RHEUMATOID ARTHRITIS.

By W. S. C. COPEMAN, M.D., F.R.C.P. and
W. TEGNER, B.M., M.R.C.P.

(*British Red Cross Society Clinic for Rheumatism, Peto Place.*)

The term Rheumatoid Arthritis is generally used in this country to denote a condition described in America as Atrophic Arthritis, and in Europe as Infective Polyarthritis.

It is a generalized disease, one of the major manifestations of which is found in the joints. It occurs in temperate climates and attacks females four times as often as males, young women in the child-bearing period being most commonly affected.

Ætiology.

In the ætiology of the condition it seems certain that more than one factor plays its part. Most frequently it is assumed to result from infection, not of a specific or constant nature but one which may attack in a variety of ways. Thus it is normally claimed that there first must exist a "focus of infection" somewhere in the body, and that from this toxins are produced which either directly or by sensitization set up the syndrome of rheumatoid arthritis. It seems that most frequently the organism centred in this "focus of infection" is the *Streptococcus hæmolyticus*, and it is claimed by some that if sensitized to these toxins the body may react allergically to further infection and develop rheumatoid arthritis. But there is evidence to show that a similar condition may arise from infection with other organisms including the tubercle bacillus.

It is necessary, however, to go further than this to explain how a "focus of infection" of this sort may produce rheumatoid arthritis in one subject and not in another, and it is here that it seems probable that a variety of ætiological factors play their part. The condition of the patients in many cases suggests strongly that there is an endocrine factor at work reducing the resistance of the subject, and similarly there is undoubtedly a factor of metabolic disorder at work in many cases, but whether this is causative or merely resultant has not yet been settled. Again, the conditions of life which surround the subject are of great importance. It is a disease found in temperate climates and is more prevalent where there is exposure to damp and cold. There is also an accumulation of evidence to show that psychological factors may play a large part in the development of the condition and this should not be forgotten in assessing the ætiology and prognosis of the disease.

These points lead to the conclusion that for the development of this condition one factor is not sufficient, but that for rheumatoid arthritis to develop, the soil must be prepared before the seed can be established in the "focus of infection" and produce this disease.

Focus of Infection.

The focus of infection which may frequently be found in association with the disease varies considerably in its site. Most frequently it lies in the upper respiratory tract. Thus the tonsils are often shown to be the site of some chronic infective process which may vary from recurrent attacks of acute tonsillitis with abscess formation, to chronic sclerosing inflammation of tonsillar remnants left behind during the guillotining of the tonsils in childhood. Similarly the teeth must always

be suspected and pyorrhœa and apical abscess formation excluded by dental aid and radiological examination. But at this point it should be emphasized that routine extraction of tonsils and teeth on mere suspicion is quite unjustified both theoretically and from the results where this has been performed. Routine examination of the nasal sinuses may reveal active or latent infection.

In males the prostate and seminal vesicles must always be regarded as potential sites of an infective process. In doubtful cases a chronic infection is often revealed by routine examination and this may be due either to the gonococcus or to non-specific organisms. Similarly, in the female a chronic cervicitis may be found. Other potential sites of chronic infection are the gall bladder and the appendix, and these must always be borne in mind. The colon is in many cases suspected of producing toxins as a result of infection. But owing to its nature, infection with a variety of organisms is its lot, and though careful examination may reveal abnormalities in its flora, treatment by alteration of these is not always as efficacious as one would hope.

Clinical Appearances.

In the investigation of cases of rheumatoid arthritis it is often possible to elicit a history of ill health of some duration before the appearance of the joint lesions. During this prodromal period the chief complaint is general malaise, unusual fatigue and loss of weight. Occasionally these are associated with fleeting joint pains.

The next stage in the clinical picture is the appearance of the joint lesions, most commonly in the interphalangeal joints of the fingers, where a soft painful periarticular thickening appears and hampers full movement. The appearance of this swelling is very closely accompanied by muscular wasting, particularly of the interossei, and this muscular wasting is a constant and marked manifestation of the disease.

The joint lesions spread centripetally, often with surprising rapidity, and soon the wrists, elbows, ankles and knees are involved and the condition is well established. At this stage the patient will complain of not feeling normally well, of a sense of weakness and of great fatigue, and locally of pain in the affected joints. On examination there will be pallor, muscular and general wasting, and tachycardia. The temperature is often slightly elevated in the evenings. The small joints of the hands are swollen and limited in movement, there may be ulnar deviation of the wrists and other small joints may be involved. In uncomplicated cases there are usually no further organic physical signs, but the spleen is sometimes palpable. Special investigations usually reveal a microcytic anæmia and the sedimentation rate of the red blood corpuscles in the serum is invariably considerably raised in active cases. Figures of 40 mm. in the first hour and 70 mm. in the second hour are not unusual.

The course of this condition is liable to arrest at any stage in its development. But arrest is in most cases temporary and the activity and progress are apt to recur if the patient is not kept under constant supervision.

If the condition progresses the muscular wasting becomes more pronounced, the joints already affected become more painful and limited and further joints are involved. Flexion contractions of the knees and hips are very likely to occur and prove most troublesome to treat; similarly, the ulnar deviation of the wrists and flexion of the elbows become fairly established. In the later stages of the condition bony ankylosis of the affected joints may occur.

Pathology.

Apart from the changes in the blood picture and the sedimentation rate, pathological findings are usually limited to joints. These are affected first by an active inflammation and round cell invasion of the soft synovial tissues. The process then spreads to the articular surfaces and the cartilage is attacked by a process starting on the periphery and working inwards. The cartilage is invaded by round cells which destroy it and replace it with fatty fibrinous pannus and thus the total area of articular cartilage in the joint is rapidly diminished. Organization of the area of fibrous tissue may take place with intra-articular adhesions which may occasionally go on to bony ankylosis. There is usually a fibrous contracture of the muscles and ligaments surrounding the joint.

Radiological Appearances.

In the radiological investigation of this condition the earliest change noticed is osteofibrosis and decalcification of the bones at their margins around the affected joints. In the next stage the ulceration of the articular cartilage can also be seen and if this has advanced sufficiently there will be diminution of the joint space. In some advanced cases the ulceration of the cartilage advances into the bones and considerable bony destruction may take place. Bony ankylosis may also be seen.

Diagnosis.

Diagnosis of the established condition does not usually present any difficulty. The insidious onset, absence of acute pain and high fever and failure to respond to salicylates are all sufficient to differentiate it from acute rheumatism. As gonorrhoea is often responsible for the appearance of joint lesions of a rheumatoid type the possibility of such an infection must always be borne in mind. Gonorrhoea usually affects bigger joints such as the wrist or ankle rather than the interphalangeals, there is usually a more sudden onset and the inflammatory condition is more painful and severe. If no history of urethral discharge can be obtained, an examination of a urethral film from a prostatic massage may often be of value. The complement fixation test for gonorrhoea does not yet seem to be of much diagnostic value in difficult cases.

In osteoarthritis, the incidence in later life in people of robust general health, the preference for the involvement of one joint which may have been traumatized, and the radiological finding of bone hypertrophy are usually sufficient to establish the diagnosis.

Treatment.

The treatment of this condition cannot be limited to one method of attack. Many factors play their part in the ætiology and the disease has many manifestations; these all require attention. It is not possible to quote specific treatment for any or every case of rheumatoid arthritis or to name a panacea that will cure the condition.

In general treatment it is necessary to remember that the patient is already mentally and physically ill and fatigued, and that any too vigorous methods can do nothing but harm. Thus rest is essentially to be prescribed together with adequate diet and fresh air. The question as to whether institutional treatment is preferable in early cases to home nursing must remain open. In certain cases removal from home worries will foster mental tranquillity and favour that co-operation on the patient's part that is going to be so necessary in successful treatment, while in others absence from home will lead to unhappiness and mental pain

which is prejudicial to success. Institutional treatment may have the advantage of facilities for physical treatment, but peace of mind and eager co-operation on the patient's part are more important than this.

Local treatment must be aimed at the affected joints and seek to allay the progress of the pathological process and restore function. In this respect there is a growing balance of opinion that the most valuable therapeutic measure in dealing with the arthritis is splinting by means of light plaster of paris splints, which can be bivalved soon after application and allow of physical treatment being carried on while favourable position is maintained so long as the condition is active. Such splints, fitting the limb exactly, give the maximum amount of rest and protection from inadvertent movement. In the more chronic cases they can be, if necessary, applied under an anæsthetic in the best position attainable and can be reapplied at intervals as the position of the joint improves. By early and conscientious treatment of this sort the dreadful contractures that still mark neglected cases of rheumatoid arthritis can be avoided.

When the condition is quiescent, massage and active movements will play their part in restoring freedom to the muscles and joints.

Drug Treatment. In spite of claims in the lay press there is no specific drug that can be claimed to cure this condition. Drug treatment can be divided into that which attempts to restore the body's normal response to the infective process and that which seeks to alleviate pain. Of the former type the injection of gold salts has received favourable comment in this country and in France. There are various proprietary preparations on the market which seem equally efficacious, but all share the disadvantage that to some patients gold can be a very toxic drug. It is because of this that it is now customary to exhibit gold in prolonged courses of a very small dosage, beginning with injections of 0.01 gm. and working through 0.02 and 0.05 gm. to 0.1 gm. and never going above this figure. Injections are given every four or seven days until a total of 1 gm. has been given, this constituting a "course." Between courses it is customary to examine the sedimentation rate and the blood count and to resume injections after an interval of about eight weeks if the former shows signs of continued activity of the process. Rashes, stomatitis, jaundice, diarrhoea and albuminuria may all occur as complications and are usually indications for stopping the injections. It is thought that gold injections elicit a mild and prolonged form of shock therapy.

Of the analgesic group of drugs aspirin is the most useful, and this may have to be reinforced by one of the barbiturate group of drugs given with due precaution. If sleeplessness is causing trouble, opium can be given in small doses in some such form as Dover's powder or as small doses of codeine added to aspirin.

Vaccine Therapy. Vaccine therapy has been found of value in certain cases but on the whole the results are disappointing. Vaccines may be autogenous, grown from some focus of infection that has been discovered, or polyvalent. They should be used when it is thought the body will suffer no harm from further stimulus to resist the infective process.

Dosage should be small and prolonged and a desire to raise the amount given progressively is to be deprecated. Much harm can be done and disastrous "flare ups" produced by over dosage with vaccines. Non-specific protein shock therapy is not indicated in active rheumatoid arthritis. The added burden of resistance

that the body is given to bear can ill be borne by the already badly hampered mechanisms of immunity. In more chronic and quiescent cases it is sometimes found of value in the restoration of function, but in these cases relapse usually occurs and very much larger subsequent doses are then required. T.A.B. vaccine or Yatrein Casein are the usual methods of giving protein shock.

Physical Methods. Physical methods of treatment should not be neglected. But again, it is necessary here to stress the importance of avoiding any form of treatment that will cause fatigue. Thus the use of baths and other tiring general methods are usually contraindicated. The value of ultra-violet radiations from the carbon arc in this condition has been proved beyond doubt, the rays are a gentle stimulus and assist in reorganizing the body's resistance. The concomitant heat has a soothing effect and it is found that patients derive much benefit and comfort from this form of treatment.

Heat may be applied locally by means of poultices, kaolin, mud packs or wax, and if means are available by electrical means such as diathermy or infra-red rays. By such means muscular spasm is decreased and the circulation increased, while heat has a pleasant sedative action. It is usually found that patients find general heat treatment too fatiguing.

In the restoration of function to the joints and the rebuilding of the muscles acting upon them, the most valuable factor is active movement carried out by a co-operative patient. Additional stimulus to muscular regeneration, such as massage and faradic stimulation, may be valuable but cannot take the place of active movement. But again, over-use must firmly be deprecated, nor should patients be allowed to put their weight on weight-bearing joints until these are sufficiently restored. Great harm can be done by overloading a joint which is not yet ready to perform its function.

Dietetic Treatment. Patients suffering from rheumatoid arthritis almost invariably enquire about their diet. There is no routine diet that will affect this condition. A varied appetizing dietary rich in vitamins must be encouraged. Milk and cod liver oil are valuable adjuncts. Meat need not be avoided, and indeed is of value in rebuilding the wasted muscles. Fruit is of value and there is no evidence to support the exclusion of citrous fruits on account of their acidity. The object aimed at should be the gradual restoration of the patient's body weight, and in this respect it is sometimes useful to give injections of 15 units of insulin, and glucose by mouth, at the midday meal to increase the carbohydrate tolerance.

Wine and beer seem to be deleterious, but small quantities of spirits may help to alleviate fatigue and combat sleeplessness.