In the children of neurotic parents to produce the same condition we require similar, if perhaps not quite so severe, influences as those which originally induced the disease in the parents. It is not the disease, but a predisposition to it, that is hereditary; so it is with the neuroses, but in this case the predisposition is much more intense than in the case of many other diseases possessing a hereditary predisposition, for we are here dealing with a much more delicate and unstable organ—the brain.

Such considerations as these should guide us in advising our neurotic patients as regards the schooling, dieting, climatic and social surroundings of their children. Our advice should have as its main object the reducing to a minimum risks of exposure to such influences as we know are likely to unbalance a mind already unstable from hereditary taint. As regards education, it is obviously a mistake to cram a neurotic child's brain either too early or too much. The simplest schooling possible, and this without competitive tests, is all that should be permitted. His food should be of the plainest, and all the luxuries of the table strictly denied him. His life should be, so far as is practicable, an open air one; Clouston advises that such cases should lead the "natural life"; that is, they should throw off all the trammels of civilization and live healthy lives in the open. Such treatment is more effective in developing and strengthening the mental and physical systems than the administration of physic with close confinement, whether it be in the school or in the office.

The last subject to which I shall refer on this occasion is that of the testamentary capacity of cases of mental disease, and of persons suffering from somatic conditions affecting their mental powers. These are subjects usually decided in courts of law, and medical evidence is generally adduced on both sides; it would be a good plan if in these cases the medical witnesses on both sides should have the opportunity offered them to consult together, as was discussed at one of our meetings a few years ago. If this were more frequently done there would be less often seen that humiliating exhibition of medical men swearing differently on the same subject—a laughing-stock of both judges and barristers. Not only may insanity raise doubts as to the validity of a will, but also many nerve diseases, such as lesions of the speech centre. And yet a man may be insane and, at the time he makes his will, know perfectly well what he is doing. In such a case if the court is satisfied the testator knew the value of his property and how he was disposing it, no matter how eccentric he may have been, or how deluded he may be, the will will be declared valid.

Bodily disease, or brain disease, such as paralysis, may so affect the mind as to render the subject incapable of making a will, but in these cases it is for the objectors to prove incapacity before a court of law will upset the wishes of the testator, and therefore much will depend upon the medical evidence one way or another.

In the remissions of mental disease, whether these be of long duration or only ephemeral, a will may be drawn up by a patient which will be upheld by the court; and even in cases of insanity, should the tenor of the will show no indications of the disease from which the testator suffered, it will be declared valid.

The question may arise whether mere eccentricity would affect the validity of a will; legal authorities say that if only eccentricity can be proved, the courts will not interfere; but, then, who is able to decide where eccentricity ends and insanity begins? There is no sharp line of demarcation separating sanity from insanity; we are here on the threshold of mental disease, and in any such case the courts are likely to obtain very little assistance from the medical evidence, for each medical witness is liable to be biased according to the side upon which he is retained; and perhaps his opinions are influenced, unconsciously it may be, by the spirit of contradiction inherent in us all.

In conclusion, these are only a few of the many questions that are liable to arise in the general practitioner's experience, but they prove the close union there is between general practice and the work of the alienist; they prove, likewise, that, however we may specialize in our separate spheres of work, we still belong to that great profession of medicine whose sole aim is to educate the people, relieve suffering, and to prevent disease.

A Clinical Lecture ON RHEUMATOID ARTHRITIS.

BY

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NEXT to cancer one of the most distressing diseases which we have to deal with, especially in institutions devoted to the treatment of patients suffering from so-called "incurable maladies," is the one which for purposes of general description might be styled "arthritis deformans." This term, however, must be clearly understood to denote not a disease but a series of conditions which have the common characteristic that they are associated with changes in the joints and other parts which lead to deformity and crippling. To attempt to deal exhaustively with this subject in the limits of a short address would be an impossible task, and I must content myself by directing attention to the fact that, like the so-called rheumatic diseases, this disorder is becoming more and more capable of differentiation, and its future classification will, if I mistake not, depend less upon clinical features than upon etiological factors.

All of the cases, to whatsoever category they belong, probably result from toxins or infections of one kind or another, sometimes being due in all probability to actual organisms in the blood—such as, for instance, the pneumococcus, which has undoubtedly proved the starting point of the disease in some cases—but more often depending upon the introduction of toxins into the blood from local seats of infection, as I pointed out about nine years ago in a paper published in the Royal Southern Hospital Clinical and Pathological Reports.

In addition to these factors, one has to remember the cases which may be regarded as secondary to such diseases as true rheumatism and gout.

There are two great classes into which cases of arthritis deformans may be primarily placed, depending upon the facts that in one of them the synovial structures and the periarticular tissues are mainly affected, the cartilaginous and bony parts being only secondarily involved, if involved at all; whereas in the second class we have to place quite a distinct series of cases, characterized by an initial disease of the articular cartilages and of the bony structures, the change which takes place being firstly hypertrophic in character but subsequently leading to atrophy and destruction.

The cases which I am going to refer to on this occasion belong mainly to the first class, and they constitute the condition which we know as rheumatoid arthritis, so called because of its resemblance to rheumatism—in fact, in its acute variety it is so often mistaken for acute rheumatism that patients are generally sent into our hospitals as suffering from that disease.

I shall not at once speak about this acute variety, because I wish to direct attention to the chronic variety of the disease which we so commonly come across, and which causes such a lot of trouble among comparatively young people.

The incidence of the disease, it is needless to say, is greatest among females. Out of a series of 150 cases of both sexes recorded by Llewellyn Jones, 24 occurred between 15 and 20 years of age, 37 between 20 and 30, and 24 between 30 and 40 years of age. The cases among males of the same ages being only 1, 6, and 11 respectively.

Although the joint symptoms are the ones which undoubtedly arrest the attention of the patient in the first instance on account of the pain and crippling which they occasion, there is no doubt that the toxin responsible for this disease produces premonitory symptoms which sometimes exist for a long time before the joints are definitely attacked.

These prodromata mainly affect the vasomotor portions of the nervous system, and, as I pointed out in a paper which I read in 1902 at the Liverpool Medical Institution,

the symptoms often exist for a long time before the joints become affected. They consist of certain Raynaud-like phenomena which I then described, and which were at about the same time independently described by my friend, Dr. Llewellyn Jones, of Bath, and are manifested chiefly by the dead, grey-blue looking fingers and numbness of the extremities, which lead up to the periarticular swellings which herald the classic symptoms of the disease. Tinglings and numbness are very common, and shooting pains along the lines of the nerves, and if the case can only be got hold of in this stage I feel convinced that an enormous amount might be done to stay its course, and to prevent the terrible crippling which it brings in its train at a later period. It has to be remembered that these conditions are not *only* connected with rheumatoid arthritis, and it is interesting to note that this disease and gastric ulcer, which are both so common in young women, have each this type of premonitory trouble; in fact, my belief is that gastric ulcer depends upon a Raynaud-like vascular spasm in the vessels of the gastric mucosa and wall, and I have no doubt that it is also due to the absorption of toxins so far similar in their effects to those which give rise to rheumatoid diseases. Another interesting set of symptoms which we must bear in mind are those which were long ago pointed out by Trousseau, namely, muscular spasms which give rise to cramp-like contractions in the hands and feet, and which sometimes show themselves before the joints become much affected, and indeed they continue all through the course of the articular affections and long after they have ceased to be the seat of pain. Like the vasomotor spasms to which I have referred, these cramps tend to be symmetrical; they flex the fingers and toes painfully, and occasionally the calf muscles or even those of the thighs and abdomen. They are evidently very painful, for one has heard patients cry out in agony when they occur. In one case that I remember, the act of micturition started this cramp in the abdominal muscles, and caused severe pain.

Another evidence of the early influence of the poisons of this disease upon the nervous system is to be found in the muscular weakness which so often precedes the joint affection. It need not be constant—indeed, as Spender pointed out, it is often quite transient in its duration, giving rise to the slipping of articles from the fingers, and leading the patients to complain that they have lost the power of performing fine muscular actions with their hands, and that they get very easily tired when they write letters or play the piano. In young girls this latter indication, associated with the others that I have named, is one never to be lost sight of. Only a few weeks ago I came across a case where the child, who had been a brilliant little pianist, lost the power in her wrists in this way, and shortly afterwards began to suffer from rheumatic pains in her hands and feet, symptoms which could not be disregarded in view of what I have told you. These feelings of weakness are sometimes associated with distinct muscular weakness, and some authors have described fibrillary twitchings of the muscles suggestive of the onset of some of the organic diseases associated with atrophic myopathy. In many cases of the disease the joints become affected, so to speak, paroxysmally—that is, a given joint does not become affected and then progress steadily from bad to worse, but it becomes the subject of a series of attacks of inflammation with periarticular swellings, and at last becomes the subject of chronic change. In some cases, however, after an insidious onset, the disease gradually (though not invariably) progresses in a centripetal way, spreading from the smallest joints of the hands to the wrists, elbows, and shoulders, and similarly from the feet upwards, and it is characteristic that the temporo-maxillary articulations and those of the cervical spine are rarely spared.

You are familiar with the spindled-looking swellings of the fingers found in this disease, and how the skin over them looks grey-blue. The joint fluctuates or feels boggy, and in all the joints, both great and small, it depends upon thickening of the synovial membrane *plus* a certain amount of fluid in the joint, but largely also is this due to villous overgrowths in the synovial fringes which are almost universally present, and it is to the presence of these that the creaking sounds so characteristic of the disease are mainly due. Occasionally they become very large and,

getting between the articular surfaces, cause sudden intense pain, with limitation of movement in the knee-joints, followed by an acute attack of synovitis.

I want, while I remember it, to direct your attention to the fact that the early deformity in many cases of rheumatoid arthritis is less due to the arthritic condition than to the extreme muscular irritability which is present. The cramps (as well as the vasomotor phenomena, including sweating of the soles and palms) continue, and if you press back the flexed hands and fingers you will find that they manifest clonic contractions, indicative of the irritable state of the neuro-muscular system. The ulnar flexion is in part due to the same thing, always remembering the stronger pull of the interossei towards the ulnar side.

I need hardly refer to the other phenomena belonging to this disease beyond mentioning that the occasional attacks of pyrexia, accompanied by fresh joint infections, the tachycardia, the more than occasional involvement of the thyroid gland, the mottling of the skin and its pigmentation, and the changes in the teeth and nails, all denote that a general poison is at work, and that we call the trouble by the name we do only because the joint symptoms are the ones which seem predominant, and by their painfulness resemble rheumatism, and lead the patient to think that she has a rheumatic disease.

All of these conditions belong to the disease in its active stage, which may last for years, and after the poison is got rid of the unfortunate patient is left crippled with flexed wrists, all her joints flexed, being no longer swollen but atrophied and even dislocated, and, as I have pointed out elsewhere, the fingers hanging like tassels, but painless and remarkably useful. The skin of the hands is now dry and thin and atrophied, and if evidence of the loss of nervous tone is required we find it in the tendency which now exists to the formation of patches of tissue necrosis, sometimes over seats of pressure, sometimes not, but which, if they once occur, almost invariably lead to death from septic infection.

The ultimate purpose which I have in my mind in this lecture is to speak about some clinical facts which I have unearthed during recent years, and which I venture to think have altered considerably the prognosis in quite a number of cases of rheumatoid arthritis, and there are one or two points in treatment also which may prove interesting. Before proceeding to illustrate these points to you, however, I must shortly say something of the pathological changes which are found in the joints of a well established case, say one which has caused the patient to be bedridden, with flexed and painful joints, and with evidence that the trouble is still progressing. It is not often that we have the opportunity of examining such a joint, because in the vast majority of cases the patients outlive the disease and reach the period of atrophy and deformity to which I have alluded. I have made three or four *post-mortem* examinations of the joints, but mostly at a late stage of the disease, when secondary changes have occurred—such as degeneration of the cartilages with rarefaction of the subjacent bones—but it seems evident that when actively causing crippling it is the synovial membranes and periarticular structures which are mainly thickened and inflamed, the cartilages remaining for the most part intact, and the adhesions which take place have much to do with the fixation and ankylosis of the parts, which is so common a feature of the disease.

I do not, in the present stage of my knowledge of rheumatoid disease, think that there is any one organism associated with it; but I have no reason for altering my conviction, long ago expressed, that the seat of infection is commonly one or another of the mucous surfaces, and we cannot get away from the impression that, being so common in the female and so comparatively rare in the male, attention must be directed to those mucous tracts which are associated with the former sex. We know how occasionally the colon bacillus finds its way into the female bladder and gives rise to very serious symptoms, probably by infecting the urine, and giving rise to a cystitis which is associated with constitutional symptoms. No doubt the infection takes place through the urethra. In cases of rheumatoid disease for some considerable period I have had vaginal swabs taken, not because any symptoms or signs have particularly

directed attention to these parts, because, as in the case of nasal infections provocative of the disease, it is not necessary to have them. A chronic rhinitis with pocketing of the secretions in which the toxins become generated is not necessarily so troublesome as to make the patient think much about it, and so, even with no symptomatic indications, organisms may and do produce toxins in the utero-vaginal passages which are certainly related to the disease. Through the kindness of Dr. Moore Alexander, a considerable number of swabs have now been examined in rheumatoid cases, and the *B. coli* has been found, and the examination of a large number of controls has proved that it is not present normally. In one or two instances staphylococci have been found (a recent case presented a large number of these organisms), but this organism is associated with osteo-arthritis rather than the rheumatoid form.

Now in treating these cases it is obvious that several distinct lines have to be followed. In the first place, the local condition must be attended to by systematic douching and cleansing. Secondly, steps must be taken to favour the elimination of poisons already in the blood; and, thirdly, the local joint trouble must be treated.

In connexion with the second of these essentials one must again refer to an observation which I made a good many years ago, and which is now becoming recognized pretty generally concerning the perverted thyroid secretion which is so often present. Quite a number of the patients get enlarged thyroids, and it is noteworthy that the glands sometimes diminish in size when thyroid substance is given moderately, and that the general symptoms of the disease improve under this remedy. I take it that the enlargement of the gland in these cases is a result of its endeavour, by drawing more blood through itself, so to speak, to supply the tissues with the normal secretion which it fails to produce, and that the giving of thyroid reduces the necessity for its attempts in this direction. There is no doubt that in many cases thyroid extract is of great value, especially in those cases where the patients tend to put on flesh and have no tachycardia. It must be borne in mind that Raynaud-like symptoms and cramps in the extremities are themselves symptoms of athyroidia. Regarding other drugs, I have found most benefit from quinine salicylate with salol. Where the colon bacillus infection is derived from a chronic colitis, in a way presently to be described, one of the most effective remedies is ox gall, given in 10 to 15 grain doses (in cachet) several times daily.

But now about the joints. I have explained how they become fixed by fibrous adhesions and by fibroid thickenings of the synovial and periarticular tissues, and I have not the slightest doubt that fibrolysin is a most valuable remedy which helps to release them and render them flexible, and another most useful application is the oleate of mercury (10 per cent. in oleic acid), having hydrochloride of morphine mixed into it in the proportion of $\frac{1}{2}$ grain to the drachm. I have had a number of cases of rheumatoid diseases in girls and children who have been treated on the lines which I have indicated—cases which have been crippled and bedridden for years, but which have become quite well, and able to take their places as workers and as useful members of society.

There is just one other class of cases to refer to here, namely, those in which a chronic colitis is the local seat of absorption. Recently I had under my care a very intractable case in a girl who had been bedridden for years. Her joints were flexed and fixed, and were progressively getting worse. She had no pathogenic organisms in her genito-urinary mucous tract, but she had a troublesome colitis. After getting her considerably improved in the hospital I sent her to the Mineral Water Hospital in Bath, where Dr. Preston King kindly carried out the Plombières line of treatment (which consists in irrigation of the colon), with the result that she came back able to use her arms and hands freely and to walk fairly well, although unfortunately her feet and ankles have remained rather stiff and painful. I believe that Still's disease in children, which is a rheumatoid disease associated with large spleen and lymphatic glands, is only another variety of the toxic class, and that, sooner or later, the source of infection will be discovered and become capable of being treated. It is possible that it follows upon one of

the mysterious colon bacillus infections which we meet with from time to time in young children, the origin of which is not yet fully understood. Chronic rheumatoid arthritis, as I have said, often follows upon an acute attack, for a description of which I must refer you to my paper in the Royal Southern Hospital Reports for 1902, and to a post-graduate lecture published in the *Lancet* of 1904. It is nearly always regarded as having been a prolonged case of rheumatic fever, and this has given rise to the impression that the disease under consideration is a rheumatic one. It is best to call the antecedent acute disease rheumatoid fever, and its later stage rheumatoid arthritis.

One word about osteo-arthritis, and I have finished. I merely name it in order to differentiate it from the diseases of which we have been speaking. This is the disease in which the cartilage undergoes hyperplasia, then disappears, leaving the eburnated bony surfaces in contact, and in which overgrowth takes place in the bones, giving rise to outgrowths. With rare exception, this disease begins during or after middle life, and a variety of it constitutes the arthritis of advanced age. It certainly occurs in young people, but much more rarely than the rheumatoid arthritis, and I have seen three cases in children, one of them quite recently. An x-ray plate of his hands demonstrated that cartilaginous destruction has taken place. The deformities are more marked in this disease than in the other, owing to the bony outgrowths, and it is in this disease alone that surgical interference is warranted.

CATS AS PLAGUE PREVENTERS.

BY

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It is now about three years and a half since I first endeavoured to show that the best way to prevent plague in India is by keeping cats, and although considerable progress has been made, and many people have now come to realize the advantage of keeping cats, there are still some who hesitate to give the keeping of cats first place in the list of preventive measures. I should like now to reply to some of the objections that have been made regarding the cat; secondly, to consider some of the circumstances which have tended to retard the proper appreciation of the cat; and thirdly, to give some additional evidence in favour of the cat, and particularly to draw attention to the very valuable evidence from Professor Koch, who for some years, quite independently, advocated the employment of cats for preventing plague, and also to the evidence which Dr. Gimlette has supplied from Malay.

OBJECTIONS TO THE CAT.

It has been stated that the Indian cat is not a sufficiently good rat killer to justify the expectation that cats will prevent plague, and here I must admit that there are many ways in which the activities of the cat can be defeated. For example, a lady informed me that although there were two or three cats in her compound (the enclosure in which the bungalow and outhouses stand) still there were several rats. It was found that about fifty old packing cases were stored in one outhouse, and as most of these packing cases contained old books, papers, straw, or rubbish, the rats had made holes in many of them, and so were able to escape from the cats. When these boxes were cleared out and the rubbish was burned we heard no more about rats in that place. Occasionally we found that a person who had a cat in his own house would complain that rats were frequently coming in, but on making inquiries it would be found that there were many servants' houses in which rats were abundant because there were no cats in them. It is particularly desirable that the servants should be made to keep cats. Early last year I made the following experiment: Eight cats and seventeen rats were let loose in a room with glass doors, so that we were able to watch the result. In a few minutes all the rats were killed; one small cat ended up with four dead rats in its mouth, another had three, and another had two. The cats were ordinary