of pain, and after that free movement is impossible. The pathological basis is very obscure and probably involves a number of different factors. The circulation in the muscles, diminished by cold, is unable to remove the waste products resulting from recent activity. Probably the muscle responds to stimuli by an irregular spasm, and a few of its fibres are torn from their origin. This conception would at least explain the fact that it is almost always at a point of attachment that tenderness is most marked.

Though the sudden onset is strongly suggestive of a traumatic origin there is usually a slight but definite constitutional disturbance, and it seems probable that the trauma would be ineffective in the absence of some error in general metabolism, perhaps due to a low grade of infection. But the local symptoms are so severe as entirely to absorb the patient's attention. A close examination will indeed show that the source of these symptoms is even more narrowly localized than the patient imagines, and that the pain spreads from a very small focus characterized by exquisite tenderness to deep pressure. This focus may be situated anywhere in the lumbar muscles, and in addition to its excessive sensitiveness may be marked by a slight local swelling, with an oedema which pits on pressure.

The precise localization of the focus of pain naturally suggests some local form of treatment, and a large number of methods have been recommended. Radiant heat, dry cupping, heavy massage, the insertion of long needles, and the actual cautery, all have their advocates, but the more lenient methods are tedious, whilst the more drastic are somewhat oriental. It occurred to me that the injection of a local anaesthetic would be a rational method to employ, and could at least do no harm. I was scarcely prepared, however, for the instantaneous cures which I have observed, and still less for their permanence.

The anaesthetic I chose was quinine and urea hydrochloride in 1 per cent. solution, and I selected it because of the length of time, up to several days, for which the anaesthesia may last. I thought at first that the action might be purely mechanical and I tried normal saline solution, but the effect proved to be only transitory. 5 c.cm. of the solution is injected through a long fine needle into the centre of the tender spot; within ten minutes the acute pain has entirely disappeared and the patient can move freely; a sense of stiffness remains, and a curious feature is that the patient may complain of a general malaise. It has seemed to me probable that some constitutional disturbance is a regular feature of the condition, but that it is masked by the severity of the local pain.

The following cases illustrate clearly the method employed and the results.

A lady, aged 45, was suddenly seized with severe pain in the right loin. The pain came in spasms so severe that whilst they lasted the right leg appeared to be paralysed and the possibility of a lesion of the lumbar roots was even considered. She lay in bed unable to move, the slightest attempt at movement provoking an attack of pain. Massage, radiant heat, and moist heat only gave partial and temporary relief. Below the iliac crest and just external to the right sacro-iliac joint was an area about the size of a florin, slightly boggy to pressure, and exquisitely tender. Into this area a hypodermic needle was passed till it reached the bone, and 5 c.cm. of a 1 per cent. solution of quinine and urea hydrochloride was injected. Ten minutes later the patient found that she could move without producing a spasm, and in two hours she could get up and walk. There were no further spasms, and beyond a feeling of stiffness which lasted for ten days she declared herself cured.

A lady, aged 52, passing through London was seized with violent pain in the lower right lumbar region on attempting to rise from bed in the morning. She had had a previous attack of lumbago which confined her to bed for three weeks (under the care of an osteopath who informed her that she had dislocated her sacro-iliac joint!). There was a tender spot just external to the right sacro-iliac joint, and as the case was one of moderate severity I tried the injection of 5 c.cm. of normal saline solution. Marked relief followed, but only lasted a few hours. An injection of quinine was, however, followed by complete relief, and two days later she was able to travel. A month later she wrote to tell me that she had had no further pain and was perfectly well.

It seems to me that a method at once so simple and so safe ought to be generally known and that it must have extensive applications. I have little doubt that it would be equally effective in those similar cases of torticollis and

pleurodynia where a localized tender spot is always a marked feature.

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THE EFFECT OF PARATHYROID ON THE BLOOD SUGAR CURVE AFTER INSULIN.

BY

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WINTER and SMITH have recently reported¹ that when insulin and parathyroid are injected simultaneously into rabbits, convulsions (due to reduction of the amount of sugar in the blood) ensue in a much shorter period and with a much smaller dose of insulin (one-third to one-fourth of the normal dose). I applied these results to the human subject, and found that parathyroid was almost, if not quite, as efficacious when given by mouth, and in the cases reported below this method was used. The procedure in all the cases was the same. The patient was not allowed any food beyond clear soup for five hours before injection. The parathyroid and insulin were administered, and the first blood taken within five minutes, and blood-sugar estimations were carried out hourly from that time to the end of the observation period. No food was given until after the last estimation.

CASE I.

H. S., male, aged 36. Diabetes diagnosed two years ago. He was treated on a modified Allen diet, but was careless, and persistently overstepped it by small amounts. He had got worse of late, and developed marked ketonuria in July, without any alteration of diet.

Twenty units of A.B. insulin given alone. Blood sugar: 0.310, 0.265, 0.227, 0.162, 0.155, 0.187, and 0.234 per cent.

Twenty units of A.B. insulin with four 1/10 grain parathyroid tablets. Blood sugar: 0.329, 0.257, 0.196, 0.141, 0.118, 0.102, 0.136, and 0.169 per cent.

CASE II.

J. A., male, aged 45. First symptoms in February, 1922. Was thirsty, and lost over 2 st. in weight. Was treated on old lines with codeine, and restriction of bread. Improved for a few months, but lost ground again towards the end of the year. Admitted to the infirmary in January, and was given three doses of insulin, and put on to the Allen dietary. Was a bad patient and did not adhere to his diet. Returned again in September, and was treated with insulin.

Twenty units of insulin given alone. Blood sugar: 0.342, 0.292, 0.256, 0.201, 0.216, 0.238, and 0.277 per cent.

Twenty units of insulin with twelve 1/10 grain tablets of parathyroid. Blood sugar: 0.329, 0.236, 0.195, 0.149, 0.125, 0.094, and 0.081 per cent.

CASE III.

H. R., female, aged 55. Chronic case. Had had glycosuria for four and a half years to her knowledge. Had been thirsty occasionally, but main complaint was pruritus. Present weight 13 st.; had been 17 st. The blood sugar curve was definitely diabetic.

Twenty units insulin given alone. Blood sugar: 0.362 per cent., missing, 0.214, 0.156, 0.172, and 0.224 per cent.

Twenty units insulin with ten parathyroid tablets. Blood sugar: 0.339, 0.246, 0.182, 0.125, 0.107, 0.091, 0.088, and 0.122 per cent.

CASE IV.

L. S., male, aged 23. In January this year he showed typical symptoms. He was treated by a modification of the Allen diet, and improved greatly. In July he felt worse again, and it was found that his tolerance had dropped from 95 grams carbohydrate to 60. He was readmitted, and given insulin, with marked benefit and slight increase in weight. Unfortunately, being worried about the necessary expense, he dropped the insulin, and became worse again.

Fifteen units insulin given alone. Blood sugar: 0.284, 0.243, 0.216, 0.153, 0.167, and 0.202 per cent.

Fifteen units insulin with six parathyroid tablets. Blood sugar: 0.322, 0.246, 0.191, 0.153, 0.124, 0.104, 0.118, and 0.143 per cent.

CASE V.

M. M. W., female, aged 26. Diabetes was diagnosed at Christmas, 1922, but she had symptoms for a considerable time previously. Refused to come into hospital until quite recently, and had had practically no treatment hitherto.

Fifteen units insulin given alone. Blood sugar: 0.410, 0.326, 0.229, 0.277, 0.229, 0.242, and 0.283 per cent.

Fifteen units insulin with ten tablets of parathyroid. Blood sugar: 0.356, 0.288, 0.231, 0.177, 0.143, 0.119, and 0.106 per cent., and after a four hours' interval, during which she was given 20 grams of carbohydrate, 0.259 per cent.

From the above cases it is evident that parathyroid extract exerts a very definite action on the blood-sugar curve after exhibition of insulin. Whether this will be of any importance as regards treatment is not yet clear. Parathyroid alone does not appear to have any action on the blood sugar; such changes as have been noticed could easily be explained as the result of starvation.

Further investigations are in progress to ascertain the therapeutic possibilities of the combination.

I am indebted to Professor W. E. Hume for Case ii.

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British Medical Association.

PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, 1923.

SECTION OF NAVAL AND MILITARY HYGIENE.

Surgeon Rear-Admiral Sir PERCY WILLIAM BASSETT-SMITH, K.C.B., C.M.G., F.R.C.S., R.N.(ret.), President.

RECENT CHANGES IN FRACTURE TREATMENT.

BY

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(With Special Plate.)

I HOPE you will forgive me if I say at the outset that this extremely important branch of orthopaedic surgery has never, in my opinion, received adequate attention in our medical schools. The unsatisfactory results of the treatment of fractures which consequently occurred in practice once prompted a celebrated surgeon to declare to his class: "Bones are not filled with marrow, but with base ingratitude."

When I was a student I remember the late Professor Chiene of Edinburgh advising us, in one of his lectures, to pass along our fractures to rivals practising on the opposite side of the street. In this sadly humorous manner our distinguished teachers warned us, at the earliest possible moment, that fractures would often prove difficult matters to deal with, and that, even in their skilful hands, the results were not always satisfactory. They were, of course, speaking of the treatment of fractures on what we now call "the old lines."

The very commencement of the twentieth century, however, marked an epoch in the history of fractures, for Professor Roentgen's discovery of x rays in 1895 and its application to the study we are now discussing wrought a wonderful change in our methods of treatment. X rays enable the surgeon to see the actual condition of the fractured bone, and the radiograph is to the orthopaedic surgeon what the ophthalmoscope is to the ophthalmologist and the cystoscope to the urologist. By its correct application he gains information as to the true state of affairs in the condition with which he is dealing, analogous, in diagnostic value, to the exploratory laparotomy of the abdominal surgeon. Still more recently the experiences of the war subjected the accepted modes of treatment to a supremely severe test, exposed their weaknesses, and forced us to evolve new methods as well as improve the old.

Surgical specialists, and others who have taken a special interest in fractures, work under ideal conditions for obtaining the best results, for the former—by holding hospital appointments—and the latter—by private enterprise—are in possession of the essential first-class x-ray equipment and a sufficiently varied selection of splints to assist them. To these the remarks I am about to make do not apply. They chiefly concern the practitioner who

is not conveniently near an up-to-date x-ray apparatus and who lacks a free choice of splints.

Without good x-ray plates or films, however, it is impossible to be sure of obtaining the best results, because a great variety of pathological details may be learnt from a careful study of them, for instance:

1. The presence of a fracture.
2. Its variety and the position of the fragments.
3. A coexisting dislocation of or other injury to a joint.
4. The presence and situation of gas gangrene and of air in the soft parts.
5. The formation and character of callus and the solidity or otherwise of new bone formed.

The condition should be studied from the original films or plates and, preferably, when dry. In a print most of the minute details will be less apparent. The surgeon in charge of the case should himself examine the plates first and diagnose the pathological conditions existing. He may then consult an expert radiologist and see how far their readings coincide. The surgeon who first reads the radiographer's report and then studies the photograph is less likely to acquire the power to perceive accurately the details of abnormalities present.

I would like to say a few words about the method of taking x-ray photographs.

1. Antero-posterior and lateral views should always be taken whenever possible, and stereoscopic pictures should only be relied upon in those situations which are inaccessible from two planes—for example, where the limbs join the trunk.

2. If a fractured limb be properly splinted, either externally by the approved method, or internally by plating, it can be x-rayed without the slightest alteration taking place in the position of the fragments. If the proceeding causes the patient any pain it is evidence of inefficient splinting.

3. In operation cases no more dressing than is consistent with aseptic safety should be in the neighbourhood of the injury at the time it is photographed, as the more material the rays have to penetrate the less clear the detail of the picture will be. On this account the sectional dressings are very suitable as, by their use, a minimal amount of dressing is placed between the limb and the supporting flannel bands.

4. When the limb is x-rayed it is also advisable to replace the metal clips which secure the supporting flannel bands by sterile safety-pins, otherwise the shadow thrown by the clips in the lateral view may obscure important features of the picture.

5. By noting the positions of these safety-pins and by placing some parallel to and others at right angles to the side bars of the splint it is possible to localize on the surface of the limb the position of the particular displacement, foreign body, or fragment of bone, information which will help considerably in deciding how to deal with it.

6. Whenever possible the photograph should include a view of one or more standard bony features, such as the trochanters, patella, etc.

7. The most convenient and economical size of photographic plate for the long bones of the lower limb is one measuring 15 by 7½ inches.

8. In the early stages of the treatment of a fractured limb it is essential to have a mobile x-ray plant which is capable of taking photographs with the patient in his bed and without interfering in any way with the extensions.

If such a mobile plant were available, and placed at the service of any practitioner who required it, in my opinion it would be a great advantage to the patient and profession.

THOMAS'S SPLINT.

Of all the forms of fracture-treatment apparatus which were called upon to stand the supreme test of the great war, it is the universal opinion of the surgeons who went through that ordeal that Thomas's splint alone fulfilled all requirements. In the earlier stages there were many of our profession who had no recollection of ever having seen a Thomas's splint used in the treatment of a fracture, although, it should be noted, these did not include any who had studied under the teaching of Sir Robert Jones.

Professors of surgery to-day cannot say enough in praise of the incomparable advantages of Thomas's splint over