of blood clots, some large pieces of gauze were packed about the pedicle of the tumour into the flanks and into the pelvis, and the ends brought out of the wound. The abdomen was now closed with silkworm gut sutures, and the usual dressings applied. On leaving the table the patient's pulse was 160, and hardly perceptible at the wrist.

After a few hours in a warm bed, it fell to 120. The actual operation took nearly an hour and a half, the greatest time being consumed in ligaturing and cutting away the mesentery. During the night following the operation, nutritive and stimulating enemata were given; he vomited a few times only. Next day he complained of severe pain and a sense of tightness, but was in very good condition, with a pulse of 112; temperature 100°. That night he was given $\frac{1}{4}$ gr. sulphate of morphine hypodermically, and he slept well all night. Next morning he was given a large enema of soap-suds and turpentine, but it was ineffectual, and was followed by some vomiting. There was of course, no distention, so much bowel and so large a tumour having been taken away. The gauzes were removed from the abdomen, and on the second day the wound was redressed; temperature 100°, pulse 120.

On the night of the third day an enema brought away considerable flatus. Still fed by enemata, and given cracked ice and champagne by the mouth. At night he was given $\frac{1}{4}$ gr. sulphate of morphine hypodermically, and slept well.

On the fourth day he vomited occasionally, and had a very dry tongue; was restless, but his pulse improved (96), and temperature reached normal.

On the fifth day beef-tea, milk, and lime water were given by the mouth.

On the sixth day he first had a stool, and after this there was rather an inclination to diarrhœa. The wound was dressed for the second time on the eighth day (January 26th), and the stitches were removed. There was a stitch-hole abscess of considerable size at the lower end of the wound, which discharged pus for a few days, but there was no rise of temperature.

During convalescence his temperature ranged from 98-99°, and pulse 90-100.

On February 18th he was so well that he went out for a drive, and he left the hospital on February 21st, about five weeks after the operation.

During the last two weeks of his stay in the hospital he gained flesh rapidly, his weight increasing during one week a pound a day, altogether 15 pounds.

I heard from him a month ago (July, 1897), and he writes that he feels perfectly well, and rides a bicycle and weighs 140 pounds. When he left Montreal in March he weighed 115 pounds.

After leaving the hospital he had frequent attacks of diarrhoea—in fact, seldom had a solid stool. He would swell up for a day or two, and then be relieved by a large number of liquid stools; in the interval his stools were always liquid, and he suffered from occasional attacks of colic.

After the operation we were in some doubt as to whether the patient would obtain sufficient nutrition from the intestine that was left, for after the 8 feet were taken away the amount of small intestine seemed very small, being unusually short in his case; however when he began to eat he rapidly gained weight, and has continued to do so up to the present. At the time, I was consoled by reading some experiments of Senn on dogs, in which he concluded, that in all cases of extensive resection of small intestines where the resected portion exceed one-half the length of this portion of the intestinal tract; where the animal survived the operation marasmus followed as a constant result, although the animals consumed large quantities of food. In all these cases defective digestion and absorption could be directly attributed to a degree of shortening of the digestive canal incompatible with normal digestion and absorption. As the small intestines usually measure from 20 to 22 feet, and as only about 8 feet had been removed, I felt there was reason for anticipating a favourable termination of the operation. Gzebicky concludes, after many experiments on animals, that a resection of 286 centimetres in man is feasible.¹ In my case 234 were removed, and in one case, a boy, operated on by Ruggi, of Rome, 3 metres and 30 centimetres were removed; the patient recovered. This is the greatest amount of intestine that, as far as I am aware, was ever successfully resected.

The question of solid mesenteric tumours has been recently dealt with by W. L. Harris and W. Herzog,² of Chicago, who report a successful case of removal of a solid mesenteric tumour (weighing 5 lbs.) and 51 centimetres of intestines from a boy aged 5 years. A table is given of 57 cases. Of these 18 were operated on, and 10 recovered from the operation. Of these 10 cases only 2 were malignant tumours, and 1 died subsequently from obstruction due to a Murphy's button. In the majority of cases nothing was done, and they all died.

Of the 57 cases death was reported in 40 cases. No data given in 7 cases. Recovered after operation 10 cases.

Of these 57 cases 16 were carcinomata, 10 lipomata, and 7 sarcomata; the rest were fibromata and lymphomata, etc.

A minute account is given of the microscopical appearance of the

tumour in the case of Dr. Harris and Herzog, which proved to be lympho-sarcoma. The case was diagnosed as one of tumour of the mesentery before operation.

There are only 3 cases of these operations for tumours of the mesentery in which there is any mention of removal of intestine. In case 30, Madeling removed 20 centimetres of gut; in case 53, Canthörn removed 43 inches (about 109 centimetres); and in case 57, Harris removed 51 centimetres (20 inches).

In a paper by Dr. J. W. Elliot, of Boston "On the Operative Relief of Gangrene of Intestine due to Occlusion of the Mesenteric Vessels,"³ a number of cases where more extensive resection of the gut than in his own was successfully accomplished is given. These are five in number, namely those of Kocher, Koeberlé, Schlange, and Braun; to these I can add as many more.

No.	OPERATOR.	AMOUNT RESECTED.		FOR WHAT.
		m.	c.m.	
1	Ruggi	3	30	Stricture and inflammatory matting of intestines.
2	Shepherd	2	34	Tumour of mesentery.
3	Kocher	2	8	Railway injury.
4	Koeberlé	2	3	Multiple strictures.
5	Kocher	1	60	Strangulated hernia.
6	Braun	1	37	Umbilical hernia.
7	Schlange	1	35	Internal strangulation.
8	Elliot	1	24	Gangrene of intestine.
9	Roux	1	24	Lipoma of mesentery.
10	Canthörn	1	9	Sarcoma of mesentery.
11	Maston, G. W. ..	1	12	Sarcoma of mesentery.
12	Trombetta	1	10	—
13	Hahn		80	Quoted by Ruggi.

In these thirteen cases the patients all recovered from the operation, and six months later eight were in good health, one died four months after from marasmus, and two from obstruction due to a Murphy's button. In the others the loss of so large an amount of small intestine did not apparently interfere with their nutrition, except in Braun's case (6). Diarrhoea was noticed in several cases, especially where careful dieting was not observed. Otherwise patients felt well, and most of them had continued to gain flesh, my own case during the last three months gained 25 lbs.

The following is a more detailed account of the cases tabulated above:

1. The most remarkable case is that Ruggi.⁴ In this case 330 centimetres of small gut were removed in 1894, from a boy, aged 8, for stenosis. Three operations were performed. The first relieved the stenosis by dividing a band; obstruction continuing, 7 to 8 centimetres were resected. This relieved for a time, when again obstruction occurred and a third operation was performed. The obstruction

this time was found to be due to matting together of coils of intestine, and in endeavouring to free them the mesentery was torn away ; so a large amount of bowel had to be removed, namely, 3m. 30cm. The ends were brought together by primary suture. The boy did well, all his digestive functions being satisfactorily performed. He gained flesh after some weeks rapidly, and was in perfect health two years after when the article was written. This, as far as I know, is the largest piece of intestine successfully resected.

2. Shepherd 92 inches (2 m. 34 cm.) of small gut measured without stretching the day after operation and reported above. In this case a solid tumour, weighing 13 lbs., was also removed. Patient well seven months afterwards and gaining flesh.

5. Kocher⁵ 2 m. 8 cm. removed for railway injury. Ends of intestine united by primary suture. Patient remained well, with the exception of having a diarrhoea easily started by errors of diet.

4. Kocberlé,⁶ of Strassburg, resected 2 m. 3 cm. (6 feet 1½ inches) for multiple strictures. The cut ends were stitched into the abdominal wound which wound closed in 6 weeks, and the patient, a woman aged 22, suffered no digestive troubles after.

5. Kocher⁷ resected 160 cm. (5 feet 3 inches) for strangulated hernia in a man aged 57 by primary suture. Patient died three years later from another disease.

6. Braun⁸ removed 137 cm. (4 feet 6 inches) by immediate suture for umbilical hernia. Patient died four months later of inanition after a second operation.

7. Schlange⁹ resected 135 cm. (4 feet 5 inches) for internal strangulation in a woman aged 42. Two years later patient was in good health.

8. Elliot¹⁰ resected 124 cm. (4 feet ¾ inch) in a man aged 25 for infarction due to thrombosis of the mesenteric veins. Patient was in good health two years after.

9. Roux,¹¹ of Marseilles, resected 124 cm. of intestine (4 feet ¾ inch) for a lipoma, with recovery.

10. Canthorn¹² resected 43 inches (109 cm.) of small intestines from a man aged 49 for sarcoma of mesentery, ends united by Murphy's button. Patient recovered from operation, but died four months later from obstruction brought about by the button.

11. Maston¹³ resected 112 cm. (44 inches) for sarcoma of mesentery, death five months later from perforation due to Murphy's button.

12. Trombetta in 1884 resected 110 centimetres (43½ inches) of small intestines in a woman, aged 40 years (quoted by Ruggi).

13. Hahn resected 80 centimetres ($31\frac{1}{2}$ inches), 1885, in a man aged 38 years (quoted by Ruggi).

The following is the pathological report of tumour in my case furnished by Dr. Wyatt Johnston, pathologist to the hospital :

Large, smooth, firm rounded growth, 11 inches by 10 inches by 5 inches. Weight 5,250 grames (13 lbs.). Attached to the growth are 36 inches of small intestine. Also two other lengths of small intestine received, 30 inches and 26 inches respectively. Total length of gut removed 7 feet 8 inches (234 cm.).

Growth encapsulated, firm, inelastic to touch. On section cut surface, pale grey, translucent and glistening; not very vascular; has a fasciculated appearance.

Microscopical examination shows growth to be fibromyxoma containing clear spaces, which contain a fluid becoming coagulated and granular on adding acetic acid. Stained sections show spindle and stellate cells, forming bundles and reticulæ. Vessels are much thickened. These growths are semi-malignant, but prognosis better than in sarcoma.

[The patient was exhibited to the Section as well as the tumour and the three lengths of intestine which had been removed. Patient was in perfect health and said now he had normal stools.]

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DISLOCATION OF THE KIDNEY:

BY

J. F. W. ROSS, M.D., TORONTO.

Dislocation of the kidney should be distinguished from movable and misplaced kidney. Dislocation of the kidney, as I understand it, is a rare affection, and is one that is difficult to diagnose. It is easy for us to criticise our apparently blinded perception when looking back upon a case that has passed through the different stages of examination and exploratory operation.

I was called some time ago to see a lady in consultation with one of our leading physicians. The patient herself was the wife of a physician who had been many years in practice. She was 53 years of age, had been married for several years, and given birth to several children. While at an entertainment on the evening of October 23rd, 1896, she was attacked with a severe pain in the right hypochondrium. She found it necessary to leave the hall, and arrived at a friend's house in about an hour. When seen, she was suffering intensely and vomiting at intervals. Examination revealed a small tumour in the abdomen situated about the point of the tenth rib, and apparently about the size of a walnut. It seemed to be attached to the liver, and moved with respiration. She complained of a dragging sensation in the region of the right kidney and a frequent desire to urinate. The tumour was not sensitive to pressure, but when pressure was made from without inwards more distress was caused than when it was pressed from within outwards.

The history of the case showed that the patient had been subject to similar attacks for twelve or thirteen years. During each attack the pain was situated in the right hypochondriac region, was accompanied by a similar dragging sensation and similar frequent desire to urinate, and occasionally with chills, fever, and vomiting. Each attack was preceded by an uneasy sensation, and by this the patient was apparently warned of impending trouble. She soon learned that on assuming the recumbent posture the pain would almost instantly vanish, and not return perhaps for days. At a later stage of the complaint the pain would not leave until after vomiting occurred. It was some time after this period that a small tumour was discovered that disappeared on pressure with a gurgling sensation, followed by sudden and complete relief of the pain.

Several physicians living in her neighbourhood saw her, examined

the tumour when down, felt the gurgling when it receded, and were of the opinion that it was a rare form of ventral hernia. About ten years ago pus was found in the urine in microscopical quantities at varying intervals, and this was supposed to be due to pyelitis.

Just prior to the last attack incipient cataracts had been discovered in both eyes. As a general rule, the tumour would vanish easily on pressure. Often when riding in a carriage the patient would lean forward, press on the tumour, and reduce it. When attacked at home she would lie down, press the tumour back, and immediately resume her duties. If, however, from any cause the tumour was allowed to remain down for any length of time, it would then be very difficult to reduce it, and its reduction would be followed by chills and fever and sometimes by night sweats continuing during several nights. These attacks would sometimes come on almost every day when the patient was in otherwise perfect health, or an interval might occur of many weeks without the occurrence of an attack. Her husband thinks that she must have had at least 1,000 of these attacks, severe and light.

During the last seizure, when I saw her, the tumour remained irreducible; the pain was very severe, and vomiting occurred frequently. After about twenty-four hours she began to have chills and fever at times; the temperature rose to 104° ; the patient looked very ill. No positive diagnosis could be made; the general opinion was that she was suffering from some obstruction of the cystic duct of the gall bladder. Exploratory operation was advised and refused, but in a few days the patient asked for operation. After six days and nights of great suffering the operation was performed.

The abdomen was opened over the situation of the gall bladder, which was found to be normal; the gall bladder itself was pressed forwards, was empty, and the mass felt before operation was found to be the right kidney pushed up under the ribs, displacing the lower portion of the liver. This was cystic and the kidney was cystic, the cyst communicating freely with the pelvis of the organ and containing 7 ounces of urine. This was evacuated, a drainage tube inserted, and the opening in the kidney stitched to the wound in the abdomen. Iodoform gauze was packed around to prevent extravasation of urine into the abdominal cavity. She made a good recovery, and went home four weeks after the operation.

For six weeks there was no return of the trouble, but in two or three days after getting up the kidney became distended again, could be felt distinctly through the abdominal walls, and she suffered from pain. After that time she had two slight attacks at intervals of about two weeks. When last heard of there had been no attack for eleven weeks. There is still some pus in the urine.

At the time of the operation I would have preferred nephrectomy to nephrotomy, but this was refused by the friends, and it is scarcely probable that the patient would have survived it. The case is in my experience a unique one, and there are several points that deserve consideration.

From the sudden onset of the pain, the vomiting, and the appearance of the tumour, three conditions were taken into consideration, namely, stone in the cystic duct and sudden enlargement of the gall bladder, some rare form of hernia of intestine, or dislocated kidney. The patient herself was suffering from a very severe form of angular curvature of the spine, producing great prominence of the lumbar vertebræ, so that they crowded the intestines into the loins and away from the median line. The edge of the costal cartilages was, as a consequence, approximated to the anterior protrusion of the spine, and through this opening the kidney slipped. A movable kidney is frequently caught in this position when the patient stoops down even when there is no deformity of the spine. The deformity of the spine in this case, I considered, accounted for the aggravation of the symptoms.

The patient, in her last severe attack before operation, frequently said that if she could put the tumour back as she had put it back a hundred times before she would be all right. But, for the first time, she failed to reduce the dislocation. On previous occasions she had been able to press back the tumour by assuming the recumbent posture.

The gurgling sensation described was unaccounted for. No cause was found in the cystic mass. The gurgling led to the belief that perhaps the enlargement was due to a partial strangulation of a knuckle of intestine. Her husband, though a well informed and experienced practitioner, was unable to throw any light upon the case, and was as much in the dark as any of us. No one ever thought that the tumour could be in reality a dislocated kidney. The presence of minute quantities of pus in the urine should have excited some suspicion as to the true nature of the case.

Hydronephrosis and movable kidney are closely associated with one another. Pyonephrosis is very liable to follow in the wake of hydronephrosis. The diagnosis in this case of temporary distention of the kidney is not easy.

At one examination during the attack of pain the enlarged, rounded, tense kidney, could be felt, and in twenty-four hours no tumour could be made out even after the most careful examination. The urine has escaped, and nothing but a collapsed sac remains.

In a case recently operated on I found the patient at my first visit in the first condition—namely, with the kidney distended. There

had been some little dispute as to the correctness of my diagnosis, and as there were several physicians in the patient's family I hesitated before making the first incision owing to the fact that no tumour could be discovered. The hesitation was but momentary; the incision was made, a collapsed kidney drawn into the wound and tapped, and a small quantity of urine slightly tinged with pus removed. Misplacement of the kidney did not tend to disorganise the organ to the same extent that dislocations do.

Recently I operated on a young girl, aged 15. She was brought to me suffering from abdominal pains, and during the examination I discovered a tumour that centred on the spine, with its lower edge on a level with the umbilicus. It was flattened from before backwards, irregular in its outline, and but slightly movable. I advised exploratory operation.

After the abdomen was opened the mass was found lying in front of the spine and behind the posterior layer of the parietal peritoneum. The lobulation of the mass was peculiar. It looked like a kidney without a confining capsule, and was not kidney shaped. Its colour and other appearances soon proved, however, that it was a congenitally misplaced, malformed, but otherwise healthy-looking kidney. The right kidney was absent from its normal position. I was pleased to find that there was nothing more serious the matter with the patient. She has since remained in perfect health. She states that she is unable to lean her abdomen against any hard substance, such as the table, without feeling pain and nausea.

For a time it was thought that misplacement of the kidney produced but little damage to the renal structure. Renal structure, is, however, very susceptible to the effects of the damming back of the urine, as is evidenced by the results produced after the continuance of stricture of the urethra from any cause. But the kidney seems very prone to become cystic under such circumstances. As the ureter is collapsible, a slight movement of the kidney may produce a condition akin to the stricture. This kinking of the ureter cannot be produced in any but a minority of the cases of movable kidney. If this were not so we would meet with degeneration, such as that described, much more frequently than we do. If the operation of nephrorrhaphy can be relied upon to keep the kidney *in situ*, and if the operation can be performed without the placing of any permanent sutures that are liable to produce renal irritation, then it is certainly indicated in every case of movable kidney in order that a subsequent degeneration may be prevented. But the harmlessness and the success of the operation have not yet been satisfactorily demonstrated.

POST-OPERATIVE ACUTE ILLNESS FROM AN UNEXPECTED CAUSE.

BY

C. M. B. CORNELL, Brockville, Ont.

On Saturday, Mrs. —, *æt.* 43, was submitted to operation for restoration of the integrity and function of the sphincter ani muscle, complete laceration of which she sustained at her first and only labour nine years before. The procedure was accomplished by means of the flap-splitting method.

There was no manifestation of wound or systemic disturbance on Sunday. On Monday morning there were chilly sensations, malaise, rapid pulse and elevated temperature. In the afternoon the pulse was 140, the temperature 104° F. Inspection of the wound revealed no evidence of departure from the course observed in favourable cases, nor did the patient volunteer any expression, indicating local discomfort. The tonsils were noted to be slightly reddened, with a sense of mild irritation in the throat, but no distinct soreness or dysphagia. My anxiety reached the degree of great mental discomfort. The operation had been done in a private house, but a careful review of the preparation of the patient and every thing and every person connected with the operation, including the several stages of the latter and the subsequent management, betrayed no circumstance or condition in which we thought ourselves culpable. Yet my impression was that the phenomena undeniably pointed to sepsis as the disturbing factor.

Evening brought no relief to patient, nurse, or surgeon, and I was about to remove the sutures, open up the denuded surfaces and treat the condition as an infected wound, when circumstances not in themselves insuperable, but fortunately deterrent, influenced me to defer the matter until morning. All night the patient was ill, but made no complaint of the wound, the bowels having moved without injury to the mended muscle.

Tuesday morning showed no abatement in the rapidity of the pulse, nor had the temperature markedly fallen. My patient did not by statement or appearance conceal the fact that she was decidedly ill. However, relief came more speedily to me than to her, for inspection of the trunk and extremities demonstrated the characteristic efflorescence of scarlatina. Investigation showed unquestionable exposure eight days before the declaration of the attack of scarlatina.

The acute illness in no way interfered with the favourable progress of the wound, removal of the sutures showing primary union of the flaps and an intact sphincter ani muscle.

The scarlatina called for no vigorous treatment.

Hospital Reports.

BY

NORREYS WORTHINGTON, M.D., Sherbrooke.

CASE I. *Cancer of Stomach.* Mrs. E. P., aged 59, widow, of East Sherbrooke, was admitted to the Sherbrooke Protestant Hospital Oct. 14th, complaining of great pain in the epigastrium and vomiting after eating. She had been under treatment for some five or six weeks for malignant disease of the stomach, but was unable to enter the hospital before. She had a slight patch of lupus on the side of the nose, also mitral disease. A hard nodular mass was plainly visible above and to the left of the umbilicus, very movable and tender on palpation.

On Oct. 18th an exploratory incision was made in the median line, when the stomach was found somewhat dilated, and the mass involving more than one-third of the organ, principally the upper anterior and posterior surfaces, from the middle of the lesser curvature to the duodenum.

The feasibility of removing the growth having been discussed and decided upon, the stomach was withdrawn and half a dozen silk-worm sutures passed under the growth to facilitate removal and prevent the escape of contents into the abdominal cavity, which was protected by sterilised gauze. The growth was then excised with scissors, the incision running longitudinally as much as possible and the continuity of the stomach and duodenum continued only by about two inches of the lower border of that organ and the bowel. The edges of the incision were brought together transversely to preserve as much as possible the lumen of the organ and increase its capacity. The mucous membrane was stitched with a continuous catgut suture, the muscular and serous coats with a continuous suture of fine silk, these two rows of sutures invaginated and another continuous Lembert suture passed through the serous coat. A small piece of the lesser omentum and of the peritoneum, supporting the stomach to the diaphragm, were found to be involved and removed, the only hæmorrhage of any importance being from this peritoneal support.

Although the patient bore the operation remarkably well, a quantity of saline solution was poured into the abdominal cavity and allowed to remain.

The wound closed by primary union and the patient made an exceptionally favourable recovery.

There was very little vomiting after the anæsthetic, what there was being dark and bloody.

Enemata of brandy and bovine, of each half an ounce diluted, were given every two hours for the first six hours, after which bovine and peptonized milk were given in larger quantities at longer intervals.

On the 21st, three days after the operation, small quantities of peptonized milk were allowed by the mouth, and not causing any discomfort, were gradually increased after some days to six ounces every four hours, and at the expiration of two weeks she was sitting up in bed and taking bread and milk, custard and soft eggs.

The bowels were not moved for 6 or 7 days with the exception of two slight dark bloody stools the day following the operation. On the 25th natural movements began. There was very little rise of temperature or acceleration of the pulse throughout, and patient left the hospital, Nov. 8th, after having been up and about the ward for several days and entirely free from pain.

CASE II. *Angio-Sarcoma of Ovary*.—Addie B., aged 17, of Newport, Vermont, admitted to hospital, Sept. 20th. I saw her first Sept. 8th, and found her suffering great pain in the left iliac region and back, which was readily relieved by a hypodermic of morphia.

She was extremely anæmic. Temp. $99\frac{1}{2}$; pulse, 120.

The abdomen was quite flat except for a slight fulness above the crest of the left ilium. Over this there was slight dulness and pain on pressure. Had only menstruated twice, the last time being four months previous. Had passed portions of tape worm six months before, and had been an invalid for some time.

She continued much in this condition for a week with pain and vomiting, but no further enlargement of abdomen, but on Sept. 13th, a distinct enlargement could be felt in the left iliac region. This increased with such rapidity that an immediate operation was urged but refused.

By Sept. 18th it had assumed such proportions as to fill the pelvis and extend nearly to the umbilicus. She was then removed to the hospital in a very low condition (temp. 102° ; pulse, 150; vomiting), and operated on shortly after admission. On opening the abdomen a quantity of dark bloody fluid escaped, which was found coming from a bluish tumour, the size of a large cocoanut, which protruded from the left side of the abdomen.

Its surface was covered with large cysts, many of which ruptured immediately the abdominal support was removed by the incision. The tumour was found to be the left ovary greatly enlarged and the

pedicle twisted. This was ligatured and easily removed there being no adhesions.

The patient made a very satisfactory recovery until the tenth day, when phlebitis set in, affecting first the leg on the side of the growth, and when that subsided, the other leg. During her rest in bed she improved rapidly with iron and arsenic, and on leaving the hospital, six weeks from date of operation, had lost her anæmic look.

Diagnosis by Dr. Wyatt Johnston as follows: "Angio-sarcoma, newly formed capillary vessels being abundant. Does not appear to be highly malignant."

The extreme rapidity of the growth can perhaps be attributed to a sudden jump out of bed in a state of alarm, the day of the onset of pain, this causing strangulation of the pedicle. In both operations I had the able advice and assistance of Drs. Austin, Smith and Farwell.

In reporting these two cases I do so principally on account of the successful termination of the first, and the extreme rapidity of growth in the second.

RETROSPECT OF CURRENT LITERATURE.

Medicine.

UNDER THE CHARGE OF JAMES STEWART.

Affections of the Liver, Complicating Typhoid Fever,

OSLER. "Hepatic complications of typhoid fever."—*Transactions of the Association of American Physicians*, Vol. 12, 1897.

DAURIAC. "Des infections biliaires dans la fièvre typhoïde."—*Gazette Hebdomadaire de Médecine et de Chirurgie*, Paris, July 25th, 1897, No. 59.

MASON. "Gall-bladder infection in typhoid fever."—*Transactions of the Association of American Physicians*, Vol. 12, 1897.

HUNTER. "A discussion on cholelithiasis."—*British Medical Journal*, Oct. 30th, 1897.

It falls to the lot of very few physicians to meet with cases of typhoid fever complicated by diseases of the liver or bile ducts. Such a combination indeed is peculiarly rare, a fact which is all the more remarkable when one considers how intimately associated are the intestines and liver. The ulcers in typhoid fever were liable, one would think, to infect the portal system, and through this the bile ducts. However, a careful perusal of the literature of the past five or six decades shows comparatively few cases where such complications have occurred, and, what is likewise remarkable, most of these were recorded more than 20 years ago.

What applies to this condition applies equally well to the vast majority of the morbid lesions occurring in disease, and which have for the most part been observed and recorded with astonishing precision by the authorities whose names belong to several generations ago.

It is just such facts as these that have so interesting a significance in connection with the value of morbid anatomy as a progressive science; for the more assiduously the pathologist investigates diseased

tissue, the more does he realise how few are the new discoveries here made of recent years and how great therefore are the limitations in that department. Text-books written more than 10 years ago, such as those of Orth and Ziegler, cannot but fail to satisfy the most eager student, and the paltry additions made in more recent works on the subject by so many authors scarcely justify their publication. The future for pathological research, indeed, would seem to rest far more on the lines of study indicated by *processes of disease* than by the minute study of the diseased tissues themselves. One must, however, make a distinct exception in the case of the nervous system where the most recent methods of technique have produced astonishing and most satisfactory results.

Whatever has been learned within the past few years concerning the hepatic complications of typhoid fever has certainly not been along the lines of morbid anatomy; it is the study of bacteriology which has added the most important information and rendered valuable service, both in the diagnosis and in the treatment of all such affections. The literature on this interesting subject of typhoidal infection of the liver is, too, peculiarly interesting, as indicating the almost inestimable value of the early observations of such great men as Murchison, Hagenmuller, Louis and others. The great boon to the medical world resulting from their careful observations and painstaking collection of facts has been strikingly set forth in Dr. Osler's recent delightful pamphlet upon the influence of Louis upon American medicine; of interest here chiefly in connection with the great work which that authority has done in his researches on typhoid fever.

Considering briefly the *means* whereby a typhoidal infection of the liver or bile ducts occurs, one may safely ascribe the invasion as proceeding through one of two paths, either descending or ascending, the former by means of veins carrying the infection from the intestinal ulcers, the other more directly by ascension from the duodenum into the bile ducts. There are numerous factors of assistance to the bacteria in this last means of progression, most notably the active motility of the organism itself, the quality of the bile as a culture medium, and the comparative stagnation of the stream of bile, a condition especially induced in this disease. It need scarcely be added that anything tending to injure the liver tissue itself, such as the existence of previous disease, the presence of calculi and so on, will materially further such an infection.

Results of infection.—The *results* of such an infection can be of the most varied character. The numerous observations recently made by Chiari and others upon the frequent occurrence of bacilli in the gall-

bladder during enteric fever is sufficient to show that this organ may yield no symptoms whatever while containing these bacteria. That further, not only may they be present and "silent," but their virulence may, under certain conditions, be entirely lost. At other times again, as has been already shown, the parasite may exist in the bile ducts in a most virulent state and yet produce no lesions. A remarkable case, too, was recently related by Cushing, where in fatal disease, other than typhoid, Eberth's bacillus was present in the gall-bladder, while there was no history of any previous attacks of enteric fever. The symptoms of this infection are usually manifested during the third and fourth week of the disease, though several instances have been described where as early as the eighth day, the gall-bladder was found the seat of the micro-organism. Every variety of inflammation may be the consequence of typhoid infection; simple catarrhal, suppurative, necrosing and ulcerative, and even diphtheritic. Commonly, perforation is the result of the necrotic process, while in the more chronic inflammation, marked sclerosis of the bile ducts and gall-bladder may be seen. In his able address before the recent meeting of the British Medical Association, Dr. Wm. Hunter referred to an interesting case in point, where a marked subacute inflammation of the gall-bladder had been found at autopsy upon a fatal case of typhoid fever.

It has been asserted, moreover, on good authority that cholelithiasis has followed directly upon the invasion of these micro-organisms, and a casual instance is mentioned here and there in warranty of such a theory. The fact, however, that Hanot discovered typhoid bacilli in the nucleus of a gall-stone, does not necessarily imply that such were the *cause* of its formation, but quite possibly a mere coincidence, while too, one can safely state that anything tending to inflammation of the mucous membrane of the organ will most naturally lead to those conditions by means of which nuclei of gall-stones are most readily formed. Dr. Hunter carefully adds a word of caution against too hasty conclusions in reference to this interesting point.

The gall-bladder itself as the seat of complications is probably the most interesting of all the hepatic regions, both from the clinical and the pathological point of view. Not a little has recently been written upon the diagnosis and treatment of such affections, and with the natural result that this complication has been discovered far more readily than before; certainly the majority of cases hitherto recorded have been post-mortem discoveries, as shown from statistics collected by Mason among records of the past 60 years.

Diagnosis.—The *diagnosis* of cholecystitis occurring in the course of

typhoid fever may be so obvious as to present not the slightest difficulty; while on the other hand, the symptoms may be so obscure as to wholly mask all signs of the true condition. Typical cases present pain, developing suddenly in the right hypochondrium, the presence of a pyriform tumour, which may be even seen to rise and fall with respiration, and which is movable under the hand, and dull on percussion. Occasionally under very favourable circumstances, fluctuation may even be obtained, and cases are on record where it was possible to diminish the size of the tumour by pressure upon the gall-bladder, which temporarily emptied it of its fluid. But, on the other hand, most marked suppurative and ulcerative conditions may be present in the organ and its size perhaps smaller than normal, while if obstruction occur in the cystic duct, the bladder may be markedly atrophied. The more difficult cases are those where the localised peritonitis causes adhesions to such an extent as to obscure all recognition of the individual organs. But as a rule in such cases there is a sensitive point midway between the ninth costal cartilage and the umbilicus medianly situated, and the abdomen itself may be distinctly distended. As has been pointed out by Dauriac, a characteristic feature consists in the intermission of the symptoms; pain develops suddenly, possibly accompanied by chilly sensations and general malaise, all of which may disappear within a very short time. After 24 to 48 hours the symptoms recur perhaps more markedly, with distension or tumour. The spleen, of course, will be enlarged and the temperature markedly irregular. Instead of running the ordinary course of typhoid, it may suddenly drop to normal, and then become either intermittent or very irregularly febrile. It is an exception to have a typical intermittent temperature such as occurs in the other forms of suppurative hepatic conditions. A curious feature of much interest, as well as of value, is the symptom first pointed out by Riedel, who has shown that owing to the distension of the gall-bladder, a tongue of liver substance may be pulled down even below the umbilicus, and can be readily felt on palpation through the abdomen. To sum up again the special features in the diagnosis of typhoidal cholecystitis, we have:

- 1st. The sudden development of pain in the right hypochondrium.
- 2nd. The sensitive point above mentioned.
- 3rd. The presence of a tumour.
- 4th. The intermission of the symptoms.
- 5th. The phenomenon of Riedel.

Treatment.—The treatment of this complication has been either expectant or operative, varying naturally according to the degree of severity. The operative treatment in Mason's case consisted in the

successful aspiration of the collection in the bladder, though all others have resorted to laparotomy and with variable success. A small proportion only recovered.

In so far as the drug treatment is concerned, antiseptics have been the routine practice in France with the hypothetical idea of eliminating the causative factor. Hence the use of Beta-naphthol, mercury, etc., and with success in such cases where the symptoms were mild and where naturally one cannot with assurance add a *propter* to their *post hoc*.

When *angiocholitis* occurs, the general features are almost identical; the intermission of symptoms, the irregularity of the temperature, the general malaise and with these, tenderness, and perhaps œdema over the liver area. But Dauriac has further pointed out the importance of watching for premonitory symptoms under these conditions and strongly urges frequent and careful examinations of the urine. His observations lead him to believe that in typhoidal involvement of the liver there will be disturbance of urea formation and an altered quantity of urobilin present in the urine. Add to this a disturbed glycogenic function with the presence of minute quantities of sugar in the urine, and the liver tissue can be assumed to be involved. Under such conditions it is necessary to watch most carefully the local condition in the right hypochondrium.

Of the other hepatic complications, such as *abscess*, solitary or associated with phlebitis, these are peculiarly rare and do not offer any points of special interest in connection with the study of enteric fever.

The occurrence of *jaundice*, on the other hand, which too is remarkably uncommon, may arise from a variety of conditions. As Dr. Osler has shown, the condition may be due to toxæmia, abscess, gall-stones or cholangitis; and in all cases its presence may be looked upon as of bad prognostic significance. Where due to a catarrhal condition of the common duct, on the other hand, the prognosis is least grave. Treatment, other than that adopted under other conditions which induce the same symptoms is uncalled for.

C. F. Martin.

Pharmacology and Therapeutics.

UNDER THE CHARGE OF A. D. BLACKADER.

A Guide to the Administration of Drugs.

HARE, H. A. "The rapidity of absorption and elimination of some commonly employed drugs as a guide to their administration."—*Therapeutic Gazette*, September 15, 1877.

The writer while emphasising the importance of a knowledge of the physiological action of drugs as the basis of successful therapeutics, thinks that in our study of this action we are apt to overlook the manner of the absorption and the speed of the elimination of a drug as having a very important bearing on the size and frequency of the dose to be administered. Owing to lack of knowledge on these points we often find that drugs which are slowly eliminated, are given frequently in the twenty-four hours, while drugs which are rapidly eliminated are given at long intervals. All drugs cannot be arbitrarily divided into those which are slowly and those which are rapidly eliminated, but some drugs do lend themselves to such classification, and some of those which are slow of absorption are likewise slow of elimination. It is because drugs which are only slowly eliminated are frequently given too often in the twenty-four hours that the so-called untoward effects of many of them are developed. Unfortunately with regard to many of our drugs, our knowledge of the mode and time of their elimination is by no means complete, and in some cases, owing to the complete destruction of the drug in the body, an exact estimation is almost impossible.

Iodide of potassium is absorbed and eliminated rapidly when taken on an empty stomach, so that there is little tendency for it to accumulate in the system. Nevertheless a certain portion remains uneliminated, partly owing to its being swallowed and reabsorbed with the saliva, and partly perhaps owing to the combination of some of the iodine with the albumen of the tissues forming only slowly soluble albuminoid compounds of iodine. Iodide of potassium should, therefore, be given freely and frequently at first, until the residual amount has reached its limit, as shown by the appearance of some toxic symptoms, when smaller doses will be sufficient to maintain its influence.

Bromide of potassium is absorbed rapidly, but eliminated only very

slowly. Amory found that one-half of the drug was eliminated in twenty-four hours, a remaining third in the next twenty-four, but the balance is only very slowly eliminated. Hence the same rule should be adopted for it as for iodine, viz., to give full doses till some toxic symptoms appear and then lessen the dose. Many neurologists prescribe full doses for one week, and then smaller ones sufficient only to maintain the effect.

The rapidity of absorption and elimination of mercury depends to a great extent on the variety of it employed. While a single dose is generally completely eliminated in 24 hours, elimination becomes very slow when the doses are persisted in.

Antipyrin is rapidly absorbed from the stomach in from fifteen to twenty minutes, but elimination continues for from thirty to sixty hours after the last dose. It should, therefore, not be given in too frequent doses.

Atropine and belladonna are, on the other hand, absorbed with great rapidity, and equally rapidly eliminated by the urine. Aconite is also rapidly absorbed and destroyed by oxidation, so that its effects do not last for any length of time.

Arsenious acid is absorbed fairly rapidly, but eliminated very slowly indeed; it should, therefore, be given at long intervals rather than in many doses each day.

Hydrocyanic acid and ammonia on the other hand are both very fleeting in their effects, being both rapidly absorbed and eliminated, and to have any steady influence on the system they should be given at comparatively short intervals.

To Stimulate the Absorption of Important Drugs.

HARE, H. A. "Stimulation of the gastric mucous membrane to aid in the absorption of important drugs."—*Therapeutic Gazette*, November 15, 1897.

In an interesting paper presented to the Section on Medicine of the College of Physicians of Philadelphia, the author refers to the fact that the rapidity of absorption from the stomach is greatly influenced by the condition of its mucous membrane and the state of the general nervous system. In cases of profound vital depression, absorption almost ceases. In surgical shock, and in advanced alcoholic coma, he has not infrequently noticed that after repeated large doses of drugs had been given with no results for the time being, absorption commenced as the depression passed off, and the patient was more or less poisoned by the aggregated medicinal doses received. In other instances where the state is less grave, the physician is content to give the

medicine, and then regard it as physiologically active, without considering the possibility of gastric torpor. In some chronic conditions the slow absorption of a remedy is not disadvantageous, but in acute cases its rapid absorption may be of vital importance. It occurred to the writer that it might be possible to combine with a remedy, another substance not possessed of general physiological action, but capable of stimulating the gastric mucous membrane, and so increasing its functional powers of absorption. To test what could be achieved in this way, he made a series of experiments with iodide of potassium, given at one time pure, and later on, after all traces of the first doses had passed off, with the addition of a little powdered capsicum. He found that when he used the latter drug absorption took place about ten minutes earlier than when it was not used. He concludes, therefore, that the use of a gastric stimulant aids very materially in the absorption of another drug, and that it is well to combine such with our remedies in all cases where rapid absorption is desired, or when we have any reason to believe that the stomach is in a state of atony.

Treatment of Anæmia or Chlorosis.

LATHAM, P. W. "On the treatment of anæmia or chlorosis,"—*The Practitioner*, October, 1897.

In discussing the reason why this apparently simple disorder is often so intractable, the writer thinks that remedies frequently are not used in the right way or under proper conditions. The food if taken in proper quantities contains sufficient iron for the wants of the system under normal conditions, but often the condition of the alimentary tract may be such as to prevent its absorption, or, after it is absorbed, the blood-forming organs may be so inert as not fully to utilize it. Dr. Latham thinks that morbid ferments in the intestinal canal, by the development of alkaline sulphides convert the organic compounds of iron into sulphides which cannot be absorbed, and which consequently pass off with the fæces. When iron is administered medicinally, not only is a proportion of it absorbed, but, by combining with the alkaline sulphides in the intestine, it protects the organic compounds of iron in the food and thus permits their absorption. The dose of iron at first should be small, and then gradually increased as the patient becomes tolerant of the remedy. While the milder preparations of iron are more readily borne, yet, when the patient is able to take it, he regards the tincture of the perchloride as the most efficacious. This is probably due to the presence in it of

free chlorine. The addition to it of acetic or sulphuric ether appears to stimulate its absorption.

Dr. Latham recommends the following combination of remedies as very serviceable in the treatment of chronic forms of chlorosis.

℞ Tinct. Ferri Perchlor.	℥ x-xx.
Sp. Ætheris Sulph.	℥ x-xv.
Tinct. Nucis Vom.	℥ x.
Tinct. Quassiaë	℥ xxx.
Aquæ ad	℥ iss. misce.

This is to be taken twice a day, an hour before luncheon and dinner. Instances, he says, occur in which iron is not tolerated by the patient even when given in very small doses; either the stomach is intolerant of the remedy or the head suffers. In cases also, which appear to be verging towards the form of the so-called "pernicious" anæmia, iron is not very effective. In such cases the administration of arsenic is often followed by most satisfactory results. In the writer's opinion, the efficacy of arsenic is diminished if combined with iron, but the addition of acetic or sulphuric ether appears to render its action more energetic. Dr. Latham dissents from the doctrine that when iron is tolerated in chlorosis the remedy is only effectual when administered in large doses. Such doses, he thinks, not infrequently set up considerable intestinal irritation, and a febrile condition, with palpitation or headache. More effective than the administering of large doses is the ensuring of a daily, satisfactory action of the bowels. One of the most useful laxatives in these cases is the aloes and iron pill of the pharmacopœia taken daily before dinner. It should be recently prepared, and with it small doses of belladonna may be combined with advantage. Cascara is also a useful remedy, but saline purgatives he thinks are objectionable. Laxatives also containing sulphur, such as the compound liquorice powder, sulphur tabloids, etc., should not be used in chlorosis. On the other hand, the antiseptic action on the intestinal contents of mercury in small doses may often be of service. Diet should be nutritious and of an easily digestible character. The last, but by no means the least, important point in the treatment is the necessity for chlorotic patients to avoid fatigue. They should have rest both of mind and body. A little over-exertion does away with the result of three or four days' care. Plenty of fresh air without much exercise, twelve hours in bed and a rest on the couch after luncheon and dinner will often do much to contribute towards the recovery of these patients.

The Treatment of Habit Chorea.

SINKLER WHARTON. "The treatment of Habit Chorea.—*Journal of Medical Sciences*, May, 1897.

The writer at the close of an interesting article on this affection, speaks of its treatment as follows: The majority of cases depend upon some distinct and positive cause, which careful investigation will usually discover. It is essential therefore in every case to determine the existence of a cause, and to take measures for its removal. In cases of long standing however, it is not sufficient merely to get rid of the cause, for the nerve centres having acquired a vicious habit do not recover their normal condition until systematic treatment has been pursued. This is especially observable in those cases in which habit chorea has resulted from an error of refraction. It has been found that medicinal treatment alone seldom arrests the choreic movements. On the other hand, mere correction of the refraction does not cure them. It is necessary first to correct the ocular defect, and then pursue a course of medicinal treatment. The same statement applies to those cases in which nasal or throat disease has been the cause of the affection. In nearly all cases the general health is at fault. The patient is anæmic, or is run down from overstudy, improper food, or some attack of illness. Tonics, more especially chalybeates are called for; and if possible change of air is to be obtained. Arsenic is the one drug which seems to exert a special influence upon the disease. It is seldom of value when given in small doses but should be given in gradually ascending doses until some toxic influence is observed. In some cases when the internal administration was not successful, Weir Mitchell has effected cures with its exhibition hypodermically. The question as to whether the patient should be urged to control the movements by an effort of the will, and also as to whether in children any form of punishment should be used are mooted points. In the writer's opinion the patient should in all cases be encouraged to make every effort to check and control them. Any form of punishment in children for the movements is to be deprecated, but in every case much can be done by the promise of reward. In all cases it is important to secure as quiet and uneventful a life as possible and a modified course of rest treatment gives the most speedily beneficial results.

A. D. Blackader.

Ophthalmology.

UNDER THE CHARGE OF J. W. STIRLING.

Holocain—The New Local Anæsthetic.

- E. TAUBER.—*Centralblatt für praktische Augenheilkunde*, February, 1897.
- R. KUTHE.—*Centralblatt f. prakt. Augenheilkunde*, February, 1897.
- R. HEINZ.—*Centralblatt f. prakt. Augenheilkunde*, March, 1897.
- R. HEINZ AND C. SCHLOSSER.—*Zehender's Klinische Monatsblätter*, April, 1897.
- GUTMANN.—*Deutsche Med. Wochenschrift*. March 11th, 1897.
- HIRSCHFELD.—*Zehender's Klin. Monatsblätter*, May, 1897.
- R. BRUDENELL CARTER.—*Lancet*, May 29, 1897.

The following is a condensed synopsis of the contents of the above articles on this new local anæsthetic, which bids fair so far to supplant cocain in many cases of eye disease.

It is used in 1 per cent. solution instilled into the eye, causes very slight irritation, and produces anæsthesia in one minute or less, which anæsthesia lasts ten minutes, it is thus more rapid in its action than cocain.

It does not dilate the pupil like cocain does, and it rather lessens the intraocular pressure.

It is more readily absorbed by the ocular tissues than cocain, hence is more useful in cases of ocular chemosis where the absorption of cocain is very slow.

In sterilising it, it decomposes if there is the slightest trace of alkalinity present, hence it should be heated in a porcelain not a glass vessel when it is sterilised.

It can not be used subcutaneously as it is very toxic, the pulse and respirations are greatly increased in frequency, and death results from tetany of the respiratory muscles.

In regard to the sterilising, several of the above authors consider this to be unnecessary as a 1 per cent. solution of holocain is directly bactericidal.

Holocain is a derivative of p. phenetidin like phenacetin, feebly

soluble in cold water, $2\frac{1}{2}$ per cent., soluble in ether, alcohol and hot water. It melts at 121 degrees (Cent), neutral reaction, not decomposed by heating, but when heated in glass vessels some free alkali is given off which affects the glass, hence it should be heated in a porcelain vessel.

A one per cent. solution remains clear for two months.

The Ocular Complications of Typhoid Fever.

CHARLES STEDMAN BULL, M.D.—*Medical Record*, April 24th, 1897.

In typhoid fever the eye symptoms are either a part of the infectious disease itself or one of its sequelæ, whereas in most infectious diseases the eye disturbances occur among the prodromata or in the early stage of the disease. This fact may be of use in the diagnosis, as in doubtful cases of measles.

The main eye lesions are :

1. Catarrhal conjunctivitis with very little secretion.
2. Phlyctenular conjunctivitis and keratitis especially during convalescence.
3. Loss of accommodation and dilatation of the pupil due likely to a general asthenic state.
4. Retinal hæmorrhages in bad cases generally at height of disease.
5. Amaurosis from anæmia due to great loss of blood elsewhere in body ; there is a tendency for these cases to end in optic atrophy.
6. Paralysis of external muscles of eye, said to be due to a chronic nephritis, are nuclear and recover rapidly but with tendency to relapses. Others hold these paralysis are due to direct action of the typhoid poison setting up a neuritis.
7. Neuro-retinitis or retrobulbar neuritis is rare, said to be due to a localized meningitis at the base of the brain and apt to end in atrophy of the optic nerve.
8. Inflammation of the iris, ciliary body and choroid varying in intensity, and never purulent, but always serous and plastic.

Treatment of Exophthalmic Goitre.

CHARLES ABADIE.—*La Clinique Ophthal.*

After mentioning failures in other treatment Abadie strongly advises the division of the cervical sympathetic below the middle ganglion, for the vasodilator fibres which go to the superior and inferior thyroid arteries emanate from the superior and middle ganglia.

Therefore, if we cut below the middle ganglion we shall cut off the paths of the vaso-dilatation which provokes and keeps up the hypertrophy of the thyroid gland.

Arthritis Secondary to Gonorrhoeal Conjunctivitis.

L. WEISS AND W. KLINGELHOFFER.—*Klin: Mon. f. Augenheilkunde*, March, 1897.

This fully reported case is very interesting.

The patient, a male nurse, thirty-five years old, while making an injection in a case of gonorrhoea accidentally got some of the discharge in his right eye.

Under treatment his eye recovered, but two months later, swelling and pain attacked his right knee joint, with some fever. The knee got well in eight or nine days, but fourteen days later the right ankle joint also was affected, recovering in eight days.

The possibility of the patient having urethral gonorrhoea was carefully excluded.

Puncture of the joint unfortunately was not made to discover if the gonococcus existed in the secretion of the joint.

Arthritic disease following gonorrhoeal conjunctivitis is very rare, only fifteen cases have been so far reported.

Bacteriological examination was made in five of these cases and in three cases cocci were found.

Cataract and its Association with the Gouty and Rheumatic Diathesis and their Relation to Diseases of the Eye.

S. D. RISLEY, M.D.—*University Medical Magazine*, June, 1897.

There are some very suggestive and valuable hints in this exhaustive article of Dr. Risley's.

Dr. Risley refers to the distinct clinical relationship between ocular affections and the lithic acid diathesis. The eye symptoms from which many persons suffer disappear promptly under open air exercise with the deeper breathing and increased excretion. The blood vessels and tissues are relieved of the accumulation of the products of imperfect metabolism.

While the relation of these ocular discomforts to the milder or incipient forms of lithæmia are overlooked, it is quite as common to neglect the important bearing this diathesis has upon the serious affections of the eye which appear in or after middle life.

Cataract would arise, from its impaired nutrition due to the altered condition of its enviroing fluids in this diathesis, just as the presence of naphthalin, or sugar in the system cause loss of transparency of the lens, presumably through some change in the normal osmotic qualities of the fluids in and around the lens.

It is a significant clinical fact that the ectodermic tissues of which the lens is one, and the connective tissue in and about the joints where it is most dense and comparatively avascular, and, therefore where nutrition is most easily retarded, are precisely the localities which suffer earliest and most constantly in the evolution of gout.

Canadian Medical Literature.

UNDER THE CHARGE OF KENNETH CAMERON.

[The editors will be glad to receive any reprints, monographs, etc., by Canadian writers, on medical or allied subjects (including Canadian work published in other countries) for notice in this department of the JOURNAL. Such reprints should preferably be addressed to Dr. Kenneth Cameron 903 Dorchester street, Montreal.]

PERIODICALS.

AUGUST, 1897.

THE CANADIAN PRACTITIONER.

Notes on some peculiar phases in appendicitis—J. F. W. Ross, Toronto, p. 547.

Inter-cranial syphilis—A. McPhedran, Toronto, p. 561.

A plea for the radical operation for hernia among the insane—H. T. Hobbs, London, Ont., p. 567.

THE CANADA LANCET.

Cystic tumours of the ovary complicating pregnancy, with notes from cases—H. Meek, London, Ont., p. 586.

A case of acute insanity due to eye-strain—Murray McFarlane, Toronto, p. 591.

THE CANADIAN MEDICAL REVIEW.

A case of typhoid fever—J. Hart, Toronto, p. 43.

THE DOMINION MEDICAL MONTHLY AND ONTARIO MEDICAL JOURNAL.

Vaginal section—Ernest Hall, Victoria, B. C., p. 567.

THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

The culture, diagnosis, and serum treatment of puerperal fever—George T. McKeough, Chatham, Ont., p. 47.

Primary tuberculosis of the breast occurring during pregnancy—George T. McKeough, Chatham, Ont., p. 49.

Some thoughts on intestinal catarrh and cholera infantum—H. Morell Slayton, Minnesota, p. 51.

CANADA MEDICAL RECORD.

Convenient local anæsthetics in minor surgery—Geo. Fisk, Montreal, p. 557.

Serum-therapy results—J. B. McConnell, Montreal, p. 592.

THE MARITIME MEDICAL NEWS.

Our duty as physicians and citizens in the work of sanitation and preventive medicine—J. F. McDonald, Hopewell, N. S., p. 261.

Clinical evidence of the identity of the micro-organisms of erysipelas and puerperal septicæmia—Duncan Murray, Lower Stewiacke, N. S., p. 270.

L'UNION MÉDICALE DU CANADA.

Troubles nerveux en rapport avec les maladies de l'oreille—A. A. Foucher, Montreal, p. 449.

Des injections salines dans le traitement de la pneumonie, spécialement chez les vieillards—J. A. Lesage, Paris, p. 457.

Décroissance rapide d'une tumeur fibreuse de la matrice à la suite du traitement par l'électricité—A. Laphorn Smith, Montréal, p. 464.

Onze cas d'insolation—E. P. Benoit, Montréal, p. 468.

LA REVUE MÉDICALE.

- Cholédochtomie—M. J. Ahern, Québec, p. 9 (No. 2).
 Cas de placenta prævia—P. V. Faucher, Québec, p. 17 (No. 3).
 Manifestations pathologiques à distance dans les maladies du nez—L. N. J. Fiset, Québec, p. 25 (No. 4).
 Etude sur la cause ou condition première de tout . maladie—C. R. Paquin, Québec, pp. 33-41 (Nos. 5 and 6).

SEPTEMBER, 1897.

THE CANADIAN PRACTITIONER.

Special Lister number.

THE CANADA LANCET.

- Inertia of the uterus following the use of chloroform—J. B. Williams, Ingersoll, Ont., p. 1.
 Hæmorrhagic pancreatitis—C. B. Shuttleworth, Toronto, p. 6.

CANADA LANCET—Special Edition.

Commemorating the meeting of the British Medical Association at Montreal, August 28th, 1897.

THE CANADIAN MEDICAL REVIEW.

Two unnamed diseases—James Samson, Windsor, Ont., p. 77.

THE DOMINION MEDICAL MONTHLY AND ONTARIO MEDICAL JOURNAL,
 Proceedings of the British Medical Association, Montreal meeting, 1897.

THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

Address in surgery—W. Mitchell Banks, p. 103.
 Proceedings of the British Medical Association, Montreal meeting, 1897, p. 121.

THE CANADA MEDICAL RECORD.

Opening address at the 65th annual meeting of the British Medical Association—T. G. Roddick, Montreal, p. 613.
 Address in medicine—Wm. Osler, Baltimore, p. 632.

THE MARITIME MEDICAL NEWS.

Milk as a medium for the spread of disease—J. W. Daniel, St. John, N. B., p. 297.
 Fracture of spinal vertebrae—John Stewart, Halifax, N. S., p. 307.
 A case of extra-uterine foetation—H. H. Read, Halifax, N. S., p. 307.

L'UNION MÉDICALE DU CANADA.

L'œuvre de Pasteur et la conception moderne de la médecine—Le Professor Charles Richet, délégué du Gouvernement Français et de la Faculté de Médecine de Paris à la 65e réunion de l'Association Médicale Britannique, p. 513.
 Séro-diagnostic de la fièvre typhoïde—Fernand Vidal, Paris, p. 526.
 Les progrès de l'hygiène au Canada—E. P. Lachapelle, Montréal, p. 530.
 Deuxième contribution à l'étologie de la dacryocystite—A. A. Foucher, Montréal, p. 537.
 Anatomie pathologique et cure radicale du pied bot varus équin congénital—Amédée Marien, Montréal, p. 540.
 Oblitération du col utérin—J. Lippé, St. Ambroise de Kildare, Que., p. 546.

LA REVUE MÉDICALE.

Influence de la lumière sur les microbes—Fred. Boulanger, Québec, p. 49 (No. 7).

De la vaccination obligatoire—Arthur Simard, Québec, pp. 57-65 (Nos. 8, 9).
 Considération sur les affections syphilitiques de l'œil—Jules Jehin-Prume,
 Montreal, pp. 73-81 (Nos. 10, 11).

BRITISH MEDICAL JOURNAL.

SEPT. 4TH.

President's address delivered at the sixty-fifth annual meeting of the British
 Medical Association—T. G. Roddick—Canada in its medical aspects, p. 569.
 Address in medicine—William Osler—British medicine in Greater Britain,
 p. 567.
 Address in surgery—W. Mitchell Banks—The surgeon of old in war, p. 581.
 Sixty-fifth annual meeting of the British Medical Association at Montreal,
 p. 607.

SEPT. 11TH.

Address in public medicine—Hermann M. Biggs—Preventive medicine in
 the city of New York (with maps), p. 638.

SEPT. 18TH.

An address on the work of Pasteur and the modern conception of medicine—
 Professor Charles Richet, Paris, p. 693.

SEPT. 25TH.

An address delivered at the opening of the section of public medicine—E. P.
 Lachapelle—The progress of sanitation in Canada, p. 757.

Surgical gynaecology in insanity—A. T. Hobbs, London, Ont., p. 769.

The after-effects of surgical procedures on the generative organs of females
 for relief of insanity—James Russell, Hamilton, Ont., p. 770.

Reflexes in psychiatry—Daniel Clark, Toronto, Ont., p. 779.

The relation of insanity to the state—James Russell, Hamilton, Ont., p. 783.

OCTOBER, 1897.

THE CANADIAN PRACTITIONER.

British medicine in Greater Britain—Wm. Osler, Baltimore, p. 703.

Treatment of gastro-intestinal catarrh—H. D. Livingstone, Rockwood, Ont.,
 p. 710.

Deciduoma maligna—J. C. Webster, Montreal, p. 714.

THE CANADA LANCET.

Axillary lipoma—D. W. McPherson, Toronto, p. 49.

Treatment of beginning deafness—Murray McFarlane, Toronto, Ont., p. 51.

Tubal pregnancy diagnosed before rupture; coeliotomy and recovery—W. R.
 Nichols, Baden, Ont., p. 53.

THE CANADIAN MEDICAL REVIEW.

Is there such a disease as glandular fever?—W. Graham, Toronto, p. 111.

THE DOMINION MEDICAL JOURNAL AND ONTARIO MEDICAL MONTHLY.

Some remarks regarding climate—Dr. Ames, Denver, Col., p. 797.

The relationship of the medical man to the state—J. R. Hamilton, Port
 Dover, p. 804.

The ætiology and treatment of asthma—J. E. Hart, p. 808.

Vaginal section, clinical report—Ernest Hall, Victoria, B. C., p. 812.

THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

Preventive medicine in the city of New York—Herman M. Biggs, p. 185.

CANADA MEDICAL RECORD.

Address in Surgery.—W. Mitchell Banks, 677.

An address on the work of Pasteur and the modern conception of Medicine.—
 Charles Richet, 593

THE MARITIME MEDICAL NEWS.

- Extra-uterine pregnancy—George I. McKenzie, Pictou, N. S., p. 333.
 Case of pylorotomy with gastro-jejunostomy for carcinoma—A. B. Atherton, Fredericton, N. B., p. 337.
 Report of a case of tetanus following a severe and extensive wound of the head, treated successfully with antitoxin of tetanus—W. D. Finn, Halifax, N. S., p. 342.
 Needle in tooth, located by the electric current—W. D. Finn, Halifax, N. S., p. 348.

L'UNION MÉDICALE DU CANADA.

- L'application de l'entomologie à la médecine légale—Wyatt Johnston et Georges Villeneuve, Montréal, p. 677.
 Association Médicale Britannique, Montréal, 1897—Discours publics et travaux des sections.

LA REVUE MÉDICALE.

- De la tenorrhaphie, son histoire et sa thérapeutique chirurgicales appuyées d'une observation—Alfred V. Roy, Lévis, p. 89 (No. 12).
 Phimosis et ses complications—Henri Lasnier, Paris, p. 97 (No. 13).
 Sur un cas de grossesse gémellaire avec avortement et expulsion des fœtus ainsi que des annexes à des époques différentes—F. X. Jules Dorion, Québec, p. 105 (No. 14).

BRITISH MEDICAL JOURNAL.

- Sixty-fifth annual meeting of the British Medical Association at Montreal, pp. 853, 909, 911, 945, 1041, 1101.

OCT. 9TH.

- Introduction to a discussion on appendicitis—G. E. Armstrong, Montreal, p. 945.
 Ventral and umbilical hernia in the same patient—A. E. Garrow, Montreal, p. 950.
 Accurate measurement of the spinal curvature, with a description of a new instrument for the purpose (illustrated)—R. Tait McKenzie, Montreal, p. 959.
 Gunshot wound of the spinal cord (illustrated)—George A. Peters, Toronto, p. 961.
 Dislocation of the kidney—J. F. W. Ross, Toronto, p. 965.
 Successful removal of an enormous mesenteric tumour and nearly eight feet of intestine—Francis J. Shepherd, Montreal, p. 966.
 Case of strangulation of a loop of ileum through a hole in the mesentery, with a Meckel's diverticulum attached—A. B. Atherton, Fredericton, N. B., p. 975.

OCT. 16TH.

- Empyema of pneumonia, with four cases—Dr. MacKinnon, Guelph, Ont., p. 1057.
 A discussion on the operative treatment of high cancer of the rectum—Introduced by James Bell, Montreal.
 The comparative frequency of appendicitis as a complication of pus tubes, with some remarks on the technique of removing the appendix—A. Laphthorn Smith, Montréal, p. 1071.

OCT. 23RD.

- A discussion on hyperemesis gravidarum—Introduced by J. A. Temple, Toronto, p. 1137.
 A case of procidentia uteri with numerous vesical calculi—William Gardner, Montreal, p. 1141.

Obliteration of the cervix uteri—J. Lippé, St. Ambroise de Kildare, Que., p. 1143.

A discussion on the diagnosis and treatment of intra-pelvic tuberculous disease—Introduced by James F. W. Ross, Toronto, p. 1144.

A discussion on the palliative and radical treatment of uterine flexions and displacements—Introduced by A. Laphorn Smith, Montreal, p. 1151.

Notes on methods and results in the Burnside Lying-in Hospital, connected with the Toronto General Hospital, Toronto, Canada (with charts)—Adam H. Wright, Toronto, p. 1156.

On gauze packing of the pelvis in gynæcological operations—T. Johnson-Alloway, Montreal, p. 1164.

OCT. 30TH.

Introduction to a discussion on the relation of rheumatoid arthritis to diseases of the nervous system, tuberculosis and rheumatism—James Stewart, Montreal, p. 1225.

Atony of the rectum—Geo. Acheson, Galt, Ont., p. 1230.

Kenneth Cameron.

Reviews and Notices of Books.

The American Academy of Railway Surgeons. Report of the Third Annual Meeting held in Chicago, Sept. 23, 24, 25, 1896. Edited by R. HARVEY REED, M.D., Columbus, Ohio. Chicago: American Medical Association Press.

The contents of this volume are divided into six chapters. It contains also the Constitution and By-laws, an official list of Fellows and a roll of Honorary Members. The first chapter is taken up with the proceedings of the executive session, the second chapter refers to expert testimony in Medicine and Surgery. The President's Address, by John E. Owens, of Chicago, was on this subject, and he was followed by Robt. Mather, General Attorney of the Chicago, Rock Island and Pacific Railway, opening up a discussion in which a number of those present took part. In the third chapter a number of papers, on subjects more or less intimately connected with railroad surgery, are gathered together. Fractures and bone trauma occupy the whole of the fourth chapter, and injuries of the joints the fifth. The last chapter is devoted to injuries of the eye. The subjects discussed throughout are of great interest to any surgeon connected with the railroad, and the volume will well repay perusal by all such.

R. C. K.

Lectures on the Malarial Fevers. By W. S. THAYER, M.D., Associate Professor of Medicine in the Johns Hopkins University. New York: D. Appleton & Co. 1897.

There are few authorities so capable of discussing from every point of view the malarial fevers as is Dr. Thayer, and his numerous previous contributions have been among the most valuable in the literature. Recently, in association with Prof. Welch, he has published a comprehensive article on the same subject, and his present volume, while quite exhaustive, has the merit of bringing into one book even the most recent observations of the present year.

Stress is laid in the early portion of the work on the pernicious habit among general practitioners of giving to any obscure disease the title of malaria, and the emphatic necessity of calling attention to the fact is obvious on glancing at the New York Statistics of Health. Here the officials publish the appalling fact that malaria is more common than typhoid and other fevers, and the same is held to be true of Brooklyn—an error of the most glaring type.

Probably the chief interest in Dr. Thayer's book rests with the clinical details, while the large series of case reports culled from his own large

experience as illustrating features of importance is most valuable ; so too with the numerous charts and excellent plates.

The Pathology and Morbid Anatomy are dealt with minutely, and include full descriptions of the recent interesting researches of Barker, on cirrhosis, mixed infections, etc., as also the observations of Bastianelli on Malarial Hæmoglobinuria.

The writer has evidently but little patience with the "mosquito theory" of Manson, and adheres as of old to the belief that the flagellate bodies are very probably mere evidences of degeneration.

All in all the work is most complete and but another evidence of the author's careful and exact methods of observation. C. F. M.

A Handbook of Medical Climatology, Embodying its Principles and Therapeutic Application, with Scientific Data of the Chief Health Resorts of the World. By Dr. S. EDWIN SOLLY, late President of the American Climatological Association. Lee Brothers & Co. Philadelphia and New York. 1897.

It is with much pleasure that we greet the appearance of a systematic treatise on the very important subject of medical climatology. For many years past there has been a growing appreciation, not only on the part of the profession, but on that of the public at large, of the value of climate in the prevention and treatment of disease. Up to the present, the means of obtaining accurate knowledge of the all important meteorological data for estimating the true value of the various health resorts has been very inadequate, and the physician has had either to rely on very biased advertisements or to take the casual opinion of patients or other laymen who have visited certain resorts, and select accordingly.

In the present volume the author treats of the whole subject in a scientific spirit. The first section deals broadly with the principles of medical climatology ; principles, which the author refers to in the very able address which we publish in the present issue. In the second section the therapeutics of climate in relation to disease are discussed. No attempt has been made to prescribe special climates for special diseases, but the author presents us with the most exhaustive consideration of the climatic treatment of phthisis that we have anywhere seen. The effect on the tuberculous process of pure air, sunlight, sunheat, temperature, humidity of soil, and of air, variability of temperature, mobility of atmosphere, altitudes, &c., are all discussed. The influence of the various climates upon pulmonary tuberculosis in its several stages is described, and general conclusions are drawn as to the class of cases suitable to the different types of health resorts.

The third section of the work is devoted to a description of special climates in every continent. Comprehensive and comparative climatic studies are presented. American climates are most excellently described and illustrated with maps, some of them in colour relief.

We have very much pleasure in recommending this work to those of our readers who are in need of such a work; and, indeed, we may ask, who in our profession at the present day is not? The work as a whole, whether we consider it as a mere work of reference on climatic resorts, or as a treatise on climatology from a medical point of view, is the most scientific and exhaustive that has so far been placed before the English speaking profession.

A. D. B.

A Text-Book of Bacteriology, including the Etiology and Prevention of Infective Diseases. By EDGAR M. CROOKSHANK, M.B., Professor of Comparative Pathology and Bacteriology, King's College, London. Fourth Edition, large oct., pp. 712. London: H. K. Lewis. 1896.

This fourth edition of Professor Crookshank's well known work has been so materially reconstructed and enlarged as to be to all intents and purposes a new work, a work also so individual in its character, so different from the ordinary run of text-books, that the reviewer has purposely delayed giving any notice until opportunity should present itself for leisurely reading and study of the same.

Without hesitation it must be freely admitted that the work is of great value—indispensable to the bacteriological investigator as a work of reference, but at the same time useless to the student as a text-book. For a text-book, even if the author personally disagrees with the usual teaching of the schools, ought to state faithfully what that teaching is, so that the student may be conversant with prevailing opinion. By this I do not mean that the author of a text-book should sink his individuality. I mean simply that that students cannot be considered properly taught who are not fully acquainted with the prevalent views upon the subject. Thus it is not correct to put into the hands of the student a book which teaches that the specific nature of the bacilli of cholera and typhoid is still a matter of doubt, without, at the same time, stating very distinctly that such a view is contrary to that of the vast majority of bacteriologists; it is not in accordance with generally accepted ideas to deal with small-pox and vaccinia as two wholly separate conditions and to dismiss peremptorily the view that the two are different manifestations of the action of one and the same virus, which in vaccinia has become modified by transmission through the cow. Similarly it is not right to tell the ingenuous youth that the real nature of the contagion in bubonic plague is unknown, or that the exact relations of the mycelial fungus to madura foot or mycetoma pedis is an open question. Now Professor Crookshank does all these things, and of necessity his work stands condemned as a text-book.

Regarded, however, as a Treatise upon Bacteriology for advanced students and investigators the book is, as I have already stated, of high value. It contains a mass of matter bearing upon the etiology of infec-

tive diseases which it is difficult to find in other works of reference; it is especially rich and suggestive in its treatment of the infective diseases of the domestic animals; it has a useful appendix upon the pathogenetic moulds and protozoa—microbes neglected in nearly all bacteriological text-books. (Had this been still further amplified and brought up to date we should have been more grateful). And lastly it is replete with references to the author's own work and own views which depart very frequently from those generally accepted. It is this last feature which gives the work its peculiar value. It is very soon evident from a perusal of almost any portion of the work that Professor Crookshank is an isolated investigator, one who mixes little with the main body of workers, and who has his own, at times, peculiar manner of regarding everything bacteriological. It is most healthy to turn to his pages as a corrective. The book is the work of one who is by constitution heterodox and a dissenter. It is well to have a good exposition of the other side of the case, and Professor Crookshank seems often to take that other side by preference.

It only remains to be added that excellent as were the illustrations and paper and printing of the former editions, the present otherwise is more admirably illustrated and more sumptuous than they, or than any previous work upon bacteriology.

J. G. A.

Tuberculosis of the Genito-Urinary Organs, Male and Female.

By M. SENN, M.D., Ph.D., LL.D., Professor of the Practice of Surgery and Clinical Surgery, Rush Medical College, Chicago. Large oct. pp. 317. Philadelphia: W. B. Saunders, 1897.

We have so great a respect for Dr. Senn as a brilliant and untiring surgeon, as a man of wide interests and attainments, that we cannot but wish he had more leisure for writing. The work before us covers a field in which there is need for full and adequate treatment by a well equipped writer. Now Dr. Senn is well equipped: he has here brought together the scattered literature of his subject, and what is more, he gives us his own abundant and most valuable clinical and operative experience. These considerations alone give the work a very definite value. Nevertheless we have to complain, as was our unpleasant duty upon a former occasion, that the volume is vitiated in places by the evidences it presents of hurried workmanship. It is true that now we have no longer to adversely criticise the absence of bibliographical references, that many parts of the book are excellently written, that the illustrations are, without exception, excellent—a statement which could not be made concerning the work on tumours. But there are still too many paragraphs which appear to be mere abstracts of articles taken word for word from the author's commonplace book. Thus in some places page after page appears to give the varying results of different observers without adequate criticism of the relative value of their results, or adequate attempt to epitomise them and to sum up the main conclu-

sions to be drawn. Indeed it is difficult at times to determine whether a given opinion is that of the author or of the authority he has just been quoting. That Professor Senn is so phenomenally busy a man is not a sufficient excuse for the publication of imperfectly digested material.

This much, however, must in justice be said, that those interested either as surgeons or as pathologists in the tubercular diseases of the organs of generation, have here brought before them a large body of most valuable material, material much of which first saw light in the form of inaugural dissertations and theses, and so is practically inaccessible to the ordinary worker. It is a work which all interested in genito-urinary surgery and pathology must possess.

J. G. A.

Essentials of Bacteriology; being a concise and systematic introduction to the study of Micro-organisms for the use of Students and Practitioners. By M. V. Ball, M.D. Third Edition, revised, with eighty-one illustrations, seven in colours and five plates; pp. 210.

Although this work has reached a third edition, and is stated to be revised, the amount of revision still requisite is such that what its earlier condition must have been is painful to consider. Opening the work at random we find such statements as the following: "Shortly after birth micro-organisms are found in the stomach, *though it is claimed by some* (the italics are ours) *that they are absent at birth.*" On the next page "the bacteria of cholera, *dysentery typhoid,*" and lower down "tubercle bacilli *seldom, if ever, enter this secretion*" (the blood). Or again of anthrax bacilli, "The bacilli are found wherever the capillaries are spread out, in the spleen, liver, . . . and *in the blood itself*" "The bacilli can be inhaled and then a pneumonia is caused . . . ; when the spores are inhaled a general infection occurs." "The anthrax disease seems confined to certain districts in Silesia, Bavaria and Auvergne" (as though it does not occur in every part of the world). "The bacillus has never been found free in nature" (as though its spore stage was not the main cause of the continued infection of certain localities, and Pasteur's classical researches upon earth worm casts were unknown to the author).

The work, in short, is too concise for the author to make his meaning clear, and while it may be of use to the student who wishes to cram and scrape through his examinations, it is useless for the serious student, while the practitioner interested in bacteriology must seek some fuller and more satisfactory presentation of the subject.

A.

Principles of Bacteriology. By A. C. ABBOTT. Philadelphia, Lee Bros., fourth edition enlarged and thoroughly revised. 1897.

We are glad to welcome a further edition of this sound and admirable work, a work which by its precision of detail and sound treatment of the essentials of bacteriology stands in marked contrast to that above reviewed.

A.

Michigan Monthly Bulletin of Vital Statistics. Edited by
CRESSY L. WILBUR, M.D., Chief of Division of Vital Statistics. Vol.
1. No. 1. September, 1897.

We have received from the Department of State, Lansing, Michigan, a copy of the above new departure in public health and we heartily congratulate the state authorities and the inhabitants of Michigan upon a notable advance.

By a law which came into force upon August 29th, 1897, all deaths in Michigan are immediately registered, with the exception of those occurring in a few sparsely populated districts, and the registrars are required to mail the returns for one month on or before the 4th of the month next succeeding. Thus for the first month in which the law was operative reports were received in time for compilation in this monthly bulletin from a total population of 2,061,616 persons according to the census of 1894, or, in other words, 93.3 per cent. of the total registrable population of the State.

Within a few days these reports are tabulated and printed in proper order, the total number of deaths for the month is recorded, together with the corresponding annual death rate thus indicated. It is immediately recognized if any one form of disease is especially rife in any urban or country district, and if this be a preventible disease public opinion is immediately directed to the matter. In this return, for example, it is noted that a greater death rate from typhoid occurred in the country than in the larger towns, and the necessity for greater care in the water supply of the smaller towns (under 5,000 population) is immediately suggested. Attention is also directed to what may be the beginning of an epidemic of cerebro-spinal meningitis, twenty-five deaths having occurred. As the disease had not seriously shown itself in Michigan for the last quarter of a century, the attention of medical men and health officers is called to the possibility that serious efforts may be demanded for its restriction.

Already by the operations of the law the death rate based upon the September returns shows, according to the editor, an increase in accuracy of about fifty per cent. as compared with the old system of yearly and more haphazard returns. In short this new law renders the prompt publication of the data possible at a time when they can be of importance and practical use to the sanitary offices of the State as well as of interest to the public.

Despite the efforts of Dr. E. P. Lachapelle and his excellent staff, we in this Province of Quebec are miserably and mediævally behindhand in this matter of registration of deaths—as also of births. We fervently hope that the great advance made by other states and provinces may at last stimulate the Government to inaugurate a system which, if not so admirable as that devised by Michigan, will at least not cause strangers and those in the other provinces of the Dominion to point the finger of scorn at us.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

Twenty-seventh Annual Meeting.

GEO. WILKINS, M.D., PRESIDENT, IN THE CHAIR.

The following members were present:—

Drs. J. G. Adani, G. E. Armstrong, James Bell, A. D. Blackader, E. H. Blackader, G. A. Brown, G. G. Campbell, D. J. Evans, F. G. Finley, William Gardner, A. E. Garrow, D. F. Gurd, D. A. Hart, J. M. Jack, F. A. L. Lockhart, C. F. Martin, J. B. McConnell, S. R. MacKenzie, A. E. Orr, T. D. Reed, W. G. Reilly, F. J. Shepherd, A. L. Smith, James Stewart, F. E. Thompson, and C. F. Wylde—28 in all.

Dr. W. I. Bradley, of Montreal, was elected an ordinary member.

Dr. J. M. JACK read the Treasurer's annual statement, showing an expenditure for the past season of \$708.90 and receipts of \$802.01. leaving a cash balance on hand of \$93.05. The assets amounted to \$668.05 and the liabilities to \$123.42, leaving nett assets of \$544.63.

The Secretary's report showed an average attendance at twenty regular meetings of 37. Ten new ordinary members had been added to the roll, making a total of 145 ordinary members. Lord Lister had been elected an honorary member.

The work done for the previous session was classified as follows :

	Medicine.	Surgery.	Obstetrics.	Gynecology.	Ophthalmology.	Pediatrics.	Dermatology.	Orthopedics.	Anatomy.	Physiology.	Pathology.	Legal Medicine.	Public Health.
Living cases.....	3	10					4			1			18
Pathological specimens..	8	9		3							5	3	28
Case reports.....	13	6	1	2			2		1		2	1	28
Papers.....	2	2		2	1	1		1		1	3	1	14
Discussions.....				1									2
	26.	27	1.	8	1	1	6	1.	1	2	10.	5	91

Dr. F. A. L. LOCKHART presented the Librarian's report.

The following officers were elected for the session of 1897-98.

President—DR. ROBERT CRAIK.

First Vice-President—DR. WYATT JOHNSTON.

Second Vice-President—DR. J. A. MACDONALD.

Secretary—DR. RIDLEY MACKENZIE.

Treasurer—DR. JAMES JACK (re-elected).

Librarian—DR. F. A. L. LOCKHART (re-elected).

Council—DR. GEO. WILKINS, DR. F. J. SHEPHERD, DR. JAS. FERRIGO

Stated Meeting, October 22nd, 1897.

ROBERT CRAIK, M.D., PRESIDENT, IN THE CHAIR.

Dr. A. G. Nicholls, of Montreal, was elected an ordinary member.

Pyopericardium following Pleuro-Pneumonia; Pericardiotomy, with Recovery

Dr. J. B. McCONNELL showed a man who had been the subject of this disease and was successfully relieved by the operation. The main points of the case were as follows:

The patient, aged 33, a jeweller by trade, was first seen on April 12th, 1897. On the previous day he had suffered from pain in the lower part of the left side of the chest and in the abdomen. There was a history of grippe two months before, followed by recovery, a cough remaining. On the first examination, there was nothing discovered to account for the pain which was in the region of the diaphragm. The pulse was 120, respiration 24, and temperature 103°. Two days later an area of pneumonia was detected in the upper lobe of the left lung and the following day consolidation at the base also. On April 21st, the tenth day of the disease, pain at the left margin of the sternum was complained of and pericardial friction was made out; the other symptoms had in the meantime abated and the lung was beginning to clear. On the 23rd it was noted that alternate systoles gave an accentuated sound, although the rhythm was normal, and by the end of the month fluid could be detected in the pericardium. From this time on the temperature remained normal.

May 1st to 10th.—The pericardial fluid kept increasing, causing difficulty, pain in swallowing and some dyspnoea.

May 12th.—Examination showed diminished expansion on the left side, no visible cardiac impulse, the interspaces widened and these and the epigastric region somewhat prominent. The upper margin of the first rib could be traced to the sternal articulation. Dulness at the 4th rib extended from 1½ inches on the right of the sternum to an inch beyond the left nipple, and to the 4th space in the mid axilla; and

from the top of the 2nd left costal cartilages to the liver which was depressed some two inches. The sternum and 5th right intercostal space were absolutely flat. There was also a dull note behind, occupying an area 3 inches transversely and from the 9th to the 12th vertebræ; this dulness gradually reached to the angle of the scapula, involving the side completely below this into the axilla. By means of the phonendoscope the heart could be mapped out and differentiated from the dulness of the surrounding fluid and the liver. The patient could not swallow any solids, and liquids caused pain.

May 14th.—Paracentesis was performed with the assistance of Dr. F. G. Finley and Dr. H. S. Shaw. The needle was inserted in the 5th intercostal space about $1\frac{3}{4}$ inches to the left of the sternum and withdrew 60 fluid ounces of creamy pus containing the diplococcus of Frankel in pure culture.

Great relief followed the aspiration but the fluid gradually accumulated again and in eight days had reached the former limits.

May 22nd—Pericardiotomy was performed under ether anæsthesia after a preliminary hypodermic injection of morphine, atropine and digitaline. An inch incision was made in the 5th space two inches from the left border of the sternum and the pulsating pericardium exposed. On excising it 66 ounces of pus welled out, and the air kept rushing in and out with each cardiac beat. On the escape of the pus the pericardial opening was drawn up behind the 5th rib and some difficulty was experienced in introducing the No. 12 soft rubber catheter used as a drainage tube. It was not thought necessary to resect a rib. Immediate relief was experienced in the symptoms, the heart sounds became distinct and the pulse regular.

May 24th.—The pericardial fistula caused no distress but the space between the pericardium and the thoracic wall required washing out. From this time on the patient did well and by June 1st, the discharge had almost ceased, the wound was completely closed by June 3rd, and a subsequent attack of pneumonia (June 30th) on the right side had been recovered from perfectly. There was at the time the case was shown moderate hypertrophy of the heart but none of the physical signs peculiar to adherent pericardium.

Dr. McConnell in reviewing the literature of the subject then referred to other cases reported, his being the eighteenth, of which eight had died, and noted the following points of interest.

The cause, pneumococcus by extension from the lung.

The comparative absence of septic symptoms although the amount of purulent material was large, the quantity removed by incision being the largest hitherto recorded. The rapidity with which the

pus reaccumulated. The use of the phonendoscope in determining the position and size of the heart from the surrounding fluid. This was done by placing the rod attachment on the pericardial region and rubbing with the fingers gently over the skin and noting when the vibrations became intensified or disappeared.

He was not aware of this use of the phonendoscope having been heretofore noted, and considered it a valuable addition to the means of diagnosis in these cases and in distinguishing between dilatation of the heart, pleuritic and pericardial effusions. As a rule he found the phonendoscope less reliable than the stethoscope. In a recent case of double pneumonia tubular breathing could not be made out with the former although quite distinct with the latter. Crepitus and grating sounds were also sometimes produced by the instrument itself where emaciation existed and its large surface failed to remain in complete contact with the chest during the acts of respiration.

Dr. F. G. FINLEY corroborated Dr. McConnell's remarks with regard to the value of the phonendoscope in distinguishing the heart from the surrounding fluid dulness. The absence of septic symptoms might in part be due to the infection being by the pneumococcus, a much milder form than by the streptococcus.

Retiring President's Annual Address,

Dr. GEO. WILKINS said: On looking over the list that was handed me by the secretary, of the work done in the Society during my term of office, I was particularly struck with the large number of cases in which their most interesting scientific aspect was a purely physiological one. Although some of the more important cases displayed, to a remarkable degree, the skill and care of the surgeon engaged, in none of them was more than a simple elementary knowledge of anatomy required. Although anatomy is supposed to be the corner stone of surgery, Lister's scientific grasp of the significance of the profound philosophic teaching of Pasteur and its application to surgery in the preventing of access of germs, both at the time of surgical operations and their subsequent dressings, seems to have removed a very great proportion of anatomical restrictions, consequently in a society of physiologists, rather than one of anatomists, the relation of many of the cases named here would have elicited interesting discussions.

The unique sight of eight feet of intestines removed by Dr. Shepherd, with a large tumour, seen on our table, and the presence at the meetings some weeks later of the patient from whom they were removed, in a greatly improved condition, naturally causes the anatomical aspect of the cases to give place to the more important one of the physiological question as to the purposes served by the part

removed, and the minimum amount of intestine that will serve to carry on the digestive, absorptive and secretive processes in a sufficient degree to maintain a long life.

In another case, operated upon by Dr. Armstrong, in which he had good grounds for hoping to have it recorded as one of the rare cases of recovery by surgical aid from perforating typhoid ulcer, the physiological as well as the pathological aspect of the case was prominently brought into view by a question aptly put by Dr. Adami. The patient referred to unfortunately died on the 40th day after the edges of the perforating ulcer had been united by Dr. Armstrong, as the result of perforation of an ulcer in another part of the bowel. The first ulcer had healed perfectly, but the continued progress of the fever, by its devitalising processes prevented the possibility of surgical success, when on the 40th day the ulcerating area referred to unfortunately gave way. During the discussion which took place on the report of this case, Dr. Adami very pertinently asked, Why not resect the ulcerating area at the first operation? A good reason given by the operator was that it was too extensive. At that time I do not think Dr. Shepherd's patient just referred to had been on the operating table; possibly had such been the case and the discussion assumed a physiological aspect, the possibilities are, had there been evidences then present, of any progressive ulcerated condition of the bowel, and of no very great extent, some further operative procedure might have been considered justifiable. Another view, a pathological one, and in my mind a very important one, is the possibility that by removing or excising the ulcerating portion, if deep seated and of limited extent, there is the probability that by the removing of the infective absorptive area the further progress of the disease might be modified.

At another of our meetings a good theme for the physiologist, as to the extent important organs may be interfered with, was furnished by Dr. Bell on his exhibiting calculi removed by him, in one case from the substance of the kidney in which a large calculus was embedded, requiring operative procedure in the organ itself, and in the other removing an enlarged prostate in order to reach a large calculus in the bladder, both of which patients are alive and well to tell of the skill of the surgeon who removed them.

When one looks back at the times before Lister's influence was felt, and compares it with the surgery of to-day, as brought before the notice of this society by the cases just quoted, as well as many others, one cannot help being impressed by the removal of anatomical restrictions, and the importance of physiological restraints.

The question now is not, what structures do you cut through, or

must you avoid, or do you push aside in order to reach a certain organ. Listerism practically gives the surgeon *carte blanche* to cut where he likes. The question is rather can you remove such and such organs consistent with their physiological functions, and the patient survive. What organs may be cut into, or partly removed consistent with life, or longevity. In what manner will the removal of these organs interfere with the functions of those that remain. These and several other questions of a similar nature point to the great importance of surgeons as well as physicians being posted at all times on the most recent physiological investigations which are continually being worked out in the modern teaching bodies. That this Society is not behind the times in which we live has been ably demonstrated by some interesting and important physiological work done by Prof. Mills in cerebral localization and related to the Society during the past session; and by Dr. Morrow on the effects of nicotine poisoning on the heart and lungs. To my mind, one of the most interesting and instructive papers read before this Society, is that by Dr. Webster on the biological basis of menstruation. His deductions drawn from the statement that every living cell possesses two forms of metabolism, one anabolic and the other katabolic, are most ingenious and afford much food for thought. In an address like the present I cannot do more than cursorily refer to it, and advise those who have not read it and thought over it, to do so at their earliest leisure hour. It displays much knowledge with careful reasoning and will amply repay its study. The paper is published in the April number of the **MONTREAL MEDICAL JOURNAL**.

Dr. Gardner's delightful study of the process of menstruation which he has so faithfully pictured to us during the last term, with modern views, reminds us again of the importance of studying the various ways in which nature may have her physiological functions disturbed. Fortunately for our patients these functions may frequently be made to resume their normal condition without surgical interference, by the judicious use of remedies and methods of treatment ably advocated by Dr. Lockhart.

There are few medical societies, I believe, that can show as good evidences of the advances made in abdominal surgery as has been brought before us during the last year. That the hitherto terribly fatal malady of perforating gastric ulcer is well within the reach of the surgeon if promptly recognised, has been demonstrated to us by two patients exhibited by Dr. Bell and one by Dr. Kirkpatrick, who deserve the congratulations of the society upon their success.

The progress of medicine during the past year has been very ably

demonstrated in the bacteriological work of Prof. Adami, Drs. Wyatt Johnston, Martin, MacTaggart and Jamieson. I have already referred to the astonishing success in surgery as evidenced by the cases just mentioned, as well as others brought before this society, whose success is the indirect result of the teaching of bacteriology. Apart from explaining the causation of many diseases, its practical benefit has been well demonstrated by a case brought before this society in which Dr. Johnston was able to avert suspicions of a violent death, in the case of a Chinaman who died a few hours after being brought into hospital. By the examination of some nodules that were present and of cultures and also by inoculation he was able to prove that leprosy was the cause of death.

In connection with typhoid fever diagnosis, much good and most valuable work has been done. As we all know, the masked and insidious character of its onset very often renders its detection in an early stage almost problematical. There are few diseases therefore in which an unfailing pathognomonic sign is more useful. Dr. Wyatt Johnston's demonstration of the nature of the work done in this direction by Widal and others in the use of the so-called serum test has been of profound interest to this society. That it is possible for cases of typhoid fever to occur and the autopsy fail to furnish the apparently necessary condition of the bowel to confirm the diagnosis is well illustrated, as is also the value of the serum test, by a case reported two months ago as occurring in St. Mary's Hospital under the care of Dr. Cheadle in which there was no ulceration of the bowel and Peyer's patches were perfectly normal. Yet the serum diagnosis during life and also post-mortem gave the required reaction, and typical typhoid bacilli were obtained from cultures of the spleen and various other organs. Dr. Johnston's method of using dried blood has very greatly simplified the procedure in the diagnosis test. His suggestion that it should be used in public health service is deserving of serious consideration. The amount of work done by him, and also in conjunction with Dr. MacTaggart is very extensive and we are delighted to see that it attracts so much favourable attention abroad. What they describe as "pseudo-reactions" caused by clumping of bacilli owing to the employment of very virulent cultures should be carefully noted and guarded against. When we call to mind the fact that Pasteur's best work was the unexpected result of a second injection of the contents of a flask containing a culture of the chicken cholera bacillus, when to his surprise he found the chickens proof to the virus, we feel that the philosophic genius at times displayed by Dr. Wyatt Johnston may, in the near future, reveal some more of the many hidden causes of some diseases.

One of the most interesting and startling productions of the physical sciences is the use of the so-called X-rays and their application to medicine. To have the metallic contents of a wooden box photographed through its cover is astounding, but its application to the practice of medicine so that the bony skeleton may be portrayed on the sensitive film of the photographer's plate is a revelation that is more than weird-like. The practical benefit of this method of demonstration was well shown in some skiagraphs of a patient of mine from whom Dr. Shepherd removed supernumerary digits, the skiagraph aiding him in deciding as to the plan of operation. Dr. Garrow also exhibited a case of a somewhat similar nature. That these rays may be injurious owing to long exposure has also been demonstrated by the formation of sloughs as was seen in a case of Dr. Armstrong's. Fortunately scientific methods have so far advanced that perfect pictures may now be obtained after only half a minute exposure—the shortening of the time being due principally to improvements in sensitiveness of the film. It is to be hoped that before another year is completed we will be able to record in this society the exhibition of skiagraphs of sclerosed vessels and of various forms of lung and heart affections as has been done elsewhere.

A very interesting case is one reported by Dr. Shaw who gives a very able clinical report of a case of "Pernicious type of anæmia incident to senile tuberculosis," in which Dr. Martin reported that tubercle bacilli was found in the fæces, whilst the intestine was perfectly normal. There can be little doubt that if the fæces were more frequently examined in phthisical cases similar conditions would be also more frequently met.

The importance of making microscopical examination in aid of diagnosis, where it is possible, is well shown in two cases of hæmatocele successfully operated on by Dr. Gardner. They were made the subject of a very interesting paper by him, the pathological examination having been made by Dr. Martin, who showed that malignant disease of the ovaries in the one case, and tubercular disease of the tubes in another, was the cause of the symptoms. If the same careful report and microscopical examination was made more frequently, when available, it is possible that tubal gestation would not so uniformly be considered the cause of that very alarming condition.

Another interesting fact demonstrated by the microscope is in connection with a case exhibited by Dr. Armstrong to the Society. The patient had suffered from one of the very frequent sequæ of typhoid fever—suppurative osteo-myelitis, and on examining the pus numerous typhoid bacilli were found.

Amongst other instructive living cases brought before this Society by Dr. Armstrong, was one of a man who was suffering from the effects of depressed fracture of the skull. At the operation twelve inches of bone were removed completely, placed in carbolic solution, and six of them replaced and the wound united, and on exhibition at the Society eight weeks after, the parts were perfectly healthy and united, no necrosis of the bone having occurred.

Modern operative methods of treatment as brought to our notice, were well illustrated; not only by those I have already related, but also by three cases of cancer of the middle and upper portion of the rectum, which were removed by Dr. Bell by cutting through and pushing aside the sacrum and coccyx. The remarks made by him that early diagnosis of cases of this kind is quite exceptional, is one worthy of being kept in view when treating intestinal trouble, especially where the symptoms are directed to the lower bowel, and not to rest satisfied without a proper examination of the lower bowel.

When one compares the character and variety of the work and material brought before this society during the last few months, with that of only a few years ago, one cannot help being impressed with the fact that amongst our most useful members are some of its youngest.

It is a source of gratification to feel that we have amongst us so many of the younger ones who have both the time and the ability as well as the proper methods of application of both to demonstrate to the society that kind of work which is the foundation of our noble science. A very good example of that is furnished by the very able paper of Dr. Archibald in which he was able to show as the result of his own investigations as well as of those of Dr. Bradley, that one of the commonest forms of enlargement of the thyroid is due to a condition of localised adenomata of the gland tissue becoming the seat of repeated small as well as of single extensive hæmorrhages.

It is with the deepest regret that we have to record the death of one of our most enthusiastic and active members. Few men will be so greatly missed by all who knew him as my dear friend Dr. T. Johnson Alloway. His popularity was unbroken. His genial hospitality and unvarying kindness earned for him the love and respect of all who had the privilege of his society. His charm of manner, and amiability of disposition, and his enthusiasm for his profession were worthy of emulation. By his departure this society loses one of its most genial members, our profession one of its highest ornaments and the sick poor one of their most cheerful consolers.

I cannot close my address without congratulating the society on the distinguished honor we have had in having Lord Lister, the father of

modern surgery, one of the noblest benefactors of our race, partake of our hospitality. His graceful and emotional response to our congratulations on his elevation to the peerage is a sight that we will all remember. I must congratulate the society on the fact that the most successful meeting that the British Medical Association ever had was in our midst, and under the presidency of one of our members who possesses all the literary, social and professional qualifications that it is possible for an ideal officer of that kind to have, and who acted with ability, grace and the most lavish use of these various respective requirements, and I must again congratulate the society that my successor in office is one whom we all delight to honour."

THE

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Our readers will notice that the present number contains the index and list of contributors for the last six months of 1897. It has been decided to begin our next volume with January instead of June. The directors find that this will be more convenient for advertisers who prefer to make their contracts from January to January, and many subscribers prefer to make their selection of journals at the beginning of the year.

The management feel much encouraged by the steady increase in the number of subscribers. The aim of the editors is to publish a high class monthly journal that will keep its readers fully abreast with the advance made in the different departments of medicine and surgery. Montreal is becoming a great medical centre and has a very active Medical Society. Her hospitals afford exceptionally good opportunities for clinical study and research, and the JOURNAL will do its best to keep its readers posted concerning the work done in all departments.

An invitation is also extended to the profession throughout the country to make the JOURNAL a medium through which their ideas and observations can be given to others. Contributions of interesting cases and papers on medical subjects are always welcome, and reprints will be furnished when requested.

THE USE OF GARBAGE AND SEWAGE AS MANURE.

The division of chemistry of the U. S. Department of Agriculture is conducting an enquiry regarding the Agricultural Value of Street Sweepings, Garbage and Sewage. The object of the investigation is to find out the extent to which these materials are used as fertilisers, the results that have attended their use, and the best method of

applying them to the soil. They desire to obtain the opinions of the Medical Profession as to the extent of the danger of disseminating pathogenic organisms among men and animals by the use of sewage for the irrigation of field and garden crops. It is specially requested that any evidence of the spreading of diseases in this manner should be mentioned and if reports of them have been published that the Department be informed where such publications can be found.

At the Seventh Annual Meeting of the American Electro-Therapeutic Association, held in Harrisburg, Pa., the following were elected, viz.:

OFFICERS.—Dr. Charles R. Dickson, President, 343 Sherbourne St., Toronto, Ont.; Dr. Frederic Schavoir, 1st Vice-Pres., 8 Atlantic St., Stamford, Conn.; Dr. Caleb Brown, 2nd Vice-Pres., Sac City, Iowa; Dr. Richard J. Nunn, Treasurer, 119½ York St., Savannah, Ga.; Dr. John Gerin, Secretary, 68 North St., Auburn, N.Y.

EXECUTIVE COUNCIL.—Dr. Robert Newman, 64 W. 36th St., New York City; Dr. William J. Morton, 17 E. 28th St., New York City; Dr. William J. Herdman, 48 E. Huron St., Ann Arbor, Mich.; Dr. William T. Bishop, Harrisburg, Pa.; Dr. G. Betton Massey, 1636 Walnut St., Philadelphia, Pa.

The next (eighth) annual meeting will be held in Buffalo, N.Y., on Tuesday, Wednesday and Thursday, September 13, 14 and 15, 1898.

NEW BOOKS, ETC., RECEIVED AND NOTED.

Medical and Surgical Gynæcology, by R. W. Garrett, M.A., M.D. J. A. Carveth & Co., Toronto, Ont.

Vaginal Hysterectomy: a Review of Sixty-six Consecutive Cases, by Chas. G. Davis, M.D., Chicago. Reprint from Journal of American Medical Association, September 18th, 1897.

Ringworm and Alopecia, by H. Aldersmith, M.B., Lond., F.R.C.S. Fourth Edition. H. K. Lewis, London.

A Manual of Obstetric Practice, by Prof. A. Duhrssen, M.D., Berlin. Edited and translated by John W. Taylor, F.R.C.S., and Frederick Edge, M.D., F.R.C.S. H. K. Lewis, London.

Hygiene, by Louis Parkes, M.D. Fifth Edition. H. K. Lewis, London.

Lectures on the Malarial Fevers, by W. S. Thayer, M.D. D. Appleton & Company, New York.

Taylor's Medical Jurisprudence. Twelfth American Edition. Edited by Clark Bell, Esq., LL.D. Lea Bros. & Co., New York and Philadelphia.

Recurrent Gall-Stones, by John Homans, M.D., Boston.

Stercorin and Cholesteræmia, by Austin Flint, M.D., LL.D.

Reprint from the New York Medical Journal, June 5th, 1897.

Ueber Stercorin, Von Prof. Austin Flint.

Separat-Abdruck aus Band XXIII. Heft 4 und 5, 28th August, 1897.

Hoppe-Seyler's Zeitschrift für Physiologische Chemie.

Karezza, by Alice B. Stockham, M.D. Chicago, 1897.

Obituary

ROBERT C. KIRKPATRICK, B.A., M.D., C.M.,
L.R.C.S., EDIN.

It is with the deepest sorrow we have to announce the death of one of our most active editors, Dr. Robt. C. Kirkpatrick, at the early age of 34 years. Although Dr. Kirkpatrick died so young, for such an age is young, speaking professionally, he had accomplished considerable work and obtained an honourable reputation as a surgeon. After graduating as a B.A., in McGill in 1882, he entered upon the study of medicine and graduated in honours in the spring of 1886. He acted as one of the House Surgeons of the Montreal General Hospital for a year and then went abroad, where he took the L.R.C.S., Edin. In 1888 he was appointed Medical Superintendent of the Hospital, in succession to Dr. McClure. In 1891, a vacancy occurring on the staff of Assistant Surgeons owing to the promotion of Dr. Armstrong on the resignation of the late Dr. Fenwick, Dr. Kirkpatrick was elected, and in 1894 was promoted to be a full-attending surgeon, a vacancy having occurred owing to the resignation of Dr. Jas. Bell on his appointment to the Royal Victoria Hospital. Dr. Kirkpatrick has always been esteemed as a careful, conscientious surgeon, possessed of great judgment, and who never endeavoured to be considered a brilliant operator but preferred to be ranked amongst those whose first consideration was the welfare of the patient, and who in operating give infinite care and attention to details. He was the first in Canada and one of the first in America to successfully repair the stomach in perforation from ulcer. He performed two of these operations with success. In many other modern operations such as resection of the bowel, gastro-enterostomy, etc., he had a good record. As

a teacher he was much beloved by the students and did everything possible to make their path easy and pleasant. It is no exaggeration to say that the nurses owed much to his teaching and influence, and the training school at its inception was much indebted for its success to him. In 1893, he was appointed Demonstrator of Surgery and soon after was promoted to the rank of Lecturer in Surgery in McGill University. His work was at the Montreal General where he aided Dr. Armstrong both in teaching and examining. It is needless to say how much he was beloved by his patients, and how much gratuitous work he did unknown to any but the recipient; he was always doing some act of kindness.

As one of the Editors of this JOURNAL he was most active, enthusiastic and energetic; he delighted in the work and in its ever growing success, which latter was greatly owing to his own exertions.

A year or two ago a slight hæmoptysis with a succeeding pleurisy laid him on the shelf for a time and alarmed his friends, but his sudden cutting down by tubercular meningitis was a surprise to all, for apparently he was in perfect health and he had been doing laborious operative work up to two weeks before his death.

Of him might be said as of Sharpey:

“He had not a single enemy, and he numbered among his friends all those who had ever had the advantage of being in his society.”

Among the younger surgeons he was one of the most promising, and his future was assured as a leading surgeon of the Dominion.

ALEXANDER CAMERON, M.D.

The announcement of the death of Dr. Alexander Cameron, of Huntingdon, at the Montreal General Hospital, on Dec. 2nd, will be received with sorrow by his many friends in this province. Probably no medical man in the district of Beauharnois was so well known as Dr. Cameron, for, in addition to a long medical career

and a wide practice, his connection with public life, both municipal and provincial, extending over a quarter of a century, made his figure a familiar one to many who knew him not as a physician.

He was born in 1834, in Pictou, N.S., where his grandfather, one of the Camerons of Lochiel, had settled in 1830. After a preliminary training at the Pictou Academy, he followed the example of so many of the young men of his native province in going to a Scotch University for his professional course. In 1863 he received the degree of M. D. from the University of Glasgow. His twin brother, Rev. Dr. Cameron, (now of Denoon, Scotland,) was at that time a parish minister in Huntingdon County, and this probably decided the young physician in his choice of a field, and Huntingdon Village has been his home ever since. He was at the time of his death, and for many previous years, its Mayor, and its municipal government owes much to his business sagacity. How much he was esteemed by the county at large is shown by the fact that from 1874 to 1892 he represented it continuously in the Quebec Legislature. An Independent in politics, he was for many years an influential member of the Protestant Committee of Public Instruction for the Province, and any educational reform found a warm friend and supporter in him; and his warm interest in Huntingdon Academy is responsible for no small measure of the success of that institution.

As a physician he was much beloved and greatly trusted, and the arduous life he led as a country doctor of the old school—a man who went through snow and flood to succor the suffering—no doubt told on his splendid physique and hastened his untimely end. His gentle manner at the bedside and his good Scotch caution in giving an opinion, added to his sound judgment and ability, made him the most successful medical practitioner in the district in which he resided. He leaves a widow and three children to whom we extend our respectful sympathy in their bereavement.

JOHN B. GIBSON. M.D.

Dr. John B. Gibson was born in Lanark, Scotland, in the year 1825. His father was a practising surgeon in Lanark, and there he received his early education in the high school. At fifteen years of age he entered his uncle's office in Glasgow with the intention of following up a mercantile career, but three or four years later, tiring of the counting house he was attracted to Canada as so many other young men have been who were destined for other careers.

His first venture was to purchase a farm in Shefford, thinking he would like the free life of a farmer, but in a short time he tired of it and directed his mind toward the study of medicine. He graduated at Castleton, Vt., early in the fifties and began his professional work with the late Dr. Butler of Dunham, P. Q. After taking his degree from McGill in 1855, he opened an office in Clarenceville, P. Q., where he remained for about three years, when he removed to Dunham. Here he married a daughter of the late Wm. Baker of Dunham. He passed nearly a quarter of a century of a very active professional life, enjoying the confidence of both his *confrères* and his patients. In 1881, he removed to Cowansville, where he resided until his decease.

Dr. Gibson was elected a governor of the College of Physicians and Surgeons soon after its organization, and continued in office until his death. During a portion of this time he was Vice-President, and for many years one of the Assessors. He was actively connected with the Volunteers for over thirty years, first as Asst.-Surgeon to the 60th Missisquoi, and later as Surgeon to the Shefford Field Battery. He was present at both Fenian raids, being at Eccles Hill with the Home Guards during the engagement and before the arrival of the regulars.

His public spirit always led him to take an active part in municipal affairs, being often elected councillor, mayor, school commissioner, &c. Being an active magistrate he was often called upon to administer the law, and this

he always did without prejudice and in a very judicial manner.

He was a member of the Church of England, with broad and tolerant views of religious questions. As one of the founders of Dunham Ladies' College and its Secretary-Treasurer, much of the success of that admirable institution is due to his courage and perseverance in carrying out the intention of its originators.

A warm politician, he was never backward in expressing his convictions, whether they coincided with the views either of his political or personal friends, and his conscientiousness often made him give an independent vote which was not always agreeable to his political friends.

He always took a deep interest in his profession and kept well to the front in all the changes that the last half century have brought forward.

He had an active mind and a warm, cheerful disposition, which gathered about him a very large circle of friends in all grades of society, who will feel that the country has lost a valuable citizen and who will long cherish his memory with the most kindly feelings.

INDEX TO VOL. XXVI.

PAGE.		PAGE.
<p>Abortion, Quinine in the Treatment of Incomplete..... 35 Abortion, The Treatment of Incomplete. 479 Abscess of the Pelvis..... 484 Addresses delivered before the British Medical Association.... 161, 186, 204, 220 Address in Dermatology, Presidential.. 331 Address in Medicine..... 186 Address in Medicine, Presidential..... 257 Address in Obstetrics and Gynaecology, Presidential..... 281 Address in Pathology, Presidential..... 313 Address in Pharmacology and Thera- peutics, Presidential..... 301 Address in Psychology, Presidential.... 322 Address in Public and State Medicine, Presidential..... 272 Address in Surgery..... 204 Address in Surgery, Presidential..... 269 Address, Presidential, Montreal Medico- Chirurgical Society..... 631 Aikin's Hoop-iron Splint in Fracture of the Humerus..... 45 ALLOWAY, DR. T. JOHNSON : Hospital Reports..... 471 Aneurysm of the Subclavian Artery..... 494 Anglo-Sarcoma of Ovary, Successful Removal of..... 602 Annual Meeting, Montreal Medico- Chirurgical Society..... 628 Atipyrine, Experimental Research on the Action of..... 7 Anti-Streptococcus Serum Injections, A case treated with..... 15 Appendectomy, Some Debatable Points in the Technique of..... 489 Appendicitis..... 453 Appendicitis, The Technique of the Operative Treatment of Acute..... 1 ARMSTRONG, DR. GEO. E. : Appendicitis..... 453 The Technique of the Operative Treat- ment of Appendicitis..... 1 Bacterium Coli Commune in Child- birth, The..... 477 BANKS, DR. W. MITCHELL : Address in Surgery..... 204 BIGGS, DR. HERMANN M. : Preventive Medicine in the City of New York..... 220 BOWIE, DR. R. A. : A case treated with Anti-Streptococ- cus Serum Injections..... 15 Brain Tumours, Remarks on, and their Removal..... 435 Breech Presentations with Extension of the Limbs..... 478 British Medical Association..... 66, 149, 253, 379</p>	<p>Bromides, On Alarming Cerebral Symp- toms produced by the Use of the..... 40 Bronchiectasis..... 486 BUCKE, DR. R. M. : Presidential Address..... 322 Canada Medical Association..... 78, 159, 366 Cancer of the Inguinal Glands, Appar- ent Primary..... 63 Cancer of the Stomach, Report of a case of Successful Operation for..... 601 Cancer of the Rectum, Three cases of High Operation for..... 65 Catheterism of the Ureters in the Male. 29 Cerebro-spinal Meningitis Complicating Pneumonia..... 486 CHEYNE, MR. WATSON : Presidential Address..... 313 Cholelithiasis, Discussion on Causation, Symptoms, Diagnosis and Treat- ment of..... 540 Cholelithiasis, Typhoidal, with Cholecy- stitis..... 572 CLARKE, DR. C. K. : A Discussion on the Treatment of In- somnia..... 389 Climatology, On..... 532 Clinic at the Montreal General Hospital. 369 COLVIN, DR. ALEX. L. : A case of Myxœdema..... 108 CORNELL, DR. C. M. B. : Post Operative Acute Illness from an Unexpected Cause..... 600 Cretinism, Sporadic..... 493 Diphtheria, Discussion on Isolation and Disinfection of, Scarlet Fever and Measles..... 56 Dislocation of the Kidney..... 506 Doctors and Law..... 63 Embolism, An Alleged case of Uterine Air..... 485 Entomology, On the Medico-Legal Ap- plication of..... 81 Epileptics, Brains of Four..... 64 Epithelioma of the Floor of the Mouth. 64 EVANS, DR. EDWARD : A case of Myxœdema..... 108 EVANS, DR. D. J. : Modified Cow's Milk in Infant Feed- ing..... 350 Fistula from Pressure of the Fœtal Head, Case of Recto-Vaginal..... 32 Formaldehyde as a Disinfectant..... 36 Fracture of the Skull, Compound De- pressed..... 61 Gangrenous Intestine, Resection of..... 65</p>	

	PAGE.		PAGE.
Gastric Ulcer, Perforated.....	63	MACKENZIE, Dr. STEPHEN :	
Gastroptosis.....	134	Presidential Address.....	257
Graafian Follicles during Pregnancy, The Ripening of.....	478	MARTIN, Dr. C. F. :	
GRAHAM, Dr. J. E. :		A Case of Typhoidal Cholecystitis with Cholelithiasis.....	572
The Symptoms and Diagnosis of Chole- lithiasis.....	555	McCONNELL, Dr. J. B. :	
GRANT, SIR JAMES :		Pyopericardium following Pleuro- Pneumonia, Pericardiotomy with Recovery.....	629
Organic Heart Disease.....	575	McGill Medical Library.....	382
Hæmoptyses, Repeated, in Non-Tuber- culous Subjects.....	25	McGill Medical Undergraduates' Society Measles, Discussion on Isolation and Disinfection of, Scarlet Fever and Diphtheria.....	517
HALLIDAY, Dr. ANDREW :		Medico-Legal Application of Ento- mology, On the.....	81
Experimental Research on the Action of Antipyrine.....	7	Mesenteric Tumour and nearly Eight Feet of Intestine, Successful Re- moval of an Enormous.....	590
HAMILTON, Dr. W. F. :		Micro-organisms in Health and Disease, The Pelvic Viscera in Relation to... Micro-organisms, The Pelvic Viscera in Relation to.....	91
An Obscure case of Purpura Hæmôr- ragica with Infection by the Bacil- lus Aërogenes Capsulatus.....	117	Modified Cow's Milk in Infant Feeding. Modified Cow's Milk in Infant Feeding, The Value of.....	495 486
Heart Disease, Organic.....	575	Montreal General Hospital.....	78, 515
HEATH, Mr. CHRISTOPHER :		Montreal Medico-Chirurgical Society... MOORE, Dr. V. H. :	56
Presidential Address.....	269	President's Address, Canada Medical Association.....	245
Hernia, Strangulated Umbilical.....	359	MORRIS, Mr. MALCOLM :	
Hospital Reports.....	471, 601	Presidential Address.....	331
Humerus, Aikin's Hoop-iron Splint in Fracture of the.....	45	Myxœdema, A case of.....	108
HUNTER, Dr. WILLIAM :		Myocarditis, Two cases of.....	487
Discussion on Cholelithiasis Causa- tion, Symptoms, Diagnosis, and Treatment.....	540	NEECH, Dr. JAMES T. :	
Infant Feeding, The Value of Modified Cow's Milk in.....	350	The Duration of Infectiousness in Scarlet Fever.....	448
Infantile Scurvy.....	520	OBITUARY ;	
Inflammation, The Definition of.....	137	Alloway, Thomas Johnson.....	522
Influenza, or the Grippe, Some Sugges- tions for the Treatment of.....	464	Cameron, Alexander.....	641
Infusions. Submammary, of Salt Solu- tion.....	476	Gibson, John B.....	642
Inguinal Glands, Apparent Primary Cancer of.....	63	Kirkpatrick, Robert C.....	640
Insanity, The Certification of.....	490	Webber, Richard Norris.....	523
Insomnia, A Discussion on the Treat- ment of.....	389	Oxygen, The Treatment of Ulcers and Wounds by.....	30
Intussusception and Suffocation.....	52	Pelvic Viscera in Relation to Micro- organisms, The.....	495
JOHNSON, Dr. WYATT :		Pelvic Viscera in Relation to Micro- organisms in Health and Disease, The.....	91
On the Medico-Legal Application of Entomology.....	81	Perforated Gastric Ulcer.....	63
Jubilee Nurses' Home.....	381	Pericardiotomy for Pyopericardium fol- lowing Pleuro-Pneumonia.....	629
KEENAN, Dr. C. B. :		Plague Bacilli.....	63
A Case of Typhoidal Cholelithiasis with Cholecystitis.....	572	Pleurisy, A case of Malignant.....	46
KINNEAR, Dr. BEVERLEY OLIVER :		Pneumonia, Cerebro-spinal Meningitis Complicating.....	486
Some Suggestions for the Treatment of Influenza or the Grippe.....	464	Polydactylism.....	484
LACHAPELLE, Dr. E. P. :		Post-operative Acute Illness from an Unexpected Cause.....	600
Presidential Address.....	272	Pregnancy, The Ripening of Graafian Follicles during.....	478
Laport's Amputation of the Foot.....	61	Presidential Addresses, British Medical Association.....	257, 269, 272, 281, 301, 313, 322, 331
La Revue Médicale.....	144	President's Address, Canadian Medical Association.....	245
Lateral Sinus, Septic Thrombosis of, with report of four cases.....	18	President's Address, The.....	161
LEECH, Dr. D. J. :			
Presidential Address.....	301		
Leukæmia, Acute.....	490		
Leukæmia, Subacute.....	484		
Levator Ani, the Functions of the.....	33		
Library of the Provincial Board of Health.....	518		
LOCKHART, Dr. F. A. L. :			
The Treatment of Puerperal Infection.....	122		

PAGE.	PAGE.		
Preventive Medicine in the City of New York.....	220	Smoking Concert, The.....	377
Puerperal Infection, The Treatment of.....	123	SOLLY, DR. S. EDWIN : On Climatology.....	582
Purpura Hæmorrhagica with Infection by the Bacillus Aërogenes Capsulatus, An Obscure case of.....	117	Splint, Aikin's Hoop-iron, in Fracture of the Humerus.....	45
Pyopericardium following Pleuro-Pneumonia ; Pericardiotomy with Recovery.....	629	STARR, Prof. M. ALLEN : Remarks on Brain Tumours and their Removal.....	435
Quinine in the Treatment of Incomplete Abortion.....	35	STEWART, DR. JAS. : Introduction to a Discussion on the Relation of Rheumatoid Arthritis to Diseases of the Nervous System, Tuberculosis and Rheumatism.....	525
Recto-Vaginal Fistula from Pressure of the Fœtal Head, Case of.....	32	Strophanthus, On the Action of.....	33
Rectum, Cancer of the, Three cases of High Operation for.....	65	Subclavian Artery, Aneurysm of the... ..	494
REILLY, Dr. W. G. : Report of 68 cases of Typhoid Fever discharged from the Royal Victoria Hospital.....	110	Submammary Infusions of Salt Solution.....	476
Septic Thrombosis of the Lateral Sinus with report of four cases.....	18	Suffocation and Intussusception.....	62
Removal of nearly Eight Feet of Intestine and an Enormous Mesenteric Tumour.....	590	Surgeon of Old in War, The.....	204
Rheumatoid Arthritis, Relation of to Diseases of the Nervous System, Tuberculosis and Rheumatism.....	525	Thrombosis, Septic, of the Lateral Sinus with reports of four cases.....	18
Resection of Gangrenous Intestine.....	65	Tuberculiæ, The New.....	361
RODDICK, Dr. THOMAS G. : The President's Address.....	161	Tumours of the Brain, Remarks on, and their Removal.....	435
ROSS, Dr. J. F. W. : Dislocation of the Kidney.....	506	Typhoid Fever, Report of 68 cases of, discharged from the Royal Victoria Hospital.....	110
Sero-diagnosis of Typhoid Fever, The... ..	26	Typhoid Fever, The Sero-Diagnosis of.. ..	26
Serum Diagnosis, Summary of Views on.....	254	Typhoidal Cholecystitis with Cholelithiasis, A Case of.....	572
Scarlet Fever, Discussion on Isolation and Disinfection of. Measles and Diphtheria.....	56	Ulcer, Gastric, Perforated.....	62
Scarlet Fever, the Duration of Infectiousness in.....	442	Ulcers, The Treatment of, and Wounds by Oxygen.....	30
Scurvy, Infantile.....	520	Ureters, Catheterism of the, in the Male	29
SHAW, Dr. R. B. : Report of 68 cases of Typhoid Fever discharged from the Royal Victoria Hospital.....	110	Uterine Air Embolism, An Alleged case of.....	385
SHEPHERD, Dr. F. J. : Successful Removal of an Enormous Mesenteric Tumour and nearly Eight Feet of Intestine.....	590	VILLENEUVE, DR. GEO. : On the Medico-Legal Application of Entomology.....	81
SINCLAIR, Dr. W. JAPP : Presidential Address.....	281	WEBSTER, Dr. J. C. : The Pelvic Viscera in Relation to Micro-organisms in Health and Disease.....	91
Skull, Compound Depressed Fracture of. Smallpox in Montreal.....	516	WEBSTER, Dr. R. E. : Strangulated Umbilical Hernia.....	359
		WILKINS, Dr. GEORGE : Presidential Address.....	631
		WORTHINGTON, Dr. NORREYS : Hospital Reports.....	601
		YATES, Dr. H. B. : An Obscure case of Purpura Hæmorrhagica with Infection by the Bacillus Aërogenes Capsulatus.....	