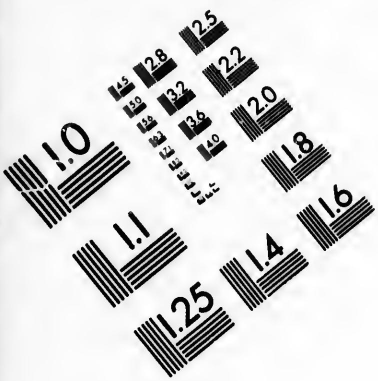

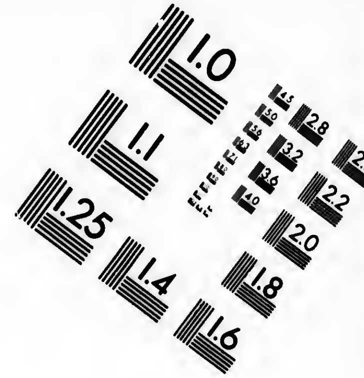

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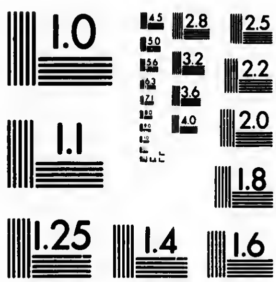

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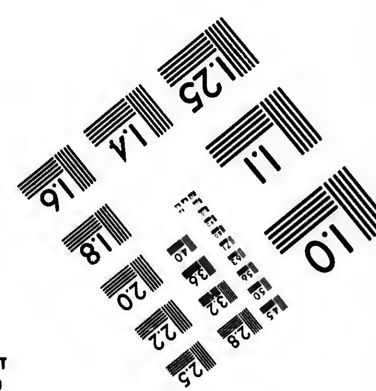

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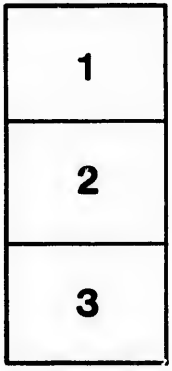

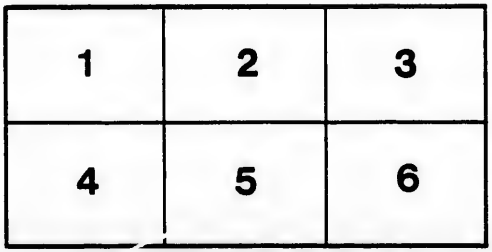

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INTRODUCTION TO THE DISCUSSION

ON THE

RELATION OF RHEUMATOID ARTHRITIS

TO DISEASES OF THE

Nervous System, Tuberculosis and Rheumatism

By JAMES STEWART, M.D.,

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

Reprinted from the Montreal Medical Journal, December, 1897.

INTRODUCTION TO

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

BY

JAMES STEWART, M.D.,

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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 on 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 ca[illegible]f 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 polio-myelitis, 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 microbic 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. Bäumler, 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. Buhler, 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 polyarthritis 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. Koplik (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 gonorrhœal 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 subacute 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.