route at this hospital. The technique that follows is that used by the officers mentioned, with the exception that I use my own needle-holder, described in THE LANCET of May 1st, 1909, p. 1248, which ensures complete control of the point of the needle (Fig. 1). I have used this holder, which was made for me by Mr. J. H. Montague of 69, New Bond-street, London, W., for over 1500 venipunctures, and find that it greatly facilitates this little operation, especially in cases where the vein is not large or prominent. I have also added a water-jacket to surround the small irrigator containing the "606" solution, as I found that the small volume of solution cooled too rapidly. The Holborn Surgical Instrument Company have also made me a convenient adjustable stand from which to hang the irrigator (Fig. 2). The apparatus consists of a container surrounded by a hot-water jacket, a rubber tube about 4 feet long which connects the container and the needle-holder, and a stout needle $1\frac{1}{4}$ inches long and of the calibre of a fine exploring needle. About 3 inches from the needle-holder a piece of glass tubing is let in to act as a window. The container, tube, and needle-holder are connected up and sterilised before use. The rate of flow is regulated by altering the height of the container, and a clip is applied to the rubber tube about a foot from the needle-holder.

The patient should be in bed, with the arm selected for the infusion supported on a pillow. Having sterilised in the autoclave a glass measure graduated to 300 c.c., and also a glass stirring rod, 30 c.c. of sterilised distilled water is poured into the measure. The end of the phial containing the salvarsan is now broken off, and the contents are *slowly* shaken into the distilled water, which is briskly stirred. A clear yellow acid solution results. This is made up to a volume of 100 c.c. with sterilised normal saline solution (0.9 per cent.). Sterilised normal sodium solution is now added slowly in the proportion of 0.7 c.c. to each 0.1 gramme of salvarsan—viz., 4.2 c.c. of normal sodium hydrate to the solution containing 0.6 gramme of salvarsan. The sodium hydrate should be added till the yellow precipitate which is first produced is just re-dissolved. A slight excess of alkali, however, is of no matter. More normal saline solution is now added to bring the volume up to 300 c.c. All the solutions employed should be at a temperature of about 100° F., and the glass measure is placed in a basin containing water at a temperature of 110°. The water jacket surrounding the irrigator is also filled with water at a temperature of 110°. The irrigator is now filled with warm saline solution which is run through till all air bubbles have been got rid of. The clip is now applied and the needle-holder put into the sterilised tumbler containing some warm sterile saline solution. The skin over the most prominent vein at the bend of the elbow is sterilised by dabbing it with a saturated solution of iodine in chloroform and a bandage applied firmly round the upper arm in order to distend the vein. The needle having been boiled is now adjusted to the holder and a little saline solution run through. The irrigator is now lowered and the needle plunged into the vein and the clip removed. If the needle is in the vein the blood will run into the tube and be seen at the "window." The bandage is now removed and the irrigator raised and the required quantity of the solution of salvarsan is poured in. The solution should only be allowed to run in *slowly* so as to be well diluted by the blood-stream, and it should take about ten minutes to run in all the solution. 0.6 gramme of salvarsan having been diluted up to 300 c.c., 50 c.c. of the diluted fluid contains 0.1 gramme of salvarsan. 0.5 gramme is the usual dose for a healthy male adult and 0.4 gramme for a woman. About 100 c.c. of normal saline solution should be poured into the irrigator when the salvarsan solution has almost run out, so that the needle may be washed free of salvarsan before being withdrawn. Otherwise some salvarsan may escape along the needle track and produce some local inflammation and possibly phlebitis and thrombosis.

The preparation of the patient is of great importance, as if the infusion is given with a full stomach and high blood pressure an alarming condition of feeble rapid pulse and collapse may supervene, which, however, usually passes off when vomiting occurs. Rigors are not uncommon, and may occur from one to two hours after the infusion. The patient sometimes complains of a throbbing in the head and a metallic taste in the mouth and a sense of fulness in the throat. I prepare the patient by giving a pill the night before and a

brisk saline purge in the morning of the infusion. I permit only a light breakfast with but little fluid, and allow no food or drink for four hours before the infusion. Since I have adopted these precautions I have recorded no alarming symptoms. The temperature generally becomes raised a few hours after the infusion, and although the rise is usually only a slight one of about a degree, occasionally it reaches 103° or even higher. The temperature usually returns to normal in 24 hours; in one or two cases it has lasted for several days.

There seems to be little doubt that the arsenic is almost entirely eliminated in a week, and therefore there can be little danger in giving a second dose even as early as a fortnight after the first. The patient should be kept in bed for at least three days or for 24 hours after the temperature becomes normal.

The practitioner must be on the look out for phlebitis and thrombosis, although this is a very rare sequela, and if it occurs the arm must be kept absolutely at rest. The Wassermann reaction should be determined before the first infusion and a month after the second infusion.

Upper Berkeley-street, W.

"NODULAR" FIBROMYOSITIS, AN EVERY-DAY AFFECTION, AND ITS IDENTITY WITH SO-CALLED CHRONIC MUSCULAR RHEUMATISM.¹

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IN bringing under notice the affection to which I have given the provisional title of "nodular fibromyositis," I cannot lay claim to any particular originality, for this condition has been recognised and the principles of its efficient treatment laid down for upwards of a hundred years, and descriptions have from time to time appeared in the literature. Dr. Balfour in 1816 wrote a very complete one, and at infrequent intervals other authors made contributions to the subject; one of major importance was by Uno Helleday, a Swede, in 1876. Since then it has been systematically studied on the clinical side, its pathology investigated, and its treatment established beyond doubt by a large number of observers. The Scandinavian school has led the way. In Sweden for the last 35 years the condition has occupied the important and prominent place in medical practice which it deserves, and to this fact the incomparably superior training and efficiency of the Scandinavian school of massage undoubtedly owe their origin. The German school has also furnished many investigators in this subject. The English literature, and I believe also the French, is almost barren of any adequate description. In 1904 Dr. R. Stockman of Glasgow wrote an excellent paper in the *Edinburgh Medical Journal*: to his monograph I am under great obligation. So much for a brief historical survey of what I consider to be the most neglected subject in the English literature of to-day.

Although I am specially concerned to describe a nodular or infiltrated condition of the fibro-muscular tissues and the symptoms to which this may give rise, laying special stress on the more marked and severe cases and on the more unusual examples which not infrequently lead to diagnostic errors, yet over and above this I have a very important thesis to maintain. It is this: That chronic muscular rheumatism, or to quote some of its synonyms—rheumatism, muscular and tendinous rheumatism, myalgia, muscular fibrositis, &c.—is a pathological condition, *the essential morbid process of which is an inflammatory exudation into the fibrous tissues in almost any situation in which fibrous tissue is found*. This exudate leads to swelling and thickening of very variable character and degree: it may be slight and impalpable; severe and definitely tumour-forming; acute and transient; chronic, and eventuating in hard fibrous lumps which resist all efforts at dispersal by the ordinary means at our disposal; but under all circumstances it tends to be painful.

¹ A paper read before the Leeds and West Riding Medico-Chirurgical Society on Nov. 25th, 1910.

To consider, first, the *nature* of the exudate which results in these thickenings, indurations, or actual nodules. The most probable view is that it is a *focal inflammatory hyperplasia of the connective tissue*. This focal hyperplasia is the result either of direct microbic action or, more probably, of toxins conveyed by the blood-stream, and clinical observations abundantly support the view that these results can be brought about by more than one toxic condition. The inflammatory foci may be limited in number, even to a single area, or they may be scattered widely through the fibro-muscular structures of the body. To quote Stockman:—

The irritant may give rise to proliferation of the fibrous tissue with serous exudation into the inflamed circumscribed parts, which are tender, painful on pressure, and if large can be easily felt or seen in the muscles and fasciæ and on the sternum or other thinly covered bones. At first they may resolve readily enough, leaving no apparent traces behind, but they tend to return on slight provocation, and if much new fibrous tissue forms in the affected area they become permanent and often increase to a considerable size, or spread out over a large area. The older and more fibrous they become the less tendency they have to disappear spontaneously or on treatment. These indurations assume various forms. Sometimes, especially in the lumbar region or in the fascia lata, large portions of the aponeurosis or subcutaneous fibrous tissue become more or less uniformly thickened, with perhaps more prominent indurations at certain points. In severe cases this gives the skin a hard, inelastic, and brawny feel. More commonly the fibrous indurations are more defined and circumscribed, varying in size from a small shot or split pea to an almond, or even half a walnut. The larger ones may be rounded or flattened, the smaller ones often feel like beaded chains along the fibrous edge of a muscle or aponeurosis. Very frequently the thickening takes the form of a strand or cord running through the fascia or subcutaneous fat. Sometimes they are deeply placed in the intermuscular septa, sometimes quite superficially in the subcutaneous tissue, in which case they may adhere to and often slightly pucker the skin. They can often be felt also as small tender projections on the surface of the ribs and other thinly covered bones.

The more recent or more diffuse exudates give rise, when palpated, to a sensation of lumpiness in an affected muscle, or the whole muscle may be brawny to the touch.

First, as to the term we apply to the local thickening; it may be swelling, induration, or infiltration. All these terms have been used, and only in the more advanced cases is use of the term "nodular" justified. "Induration" is perhaps the best general term and has the advantage of not committing one to a particular pathological view, for the view that an inflammatory fibrous hyperplasia is the underlying lesion has not been universally accepted. Moreover, I do not wish to defend very strongly the term "fibro-myositis," because the condition is probably not really a muscular one at all. "Fibrositis" is a better term. "Myositis" is useful, however, because it directs attention to the frequent involvement of the muscles, even though such involvement be secondary, and, again, because it has been largely used in this connexion, as also the terms "myositides" or "myitides," preferred by the Germans.

My position, therefore, may be summarised thus: all chronic rheumatism is essentially an exudative hyperplasia of fibrous tissue, probably inflammatory in origin, and the clinical characters of which depend upon the amount, persistence, and anatomical situation of such inflammatory exudate. It has a preference for certain fibrous areas, the frequency of ordinary lumbago testifying to this. The varying situation of such inflammatory exudate is well illustrated by the fact that most cases of sciatica are due either to pressure on the nerve by a nodule or to infiltration into its sheath. Many cases of supraorbital neuralgia are similarly explained.

The one almost constant symptom which results from this fibrositis is pain. These infiltrations are painful when they are pressed upon, and if vigorously rubbed they swell up and the pain is greatly increased. To quote Stockman once more:—

Under the action of certain irritants (cold, damp, meteorological changes, muscular exertion, indigestion, and unknown toxins) these indurations are apt to swell and become tender, and then they give rise to stiffness, aching, or acute pain. The local tension probably exerts pressure on the filaments of sensory nerves; hence these symptoms. Sudden movement of muscles, by increasing the tension or by exerting pressure on the swollen tissue, often greatly aggravates the pain or causes it to shoot excruciatingly.

This local pain on pressure is practically the diagnostic feature of these cases. If a patient presents himself with any of the ordinary manifestations of chronic rheumatism, as a lumbago, sciatica, pleurodynia, or a cephalalgia, and I would add (having abundantly confirmed it from my own experience) with any obscure myalgic or neuralgic pain in any part of the body, a careful investigation should be made of the fibro-muscular tissues of the affected areas. In the more recent diffuse cases there is general tenderness of these

tissues, and one may not be able to feel anything which one could definitely assert to be a palpable thickening. But more usually, either with or without such general tenderness, one will find areas which are definitely, often exquisitely, tender to touch. All that is needed is a careful digital exploration of the structures involved, asking the patient to let you know when you are pressing upon a painful spot, though in many cases such a request is far from necessary. It is astonishing how sharply many of the painful areas can be localised, though, of course, this is not always the case.

Having localised the painful areas, the next point is to determine whether they are definitely thickened, either as doughy swellings, strands or septa, or small beads or hard nodules; all variations occur. The detection of indurations is where the sceptics come in, and with a certain measure of justification. The slighter degrees require much practice for their detection, though no one can mistake a really nodular case. Patients sometimes discover their own nodules, and in an extreme case, which I shall presently describe, the patient was the first to draw attention to them as the source of the pain and described them as "glands." But there are two ways of examining a case. To do it properly you must have the patient symmetrically disposed, and the muscles to be explored must be in a state of relaxation. You must carefully and slowly go over the affected areas, using both light and, if necessary, deep pressure (if this can be borne), comparing exactly corresponding areas of the muscles and fibrous tissues on each side of the body. It aids greatly if the skin be smeared with some lubricant, the fingers gliding more easily over the surface. The wrong method is obviously that which means a perfunctory and asymmetrical palpation of the muscles; this prevents one drawing any reliable conclusions.

If the examination is made in the way I have described, after a little practice in detecting the more obscure forms of infiltration one will be surprised at the number of cases yielding positive findings. Two points must not be forgotten. If the exudation is slight, if it is recent, if it is diffuse, or if it is deep-seated and difficult to reach, one cannot expect a positive result. One localises the pain but one cannot convince one's self of the actual thickening. Again, if one finds a painful and thickened area one cannot in most cases swear to it as a thickening without the most careful comparison with the corresponding region on the opposite side, unless, of course, it is particularly well marked and approximately nodular in character.

A few years ago I did not believe in these infiltrations, though their existence was asserted by competent observers. It simply was not in English literature, therefore one disregarded it. But one or two striking cases led me to think that the teaching of other schools might be worthy of investigation. I then began to study a few of the more obvious cases which came in my way. The positive nature of my findings, and the success of treatment based thereon, led me to more and more detailed investigation of these cases, many of which are labelled anything but chronic rheumatism. As a result of the experience which I have now acquired, it is my absolute conviction that this is the real nature of chronic rheumatism, and that all cases form a connected group, whether slight and negative to palpation at the one end of the series, or abounding in nodules of almost gristly hardness at the other. If this be so I think everyone will agree that my sub-title, "an everyday affection," is justified.

Having now, I hope, made the general nature of these cases clear, I can proceed to cite some actual cases, and in doing so I wish to draw attention especially to the following points: (1) the extreme development as to size and hardness of the more severe indurations; (2) the extreme character of the pain that may result from indurations of every kind; and (3) the secondary nervous phenomena, or states of acute or chronic invalidism which may supervene as results of the extreme or persistent pain. It is difficult to realise, short of actual experience, the severity of some of the cases. A further point, and one upon which I wish to lay the greatest possible stress, is the extremely wide range of the painful manifestations, and the serious, yet at the same time avoidable, diagnostic errors for which this is responsible. But really this is strictly deducible from my foregoing description.

I have said that the fibro-muscular apparatus in practically any situation of the body may be affected, in slight or serious degree, in one area or in many. Certain situations are specially favoured. Implication of the tissues of the lumbar

region causes the lumbago familiar to us all, not only in our patients, but more regrettably and not infrequently in our own persons. One nodule is sufficient to cause an extremely painful and persistent lumbago. This is a clinical fact of the greatest importance. The better-known situations of muscular rheumatism I need not enumerate, but some special situations must be mentioned. A very common but much overlooked group of cases is that in which headache is the prominent symptom, the so-called myalgic or indurative headache. This is due to indurations in the retrocollic muscles, which frequently cause a direct or reflex headache, or to indurations in the temporal or other cranial aponeuroses. The abdominal muscles are not infrequently affected; a single nodule in the abdominal area may give rise to either continuous pain or to the most excruciating paroxysms of pain. Such cases have been wrongly diagnosed as gastric ulcer, appendicitis, biliary and renal colic, and a host of other things. Many negative laparotomies undoubtedly owe their undertaking to a failure to recognise chronic rheumatism.

The two points one has to keep in mind are the almost infinite possibilities as to localisation and the variations in the character of the pain owing to the local intensity of the process. In regard to the almost constant symptom of pain I have mainly laid stress up to now upon its local character, occurring with or without pressure, and upon the general stiffness and aching in the affected areas with which you are all familiar, and also with the acute twinges which occur on sudden exertion. But there are two further points which must never be forgotten—the frequency of the radiation of the pain and of its occurrence in paroxysms, such paroxysms being often of the most excruciating and agonising character. These phenomena are probably due to the involvement of nerves and nerve-endings by the indurations, and in really marked and persistent cases a cure is only possible by excision of the offending nodule. As may be expected, pain, from its persistence and its severity, may break down the resisting power of the patient, and many of the so-called chronic neurasthenics owe their myalgic invalidism to this cause. This is no exaggeration. Paroxysmal pain is always liable to be complicated by secondary and reflex phenomena, of which vomiting is a very notable example.

If now this general description be fully comprehended one could almost describe in advance the varieties of case which one would expect to meet. I do not desire to burden this communication with descriptions of many cases or of any at great length, but those which I now quote illustrate very well both the severity and the protean character of the manifestations of this disease. The following is the most severe case that I have so far seen.

CASE 1.—The patient was an unmarried lady, aged 26 years, whom I first saw in consultation with Dr. O. L. Scarborough of Leeds. Very briefly the history is as follows. She was a healthy and vigorous girl when, about four years before the onset of this trouble, she fractured her coccyx, which was removed by Mr. H. Littlewood. She then suffered from severe indigestion and constipation, and some two years later developed suppurative appendicitis, which was successfully operated upon by the same surgeon. Her indigestion was better, but her health was not good; she had much trouble with her teeth, and soon after the operation began to suffer from pain which may be shortly described as a combination of lumbago and sciatica. This increased in severity, being both continuous at times and paroxysmal. Adhesions were suspected, sought for, and not discovered. About 18 months before I saw her she felt in her own back what she described as little lumps or "glands," which were very painful when pressed upon, and from which the pain appeared to take origin. She underwent various treatments—electrical, thermal, and rubbing—at hydro-pathic establishments and at home, but got worse. Some six months previous to my seeing her the pain began to take on the most severe paroxysmal character. She had crises of pain which were agonising to her, and which, it is no exaggeration to say, were almost torturing to the onlooker. She became practically never free from pain, was bed-ridden, almost helpless, and a nervous wreck, with, it is not surprising to record, a considerable train of secondary so-called neurotic phenomena. Her resisting power when I saw her was almost *nil*.

Upon examination I found what had, indeed, been found by her medical man, but which he scarcely thought could account for the extreme severity of the pain—numerous and extensive areas of infiltration in the muscles of the lumbar, gluteal, and sciatic regions. There was no doubt about them. If the pain and the patient would have permitted one could have rolled the more superficial ones beneath one's finger. A large sheet of skin over the right gluteus was markedly infiltrated. One induration at the lower border of the gluteal muscle was so massive and so painful that it had been explored with a needle in the hope of reaching some deep-seated suppuration. I immediately put her under a course of special massage, and later gymnastics; and this treatment, commenced on Sept. 9th, 1910, has at the moment of writing resulted in a progressive improvement, so much so that a helpless bedridden invalid, scarcely able to move, suffering the most excruciating pain, is shortly going abroad.

This result has been accomplished in a period of 11 weeks

despite many difficulties, such as the elimination of necessary morphia, and the correction of the most marked secondary neuroses. A serious degree of secondary lateral curvature had occurred, and the treatment is still going on, and will have to do for many months yet before a final cure is accomplished, but the change in the patient's condition was nothing short of dramatic.

The next case demonstrates the serious degree of chronic invalidism which may result; the trouble had a different localisation, and I was able to achieve a great deal of benefit from treatment.

CASE 2.—The patient was a widow aged 52 years. She had some general dyspepsia and constipation. She had been a myalgic invalid for about six years when I saw her on Jan. 1st, 1910, but for the last two years had been so bad that she had been unable to earn her living and had been intermittently bedridden, and was in a truly miserable condition. She complained of pain of varying character and intensity in and about the left shoulder, and radiating thence. Her history was very clear, however, about the pain and stiffness always starting in this neighbourhood. She had pain elsewhere, in the lower lumbar region and in the gluteal muscles. The pain was always brought on or aggravated by movement. It occurred in attacks which would last perhaps a fortnight and then leave an interval of some weeks reasonably free from pain. The shoulder muscles—that is, the spinati, the deltoid, &c.—contained numerous infiltrations, easily identifiable as they were almost nodular in character; I could demonstrate them to my students with ease. These were extremely painful to pressure. Massage and exercises at once improved her. In a few weeks she left the hospital a different woman and returned to her work, which she has since satisfactorily performed. I wrote to her this week to come up for re-examination and found that her shoulder pain had not returned. We did not treat the lumbar region and she now has some pain there; on examination there were numerous doughy infiltrations of the erector spinae muscles; I have no doubt we shall achieve a permanent cure by treating this area as well.

A further example of the generalised nature of this trouble was furnished by the next case:—

CASE 3.—The patient, aged about 30 years, the son of a medical man, had suffered at frequent intervals since childhood from rheumatic pain, principally in the muscles and fibrous tissues of the back; from time to time exacerbations occurred in which he had myalgias almost everywhere. I saw him first about four years ago, and advised treatment by massage, &c. He was due for foreign service, however, and did not carry out this treatment, because on the West Coast of Africa it was difficult to do so, and the pain, though continuous, was not very severe. I saw him on his return three years later, when his general health was much impaired by malaria, &c. He was then becoming a chronic rheumatic, with serious danger of permanent crippling, and faced with the imminent probability of having to give up the service. His lumbar muscles and aponeuroses presented in abundance the usual painful infiltrations. I put the serious aspect of the case very fully before him and pointed out the necessity for a prolonged course of treatment. Being anxious to have my view confirmed in this particular instance I sent him to Dr. Stockman of Glasgow, who fully concurred with the diagnosis and treatment. Under energetic massage and exercises the patient rapidly improved, but before complete cure could be effected (for the case was a very old-standing one) he returned to foreign service. He had, however, learned the routine of the treatment and promised to have it continued for a considerable time. The amount of improvement in this case far exceeded our expectation in the all too short time at our disposal.

The next case is an excellent example of chronic invalidism brought about by a serious and general infiltrative condition of the abdominal muscles, and to a less extent of the muscles of the back.

CASE 4.—The patient, a woman, aged 36 years, was sent to me by Dr. J. W. Hopkins in June, 1909. She was a chronic dyspeptic. She had suffered from an aggravation of the dyspepsia and epigastric pain for nine months before I saw her; her health was considerably impaired and she had lost much weight. Her medical man feared organic disease of the stomach. On examination I found a good deal of general tenderness in the abdominal wall, but could not identify any definite infiltrative areas. As there was no doubt about the dyspeptic symptoms I thought a trial of treatment on this line was indicated. This was strictly carried out, and though the dyspepsia improved, the pain on the whole increased, and her condition became a miserable one. She was sent to me this week again, and then the explanation of things was abundantly clear. Her pain was caused or aggravated by any movement or strain and was relieved by rest; it was not definitely related to food, and was practically continuous, with neuralgic paroxysms from time to time. All the abdominal muscles and fibrous tissues were tender, and there were numerous areas which were exquisitely sensitive to pressure, and any number of infiltrations and irregularities and small pea-sized nodules could be made out.

I quote this case, not because I am yet able to say what treatment can do, but because it is a typical example of the abdominal type of chronic rheumatism, and one which I feel sure will be quite cleared up by massage if that is persevered with for a sufficient length of time.

The next case is an illustration of one single area of fibrositis giving rise to a diagnosis of cardiac disease.

CASE 5.—The patient was an able-bodied policeman, about 26 years of age, sent to me by Dr. G. W. Middlemiss of Settle. Two years before he had had influenza with severe pain, apparently cardiac. This pain persisted up to the time that I saw him. There had been no cardiac lesion noted at any time, and his medical man had persistently refused to diagnose cardiac mischief, though this had been done by another

medical man and he had been told that he was unfit for his duties as a policeman. I found that the pain could be definitely localised to one tender area, involving the upper attachment of the rectus abdominis to the costal cartilages. This was sharply painful, and pressure on it set up the diffuse pain radiating to the cardiac area of which he had complained all through. I showed him how firm massage should be given, and there being but a single area I felt that massage might in this case be performed at home. This was done. Three weeks later I wrote to his doctor and quote his reply. He says: "I have looked up the policeman and he states that he has not felt so well for two years (i.e., since before his first attack of influenza in November, 1908) as he does now. He started the massage as soon as he returned from seeing you, and to this alone he ascribes the great improvement and diminution of pain, for he has neither taken nor done anything else."

Another striking case of localised pain is the following:—

CASE 6.—A medical man, aged 35 years, had suffered for two or three years from attacks of pain in the upper part of the right chest. This would start as a pain localised approximately in the situation of the second right costal cartilage. It would remain localised for some days and would then become more diffuse, spreading over the front of the chest, causing pain, not particularly severe, with every inspiration. This would last for a few days longer and would gradually disappear, the attacks lasting for about 7 to 14 days. Upon examination this pain could be absolutely localised to a tender spot in the upper border of the second right costal cartilage at its junction with the rib, where there was a slight thickening to be made out. Massage of this area quickly caused it to swell up and become exquisitely tender, but a few days' rubbing effected the dispersal of the swelling and a complete cessation of the pain. So far there has been no recurrence.

The next case is a very good example of the mimicry of appendicitis.

CASE 7.—The patient, an anæmic, delicate lad, aged 13 years, for some years had had recurring abdominal pains with sickness, of uncertain origin. About five months ago he had more or less pain in the neighbourhood of the pubic symphysis and sharp pain throughout micturition. There was tenderness in this area and in the right iliac fossa. By X rays the presence of calculus was eliminated with practical certainty, but a dark shadow suggested that there was possibly a calcareous gland in the right iliac fossa, but entire reliance could not be placed on a single observation of this kind. A few days ago I was asked to see him. His medical man said that his general health had greatly improved, but the attacks of pain had been more severe, more definitely localised to the right iliac and pubic regions, where there was great tenderness on pressure, and he feared a chronic appendicitis and the necessity for an operation. The one puzzling feature, however, was that the pain was felt on pressure over the attachment of the rectus to the symphysis, extending well to the left of the middle line. I found on examination that the pain was entirely superficial—that is to say, in the abdominal wall and localised in and near the right iliac fossa. The lower insertion of the rectus abdominis was markedly tender throughout its length. Muscular and fibrous thickenings could be felt, and here and there was a sharply defined pea-sized nodule at a point of maximum tenderness. The condition extended more than half way up the rectus. Deep pressure in the right iliac fossa, of course, also produced pain by dragging on the tendinous structures attached to the symphysis. This case is too recent to be able to report any result of treatment which has been commenced, but I have no doubt but that we shall cure him in a few weeks.²

I commend this and the other abdominal cases of fibrositis very specially to the notice of the surgeons, and I think one is permitted to wonder whether some cases of "appendix trouble" that eventuate in operation, and in which the appendix, when removed, presents practically a normal appearance, may not be of this nature.

The following case is a very excellent example of a shoulder type:—

CASE 8.—The patient was a woman, about 40 years of age, who was sent to me by Dr. J. O. Ward of Ferrybridge. For over a year she had had very troublesome pain in the shoulder and down the left arm. It had seemed to take its onset in what was described as an attack of bad neuralgia in the eyes, back of the head and back of the neck, and shoulders, following influenza. This undoubtedly was the acute onset of a more diffuse form of the trouble. The pain subsequently settled down to the muscles about the left shoulder. It came on in attacks in which there were both continuous pain and sharp neuralgic pain down the arm. The persistence and paroxysmal character of this had been so severe as to raise the suggestion of some organic nerve trouble. Upon examination very definite areas of tenderness and infiltration of the muscle in elongated bands and septa could be made out in the deltoid, biceps, and spinatus muscles. Eight days after the commencement of special massage there was a striking improvement. For the first few days the pain was, of course, aggravated, then it was greatly relieved, and she was able to use her arm in a way which had not been possible for months. The case, of course, is still under treatment.³

I must content myself with one example out of many of the cephalalgic type of case, which is, I believe, of much more frequent occurrence than is supposed. In this group the indurations occur in the retrocollic muscles, most commonly in the trapezius and sterno-mastoid, and not infrequently in the temporal aponeuroses. They give rise to headache of the most persistent and recurrent character, and unless this condition be remembered in investigating any cases of chronic headache or cephalalgia, I have no hesitation in saying that

many of the cases will be missed and the patient's sufferings pass unrelieved.

CASE 9.—The patient was a man, aged 26 years, sent to me by Dr. Scarborough. For ten years he had suffered from severe periodic headache which was increasing and rendering him unfit for his duties. No definite cause had been discovered and no treatment had been of any avail. The history was very striking, in that the attacks of headache always started by painful stiffness in the retrocollic muscles. This is a very characteristic feature in these cases and is almost diagnostic. The trapezius muscle contained numerous more or less well-defined infiltrations. A few weeks' massage cured him. Some months afterwards he greeted me in a tramcar with the most effusive thanks, saying that I had transformed his existence by freeing him from pain.

One is sorely tempted to go on quoting cases, each of which presents some different and specially interesting feature; but I have confined myself to my own recent experience, to the exclusion of remarkable cases to be found in the literature.

With regard to the causation of chronic rheumatism, the limits of space will not permit me to go into detail. It is convenient, however, to consider the etiology under two different headings: (1) as to the original causes of the local fibrous thickenings and nodules; and (2) the causes of the attacks of muscular or neuralgic rheumatism when once these indurations are established.

Original causes.—By many rheumatism is supposed to be one. That true rheumatism does cause fibrous nodules is familiar to you all, and the remarkable and rapid way in which they disappear is a sufficient answer to those who cavil at the curability of the indurations and nodules of chronic fibrositis. Personally, however, I am unable to accept the view that chronic rheumatism, as ordinarily met with, is a sequel of true original rheumatic fever, or, indeed, that it occurs with any frequency in genuine rheumatic subjects. Influenza is responsible for a certain number of the cases; a fact of clinical importance. Exposure to cold and wet is very frequently responsible. My own feeling is that disturbances of the gastro-intestinal tract, such as oral sepsis, flatulent dyspepsia, chronic constipation, &c., all conditions leading to the production and absorption of toxins, play a somewhat important etiological rôle. Trauma certainly explains some cases, either in the form of frequent slight traumata from over-exertion, as in athletes or labourers, especially when coupled with exposure, or in the form of local injury. This undoubtedly gives rise to the condition, and is a point which is well worth bearing in mind in regard to certain cases occurring under the Workmen's Compensation Act. I quite admit that the majority of the alleged persistent pains and neuralgias which occur in these cases (the painful back and spine being common examples) come very near to deliberate malingering. On the other hand, I am quite certain that some of the cases are genuine examples of the condition we are discussing, and I have been able by suitable treatment to clear up such local pain. An opinion is, perhaps, rather widely held that chronic fibrositic rheumatism is a disease of middle and later life, but this is not so. It is very common in adolescence and in early middle life.

The exciting causes of pain after the indurations have once formed.—These are well known to you all and include various meteorological conditions, cold and damp being most prominent. Violent muscular strain is another frequent cause. Acute indigestion, especially resulting from dietetic indiscretions in which champagne and port frequently play a part, is especially liable to precipitate an attack. Many cases also supervene upon an ordinary tonsillitis or pharyngitis, possibly due to septic absorption from this source.

Treatment.—Many of the cases are of an acute type, with general malaise and widespread myalgia. These frequently clear up but may settle down into a more chronic condition. There may be a slight degree of temperature. General treatment meted out to a feverish attack, with the employment of the ordinary pain-relieving drugs, is generally sufficient to effect a cure. If the pain is at all localised a single thorough application of massage may result in cure in this early stage.

The treatment of the chronic cases.—General treatment.—The removal of any discoverable cause, such as gastro-intestinal irregularities, must be undertaken, and will not only help towards a cure, but will tend to prevent recurrences. During the more acute exacerbations drugs such as sodium salicylate, antipyrin, or pyramidon, and the various means described in the acute attack produce a certain measure of relief, but recurrence is liable to occur indefinitely. To obtain a permanent cure and a complete relief from the recurrent attacks it is absolutely necessary

² Since writing the above I am able to report that the pain entirely cleared up in about two weeks' massage, and has so far not returned.

³ The patient is now perfectly well.

that local treatment should be adopted with a view to obtain a complete dispersal of the indurations.

Local treatment.—There are, of course, palliative forms of local treatment. Counter-irritation by blistering or cauterisation produces relief. Nothing, perhaps, is so efficient as the rubbing in of oil of gaultheria. But these measures are at best temporary; mechanical treatment must be adopted to secure a permanent dispersal. The most important of the forms are massage and systematic exercises. Acupuncture is undoubtedly of great use in relieving the pain, but in my experience does not produce complete dispersal of the infiltrations. Injection of chromic acid into the nodules has its advocates, and is undoubtedly useful, but I think it is a less convenient form of treatment than massage and may be reserved for the more refractory cases. In cases of fibrous nodules which will not yield to simpler measures, and which by implicating or pressing upon nerves cause persistent pain, excision is not only advisable but necessary, the only caution being that the nodule must be very definitely localised beforehand.

Massage.—The form of treatment which for over a century has been almost uniformly given first place is some form of massage, and exercises which are designed to replace massage for inaccessible areas and wide tracts and sheets of fibrous tissue. In recent cases from three to ten days will cause dispersal, in more chronic cases weeks or months may be required, and if the indurations have become too fibrous a cure short of excision cannot be expected. There is scarcely any painful ailment of everyday occurrence in which the results of massage are so striking and gratifying as in the more recent cases, while, on the other hand, the cases of years' standing are liable to prove disappointing. This, of course, merely constitutes a plea for the earlier and wider recognition of the disease. Massage should at first be gentle because it causes the painful areas and infiltrations to swell up and to become still more painful and very acutely sensitive to pressure. The patient must always be warned of this, otherwise discouragement will result. In ordinary cases the painful stage is over in a few days, and during this time the patients are often with advantage confined to bed. After that they should get about as much as possible, for exercise is beneficial and tends to improve the condition. This in itself is a striking gain, for with many physicians the routine treatment of these cases is rest. Rest relieves, it is true, because the tender areas are not pulled upon or pressed, but for the most part the disease takes its own time to clear up and not infrequently fails to do so. By active treatment we not only cure but very materially shorten the duration of the disease. Instead of confining your business man with lumbago or sciatica to bed for longer or shorter periods, you can very quickly have him going about his ordinary affairs while at the same time continuing his treatment.

Just a word as to massage. The drawback is its expense, and I know no way of obviating this. Secondly, it is always desirable to employ *skilled* massage, and herein I must digress a little. Some of my patients, on being advised to have massage, inform me that that has already been tried and found to be useless. On inquiry one feels certain the reason why such massage was useless was that the tender areas were left alone because they were tender, and rubbing was directed quite uselessly to those parts which did not require it. In no instance of this kind which has come under my notice has massage failed to be of benefit when given according to my instructions. General massage is useless. The one thing useful is that the tender and infiltrated areas shall be specially marked out for treatment, and the character and vigour of the massage must be varied to suit the requirements of a particular case. I regret to say so, but I have very little confidence in the majority of English-trained masseurs. England at the present moment is flooded with a host of so-called trained rubbers. A large number of these people when calling on one claim to be certificated for massage and medical gymnastics. I daresay they are, but their certificate is obtained on from three to six months', or less, training. Apart from the fact that this results in an almost complete lack of anatomical knowledge, it does not constitute a training. The course in the Swedish school is a full two years' one, and there special attention is devoted to the very numerous class of cases with which we are dealing. To put a case of this kind under a Swedish

rubber is to hand it over to an expert. The ordinary English masseurs know practically nothing about this condition (though efficient training *can* be got in England), whereas the Scandinavians not only recognise it, but almost without exception, when cases fall into their hands, treat them at once and successfully without any special directions, and often without any definite diagnosis from the medical man. A correct and nice knowledge of anatomy is of great help in securing the best and most rapid results, and that is just what distinguishes well-trained operators from the rabble of rubbers, comparatively unskilled and anatomically uneducated, which floods our own country.

In conclusion, I would ask practitioners to put the statements that I have made to the test of investigation. Most of us, I am sure, are able to recall difficult cases of persistent neuralgia which baffled elucidation and failed to respond to treatment. To say that such cases were all due to chronic rheumatism would be untrue, but a very large number of them probably were. To treat chronic rheumatism as I have suggested is to get results which are as rapid as they are certain, if the cases be taken early enough, with, naturally, much gratification to the patient. With regard to the infiltrations, which in many cases are slight and elusive, I can only say that their existence is genuine and undoubted, and the advice which one would give, both in regard to them and to cases of chronic rheumatism in general, is "Seek, and ye shall find."

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Leeds.

THE INFLUENCE OF CHLOROFORM WHEN REPEATEDLY ADMINISTERED IN SMALL DOSES.

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THE very striking results obtained when administering a single large dose of chloroform and referred to at length in a paper published in 1908 (1)* suggested to the author that a very much smaller dose might have some influence on the tissues of an animal, particularly when the small dose was repeated daily.

Sir James Crichton-Browne in 1907 (2) called attention to the habit in certain districts of taking lozenges and jujubes containing chloroform, and pointed out that samples of the lozenges contained as much as 2.9 per cent. of chloroform. He pointed out that these lozenges are taken in considerable quantity and over long periods, and he expressed the opinion that such repeated doses must be harmful. The repeated administration of small doses of this drug by the stomach to lower animals is therefore of practical as well as of scientific interest.

In the series of experiments undertaken rabbits were used throughout and the chloroform was administered as in the paper referred to above in one of three different ways—either by inhalation, by the mouth, or subcutaneously. The weight of the animal was taken day by day, and after death in many cases the weight of the heart was taken, and also the weight of the spleen. In all cases portions of liver, spleen, kidney, and heart were examined for fat and also stained and examined for degenerative changes. In the first experiments of the series the animals which were injected with CHCl_3 had 0.2 c.c. on two consecutive days, and two days were allowed to elapse before this procedure was repeated. This method proved so rapidly fatal that in the subsequent experiments 0.1 c.c. of CHCl_3 was injected daily. In the cases where the rabbits received the CHCl_3 in the form of an inhalation they were rapidly anaesthetised and then kept lightly anaesthetised for 15 minutes. In the first experiments of this series this was done daily, but as all the

* The parenthetical figures throughout the paper refer to the bibliography at the end.