OSTEOARTHRITIS.

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A useful way of classifying chronic arthritis, and at the same time clarifying our ideas thereon, is to regard all kinds of joint affections as falling into two categories—inflammatory and degenerative. The former or inflammatory group naturally divides itself into cases due to a known cause such as trauma, altered states of metabolism or the sequel to a recognized infection to which we should apply the term “specific” and those in which the ætiology is undetermined and therefore regarded as “non-specific.”

The “non-specific” or rheumatic group of diseases includes a medley of affections which as Babbington says—“though connected with and often changing into each other yet differ considerably both in their respective assemblage of symptoms and methods of cure.” To these conditions such names as chronic, infective, focal, metastatic, atrophic, hypotrophic and rheumatoid are given, while the nomenclature is further complicated by the fact that there is no general agreement as to what is meant by any of these terms. It has been suggested that, as the joint changes associated with these affections are in many respects very similar to each other and more or less conform to a recognized type, the designation “rheumatoid” would appear to be legitimate.

We speak therefore of a “rheumatoid type” of arthritis which includes among its constituents that condition known as “rheumatoid arthritis.” While according to this view the non-specific joint affections mentioned above belong to the “rheumatoid” type, the term “rheumatoid arthritis” should only be applied to a condition which is now regarded as a definite clinical entity.

The nature of the changes in the rheumatoid type of arthritis is outside the scope of this article which is concerned with the second of the two categories mentioned in the opening paragraph, viz.—the degenerative or as it is commonly called—the osteo-arthritic type. Degenerative changes are apt to be the end results of most forms of arthritis. It must be realized that the two conditions are often present in the same joint at the same time so that their differentiation is not always so clearly cut as might be imagined at first sight.

CLINICAL FEATURES.

Osteo-arthritis, unlike some forms of rheumatic disease, is much more of a local than a general affection. Its subjects are usually well nourished individuals of a fairly robust type and frequently of a plethoric habit of body.

It is essentially a disease of late middle life at a period when degenerative changes first appear. One might say that its onset coincides with a failure on the part of the joint tissues to fulfil their normal function.

The sexes are fairly evenly divided. The spine and hips are more commonly implicated in men and the knees and fingers in women. Increasing stiffness and pain usually impel the patient to seek medical advice. A definite history as to the mode of its appearance is rarely forthcoming, as its approach is so insidious that any inconvenience which is experienced in its early stages is usually ascribed to a cold or a strain.

Generally speaking, one of the larger joints is affected and which one largely depends on the patient's occupation. The joints in the lower extremity show a greater incidence because the weight of the body is borne by them and they are exposed to continual strain. It is of interest to note that slaters, plasterers and decorators are very prone to suffer from an arthritis of the shoulder joint on account of the nature of their work. It has been said by Van Breemen of Amsterdam that every trade has its own particular form of arthritis.*

A direct association with a focus of infection is not nearly so apparent as is the case with some of the members of the inflammatory or rheumatoid type. As Glover says in his Ministry of Health Report on Chronic Arthritis, 75 per cent. of the population over forty years of age have septic mouths yet nothing like this proportion suffer from arthritis. Any temporary benefit that may be claimed for extensive extraction of teeth may be explained by the fact that people with sore mouths have to be content with a very light diet and as many subjects of osteo-arthritis habitually over-eat, a period of dietary restriction is all to the good.

Climatic factors have apparently very little to do with the incidence of osteo-arthritis as it is found all over the world.

CHARACTER OF THE JOINT CHANGES.

The osteo-arthritic joint where it is sufficiently superficial to be palpated is characterized by an irregularity of contour, thus differing from the rheumatoid type which is often spindle shaped and regular in outline. While in the former type there may be effusion into the joint in the early stages it is not as a rule a prominent feature. A certain amount of pain on the performance of certain movements and a diminution of their range are constant symptoms. Fine or coarse crepitations on movement are very early signs and may be present for months before any other change is noticeable.

As the name—osteo-arthritis—implies, the changes mainly affect the bony tissues. The alterations in the contour of the joint are due to an enlargement of the bone ends and its somewhat gnarled appearance is frequently caused by peri-articular lipping. The increase in the size of the articular surfaces, brought about in this way, is Nature's endeavour to strengthen a weakened joint by throwing out buttresses.

It should be realized that the formation of osteophytes and the lipping of the articular margins are early occurrences in the progress of the condition. This constitutes a valuable diagnostic feature because in the rheumatoid type of arthritis, osteophytes appear at a much later period. It may also be noted that the articular cartilage in osteo-arthritis becomes eroded after the appearance of osteophytes, and is therefore a comparatively late event. On the other hand, in the rheumatoid type erosion of cartilage takes place early. As the new formations are recurved beyond their articulating surfaces there is not the limitation of movement which might be expected. Any diminution of the range that occurs in the early stages is mostly due to neglect to put the joint through its full range of movement at regular intervals.

* Well-known examples are seen in the "labourer's spine" a form of osteo-arthritis affecting gardeners, navvies and coal miners. Men who stand for long hours often suffer from an arthritis of the mid-tarsal joint. Tram drivers often have an arthritis of the hip. The arthritic hip of horsemen is well recognized and it is frequently associated with a most intractable sciatica from the implication of the lumbar origins of the sciatic nerve in osteo-arthritic changes in the vertebræ.

The bone below the articular cartilage is thicker and denser than normal and when the time arrives for the splitting and erosion of the cartilage, the exposed osseous tissue becomes polished and glistening. Beneath the sclerosed bone the cancellous spaces have an unusually open and fatty texture. Radiographic films often show cyst-like cavities surrounded by a zone of bone stimulation and protective sclerosis. The exact nature of these cavities has not yet been determined.

While alterations in the bony tissues are the most prominent features in this type of arthritis there are, besides the splitting and wearing away of the articular cartilages, certain changes in the synovial membrane and capsule that must be referred to. These usually follow the lipping of the articular surfaces. The membrane becomes thickened and the synovial villi proliferate. In some cases these enlarged villi are the seat of chondromata which may be single or multiple. Sometimes these chondromata may become ossified and detached and set free in the joint cavity and thus constitute one variety of loose body. When such a loose body becomes nipped between the two opposing joint surfaces a painful synovitis with swelling of the joint frequently results. In some instances the chondromata may undergo mucoid degeneration with the formation of cystic cavities. These are known as "Baker's cysts" which, while mostly situated in the popliteal space at the back of the knee joint, are also to be found in other joints.

The capsule of the joint becomes thickened and adherent which greatly limits the mobility of the articulation. At a much later stage, the various interarticular ligaments undergo changes which may result in their eventual disappearance. In consequence of this there may be deformity, joint instability and even dislocation. As Timbrell Fisher points out, the tendons may be affected and even acquire new attachments. True ankylosis practically never occurs. All limitation of movement is due to alterations in the shape of the articulation, the interlocking of the larger osteophytes and the thickening and adhesion of the capsule. Muscular spasm is also responsible for the diminution of the range of mobility to a much greater extent than is usually realized.

After the foregoing general description of the articular changes in this type of arthritis some consideration must now be given to the various joints which are most commonly involved.

The Hands.

A great deal can be learned from a hand-shake. In true rheumatoid arthritis the fingers are cold, clammy, moist and fish-like, whereas in most cases of osteoarthritis the grasp is quite normal.

The terminal phalangeal joints are often affected and gross deformities may result from osteophytic outgrowths. Besides the irregularity of the articulating surfaces, the capsule of the joint often undergoes fibrotic changes which further increase the pull. It should be noted that osteophytic outgrowths are not quite the same as Heberden's nodes which spring from the epiphyseal ends of the bone.*

One would say that an osteophytic outgrowth that was causing distortion was not a Heberden's node because the latter does not give rise to any displacement

* In Chapter 28 of his "Commentaries" Heberden writes as follows :—

Digitum Nodi. "What are these little hard knobs, about the size of a small pea which are frequently seen upon the fingers, particularly a little below the top near the joint? They have no connection with the gout, being found in persons who never have had it; they continue for life; and being hardly ever attended by pain or disposed to become sores, are rather unsightly than inconvenient, though they must be of some little hindrance to the free use of the fingers."

of joint surfaces. Another point to remember is that gouty tophi are moveable on their base while a Heberden's node, being an outgrowth from the epiphyseal end of the bone, is not.

The basal joint of the thumb is very commonly the seat of an arthritis. Either the carpo-metacarpal or the metacarpal-phalangeal articulations may be affected. For purposes of grasping, the strongest grip is obtained with the wrist in dorsiflexion. The normal carpal arch must be maintained and there must be free movement at the basal joint of the thumb. When these two joints (carpo-metacarpal or metacarpal-phalangeal) are inflamed there is always pain on grasping. It will be noticed that if the two joints just mentioned are immobilized even temporarily, opening and closing the hand can be accomplished with much less pain. Probably the best method of treating painful conditions in this situation is the application of a moulded leather wrist casing which immobilizes the basal thumb joints. The splint should be removed every day and the joint put through its full range of movement both actively and passively. The casing should only be used so long as there is actual pain in the parts.

There is often great difficulty in distinguishing between osteo-arthritis of the hand and fingers and gouty arthritis in their early stages. A well-established tophaceous gouty arthritis, probably oozing a white creamy fluid is easily recognized. Before the development of recognizable tophi the diagnosis is extremely difficult. It may, however, be remembered that in gout the swellings do not keep to the line of the articulation and immature tophi may form which have no relation to the joint.

At one time it was customary to speak of "rheumatic gout" and it is by no means certain that the clarity of our ideas has been in any way improved by the abolition of this term. Our forefathers recognized tophaceous and rheumatic gout and no doubt the latter frequently became the former. A hand that is subject to recurring attacks of arthritis with shiny redness of its dorsal aspect is most likely gouty especially if the attacks come on suddenly.

X-ray appearances are sometimes a help in diagnosis. Clear "punched" out areas are described which are thought to be uratic salts in the bone tissue. However, proof of this is wanting. As the appearance of these clear areas, apart from clinical findings, is the only evidence on which to base a diagnosis of gout it should not be too lightly discarded. Estimations of blood uric acid are only of value to those clinicians who still adhere to the idea that gout has some relationship to hyper-uricæmia.

The treatment of the osteo-arthritic hand should be directed to the avoidance of stiffness. Ankylosis does not occur and limitation of movement is purely mechanical or obstructive from the presence of osteophytes. There is an old saying that these should be trained up in the way they should go. The immersion of the hands enveloped in rubber gloves in hot water for about twenty minutes each day relieves muscular spasm and lessens pain. After the hands have been removed from the water and the gloves taken off, they can be well massaged with winter-green oil.

No treatment is of the slightest use for osteophytic outgrowths or Heberden's nodes. As a rule they are comparatively painless and unsightliness is their main objection.

Elbow.

An osteo-arthritis of the elbow joint is not common. If it does occur as a sequel to repeated traumata or to some infective condition of the articulation, a good deal of limitation of movement is bound to result. The elbow being a perfect example of a hinge joint, any outgrowth of bone however small must interfere with its mobility just as in the case of an ordinary hinge when some mechanical obstruction is placed between its two constituents.

Shoulder.

Stiffness of the shoulder is much more likely to be due to a capsulitis than an arthritis. The head of the humerus lies very loosely in relation to the glenoid cavity and there is not that likelihood of the cartilages of the articulation wearing away and exposing the subjacent bone as seen in "weight-bearing" joints. An osteo-arthritis of the shoulder, therefore, is only to be found in cases where the joint is submitted to continual strain. A few examples have been found on X-ray examination where a ring or collar of osteophytes surrounds the head of the bone. These cases are characterized by extreme muscular wasting. It is practically impossible to make a diagnosis without an X-ray examination.

Treatment mainly consists in endeavouring to keep up as much movement as possible. Any physical measure that promotes an increase in the circulation of blood through the part will do good. Massage, diathermy douches of various kinds as well as friction with stimulating liniments are all of value. The hot pool bath is most helpful in that the weight of the limb is greatly reduced and a much greater range of movement is thus obtainable. As this is only procurable at one or two spas and similar institutions, its usefulness is very circumscribed.

The Spine.

Osteo-arthritis of the spine is extremely common. The most important factor in its causation appears to be heavy laborious occupations. It is probable that the intervertebral discs undergo the same changes as the cartilagenous surfaces of other articulations. Osteophytes are thrown out to support the weakened joints, which can be seen on X-ray films and are sometimes known as "parrots' beaks" from their fancied resemblance thereto. These bony excrescences may exist without symptoms as shown by the fact that their existence is only discovered when a radiograph is taken for some condition unconnected with back-ache. On the other hand, they may be the cause of considerable pain from their situation in the neighbourhood of various nerve roots when sensory and motor pressure symptoms are very liable to arise. Elderly men frequently complain of vague pains referred to the hip joint and shooting down the thigh. A diagnosis of sciatica is frequently made or they may be attributed to an incipient coxarthrosis. Careful consideration of the exact distribution of the pain shows that it conforms more to the implication of the roots of the lumbar plexus as it affects areas which are not usually involved in true sciatic neuritis.

The spine is not markedly rigid. There is usually some flattening of the lumbar curve as well as some dorsal kyphosis due more to the posture the patient adopts than to an actual spondylitis.

The other affection from which this condition is to be distinguished is the ankylosing spondylitis which mostly appears in younger subjects and to which

the term adolescent spondylitis is frequently applied. In this condition the ossification is mostly round the margins of the intervertebral discs so that the articulations become fused so as to form one continuous piece of bone. The term "bamboo" is applied by Krebs to the X-ray appearances of a spine affected in this manner.

Treatment. The osteoarthritic spine derives great benefit from rest and some local application of heat. Unfortunately, this benefit is only temporary as the symptoms reappear directly the patient returns to work and the spine is once more exposed to strain. For this reason a change of occupation is frequently beneficial, at any rate, for a time. Soon, however, pain and discomfort return and another period of rest is essential. Where available, the pool bath with the underwater douche is very comforting. Peat or mud packs also afford relief.

The Hip Joint.

Coxarthrititis, or as it was formerly designated "*malum coxæ senilis*," is essentially a disease of late middle life or old age. As the hip joint is exposed to much more strain and traumata in men than women the condition is much more common in the former sex.

It is extremely insidious in its onset. As the hip receives contributions from all the nerves that activate the various muscles that move the joint the distribution of pain in the initial stages depends on the part involved. The pain might be felt in the front of the knee or the inner side of the ankle if the anterior crural nerve were implicated, whereas if the sacral plexus were involved, pain would be referred to the heel or foot. It must be remembered that the pain in coxarthrititis is greatly dependent on movement or weight bearing. When the patient is resting there is comparatively little discomfort.

Limitation of the range of movement is an early sign. Difficulty is experienced in crossing the affected thigh over its fellow or stooping down to lace the shoes with the foot on the ground. Horsemen have increasing difficulty in getting up from the stirrup and, as Llewellyn said, "have to submit to the indignity of a mounting block." As the condition becomes more established pain is felt actually in the joint and from there shoots to the groin and trochanter.

Wasting of the buttock on the affected side is one of the earliest objective signs and appears before general wasting of the thigh muscles, shortening, inability to adduct or abduct the limb, and flattening of the lumbar curve. With the patient lying on the back, the leg and thigh can normally be rolled through very nearly half a circle. This movement is impossible in arthritis of the hip.

X-ray appearances are very suggestive. A ring of osteophytes is often to be found surrounding the head of the femur. Within the acetabulum, bone may be deposited, causing a displacement of the head outwards. At a later stage there may be absorption of the acetabulum and when this occurs there is a bulging inwards of the pelvic wall. Sometimes, due to the disappearance of the upper part of the socket, the head of the bone may travel upwards. A distinct flattening of the contour of the head of the femur can be made out in such cases.

As regards **treatment**, the two chief indications are the relief of pain and the avoidance of fixation in a bad position. The relief of pain can be assured by rest but this does not preclude the assumption of a position of flexion and adduction.

It should be noted that in the position of abduction the joint surfaces are least in contact. Pain is always directly or indirectly associated with weight bearing. A reference to the radiograph of an osteoarthritic hip will always show that the wearing away of cartilage is at the maximum pressure point. The more the patient can be spared weight bearing the better for the ultimate prognosis. A properly applied caliper splint will take the weight off the hip and diminish the pain, but the consensus of opinion on the part of those who have worn the appliance is that its discomfort is as great or greater than the pain. Crutches are infinitely preferable if the patient will agree to their use. After the condition has to some extent settled down they can then be discarded.

Limitation of movement in a case of coxarthrosis is not entirely due to bony changes. Muscular spasm and a thickened capsule play a much greater part than is generally realized. That this is the case is easily demonstrated by the fact that a much increased range of movement is obtainable when the patient is immersed in warm water in a pool sufficiently large and deep to permit the upright position and to walking a step or two. It is a frequent observation that patients who require to be wheeled in a bath chair to the side of the pool are able to walk quite well once they are submerged.

Combined with the pool is an underwater douche at a temperature about ten degrees higher than its surrounding water. It is given with a force enough to depress the skin at the point of impact. In this way the douche has a powerful effect on the skin circulation and is in reality a very efficient form of sub-aqueous massage.

Besides the relief of muscular spasm just mentioned, the efficacy of the pool can be explained by the support given to the limb by the water. As all objects weigh less in water than in the air, it naturally follows that a limb so immersed can be moved with less expenditure of energy than in ordinary circumstances.

In a great number of instances the question of *operative interference* to induce fixation to relieve the patient of the pain, is sure to arise. The choice of operation depends a good deal on the type of patient. The very fact that he is suffering from an osteoarthrosis at all is clear evidence that his recuperative powers are diminished. A stout plethoric habit combined with a certain degree of myocardial degeneration are obvious contraindications. Still there are cases that derive considerable benefit from, say a Whitman's reconstruction in which the capsule is opened and the greater part of the head along with all the cartilage and marginal exostoses and any underlying degenerated bone is removed. After rounding off and smoothing the articulating end of the femur it is inserted into the acetabulum. Previous to opening the capsule the base of the tochanter with its attached muscle was separated from the shaft and turned upwards; this is now brought down and firmly secured to the shaft of the bone which is maintained for some time in a position of abduction. Firm bony union is sometimes, but not always, obtained by an arthrodesis which consists in the removal of one-third of the upper hemisphere of the head of the femur by means of an osteotome or a chisel, in a plane parallel with the neck of the bone. The roof of the acetabulum is then chiselled out and made into a flat surface and to this is joined the newly fashioned flattened head of the femur.

Osmond Clark (Reports on Chronic Rheumatic Diseases, R.C.P. 1937) refers to some work by Smith-Petersen who published the results of a new procedure

which he called acetabuloplasty. He argues that pain is caused by the impingement of the hypertrophied anterior margin of the acetabulum on the neck of the femur. The object of the operation is to remove this lip, a procedure in the execution of which a large triangular portion of the anterior capsule is excised. Osmond Clark thinks the cause of pain is from nipping of, or pressure on, the capsule and that much of the benefit of the operation results from the removal of the anterior capsule. At any rate, the results are most impressive and the relief of pain striking. The method deserves a more extended trial and, according to the authority just quoted, appears to hold out the most hope at the present time to sufferers from osteoarthritis of both hips.

The Knee.

As its strength lies in the toughness and resisting qualities of the complex structures which bind together the articular ends of the bones, it is easy to see that from strains and relaxations of the muscles and ligaments, faulty apposition of the bony components of the joint can readily be brought about.

While both sexes are liable to the condition, it is more common in women who "put on flesh" about the time of the menopause. Llewellyn and Bassett Jones refer to two stages in its development: viz. a primary or "pre-osteophytic" stage, often of prolonged duration, whose clinical characteristics are those of a villous hypertrophy and a second or terminal stage in which bony and cartilagenous out-growths make their appearance.

In the early stages the knee creaks a good deal on movement. This is often the first symptom to be noticed. Over-use may induce a mild synovitis which clears up with rest. Crowe has drawn attention to another early sign viz., a roughening of the posterior surface of the patella which is at once noticeable on attempting lateral movement of that bone. The writer has investigated this in a great number of cases and is inclined to agree that the sign is reliable. Constant strain on the knee causes more frequent attacks of synovitis with a consequence that the synovial stratum becomes thickened and boggy swellings can be made out on each side of the patellar ligament. The muscles that control the knee joint—particularly the quadriceps—become flabby and show distinct signs of wasting.

A most important point to be kept in mind with regard to arthritis of the knee joint is that the condition is primarily due to faulty apposition of the two articular surfaces and that the commonest cause of this is a faulty alignment in the process of weight bearing by the lower limb. Consideration should therefore be given to the joints above and below and it is surprising how often static abnormalities are to be found in the foot.

Treatment is both general and local. The former is directed towards remedying any metabolic error that is responsible for an increase in the weight of the body. Where there is evidence of hypothyroidism, and there usually is in women, thyroid medication is clearly indicated. The initial dose should be small; about $\frac{1}{4}$ grain of the dried gland is quite sufficient. The dose may be gradually increased and adjusted to avoid toxic effects. Small and gradually increasing doses of French tincture of iodine find favour with some prescribers.

If the patient can afford it, a visit to a spa where a suitable dietary can be prescribed is always attended with good results. The chief difficulty about local treatment is to know when to move the joint and when to immobilize it.

Remembering that no joint can be kept in a healthy condition unless it exercises its proper function, i.e. movement, one should try and preserve this as long as possible. But movement does not necessarily imply weight bearing and that is where mistakes are apt to occur. People are told to keep the joint moving and assume that as much walking as possible must be indulged in. If there is any tendency to inflammation about a joint, prolonged weight bearing will bring it out. Movement without bearing the weight of the body is what is needed. Attempts should be made to restore full flexion and extension and, if as a result of these attempts the range of movement is in any way lessened, the joint should be put up in a splint and kept at rest for a week or two. Patients should be told to do certain exercises in their baths *e.g.* kneeling down and then trying to sit on the heels. With an ordinary bath tub nearly full of water it is surprising with what ease this can be accomplished.

Synovitis is perhaps more common in relation to the knee than any other joint in the body. Attacks constantly occur in the course of this disease. They are best treated by one or two Scott's dressings combined with rest.

The muscles that control the joint being very apt to waste, massage either with or without Faradism should be regularly given. When the condition becomes more or less chronic, diathermy may be applied by pads each side of the joint. At this stage heat is particularly valuable and can be given in various ways, by a radiant heat apparatus or by hot packs of mud or paraffin wax. The local vapour bath followed by massage is very useful in these cases.

In cases where the intra-articular structures are destroyed and the limb in consequence has become flail-like and useless, an excision of the joint should be considered or, if this is not deemed necessary, a synovectomy or the dissection away from the supra-patellar pouch and from the interior of the joint all diseased synovial membrane, often does extremely well.

Foot and Ankle.

These being more exposed to stress and strain than any other part of the body it necessarily follows that osteoarthritic changes are extremely common. It must also be remembered that such changes are also the natural sequelæ of rheumatoid types of arthritis as well as gout. Untreated static derangements are very liable to set up an osteoarthritis. For example, a rigid valgus deviation of the fore-foot is always associated with some degree of osteoarthritis. Once a deformity is initiated, whether a displacement of the astragalus or os calcis or else a rigid and deviated great toe or a hammer toe, the changes take place almost as a matter of course. The base of the familiar bunion is really an osteoarthritis of the head of the metatarsal. The extremely painful spots to be found on palpation over the "tread" of the os calcis are often due to "spurs" formed by the ossification of the plantar fascia at its attachment. Bony outgrowths are to be found in the neighbourhood of the sub-astragaloid joint as well as in connection with the scaphoid.

Treatment should be directed towards keeping up the mobility of the foot as long as may be. Local vapour, radiant heat, paraffin wax packs and applications of mud with massage should all be tried. If the foot and ankle are in a fairly good position, there is no necessity to try forcible movements under anæsthesia. Where there is any tendency to osteoarthritis, the correction of deformities following an injury is not as a rule a very satisfactory procedure.

COMMENTARY.

One sees then in osteoarthritis the results of the failure on the part of the joint tissues "to stand up to their work." The changes brought about in the various articular structures partake more of the nature of a symptom complex than an actual disease picture. If the question be asked why the joints have failed in their function an answer can only be forthcoming, if the manner of their development be considered. It will be recalled that articular cavities, tendon and nerve sheaths, bursæ, etc. are formed from actual and potential spaces that exist in the mesoblast. The cartilagenous surfaces of the joints, the synovial linings of the articulations and their fibrous capsules are not highly differentiated structures any more than the prolongations of white fibrous tissue, which form the coverings of the muscular bundles and their tendinous attachments as well as the sheaths of the nerve fibres. All are formed from the same elements and all contain transudates from the blood plasma, the percentage composition of which varies according to the function of the different spaces. To this unified connective tissue Achard gives the name "lacunar."

As some individuals are born with a weakness or inferiority of the circulatory respiratory or alimentary system and the various ills that the flesh is heir to are referred to these "diatheses" or tendencies to disease, is it not equally likely that some individuals inherit a "lacunar" or articular inferiority which would obviously be a handicap in their struggle against such adverse influences as occupational stresses, chills, climatic vagaries and other environmental conditions?

In the third volume of "Reports on Chronic Rheumatic Disease" by a Committee of the Royal College of Physicians, attention is directed to some work by Haden and Warren who made a careful analysis of fifty patients suffering from osteoarthritis of various joints. They found that degeneration of the articular cartilage is accelerated by obesity, a lowered metabolic rate, alimentary disturbance, endocrine dysfunction and circulatory inadequacy. They point out that there remains much to be learned concerning the effects on articular cartilage of the abnormal products of tissue activity—e.g., uric acid, homogentisic acid—which arise when for any reason combustion is impaired. While changes suggestive of a toxic or infective element may be superimposed, there seems to be no evidence at all to suggest that focal sepsis plays any ætiological role in osteoarthritis.