Rheumatoid Arthritis

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Rheumatoid Arthritis

In the selection of a subject for my thesis on the present occasion, I have been influenced by the fact that whilst holding a resident appointment at Bath Hospital, I enjoyed somewhat exceptional opportunities for the clinical study of a class of diseases popularly classed under the head of Rheumatism. Bath has been termed "a museum of living osteo-arthritis," and certainly the far-famed reputation of its mineral waters attracts large numbers of patients from all parts of the country, and gives it a wealth of clinical material probably unsurpassed in this country.

During the last 3 years I have been able to extend my observations whilst engaged in active practice amongst hospital patients in Cheltenham, and I have been surprised to find how frequently one meets with this disease in every day practice, at least in this part of England.
In the wards of our various hospitals, the student of medicine sees many cases of Acute Rheumatism, and if it is to this form, and to its effects upon the heart, that his attention is directed and his interest in this class of disease mainly confined:

The deformed and crippled subject of its more chronic manifestations is considered an object of greater interest to the medical officer of some workhouse infirmary, than in the wards of a general hospital.

And perhaps it is necessary that this should be so; the result is none the less a fact however, that the average medical student is launched upon society as a general practitioner, with little or no knowledge of a certain class of ailments, with which he will be coming into almost daily contact, and for which his advice will constantly be sought.

This is especially the case with regard to that disease which is commonly known as Rheumatoid Arthritis, and my object in the present thesis, is to suggest a few thoughts which may enable us to differentiate
it in practice, and which may aid us in clearing up the diagnosis of this obscure disease.

I propose, in the first place, to give a brief outline of the history, causes, and nature of Rheumatoid Arthritis. I shall give a short account of its clinical varieties of features, going somewhat into more detail into a description of some of the deformities met with in this disease, and finally, reviewing the whole subject, I shall see what new light can be thrown upon the nature of this much-disputed malady.

Rheumatoid Arthritis has for long been a favourite theme of many writers, both in this country and also abroad. It is therefore with no small degree of trepidation that I approach this subject, for I am only too conscious that my experience is but small when pitted by side with the life-long study that has been bestowed upon this disease by so many careful observers.
History

Although the description of this disease as a distinct disease, is of comparatively recent date, there is no reason to suppose that it is a new disease.

If not differentiated from other forms of joint affection, it was doubtless one of the many distempers which afflicted our forefathers, and for which the advice of the Seer, or the Barber-Surgeon, was frequently sought.

Bones showing the familiar osteo-artritic changes have been discovered in some Egyptian "tombs," amidst the remains of long-departed Vikings, in the ashes of Pompeii, and in the Catacombs of Paris.

Sydenham, in his classical writings of the 17th century, describes its clinical characteristics under the head of Rheumatism, and, after him, many writers refer to the disease, more or less vaguely. But it is not till the dawn of the present century, that the condition begins to be more accurately distinguished from
gouty and rheumatic affections, and it is mainly through the clinical ob-
servations and teaching of such men as Heberden, Haygarth, Brodie, Adams,
and Charcot that the nature of the disease has been gradually elucidated.

nomenclature. — Many are the names by which the condition has been known, and under which it has been described. Trousseau calls it Nodular Rheumatism (1860); it is Haygarth's Broadness of the Joints (1805); the Chronic Rheumatism of Adams (1857); Arthritis Deformans of the writers (1869); It is known as Ostéo-Arthritis in the nomenclature of the Royal Coll. of Physicians, and it still remains the Rheumatic Gout, of a large proportion of the profession. Of all its names, and I have only mentioned a few of them, that of Rheum-

Avoid Arthritis seems to me to be the best, since it does not carry with it any suggestion as to a theory of origin, while, at the same time, it conveys to one's mind the idea of a joint affection somewhat simulating Rheumatic.
— The theories that have been advanced as to the nature of Rheumatoid Arthritis are no less numerous than its names.

By some, especially Charcot and the French school generally, it is looked upon as directly due to Rheumatism, and as essentially a joint disease.

No doubt, as most statistics show, Acute Rheumatism is not uncommonly a direct antecedent of Rheumatoid Arthritis, but to a lesser extent, this may also be true of other cases of joint disease, such as those seen in Gout, or in Gonorrhoeal Rheumatism.

But the whole picture of Rheumatoid Arthritis—clinical, pathological, and therapeutical—differs so essentially in many important respects that we are justified in regarding it as a distinct disease, even though we allow it to be closely allied with the Rheumatic state.

(1) Others have thought it to be simply of the nature of a senile change (Rye-Smith) or, a direct result of hard and long-continued work, the articular lesions
being the result of wear and tear and merely a local effect. (6)

But this cannot account for true Rheumatoid, and some other cause must at any rate exist to account for those acute cases occurring in early life when a 'Seneile' change is out of the question.

Neither will the above explanation account for the marked and curious symmetrical character of the disease.

And again the condition is by no means confined to those who have done hard manual labour, as it is often met with in the well to do, who have never undergone any privations or done hard work.

(c) Mr. Hutchinson regards the inheritance of a gouty or rheumatic taint as the important element in its causation, sometimes the former, at another the latter, element predominating.

No doubt there is a constitutional diathesis we may term "arthritis", but what the resulting changes in the joints may be will depend on other conditions —
(d) Sir Ord sees in it the outcome of some uterine or other visceral irritation, affecting the joints secondarily through the agency of reflex nervous influences.

As a predisposing cause, by setting up ill health, anaemia, and general debility, such reflex influences may indeed leave the joints, and the system generally, more open to attack — but there certainly is no evidence that they can actually give rise to organic mischief.

We see reflex influences, in cases of ovarian disease and in pregnancy, giving rise to trophic changes in the skin, etc., and in this way the diseased joints may reflexly be the origin of pigmentation, sweating, and other trophic disturbances, which are so frequently a feature of Rheumatoid Arthritis.

But that reflex action is able to set up acute joint changes and a generalised disease is hardly credible.

(e) Quite recently, a microscopic origin has been suggested by Dr. Bannatyne, of Bath (9). He was led to search for a
specific microbe by the resemblance in the clinical features of this disease to those of tubercle — he describes a microbe, a dumbbell shaped bacillus found chiefly in the synovial fluid taken from the affected joints.

The conclusions he arrives at are —

(a) the organism was found in 24 out of 25 of the cases examined,
(b) in a few cases it was also seen in the blood
(c) and it is not found in Synovitis in any other form of arthritis.

The crucial test of the production of the disease in animals by inoculation with the micro-organism he had not been able to work out.

— A similar infective theory of origin for Acute Rheumatism is gradually growing in favour in this country and is almost universal in Europe — and though no specific organism has yet been isolated, this in itself does not offer any insuperable obstacle to the acceptance of the theory, as in other diseases the same thing holds good and yet the infective nature is not
questioned.

Granting that the infective theory of Rheumatoid Arthritis is a very strong one. I think that at present the evidence of it is not very conclusive, and it seems to me that we must rely chiefly on the clinical features of the disease, and there is little, if any, to support this theory as to its nature.

Having thus briefly alluded to some theories as to its nature, I pass on to consider the various causes to which we may attribute the onset of an attack.

Among predisposing causes are many debilitating illnesses — to which, of late years, we may especially add influenza; also, such weakening influences as rapid childbearing, prolonged lactation, and severe hemorrhage, all of which act by producing nerve exhaustion.

Among the more directly exciting causes, exposure to cold and wet is rightly given an important place; thus the disease is undoubtedly more
prevalent in damp districts and countries, e.g., than in those possessing a drier climate. "Irish Gout"

though this in reality may act indirectly as a predisposing cause, rather than as a directly exciting agent.

Overwork, worry, and other emotional disturbances, such as fright and shock, are commonly met with in the past history of a case, and, undoubtedly, during the progress of the disease, we often notice an aggravation of the symptoms under these conditions.

Cases are said to have occurred during the Franco-Prussian War (10), among those shut up in some of the besieged towns, but it must be remembered that these sufferers were also exposed to all the horrors and privations consequent upon a prolonged siege.

As to the influence of heredity as a cause of Rheumatoid Arthritis, it is not easy to obtain any statistics which are at all reliable - In fact and rheumaticus, the influence of
Hereditary is marked and indisputable, but this is not so with Rheumatoid.
though perhaps, this is due to the fact that Gout and Rheumatism are diseases
well known and long recognised, whereas Rheumatoid is not.

The difficulty of tracing any family
history in this disease, is greatly increased
by the confusion that exists in the nomenclature
of the various 'rheumatic' diseases, even among
the profession itself, and this becomes hopelessly
chaotic when the liability is concerned.

In my own experience, I have had 26
cases during the last 3 years in Cheltenham,
and in only one of these did I obtain
any evidence of heredity.

It is, I think, proved that a general
predisposition to arthritis disease does exist,
but this 'arthritis diathesis' may show itself
in Rheumatoid in one, Gout in another,
and Rheumatism in a third.

As regards the influence of age and
Sex, I shall allude a little further
on. When speaking of the clinical
features of the disease.
Clinical Varieties

There appear to me to be two fairly well-defined forms of Rheumatoid Arthritis. In one, the symptoms come on in early life, from about the age of 18 to 25; in the other, from about 40 onwards. Now it is noteworthy, that these periods in women correspond to two great epochs, viz. the time of puberty, and of the climacteric. Both of these periods are times of great nervous strain, and instability, and of aptitude for disease, and there is also a marked connection between these physiological processes, and the general bodily health. This is of special importance in considering the influence of the nervous system on this disease.

Now there are many points in the previous history, onset, and clinical features of the cases occurring at these two periods of life, which warrant one in placing them in distinct classes, and describing them separately; on the other hand, however, they have many points in common, and I shall content myself
with a single description, drawing attention to special points of distinction, as occasion arises.

It is in the latter class of cases, those occurring at about the age of 40—what has been termed the 'early degenerative period'—that we find those bony changes around the joints, which have given origin to the name of Osteo-Arthritis, as distinctive of the disease.

In the early cases, we find no such changes, and although, they may progress, and in course of time, develop changes in the bones, yet many do not do so.

The more typical cases of this variety run a comparatively acute course, with frequent febrile attacks, great muscular wasting, and marked constitutional disturbance.

But again, we see cases of Osteo-Arthritis which have developed without ever passing through the stages of the earlier form, but which, nevertheless, must be included in a common description with these.

Cases of Rheumatoid Arthritis may, and do, present Osteo-Arthritis phenomena, but many of them do not; and certainly,
a large number of cases in which one sees these bony changes are not rheumatoid.
It is on these considerations that I have objected to the use of the name osteoarthritis, though it has received
official sanction.
When we are in search of a name by which to denote a certain disease, let us
at least choose one sufficiently comprehensive in its terminology to include that disease
in all its forms.


Less — women suffer much more frequently
than men. The ratio as I find it, is
about 7-1 (out of 26 recent cases 4 were men), but the difference is less
marked amongst cases occurring in early
life, than in those that develop later.
—When occurring in women this disease
is more liable to attack the smaller joints,
in men, the larger.
This great difference in incidence in the
sexes, contrasts markedly with our experience
in acute rheumatism, where both are equally
liable; in infantile rheumatism, where both are uncommonly affected.
Symptoms - As we have just seen, the disease may come on after exposure to a chill, or recovery from some illness, but often, it is impossible to assign any distinct cause for its onset.

Sometimes, before any joint trouble is noticed, the patient will complain of a feeling of lassitude, and disinclination for work, and general loss of power.

At other times, he may notice sensation as of 'pins and needles,' especially in the arms and hands, or experience aching and a feeling of stiffness in the joints on movement.

At another time, muscular weakness with loss of power in the grasp of the hand is the first thing to attract the attention of the patient to the fact that something is wrong.

In one case that I saw of this kind, the patient was at work one morning as usual, when he suddenly lost the power in both arms; a few days later, the joints began to be affected, and six months from the onset of the attack, he was admitted to hospital, presenting all
the features of a well-marked case of Rheumatoid Arthritis.

But, whatever be the premonitory symptoms, changes in the joints soon set in.

Of these, it is most commonly some swelling in the wrists and phalangeal joints that is first noticed; this swelling may pass off in a few days, but only to return ere long, bringing in its train the involvement of other joints, and the occurrence of further symptoms, which declare the grave nature of the disease.

There is always great emaciation, and patients will tell us they have lost one, two, or more stone weight, since the onset of the disease.

The wasting is most marked in the hands, forearms, legs, and sometimes there seems to be little more than a thin layer of skin to act as a covering for the bones.

The facial aspect of the patient suffering from Rheumatoid Arthritis, is a point on which emphasis is not usually sufficiently laid; it is certainly a point of great diagnostic value.
Photograph - No 1 -

Well marked case of Rheumatoid Arthritis, showing poly-articular lesions specially of wrists, knees, ankles, phalanges. Also shows typical "facies" and muscular wasting.
It is usually a dusky, wasted, anaemic face, with a pinched and anxious expression. Sometimes, and especially among the younger class of patients, it approaches very closely to a sternous cast of features; but it is a face much easier to recognize than to describe.

A good illustrative type is seen in the accompanying photograph (No. 1) seen on the previous page.

As I have already said, the wrists and fingers are usually the joints first to suffer; and there is a general tendency in this disease to a symmetrical and centripetal affection of the joints; from the hands and feet, the disease spreads to the elbows, and knees, then to the hips, and shoulders, until there is hardly a joint in the body that is not affected.

I have seen several cases in which the articulations of the vertebral column have been involved, and the temporo-massillary joints frequently suffer.
Besides the joint affections many other symptoms are met with in Rheumatoid Arthritis. There are various digestive troubles, such as dyspepsia and irregularity of the bowels; and there is loss of power for assimilating any but the most easily digestible forms of food, which constitutes a grave obstacle in the maintenance of the patient's strength.

Among cases occurring in women there is frequently some disturbance of the uterine functions, such as amenorrhoea, dysmenorrhoea, or menorrhagia, and, in many cases, there is leucorrhoeal discharge.

Of the nervous phenomena there are many besides those of numbness and loss of power already mentioned: Among these are fibrillary twitchings, and cramps, and a marked increase of the tendon reflexes, also, as pointing to the implication of the vasomotor system, an increased rapidity of the heart's action, local sweatings, and pigmentation of the skin, but to these phenomena I shall allude more fully later on.

The heart does not usually suffer in
Rheumatoid Arthritis, but nevertheless one does see cases where there is tubercular disease, and in which careful cross-examination fails to detect evidence of the previous existence of acute rheumatism.

Pyrexial attacks are not uncommon during the progress of the disease; the temperature usually presents diurnal variations, with an evening rise to 100° or 101°F. and a morning fall. These attacks generally last 2 or 3 days, but sometimes much longer, and during their occurrence, there is always increased pain and swelling of the various affected joints.

I will now briefly summarize the chief characteristics of the 2 groups into which I have divided cases of this disease.

1. Those cases occurring in young subjects, much more frequently in females. The disease here appears in its most typical form and in its severest character. Here many joints affected, accompanied from the first with profound debility and showing marked nervous phenomena, such as,
tachycardia, muscular wasting and perspiration.

(2) Cases occurring in women when passing through the climacteric period and frequently showing some uterine disorder; though these cases are more commonly less severe than the former group, and often show some intermission in the advance of the disease after the first onset, with a tendency to quiescence, perhaps with localisation to one or more joints. The constitutional disturbance is altogether less severe and the prognosis therefore is more favourable.

Having thus given a brief outline of the chief clinical features of Rheumatoid, I shall now consider some of these in more detail, and first, almost conspicuous, if not most important, I shall take the affection of the joints.

In a case occurring in comparatively early life, such as that from which the photograph No. 1 was taken, we see that the articular enlargement follows pretty
accurately the outline of the synovial sac.

On examining, to say the Knee, in such a case as this, we find, that, to the touch, the enlargement is elastic and semi-fluctuating, though it is firmer than in the case with an ordinary hydro-arthritis.

On movement a curious cracking sound is communicated to the hand held on the joint, this is due to the presence of prolongations of the synovial membrane in the form of fringes - portion of these fringes sometimes get detached and constitute loose bodies in the joint.

There is a tendency in this disease to weakening and consequent stretching of the ligaments in and around the various joints - as a result of this, we see in some cases a partial dislocation of the knee, the tibia being flexed and drawn backwards on the femur by the action of the muscles. I have a case at present under my care in which the Knee joint has, during the last 3 years passed through these various stages, and is now partially dislocated.
backwards and attacked quite loosely by its ligaments, so that the joint is flail-like useless.

A similar condition is caused by the action of forces in the production of flat foot, which is not uncommonly caused in this manner.

— As the disease proceeds there is gradually an impairment of movement in the affected parts; this is partly due to the formation of fibrous bands, and partly to the changes in the articular cartilage, which gradually becomes eroded, and the eroded and surfaces of the bones moving on one another give rise to that grating sound, which speaks so plainly of the changes which have taken place in the interior of the joint.

At about the same time too, there is a tendency to the formation of osseous outgrowths from the ends of the bones, which, by their locking action, further limit the range of movement — the case then presents the typical phenomena of osteo-arthritis.

—I do not wish it to be supposed
however that a case of this class of Rheumatoid Arthritis need have gone through the stages of the earlier form of the disease. It is quite otherwise. Cases occurring in middle or later life show these Osteo-Arthritic conditions soon after their first onset, and it is in these cases too, that we find those peculiar enlargements about the terminal phalangeal joints which are known as Heberden's Nodes; they are of bony hardness and appear to arise from the ends of the phalanges.

These nodes usually cause some lateral displacement of the last phalanx, generally to the radial, but sometimes to the ulnar side. This displacement is permanent and irreducible, and the movement of the joint is often of the slightest.

What may be taken as a typical hand of Rheumatoid Arthritis is well shown in the photograph No. II. on next page, and the Cast No. I. also gives a good example of the deformities seen in the earlier stages. We see here a circumscribed spindle-shaped
Hands of a girl- aged 19-

Shows enlargement of middle phalangeal joints
Thickening of wrist joint.

Early Rheumatoid Arthritis
enlargement of the middle phalangeal joint of the little finger, which in life, is soft, yielding, and elastic; there is also been thickening about the wrist destroying the natural contours of the joint—this enlargement being made all the more noticeable through the hollows left by the muscular wasting of the hand, especially of the interossei and muscles of the thumb.

A shadowgraph of the affected joints taken at this early stage of the disease by means of the Röntgen Rays, proves that these naked eye changes are entirely due to alterations in the soft structures around the joints, and not to any enlargement of the bones themselves.

In Case No. II—taken from the hand of a woman about 50—this thickening about the wrist is still more marked and it is firmer than that round the phalangeal joints; it gives more the impression of being due simply to a thickening of the synovial membrane. In this case there is also slight ulnar deflection, and the
Röntgen Ray photo of hand shown in Case No. IV. — Woman, aged 54. Case of Rheumatoid Arthritis.
movements of the fingers were much
interfered with, which was not the case
in Case no. I.
I will here draw special attention to
the radiograph shown on the previous
page. I took this recently from the
hand of the woman aged 54, and it
shows the same hand as seen in Case IV.
I think this photo shows that the
X-rays are serviceable in the diagnosis
of joint diseases, as the osteophytic
outgrowths and nodules around some
of the phalangeal and metacarpal-phal.
joints are well seen. And these outgrowths
are thus clearly proved to be bony in
character, and thus distinguished from the
toophi of foot, which are far more trans-
parent to the X-rays.

Although these specimens I have alluded
to may be taken as illustrating the
conditions most typical of Rheumatoid
Arthritis, there are many other deformities,
which are met with in this disease, a few
of which are shown in the various cases.
We here see various conditions of flexion and extension of the phalanges, one on the other, and on the metacarpal bones.

Sometimes it is flexion of the 1st phalanges with overextension of the 2nd, so that the fingers bend backwards at their middle joints in the wrong direction. This is a condition to which Sydenham apparently alludes, when in speaking of the deformities of Rheumatism, he says: "the joints of the fingers become so to speak inverted and present nodular protuberances, such as are met with in gout, on the inner rather than the outer sides of the fingers."

This deformity is well seen in the index and middle fingers of cast III and all the fingers of cast V.

It is not very clear how we are to account for these peculiar deformaties. The interossei and lumbricales have got much credit for causing them, either by their overaction or their atrophy, as the case may be; the cast no III to which I have just alluded, illustrates very well the physiological action of these muscles, which is to flex the
1st and extend the 2nd phalanges.

Why, however, these little muscles should, in a case like this, take on the entire management of the fingers, and counterbalance these stronger flexors and extensors is not very evident.

And it is at least very difficult to understand how they can have been the chief factors in the production of the deformities shown by the photograph IV (on next page) which was taken from a man, aged 26, who, when in the Army, had a severe attack of acute Rheumatism three years before. Both his hands were markedly distorted, and there was much muscular wasting, especially of the forearm. The contracture of the fingers and flexion of the left hand on the forearm are well seen.

Marked contraction of the fingers in a state of flexion is also shown by Case VII from a case of Rheumatoid Arthritis. This case also shows enlargement of wrist. At present we don't know the true explanation of these deformities, but can only devise theories.
Photograph No. IV

Case of Chronic Rheumatic Arthritis

Hand of a man - aged 26 -
-idges of fingers.
No enlargement of phalangeal joints.
No thickening of wrist.
There is one peculiar deformity of the hand which is found most commonly in the cases occurring in later life, though it is sometimes met with in younger patients. I mean the "ulnar deflection of the fingers". The condition is shown to a varying extent in several of the casts, but especially in Casts II - VI - and in photo VIII page 57.

In a typical example we find the 1st phalanges are slightly flexed on the metacarpal bone, and the 2nd and 3rd are extended, while the general inclination of the fingers is toward the ulnar side of the hand.

Though the cause of this condition is, as far as I am aware, most unsatisfactorily dealt with in text books on the subject, there has yet been a good deal of discussion among writers as to its origin.

Some have supposed that it is due to an enlargement of the head of the 1st metacarpal bone, which would carry the index finger inwards and with it the other fingers. But against this view I have found in my cases that it occurs quite as often...
in cases where the metacarpal bone presents no such enlargement. Others seem it the result of certain kinds of employment, but they do not explain how they suppose this to act.

In my study of this disease, I have been much interested in this deformity, and my researches in this direction have led me to formulate the following theory, which I think accounts very well for the condition, and which is certainly less open to objection than most others.

There is no doubt, as we have already seen that Rheumatoid Arthritis causes the ligaments in and around the joints to become lax, and as a result of this, we see in certain cases where the metacarpophalangeal joint have been affected, that a flail-like condition of the fingers, which is so well known. There is doubtless, at the same time a similar loosening of the sheaths of the tendons, and these would, as a result, tend to leave their proper grooves in the bones, and pass to one or other side.
Now there are certain anatomical reasons why they should pass to the ulnar, rather than to the radial, side. and to bring out this point more clearly, I am inserting on the next page an X-ray photo of a normal hand, which I have taken for the purpose.

The metacarpal bones decrease in length as we pass from the 2nd to the 4th, and the relative size and strength of the fingers tends in the same direction.

As a result of this formation, we find that in a normal hand the fingers possess a much greater range of deflection towards the ulnar side.

Now if there be atrophy of the interosseous, and more especially of the abductor indicis, this tending towards the ulnar side will be still more apt to occur.

Again, as the patient sits, more or less helpless with his hands before him, the fingers suspended, as it were, from the metacarpal bones by their already loosened joints, will, by virtue of their own weight, tend to gravitate towards the ulnar side.

And, once let the fingers, from any of
Photograph No. V.

Skiograph of Normal Hand — Adult.

Compare with photograph No III — (Rheumatoid Arthritis).
these causes or from all combined, take an oblique direction, then the ulnar deflection will ensue as a result of the action of the flexor and extensor muscles.

In some of the cases notably III and IV it will be further noticed that there is a partial dislocation forwards of the 1st phalanges on the metacarpal bones. This condition is no doubt due to the action of the flexors, which have carried these bones forwards out of their loosened joints in a similar to the subluxation of the knee to which I have alluded.

I pass on now to consider some of the nervous phenomena of Rheumatoid Arthritis, and will take first the muscular atrophy, which is one of the most important symptoms, and also one of the earliest, as it usually is well marked from the first onset.

It is especially well marked in the muscles of the arms and legs, and is selective in its character, especially affecting certain muscles, and its rapid development, and pronounced nature, are too marked to be accounted for on the ground simply of disease. It is evidently brought about through the agency
of the nervous system, I think through reflex nerve influence from the peripheral nerves of the past affected interfering with the nutrition of the motor cells of the cord. The weakness in the grasp of the hand is very marked and the dynamometer is often serviceable in indicating the amount of power that is present; and as a means of comparing the relative strength of the 2 hands, or in showing any slight change, either of loss or gain, that may have occurred between 2 or more observations. In several cases in which I have specially investigated this point I have convinced myself that the loss of power is not merely the result of disease, and in support of this view, I will quote a case which proves this beyond doubt.

It is the case of a man, aged 19, who came under my care with well-marked Rheumatoid Arthritis. His left hand showed enlargement of the shoulder joint and wrist though there was free movement in these joints. In the right hand there was less enlargement about these joints, and it was altogether a hand less typical of the disease. In this hand however, the fingers were slightly flexed, and their range
of movement was very small; the wrist was also stiff, semiflexed, and admitted of very slight flexion or extension.

Now if the loss of power were proportional to the loss of mobility, we should expect to find that the left hand stronger than the right; but this was not the case; the power of the left hand compared with that of the right, as tested by the dynamometer, was in the proportion of 15 to 22, that is, the hand in which the joints were more fixed, and in which consequently the element of disease would have played a more prominent part, was much stronger than the other, in which there was free movement.

Further, the muscles of the left forearm barely responded at all to a faradic current that caused marked contraction in those of the right.

Increase of the patellar reflex I have already alluded to—it is often present but sometimes it is not possible to obtain satisfactory results, either way on account of the local condition of the joints.

Persistent cramps and muscular twitching may also occur and often occasion great distress.
Whilst speaking of the nervous aspect of this disease I will just allude again to the man whose case I quoted page 16—here the first indication of illness was a more or less complete loss of power in the arms, and it was after this had existed for a short time, that the characteristic phenomena of the disease began to show themselves.

There are 3 [nervous] conditions in Rheumatoid to which attention has been specially drawn by Dr. Spender of Bath, and which he considers diagnostic of the disease (12). They are a rapid and incompressible pulse, localised sweatings, and pigmentation of the skin. He attaches great importance to the increased rapidity of the heart’s action in Rheumatoid. I have seen several cases in which the rapid pulse has certainly been very marked, its rate ranging from 100 to 120 a minute, but I have also seen a larger number of cases in which there has been no such rise.

Those cases in which it has been present, have mostly been in patients of middle or later life, it is much less frequent among the younger class. The very fact of Dr. Spender
drawing attention, as he does, to a patient in which this condition is present as "one of my quick pulse cases" implies, I think, an unconscious admission that they are the exception and not the rule.

Of the high tension which is paid to accompany the increased rate, I can only say that I have not noticed it; such a combination is contrary to the usual physiological rule, that the tension varies inversely as the rate.

[67] There is a much stronger connection between Rheumatoid Arth, and the presence of pigmentation of the skin. Sometimes we see it as small mahogany-coloured spots, scattered about irregularly, especially on the arms, hands and forehead; at other times, it takes the form of a diffuse staining, giving the patient a bronzed or unwashed appearance; or it may follow the track of some cutaneous nerve, as in case of mine in which the course of the supra-orbital nerves and their branches were well marked out by lines of this brown pigmentation. The patient has usually no doubt whatever as to the exact development of this pigmen
and says that it made its appearance at, or about, the time of the onset of the joint trouble.

(c) The presence of localized sweatings is, I think, of less importance than either of the previous conditions we have considered. Their occurrence about the hands and feet is very common in Rheumatoid Arthritis, but it is equally often seen in Chronic Rheumatism, Chronic Gout or Chronic Rheumatic Arthritis. I do not therefore look upon it as of much diagnostic value.

I think it still remains for the future to work out more definitely the relations that these 3 conditions bear towards the disease we are considering, whether, in fact, they are distinct features of Rheumatoid, or only accidental results of the morbid process.

In the absence of joint lesions and other characteristics of the disease, I do not think we are justified in forming a diagnosis on the strength of these phenomena, and in their presence, we do not need them to declare to us the nature of the case that we have before us.
I do not propose to dwell at any length on the morbid anatomy of Rheumatoid Arthritis.

I have made a careful post-mortem examination in 2 cases in which I had the chance of obtaining a 'Secio' — for the opportunity is rare, and for a rare one — but I failed to find any changes but those which are well recognised and which are well described in the literature of which it is, I think, not necessary for me to enter.

I have already alluded to the tendency there is to a weakening in the ligaments in and around the joints which is an important factor in the production of many of the deformities we see.

Dr. Freeman, of Bath, who has had large experience of this disease, believes that there is a change in the red marrow of the long bones as a result of which its function as a blood-forming organ is diminished. This certainly agrees with my own observations in a large number of cases in which I have examined the blood of patients suffering from this disease, with the hemocytometer, and in which I found a marked deficiency of the red corpuscles, and some diminution in the haemoglobin.
In his very comprehensive work on this subject (Dr. Arch. Garrod, classifies the cases of Rheumatoid Arthritis into 4 distinct groups — to which I will now allude.

(a) The polyarticular cases.
How I hold that if Rheumatoid is anything it is polyarticular.

(b) Cases showing Heberden's Nodes.
I think it unnecessary to include these cases in a separate group, as when present they are found in combination with other symptoms.

(c) Cases occurring as a direct result of Acute Rheum": Gonorrheal Rheum": or Gout.
But I think it not at all advisable to classify those cases in which there is a previous history of Acute Rheum": with those due to Gout.

Acute Rheum": is found as an antecedent in a much larger number of cases than is generally allowed, but I have never met with a case of Rheumatoid developing after Gout.

What may be termed "Osteo-Arthritis grafted on Gout", that is to say, a case of Chronic Gout with Osteo-Arthritic symptoms. I have met with, but not true Rheumatoid.

And the same may be said concerning Gonorrheal Rheum":
The last group comprises the most particular forms—these usually result from injury, and a good example is seen in the moribund, antecedent hip of old age; in whom it is most frequent—"the Morbus coxae senilis." Here there are no severe trophic phenomena—muscular wasting if present is merely the result of disease—the peripheral joints are mostly unaffected, and the disease is usually confined to the hip or shoulder.

Now these cases would, I think, be better classed under the head of Chronic Rheumatic Arthritis, or, with those chronic affections in which the changes are of a chronic nature, and where some slight influence has given rise to the local condition, in a joint whose vitality has been lowered by injury, overuse, arterial degeneration or some other cause. But to place all these various chronic joint affections in separate classes and then describe them under the common head of Rheumatoid Arthritis seems to me an unnecessary process of still further complicating the nomenclature of an already sufficiently perplexing disease.
I will now say a few words regarding Chronic Rheumatic Arthritis which often causes deformities in the joints very similar to those of Rheumatoid Arthritis.

I am in the habit of drawing a distinction, somewhat arbitrary it is true, between Chronic Rheumatic Arthritis and Rheumatism which, as their names imply, are both the result of the same disease. Under the former head, for the purpose of this description, I shall include only those cases in which there are changes in the joints leaving the term Chronic Rheumatism for those painful affections of the nerves and muscles such as sciatica, lumbago, myalgia.

The condition of a joint during an attack of Acute Rheumatism may be described as one of Acute Rheumatic Arthritis: when the fever has passed off and permanent crippling is left behind, we recognise the case as one of Chronic Rheumatic Arthritis.

In other instances, we may elicit no such history of a previous acute attack, but the symptoms have come on and slowly progressed, sometimes affecting one joint
only, at another severer, but the clinical features of the case and the local conditions of the joints are similar to those met with after an attack of Rheumatic Fever.

The patient, who is probably past middle life, first noticed slight pain and stiffness in the affected joint a year or two ago, this perhaps passed off in a few days, only to return after an interval with increased violence, until at last a hopeless condition of Chronic Arthritis results.

As an example of Chronic Rheumatic arthritis directly following an attack of Acute Rheumatism the photo on the next page is a good one.

This patient, who is at present under my care, is a girl of 25, who 8 years ago had a severe attack of Acute Rheumatism. As a result of this her joints became affected and have ever since gradually been getting worse until they have reached the crippled state so well seen in the hands shown.

These marked deformities have been chiefly produced by the counterbalancing action of certain muscles & groups of muscles over others.
Photograph No VI

Chronic Rheumatic Arthritis

Shows marked contractions of fingers with fibrous nodules on knuckles.
but in addition to this, there seems to be, as a result of the rheumatic poison, a tendency to the contraction and shortening of the fascia, especially about the palms, the effect of which contraction is seen in the photograph.

Of the other joints of this patient scarcely one is not affected—the elbows, shoulders, knees, ankles, and even the temporo-maxillary joint, having all suffered to a greater or less extent.

This case also shows well the small rheumatic fibrous nodules about the knees, and the skin of the hands is markedly glossy and quite devoid of hair.

Photograph No. 11, page 32, shows a similar condition.

It will be noticed as distinguishing these cases from Rheumatoid Arthritis that there is no thickening of the synovial membrane of any of the joints (aside from arthritis), but in each of these there is a condition of dry arthritis. There is often however considerable loss of flesh and muscular wasting, but in spite of this, the general health is fairly good.

In the absence of any previous history, unless a careful examination is made, these cases may
sometimes give rise to doubt, and it is in such cases that we are aided in arriving at our diagnosis by the rate of pulse, the presence or absence of pigmented discolorations, and above all by the aspect of the patient, and his general condition.

Though I have laid considerable stress upon the deformities met with in Rheumatoid Arthritis, it must not be supposed that they all differ essentially from those seen in other chronic joint affections, for, on the strength of these alone, a diagnosis would not be possible in many cases.

Here are, however, as we have seen, some deformities which are pathognomonic of Rheumatoid, and this form of hand is shown in photos. I: III: VIII and Cast. I to IV.

Seeing such hands as these, we can say for certain that they belong to a patient suffering from Rheumatoid Arthritis, but of many of the other deformities we can only arrive at a conclusion after a consideration of all the factors of the case. Thus the ulnar deflection of the fingers (so marked in many typical cases of Rheumatoid) may also be produced by repeated attacks of acute
Photograph No. VII

Typical hands of Rheumatoid Arthritis

Shows:
- Enlargement of phalangeal joints
- Thickening of wrist
- Muscular wasting
Rheumatism and foot also will give rise to a similar appearance.

Having thus given a general outline of the chief clinical features of Rheumatoid and entered into some detail in describing the various deformities met with in this disease, it now remains for me to sum up my conclusions as to its nature.

Conclusions - I have already alluded briefly to a few of the theories which have been advanced by various observers. At the present time, what is known as the dystrophic theory has perhaps the largest share of support. This theory holds that the articular lesions are the only primary manifestations of the disease, and that there are the result of a disturbed nutrition of the joints, which may be due to many causes, either local or constitutional.

Thus in geometry, we may have an affection of isolated joint, with arthritis of a similar character to that met with in Rheumatoid Arthritis, together with...
in this instance, a well-recognised
degenerative lesion of the lateral column
of the cord.

It must therefore be allowed that the
change seen in the joints in Rheumatoid Arthritis
closely resembles those sometimes found to
result from a definite lesion of the
spinal cord.

For my own part I think there can
be no doubt that Rheumatoid Arthritis
owes its peculiar features to certain change in
the nervous system, but whether these changes
are in the nerve centres, the spinal cord or
the peripheral nerves, or in all of these,
is at present not clear.

It seems to me to be quite impossible for
us to close our eyes to the vast and many-sided
influence of the nervous system, as a whole,
in the production of the symptoms of this disease.

Numerous phenomena, both motor and
sensory, can only be accounted for
by assuming this influence.

And in one instance, the muscular atrophy,
its selective and distinctive character warrant
me, I think, in ascribing it to some change
in the multipolar nerve cells of the anterior cornua of the cord. Again, in the later stages, we sometimes see true atrophy as a direct consequence of a peripheral neuritis, secondary to the joint affection.

Some have regarded the symmetrical character of rheumatoid as a strong argument in favour of some central cause, situated in the central nervous system. But, in my opinion, the existence of this symmetry does not really show more than that we have to deal with a constitutional condition for, as Sir James Paget has well said (14) "all symmetrical diseases depend upon some morbid material in the blood, and certain blood diseases have seats of election."

But I think we hardly need such arguments as these, we have sufficient evidence without them, to prove our point that it is through the agency of the nervous system that the morbid material in the blood brings about the results which we see.

Let us therefore now consider what the nature of this morbid material may be.
We have seen that several of the special joint deformities found in Rheumatoid Arthritis may also arise from attacks of Acute Rheumatism, and that in cases of Rheumatoid there is frequently a distinct previous history of Rheumatic fever. We sometimes notice the existence of heart disease in instances where more direct evidence of Rheumatic fever has been wanting, and which we must ascribe to the Rheumatoid present.

We cannot have failed to recognize in numerous instances the various ways in which Acute Rheumatism may affect the nerve centres, the meninges, and the peripheral nerves, not merely as an accidental occurrence, but as one of the distinct manifestations of the disease; and in chorea, we have an example of a disease of the nervous system distinctly of a Rheumatic nature.

Bearing these things in mind, and remembering the marked nervous phenomena of Rheumatoid Arthritis, in my opinion we are justified in regarding this disease
as one of the irregular manifestations of the Rheumatic state—a disease the symptoms of which are caused by the specific poison of Rheumatism, acting through the agency of the nervous system, in other words—a Rheumatic nervous disease.

There seems to exist in this country a popular fear, an unshakable dread, of being thought to belong to that school, which sees in these 2 diseases any close connection. But writers speak of Rheumatoid 'overlapping' such diseases as, Exophthalmic Goitre and Locomotor Ataxia; why do we not hear of its overlapping Rheumatism? It has no doubt points in common with these diseases, but surely with none is the similarity so marked as it is with Rheum.

I know that this view presents many difficulties—all theories at present do so—but in the words of the immortal Burke: "I trust that you will not reject a reasonable proposition because it has nothing but its reason to recommend it."
When first I began my investigations into this disease, I was specially anxious to avoid approaching this subject with any preconceived theory as to its nature.

There is always a temptation to do this, for by looking at the subject in a broad manner, from an impartial standpoint, by considering its many and various phenomena, seeking the marked influence the nervous system bears in their production, and reflecting on the connection between Rheumatism and many nervous conditions, I was gradually drawn to the conclusion as to its nature, at which I have arrived.

It is only by regarding it in this aspect, that we can comprehend how many of the influences that are taken as causes of Rheumatoid Arthritis may be supposed to act.

We hear of such various conditions as overwork, worry, shock and fright, the bursting of shells, and the failure of banks, each of which in turn has been found to be the cause of the disease.

Surely such causes as these could only produce such marked change, though
the action of the nervous system.

As fright may bring on an attack of chorea, so may any one of these acts as an exciting cause in a patient already predisposed, and, as in chorea, they may have an important effect in modifying the character of the rheumatic attack.

Much yet remains to be done, we want further knowledge of this subject before we can satisfactorily clear up many points of difficulty. And this, in my opinion, will be best achieved by careful observation of a large number of cases of joint affection from all causes; by an accurate description of their various deformities; and by a thorough investigation into the influences that have been at work in the causation of each separate case. Then and only then shall we be able to satisfactorily to tabulate them into distinct groups, and to say with certainty, whether a case, such and such cases, are to be included under the head of Rheumatoid Arthritis.

Richard Davies.


Late House Surgeon, Royal United Hops. Bath.
Photograph No VIII

The condition of this hand is due to the late stage of Rheumatoid Arthritis.

An excellent illustration of the bony changes in the late stages of Rheumatoid Arthritis.
List of Casts

Cast I - Hand of Man - Catat 70 - Shows spindle-shaped enlargement of middle phalangeal joint of little finger. Thickening of wrist & muscle wasting of intrinsic muscles of thumb.

Cast II - Hand of woman - Catat 50 - Shows enlarg' of metacarpo-phalangeal & proximal phal. joints, with ulnar deflection of fingers - Rheumatoid Arthritis.

Cast III - Hand of a woman - Catat 45 - Shows inverted finger of Trousseau, with slight flexion of terminal phalanges - Rheumatoid Arthritis.


Cast V - Hand of man - Catat 50 - Showing marked inversion of fingers, slight ulnar deflection and forward dislocation of metacarpo-phalangeal joints - Rheumatoid Arthritis.

Cast VI - Hand of an old man - Had 'rheumatism' for years - marked ulnar deflection of fingers, which are dislocated forward - Rheumatoid Arthritis.

Cast VII - Hand of a man, aged 19, shows thickening of wrist & marked flexion of fingers - Rheumatoid Arthritis.