results are necessarily much less conclusive, but it is possible to demonstrate the presence of the *B. tuberculosis* by direct examination after centrifugalisation, in quite a large proportion of cases, varying with different observers from 20 or 30 up to 70 per cent. Fürbringer gives the latter percentage of positive results in over seventy cases, and Stadelmann the former. My own cases are not sufficiently numerous to compare with the large number of observations made by these physicians. I have been able to demonstrate the presence of the bacillus in three cases only. Here, of course, a negative result has no signification whatever.

It is possible that other organisms which may be found to infect the central nervous system, *e.g.* the organism which the Italian observers, Memmo and Sanfelice, claim to have discovered and cultivated in rabies, may also admit of demonstration in this way, but I have not yet seen their original papers.

I submit, then, that the value of the three methods of diagnosis which I have referred to is now sufficiently established; and, while the first is in habitual and daily use, the two remaining methods, the bacteriological examination of considerable quantities of blood and of the cerebro-spinal fluid, are not appreciated at their full value nor practised as frequently as they deserve.

ACUTE RHEUMATOID ARTHRITIS.

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At the outset it will be well to state that the class of case which, for want of a better name, at present may be defined by the term acute rheumatoid arthritis, is totally distinct from the apparently similar but more chronic form, not only with regard to its symptoms and progress, but possibly also from an etiological and pathological point of view. Its frequent occurrence at an early period of life, its rapid progress associated with increasing debility, form a striking contrast to the chronic variety, with its slow development and little if any constitutional disturbance.

The large majority of cases of acute rheumatoid arthritis occur in females, though occasionally males may be affected by it. The age of the patients varies within somewhat wide limits; children of even 4 years of age having been seen, presenting all the typical signs of the disease, whilst, on the other hand, the onset may be delayed till the individual has reached 45 years and upwards. The cases occurring in early childhood are, as a rule, amongst girls.

The causes producing the disease are still, to a great extent, matters for conjecture and speculation. It cannot be gainsaid,

however, that climatic conditions form a prominent factor in the production of this malady; residence in a damp locality, or in the vicinity of stagnant water, or on marshy ground, being the only assignable reason in many cases. It may follow on some other acute affection, such as one of the exanthemata, or even after childbirth, but their influence is probably only of an exciting kind in an individual already prone to the disease. More recently, Drs. Bannaytne and Wohlmann have attributed the origin of rheumatoid arthritis to the invasion of the system by a distinctive and characteristic bacillus, which they found in the fluid obtained from the joints, but further elucidation on this point seems necessary before it can be finally accepted.

In some cases the patient gives the history of having had acute rheumatism a few months previously, since when the joints have never resumed their normal condition, and have been gradually getting more stiff and swollen. It is, however, a point for determination whether this previous affection was of a purely rheumatic kind, or whether it was simply the commencement of the rheumatoid condition.

Generally speaking, acute rheumatoid arthritis begins in an insidious way, the fingers of one hand very frequently becoming enlarged and stiff. The patient, as a rule, takes but little notice of it until he finds his other hand affected, when the consequent loss of power prevents him from following his usual calling. The other joints soon become affected in rapid succession; the ankles, knees, wrists, and elbows, being the most prominent ones disabled at first; whilst later on the hips, shoulders, and articulations of the jaw and neck are very frequently implicated.

The appearance of a typical case at this period of the disease, which may be reached in only a few months, is painfully characteristic of the complaint. The patient has a careworn expression, with often a slight localised pink flush on the cheeks. Anæmia is present in a variable degree, as likewise general wasting. The joints present an appearance which, at any rate in the advanced stages, is quite unmistakable, and even in the early weeks of the disease is ominously significant.

The deformity of the hands is perhaps one of the most peculiar features of the malady. The phalangeal joints are swollen in a fusiform manner, and the joint cavities often contain fluid which, by the increased tension, causes pouch-like protrusions to be formed around them. There is well-marked wasting of the muscles of the back of the hand and forearm, which in the former position produces a curious scooped-out appearance, as it were. The whole hand is, as a rule, deflected to the ulnar side, which together with the flexion of the fingers (due to the more or less unopposed action of the flexor muscles) combine to give rise to much distortion. The wrists, too, may be enlarged, and not at all unfrequently completely ankylosed. The

elbows, shoulders, and ankles are also in their turn affected. The knees are most commonly implicated, and often present a considerable amount of swelling, which sometimes is due to the presence of free fluid in the joint, though more frequently to thickening of the synovial membrane and peri-articular tissues. The muscles of the calf and other parts of the lower limbs are atrophied to a degree which is sometimes almost incredible, and the feet may be flat, from the giving way of the various structures supporting their arches.

Profuse sweating of the hands and feet may be observed now and again, whilst occasionally the fingers have a bluish appearance, and are cold and clammy to the touch. Pigmentary deposits are present sometimes on the back of the hands and forearms, but their connection with the disease is somewhat problematical. In a number of cases the glands in the neck, axillæ, and groins are enlarged, hard, and tender, though the spleen is unaffected, as far as can be ascertained by palpation and percussion.

The gastro-intestinal tract is as a rule more or less deranged; dyspeptic symptoms, with furred tongue and troublesome constipation, being commonly met with in the course of the malady.

The temperature in quite a large majority of the worst cases is of the hectic type, reaching from 100° to 102°, or more at night.

The progress of acute rheumatoid arthritis is interesting, though, as most of the hospital patients after being discharged drift out of sight, their ultimate fate cannot be definitely ascertained. It is certain, however, that under suitable treatment a fair number greatly improve, and maintain their ground for years, eventually dying of some intercurrent malady; whilst others rapidly succumb under the influence of one or more of the many complications so apt to arise in the course of the disease.

The chief complications are endo- and pericarditis, pleurisy with often rapid effusion; and in one case the patient, though in hospital and carefully dieted, had a sharp attack of appendicitis. It is a moot point whether primary endocarditis can occur in acute rheumatoid arthritis, but in many cases there has been distinct evidence of a valvular lesion without any previous history of acute rheumatism.

Peripheral neuritis may here be mentioned as occasionally occurring in the later stages, doubtless due to the extension of the morbid process to the nerve-trunks.

The pathology of this truly terrible malady is still to a very great extent shrouded in mystery. It is held by some, that it is due to a primary lesion of the spinal cord, the joint affection, muscular atrophy, and other trophic anomalies being secondary to it. This theory, however, seems hardly to explain all the symptoms, and in only a very few fatal cases has any definite abnormality been discovered in the central nervous system.

Other writers consider it to be a secondary form of rheumatism;

but it must be admitted that, compared to the acute form of rheumatoid arthritis which we are now discussing, there is very little similarity. Reference has been previously made to the bacteriological view of the malady.

What, then, is the best explanation to account for all the chain of symptoms detailed above? I think there can be no doubt that it is a general disease of the system and not a localised affection of the joints, the various manifestations of the malady being due to the blood dyscrasia. What, however, gives rise to this altered condition of the blood still requires to be discovered.

The pathological anatomy of acute rheumatoid arthritis centres naturally round the most prominent parts affected, namely, the joints. On examining a joint post-mortem, the peri-articular tissues are thickened, and the synovial membrane has lost its shiny character, and has oftentimes developed fringes. The cartilages are eroded, bare bone being in places exposed, whilst here and there signs of commencing proliferation may be seen on their surfaces. The joint cavity sometimes contains fluid of a more or less turbid character. The body generally presents all the signs of wasting disease, there being considerable atrophy of the muscles and but little fat.

The treatment of acute rheumatoid arthritis is not quite so hopeless as one would imagine from the foregoing, though, of course, an absolute cure is out of the question. A great deal, however, can be done by judicious and persevering measures to improve the condition of the sufferer. The surroundings of the patient should in every way be of the best possible kind, residence in a dry climate being an absolute *sine quâ non*. It is important, too, that the patient's clothes should be of some woollen material. The diet should be plain but nourishing, and all rich dishes or sauces must be entirely eschewed. Some stimulant, preferably whisky, may be taken with advantage, especially if it seems to improve digestion.

If there is much elevation of temperature, the patient should, of course, be confined to bed, though it is desirable that he should sit up for a short time daily, as matters improve, to prevent the joints from becoming stiff.

Many drugs have from time to time been brought forward as more or less efficacious in the treatment of acute rheumatoid arthritis, the chief of which are carbonate of guaiacol, salol, salophen, β-naphthol, and benzosol. I think, on the whole, guaiacol carbonate gives the best results, and it may very conveniently be combined with the saccharated carbonate of iron, where much anæmia and debility exists. Cod-liver oil, maltine, and petroleum emulsion are all exceedingly useful when there is much loss of flesh and wasting. Any irregularities of the digestive organs should be attended to, and appetite may be promoted by the administration of some dilute mineral acid along with strychnine.

The local treatment is by no means the least important. Thermal baths, which can be obtained (chiefly in this country) at Bath, Buxton, or Harrogate, or at the numerous continental spas, give great relief to the sufferer, render the joints more supple, and by promoting the action of the skin aid the elimination of the morbid products. The mineral waters may also be taken internally, producing a beneficial flushing action on the system. The adjuncts to all good bathing establishments, namely, hot and cold douches for all parts of the body, aix-massage, vapour baths, and hot-air baths, are all in their turn useful in restoring to the joints some of their lost mobility. Dry massage may with advantage be practised on the day alternate to that on which the bath is taken.

Several medicaments applied locally to the joints have been tried, with a view to relieving pain, and causing, to some extent, the absorption of the adventitious tissues. Passing over the older remedies, such as glycerin and belladonna and iodine, which in their way are useful, we come to two drugs which are worth consideration, namely, guaiacol oil and salicylate of methyl. They are both used diluted with one or more parts of olive-oil, and painted on the skin over the affected joint. Gutta-percha tissue is then applied, and round this a layer of cotton-wool, the whole being held in place by a bandage. Guaiacol certainly relieves pain, reduces temperature, and under its continued application the swelling often diminishes. As a local anodyne, methyl salicylate is undoubtedly superior, though it is questionable whether its results are so far-reaching, as those obtained by the use of the guaiacol.

If the joint is acutely inflamed, a hot dressing of boric acid lotion, frequently applied, is very comforting to the patient.

Aspiration of a joint considerably distended with fluid, pressure being applied afterwards, is sometimes a useful procedure, but extreme care should be taken to perform the operation with the strictest antiseptic precautions, otherwise mischief of a very disastrous kind may be set up.