

## CHAPTER XIV

### IMMOBILITY AFTER JOINT INJURY

MANY men who have had accidents at or in the neighbourhood of a joint draw sick-allowances from industrial clubs and insurance companies long after all inflammation has subsided, and when there is no apparent reason why pain should be complained of. The suspicion of malingering not unnaturally arises in the mind of those who have to pay, and a medical opinion is sought where it is assumed there is a *prima facie* case of fraud. The vast majority of these cases are, however, not fraudulent, but are the result either of mismanagement by those in charge of the case, or of the patient having adopted his own methods of treatment.

**Obsolete Methods.**—At one time it was almost the universal practice of the medical profession to keep joints fixed for many weeks after the reduction of a dislocation, and to allow splints to remain on fractured limbs until the muscles had wasted and strong fibrous bands had fixed the adjacent joints. This bad practice is still common. Large numbers of these cases subsequently apply to bonesetters, and many are cured.

**The Bonesetter.**—It is scarcely fair to blame the public if, not having obtained relief from regular practitioners, it deliberately takes the small risk of having adhesions broken down, and resorts to irregular practitioners for this purpose. They occasionally come across unreduced dislocations, but since the discovery of X-ray photography their number must be few. Perhaps more frequently bonesetters replace dislocated semilunar cartilages where regular practitioners have failed.

Many believe that the bonesetter lives by fraud and chicanery, that every joint he is asked to treat is “out,” that he gives a mysterious twist and turn of the limb, surreptitiously cracks

his fingers in the neighbourhood of a joint, and, heigh presto ! an unreduced dislocation is cured. Now, in most cases the patient is cured, but not by the reduction of a dislocation. The swift, accurate, and definite movements are those which experience has taught the bonesetter break down the fibrous bands which always form round joints which have become stiff for want of passive movements.

Many bonesetters administer an anæsthetic daily for a few days after the initial operation, to overcome the muscular resistance. People who go to bonesetters do not mind the risk and the expense; but a second anæsthetic is quite unnecessary, for carefully regulated exercises, although a little painful at first, are all that are required to complete the cure. I have seen a large number of joints both in civil and military practice, some of them temporarily and many permanently disabled because the surgeon in charge has failed to recognize that immobilization of a joint is inevitably followed by adhesions. It is not sufficiently recognized that the longer adhesions are allowed to remain, the greater is the risk of permanently impaired function. This is especially common where a shoulder-joint has been dislocated, or where a knee-joint has been the subject of a mild form of traumatic synovitis.

**Adhesions.**—Adhesions sometimes take place at a joint which has been fixed so short a time as three weeks. They may bind together the articular surfaces and the folds of the synovial membrane in the joint, or they may be entirely outside the joint. The surrounding tendons may become adherent to their sheaths as the result of tenosynovitis.

Adhesions form in the shoulder-joint in the capsular ligament, over the bicipital groove—where an adventitious band is sometimes found in connection with the sheath of the long head of the biceps—and over the deltoid bursa; at the elbow-joint from the tip of the internal condyle of the humerus, corresponding to the fan-shaped internal lateral ligament. At the knee the bands adhere to the internal semilunar fibro-cartilage and the internal lateral ligament.

When estimating the mobility of the shoulder-joint, the scapula should always be fixed. After adhesions in the shoulder-joint have been broken down, the arm must on no account be put in a sling.

I find a very good method of inducing patients to extend the shoulder-joint is to place them face forwards against a closed door, with the hands against the door. They are instructed to make both hands gradually creep up by the support of the door until the hands are well above the head. The gradual, slow, and comparatively painless upward gliding of the hands always produces a fascination in reaching a higher point, which has generally a very happy result. This movement is much more easily performed than raising the hands apart from the support of the door, for the strain on the deltoids is not so severe, and the upper extremity is raised partially by the assistance of the muscles of the forearm.

The after-treatment of accident cases for which the State, an insurance company, or an employer, is responsible is always difficult to carry out. Amongst a certain class of employees there is a feeling of resentment against the employer, especially if, as sometimes happens, the injury is the result of want of proper care on the part of the employer, as, for instance, where a faulty rung of a ladder has been discovered to have been the cause of the accident. The patient, perhaps not unnaturally, thinks that it is his business to see that, now that the initial suffering is past, he shall not be submitted to any further pain or inconvenience of any sort, and that if he does not fully recover his master must take the consequences. Apart from this short-sighted policy, it should not be forgotten that many of these people have already suffered much both physically and mentally as the result of their accident, and that the responsibility for the necessity of an operation for breaking down adhesions is not that of the master, the patient, or the insurance company, but comes a good deal nearer home than many members of our profession care to admit, even to themselves.

Attempts are sometimes made to break down adhesions under nitrous oxide gas, but with it complete muscular relaxation cannot be obtained, and the results are unsatisfactory. I never advise men of the working-class who are suffering from adhesions in or round a joint to submit to treatment in the out-patient department of a hospital. For although the operation itself is comparatively trivial, and it would appear at first sight to be one eminently suited for the out-patient ward,

experience shows that subsequent to the operation the daily forced passive movements upon which success or failure depends cannot be secured in this way. The only satisfactory treatment for these cases is to obtain admission to a hospital; fortunately, only a few days' stay is necessary.

The way not to succeed in a case of this sort is to send such a case to the out-patient department of a hospital, to have nitrous oxide gas administered sufficiently deep for a dental extraction, to have the limb bent as far as the opposing muscles will permit, and then to instruct the patient to attend as an out-patient at intervals, to be massaged by a nurse two or three times a week. The anæsthesia is not sufficient, the operation cannot be complete, the patient may or may not attend for the massage, and in any case it will be useless, for the patient will assuredly not undergo any passive movements which are in the least painful at the hands of anyone except a surgeon.

Romer, who has made a special study of this subject, points out that when adhesions have to be broken down an anæsthetic should always be given, not so much for the purpose of avoiding pain as of insuring the complete relaxation of the muscles; otherwise the muscles which will be involuntarily brought into action may be injured by the force necessary to break down the adhesions. He points out that sufficient muscular relaxation cannot be obtained by nitrous oxide gas, and that it should never be relied on. The elder Hutton, the bonesetter, necessarily performed his operations without an anæsthetic, and he overcame the resistance of the muscles by rotating the limb on its own axis for a considerable time. The rationale of this movement seems to be that by throwing the muscles out of their ordinary lines of action they are for the time rendered powerless. I learn that there is now no difficulty placed in the way of a bonesetter who wishes to administer an anæsthetic, provided he does not mind risking a charge of action for manslaughter.

When adhesions give way there is no mistaking the result of forcible movement; the loud crack or the less highly pitched crunch, or it may be merely a tearing sound, indicates to some extent, to those who have much experience, the duration of the adhesions. Pain which follows the operation is insigni-

ficant, and seldom lasts more than an hour. The important point is that, unless the medical man who undertakes this comparatively simple operation is prepared to carry out the *after-treatment* on scientific lines it is infinitely better for his patient and himself not to undertake it. Prior to the necessary passive movements of the joint, which should be commenced within a few hours of the operation, it should be skilfully massaged. It must never be bandaged, and to apply a splint is folly. If the joint is not manipulated within twenty-four hours, the ruptured adhesions will reunite.

If the injury to a joint was merely such that fibrous bands formed, the damage done could in most cases be comparatively easily repaired by breaking down the adhesions. But prolonged immobility of a joint necessarily entails muscular wasting, which is the result partly of disuse and partly of nervous reflex action set up by the original injury to the joint.

To restore the muscular wasting special simple exercises are always most useful. The ordinary physical exercises of the gymnasium instructor, so useful in health, are not suited for these cases. The anterior, middle, and posterior fasciculi of the deltoid, for instance, move the humerus in different directions, and it is obvious that, if a few of the anterior fibres are lacerated, the exercises useful for the development of all the muscles of the upper extremity, such as dumb-bells, etc., cannot be the most appropriate. Dr. Wharton Hood points out that any movement which causes pain will not only be avoided, but whenever circumstances call for any approach to it, the stronger portions of the muscle will be thrown "on guard" to protect the weaker parts from going into action. Thus the exercise will fail. The secret of success in all these cases is to give the muscle very light work at first; for instance, in the case of the upper extremity the gradual lifting of a weight of at first not more than 2 pounds, by means of a handle, rope, and pulley, is more effective than forcible but indiscriminate movements. The weakened portion is coaxed, as it were, to take part in a light movement, whilst it would rebel against even attempting to lift a heavy weight. The size of the weight should be gradually increased.

The author whose views I have just referred to observes that a few days of such treatment "will generally suffice to bring

the specially weakened portions of a muscle into line with the remainder, and to get rid of any pain which the earlier efforts may have caused. When this has been accomplished, the muscle may be exercised more freely, and as a whole, and the weights employed may be increased. All that is necessary in the first instance is so to arrange the exercises as to furnish a movement in which the weakest part of the affected muscle must take its share, and to do this in such a manner that the movement in question is started, and in its course is facilitated, by the descent of the weight which the opposite action has drawn up."

## CHAPTER XV

### MUSCULAR ATROPHY AFTER INJURY

**Muscular Atrophy.**—Paralysis of some part of the body is a symptom often complained of by malingerers. As a rule the alleged paralysis is limited to one limb or portion of a limb, and it is rare to find an extensive lesion, such as a hemiplegia or a paraplegia, simulated. A recent writer tells an amusing story of a suspected malingerer, who said he had lost the use of his limbs.

“It was in the days before electrical apparatus was up to its present efficiency, and electrical testing of muscles was in its infancy. The man alleged loss of power of both legs, the condition having lasted for about two years. He was brought to the infirmary in an ambulance, and was detained in one of the medical wards for diagnosis and treatment. He was suspected of malingering by the physician in charge, and was sent on a trolley to the Electrical Department to have his muscles tested and treated if necessary.

“By accident, and on account of the less efficient apparatus available at that time, a huge electric spark passed between the man and an electrical machine which he was lying near. He jumped off the trolley, and his heels were last seen in the vicinity of the infirmary gate.”

The usual history is that, after an injury to the shoulder or some other joint, the patient is “paralysed” in the limb affected. He uses the word “paralysis” in a loose sense, for it is very rarely indeed that he alleges total inability to move the limb. What he really means is that he has not the full power in it that he should have. Signs of organic disease should be carefully sought for. These are, of course, the well-known cardinal symptoms: loss of power, wasting and flabbiness of the muscles, blueness, decreased temperature, vasomotor changes, reaction of degeneration, and secondary contractions.

Pretended muscular weakness of an indefinite character, with loss of sensation and the presence of pain, is a very

common combination of symptoms complained of by a malingerer. Fortunately, not even the most artful can seriously interfere with the normal reflexes. The muscles complained of may waste from disease or disuse, but no one has control over the electrical reactions of muscle tissue.

It should be remembered that genuine immobility of a joint is always followed by change in the corresponding muscles. In slight cases this may amount only to flabbiness, but in prolonged cases there will be more or less actual wasting of the muscles.

Speaking generally, the nerve filaments distributed to articulations come from the larger nerve trunks in the neighbourhood, which supply the muscles clothing the joint; and the trophic changes which take place in the muscles have a direct ratio to the changes going on in the joint.

Where the movements at a joint are limited, the exact nature—i.e., whether the limitation is of flexion or extension—should be stated, and the amount of limitation, expressed as a percentage of the normal, should also always be indicated. If possible, an opinion should be expressed as to whether the limitation of movement is due to adhesions of bones or other permanent deformity. If there are adhesions, an opinion should be given as to whether they are soft or dense.

Care must be taken that pathological wasting is not too readily assumed because of difference in measurements between opposite limbs. It is fairly common to find cases of marked congenital asymmetry, for a description of which see pp. 337 to 344.

A certain amount of wasting and flabbiness will follow if a limb is deliberately unused for any length of time. In the absence of these symptoms, we should next endeavour to find out whether or not there is genuine lack of power, and one of the first things to do is to try and determine whether the limb is being used or not. Various methods of testing this are detailed in the two following chapters on the examination of the extremities.

A great part of the treatment received by working-men at the out-patient departments of our large London hospitals consists merely of the dressing of a wound by a student or nurse. I have known of cases where, upon my suggesting that massage would restore an atrophied muscle, I have been

told that the patient *is* being massaged at such-and-such a hospital; but upon inquiry I have found that the so-called massage consists of a certain amount of rubbing for ten minutes once, or it may be twice, a week! Such treatment naturally fails, partly because the massage itself is inadequate, but still more because the right kind of suggestion is lacking.

Wasting and incapacity the result of rupture of the fasciculi of a muscle, besides being proportionate to the number of fibres torn, depends largely upon which muscle, and what part of it, is involved. For instance, even an extensive injury of the triceps would probably wholly recover in about six weeks, but a rupture of the muscular attachment of the deltoid is likely to last a considerably longer period.

Muscular wasting may be due to disuse; this is frequently seen as the result of neuritis, or it may be due to the fact that a joint has been temporarily fixed as the result of an injury. Wasting from *disuse only* of the limbs follows lesions of the upper neuron, as, for instance, hemiplegia. In lesions of the lower neuron, wasting is always a prominent feature—*e.g.*, acute anterior poliomyelitis. Certain poisons, such as alcohol and arsenic, may produce peripheral neuritis, and consequently muscular wasting.

The possibility of muscular wasting being due to idiopathic muscular atrophy should not be lost sight of.

Lastly, muscles are sometimes congenitally absent; recently, whilst examining a batch of 130 soldiers, I found one had unilateral absence of the deltoid, and another complete absence of the gluteus maximus.

## CHAPTER XVI

### EXAMINATION OF THE UPPER EXTREMITY

#### **Alleged Loss of Muscular Power in Shoulder and Arm.—**

Considering the importance of the upper limb in the daily life of the industrial members of the community, and the frequency of complaints relating to the shoulder, arm, and hand, the subject has been dealt with at some length in this chapter. Hints are given as to the detection of fraud in cases of alleged injury to the shoulder and arm; the various conditions which injury to the digits may give rise to being subsequently dealt with.

When a claimant alleges that, as the result of injury, he has loss of power in his shoulder, arm, or hand, disproportionate in degree to the physical signs present, the following experiment is useful in determining his *bona fides*, and the true extent of the incapacity.

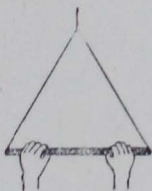


FIG. 15.

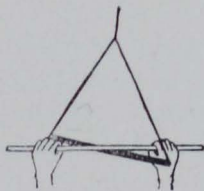


FIG. 16.

The patient is induced to hang by both arms on to a small trapeze attached to the ceiling of the examiner's consulting-room. He is then gently raised off his feet by means of a small block and tackle attached to the trapeze, and encouraged to suspend himself for as long a period as he will, holding on by both hands (see Fig. 15).

In case it should be contended that he really hangs to the trapeze chiefly by the strength of the uninjured limb, a cross-bar

is placed loosely through the triangle of the trapeze (Fig. 16), and he is then instructed to hold on to the cross-bar, and is once more lifted off his feet by the block and tackle. If care has been taken that the hands are equidistant from the trapeze bar, it is obvious that he must be using equal strength with both hands, for were he not doing so the cross-bar would at once slip sideways through the triangle as soon as he is raised off the ground, instead of which, in the majority of cases, it retains its position.

The patient is then weighed, and a note taken of the fact that he is able to *suspend* half his weight with the injured limb.

Frequently patients, when suspended by the trapeze, may in addition be induced to raise themselves by their arms so that their chins are brought to a level with the bar of the trapeze.

Many dishonest people think that in medico-legal examinations they must oppose *everything*, and not infrequently they oppose the forced straightening of the fingers, thus demonstrating the power of the flexors of the forearm.

In examining the biceps and brachialis anticus, the patient may be asked to bend his elbow and to resist the straightening of it.

For the deltoids he is asked to lift his arms to a right angle to his body, and to resist the examiner's forcibly pressing his arms down.

Another useful method is to lift the arms at right angles to the body in a horizontal position, and then suddenly to withdraw all support. If one arm were really incapable of being raised, as is so often alleged, it would drop limply to the side when the support is removed. Often, however, what happens is that it remains in position for a second or two, and then, as the patient becomes aware of the trick that is being played on him, it is gradually allowed to fall to the side. The movements of the two arms under these conditions should, of course, be carefully compared.

Sometimes, when an examinee says that he cannot raise his arms because of alleged paralysis of the deltoid and other shoulder muscles, if the upper extremity is placed by the examiner in a horizontal position, and the patient be sympathetically exhorted to be very careful how the arm is allowed

to fall to the side, not infrequently he will slowly and gradually let the limb down, showing that the muscles are still capable of exercising their functions.

A shoulder-joint which is the subject of a severe and chronic arthritis invariably shows first a flabbiness, and then an atrophy of the deltoid and other muscles.

Patients sometimes allege that they cannot raise the arm above a certain height. This height should be carefully noted, and the patient repeatedly asked at intervals during the examination to show again and again to what height he can raise it. If he is a malingerer, not infrequently the height will be found to vary. Sometimes, when the attention is diverted, the patient allows free manipulation of the arm. My favourite device is to ask whether proper notice of the accident was given, a point on which patients lay enormous stress, although it does not really concern the examiner.

Meantime, it is a good plan to watch the facial expression when a joint which is alleged to be painful is being moved, and this can be done quite unobtrusively by placing the patient in front of a mirror and examining the joint from behind.

The following experiment also is useful in the case of a patient who alleges that he cannot raise his arm above his head on account of injury. He is asked to stand with his hands resting lightly on the back of a chair, and his attention is diverted from the injury. On the pretext of examining his back, the medical examiner induces him gradually to step backwards away from the chair, thus lowering his shoulders and extending his arms until, from the hips upwards, he is practically in a horizontal position. It will be seen that his hands are now actually high above his head, although he does not recognize this, because he is in a horizontal instead of a vertical position. Sometimes at this stage he may, forgetting his alleged shoulder trouble, freely admit that the position is a painless one. Allowance must be made for the support afforded by the chair in considering the question of *weakness* of the shoulder muscles.

An alien who met with an injury to his shoulder stated that he could not raise his arm from his body more than a certain height, and this he demonstrated by raising it to no more than a right angle. It seems almost incredible that,

upon my suddenly asking him how high he could raise it before the accident, he shot it high above his head!

C. G. complained of one thing only, and that was inability to raise his arm above a right angle. He had fractured his clavicle some four months previously. When asked to take off his vest, which was very tight, in his struggles he raised both arms high above his head, without noticing that he was doing so, and without complaint. The attention of his medical attendant, who was present, was drawn to this. The doctor seemed much impressed by this silent confirmation of my contention that no real disability existed.

Sir Hector Cameron tells the tale of an easily won victory in a difficult shoulder case:

F. C.—In the Scottish Courts a witness is always sworn by the Judge himself. The ceremony is more imposing than in the English Courts; the Judge stands, and with uplifted right hand orders the witness to do the same, and to repeat the oath, sentence by sentence, after him. Not very long ago a witness from the country, who alleged his complete inability to raise his right arm higher than a right angle, sued a wealthy railway company for damages. The case was tried in the High Court in Edinburgh; the plaintiff was the first witness, and the President of the Court, bedecked with the brilliant robes of his office, suddenly arose and, addressing the plaintiff, ordered him in somewhat stentorian tones to hold up his right hand, and to repeat after him the words, "I swear by Almighty God, as I shall answer to God in the great day of judgment," etc. The scene was so imposing that it brought about a condition that many doctors had failed to effect, for the plaintiff, forgetting his disability, shot his arm high above his head, and repeated the oath as requested. And so the case had an unexpected and happy ending.

A puzzling condition of the shoulder-joint is sometimes found where a claim is being made by a workman for damages on account of injury received whilst on duty. The condition is somewhat rare, but I have been fortunate enough to have seen several cases.

The symptoms complained of are pain at the shoulder-joint, freedom from painful movement when the arm is abducted to a right angle with the body, but alleged complete inability to raise it to a higher level, because of pain extending down the arm, sometimes ending in the middle of the arm in the neighbourhood of the insertion of the deltoid muscle. As a rule there is no wasting of the deltoid or any of the muscles which clothe the shoulder. When the palm of one hand is placed over the shoulder-joint, and the arm moved with the

other hand, a peculiar coarse grating may be felt on the palm of the examining hand; indeed, even a peculiar clicking sound may sometimes be heard.

For many years I thought this was produced by a dislocation from the bicipital groove of the long head of the biceps, but I believe that this is not the real explanation, and that it is caused by a thickening, or possibly a subacute inflammation, of the large bursa which is situated beneath the deltoid muscle. The circumflex nerve arises from the posterior cord of the brachial plexus. It supplies, besides many other structures, the subdeltoid bursa, and gives off an upper or anterior branch which pierces the deltoid muscle, supplying the skin over the insertion of that muscle in the middle of the external surface of the humerus.

This, therefore, accounts for the pain being referred, as it so often is, in the condition above described, to the front and outer side of the arm near the insertion of the muscle.

Hilton pointed out that "the same trunks of nerves whose branches supply groups of muscles moving a joint furnish also a distribution of nerves to the skin over the insertions of the same muscles, and the interior of the joint receives its nerves from the same source."

The circumflex nerve may therefore, through its distribution to the bursa above referred to, set up a reflex pain in its cutaneous branches, as the result of an inflammation within the joint itself or at the surgical neck.

I believe the condition produces at times inconvenience, and sometimes pain; but its significance is exaggerated by the patient on account of his hearing the rough, grinding sound of the movement of the joint, for he not unnaturally comes to the conclusion that there is something seriously wrong with his shoulder-joint.

An accident which is comparatively rare in general practice closely resembles in its symptoms the condition above described: I refer to the dislocation from its groove of the long head of the biceps. The symptoms are somewhat puzzling, and the diagnosis between that and inflamed deltoid bursa is by no means easy.

The usual diagnosis made in both these cases is osteoarthritis of the shoulder-joint, a conclusion which is particu-

larly unfortunate from the point of view of the patient and the employer.

It should be remembered that bones are kept in their position at the joints not only by ligaments, but by the normal tension, even while at rest, of the muscles which surround them. In the later stages of drunkenness these muscles become relaxed, and thus the normal muscular protection of the joint is weakened. Instinctively, when in the act of falling, one puts out his hand to protect the head and face, and the muscles of the whole upper extremity from the shoulder to the wrist tighten, and come into action. The wrist may be broken, but a dislocation is rare. A tipsy man, however, falls in a lump, probably directly on his shoulder, his muscles being in a state of relaxation, and a dislocation occurs.

Not infrequently patients complain that they have lost all power of bending the elbow. To test the truth of this, slowly flex the patient's elbow-joint, and then with a great exhibition of force suddenly attempt to straighten the forearm; when the power is *not* lost there will be more or less resistance to extension, due to the sudden involuntary contraction of the biceps, which the malingerer, taken unawares, cannot control.

The following case illustrates the value of adopting a firm attitude where one is satisfied that the time has passed for leniency and consideration :

*History.*—C. K., a painter, fell off a ladder whilst at work. He attended for seven weeks as an out-patient at a large general hospital for treatment of dislocation of shoulder-joint, simple fracture of radius and ulna at right wrist, and abrasions.

The alleged disability still continuing nineteen weeks after the accident, he was examined on behalf of his employers by a doctor who reported that C. K. had recovered sufficiently to return to work without further delay, and that his wage-earning capacity should not be less than before the accident.

Compensation was stopped, and work offered him by his employers. He replied that he would "think it over," and nothing was heard of him until three weeks had elapsed, when an application for arbitration was issued. In an interview a few days later C. K.'s solicitors admitted to the employer's representative that the applicant was not then under medical treatment. A small sum was offered in settlement of the claim, but C. K. persisted in his demand for £80.

*Examination.*—Six and a half months after the accident, when I was asked to examine C. K. on behalf of his employers, he told me that

his shoulder had now wholly recovered, but that he was still unfit for work on account of the condition of his right wrist. The wrist was slightly twisted (a common result of fracture of ulna and radius), but this slight lateral displacement was insufficient to interfere with his working capacity. Although a certain amount of muscular wasting, due to disuse, was present in the right forearm, it was evident that he had been using his hands for ordinary work, for they were both equally dirty.

He was asked to turn the hand palm up, and then palm down, whilst at the same time I opposed movement, and in several other ways satisfied myself that the hand had wholly recovered. He complained that it got tired when he worked, but I pointed out to him that at first this must needs happen after a long period of idleness. To carry out his line of argument to its logical conclusion would involve never working again, if he had not sufficient pluck to endure a little inconvenience for the first few days. Finally, he told me that he had used his hand to paint two doors, but that it took him four hours, whereas in the ordinary way he would have finished in an hour. Upon pressing him, however, he admitted that he had not used the right hand at all whilst painting the doors.

In my report to the insurance company representing his employers, I stated that the claimant was a lazy fellow, who had been taking advantage of his employers, that he was fit for work, and must certainly have been so for some months. This statement I was prepared to uphold in the witness-box at the arbitration proceedings.

*Result.*—A few days subsequent to my examination, I was informed that the applicant, who had originally claimed £80, now indicated his willingness to accept about £2, and in these circumstances the legal advisers, on behalf of his employer, decided to pay this small sum rather than go to the expense of taking the case to Court.

**Loss of Power in the Hand and Digits.**—In my opinion, one of the most difficult things in medical jurisprudence is to state with any degree of accuracy the amount of disability resulting from impairment of the hand as a whole, or any of its digits, severally or together.

The hands should be carefully examined and compared, to see whether the skin of one is markedly cleaner and softer than that of the other. If they are stained with tobacco-juice or are both equally dirty, and if callosities are equally well marked, the inference is obvious.

Weakness and inefficiency of grip in the hands is often complained of, and the following means may be taken to test its reality:

The difficulty in getting a patient to close his fist or to flex his forefinger when he thinks he cannot, or when he will not

and says he cannot, is very great; and this is always enhanced by the invariable habit of patients, when they are being examined with a view to fitness or otherwise for work, of watching every movement which they are asked to make, with the result that the malingerer consciously, and the honest man unconsciously, restrains all movements.

In attempting to estimate the amount of maximum voluntary flexion or extension of digits, I am satisfied, from a very considerable experience, that it is hopeless to gain any real information unless the patient's view is entirely obscured, and this should not be done by merely asking him to look on one side. My experience is that he simply cannot do so; therefore it is imperative either that a book or newspaper should be held in front of his eyes, or, better still, his permission be obtained to blindfold the eyes.

It is best to explain to the patient that you are well aware of, and do not doubt, his difficulty in closing one of his digits, but you feel he will *try* to close it, with the others, when asked; that, as the other digits of the hand are uninjured, you will expect him forcibly to close them, and of course all the digits of the sound hand. The patient is asked to hold out both hands, and is instructed upon a given signal to close both firmly; when the signal "One, two, *three*," is given rapidly with a raised voice, the result often is that all the fingers are closed, including the alleged stiff one. This experiment should always be made early in the examination, *before* the patient has repeatedly demonstrated to the examiner the alleged stiffness.

Now, if future incapacity is to be prevented, the digits must be moved somehow, and the sooner the better.

F. D., stevedore, injured the terminal phalanx of the little finger of his right hand whilst at work; a month later the doctor who examined him for his employers stated he would be fit for duty in two weeks. He did not resume work, and six months later compensation was stopped, and the case came to arbitration, when the Court decided he was unfit for work and ordered the weekly allowance to be continued, with costs against the employers.

Five months later he was sent to me. I found the last joint of the little finger was stiff, having only one quarter the normal range; but he complained that his *whole hand* was defective in grasp. He was asked to pull a ruler out of my hand, and he literally pulled me out of my chair, smiling all the time. Only when it was pointed out

to him that he was not really unfit for work did he explain that it had pained him.

Shortly afterwards the case was by my advice again taken to Court, for review, and the Judge terminated the compensation.

It was subsequently discovered that the man had worked regularly four days a week *from the date of the accident!*

The patient should be asked to clasp his hands as firmly as possible, and the position of the thumb should be noted, for a much firmer grip is obtained if the thumb is opposed to the other digits. If, therefore, the patient makes the movement with his thumb abducted, he is certainly not trying his best. Another method is to get him to grip the observer's hands with his own hands crossed; he will often get confused, in this position, as to which is the "paralyzed" and which the sound hand, and will so give himself away. If this fails, success may be obtained by getting him to do the gripping movement behind his back, when he is still more likely to be confused.

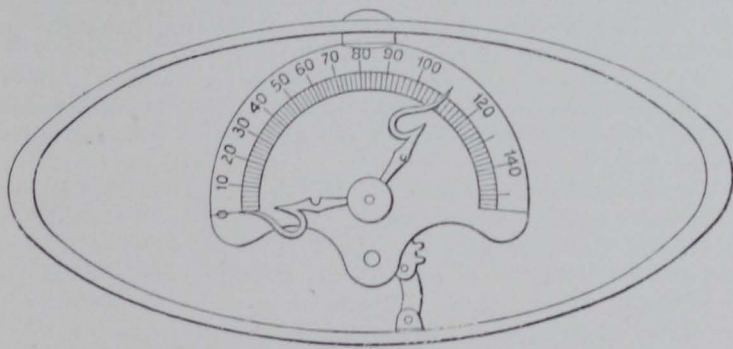


FIG. 17.

Another method suggested by Leon Gallez is to ask the patient to press an ordinary dynamometer (see Fig. 17) with the sound hand. The reading is shown to the patient, and he is now given another dynamometer in the other (injured) hand, and quickly and abruptly instructed to press both as hard as possible. Gallez states that, if the patient is simulating, owing to the fact that his attention has to be given to both hands, he will be unable to exercise independent control over the two hands, so the reading from the sound hand will be much less than it appeared previously.

In testing the power of closing the fingers on the palm, a useful plan is what is called the "bilateral method," in which the patient is first asked to squeeze the examiner's hand with the hand which he alleges is defective in grasping power. He is then asked to squeeze both one's hands simultaneously. Involuntarily, he will then contract more powerfully with the "weak" hand, if simulating, than at first. Do not forget that the hand can be much more firmly clenched when the wrist is extended than when it is flexed.

*History.*—F. E., a coal-trimmer, aged thirty-eight, was said to have injured his left elbow, shoulder, and wrist, whilst wheeling a barrow. He did not cease work until three months later, when he was medically certified to be suffering from "inflammation of the left olecranon bursa," and unfit for work. Later it appears that his left elbow-joint became stiff, apparently from want of use. Six weeks thereafter he complained of a sensation of "pins and needles" in his left hand, and still later of numbness in the middle and index fingers, accompanied by weakness. The medical man who examined him, however, stated that he was induced to give a very firm grip with his left hand. It is important to note that even at this stage the numbness which F. E. alleged he had in his fingers did not correspond to the distribution of either the median or ulnar nerves, and that exercise in the shape of work was recommended by his doctor. It was noticed that the circumference of the left elbow-joint and the left forearm measured a quarter of an inch less than the corresponding measurements of the right.

*Examination.*—Four months later, as he had not resumed work, he was sent to me for an opinion. He stated that he could not raise his arm, and that all his trouble was at his left shoulder-joint. The left *elbow* and *wrist*, he said, were now well; he made no complaint of loss of grasping power in the hand, or of loss of sensation anywhere. Although at first he alleged he could not raise the arm above his head, he was in fact induced to do so, and finally resisted with considerable power an attempt to pull his arm downwards from the horizontal position. There was a little flattening of the left deltoid muscle, but it was abundantly evident he was fit for work, and I so reported.

Two months after this the case came before the Court. F. E. made no complaint of his shoulder, but specialized on his elbow, and the Judge, who sat with a medical assessor, made an award in F. E.'s favour. The medical assessor stated that the man was suffering from median nerve paralysis, that he was fit for light work only, but should be well in a few months.

Nearly nine months later he was sent to me again; I found the left deltoid was, as before, somewhat smaller than the right. He now complained of loss of sensation in the forefinger and thumb, and there was *apparent* loss of grasping power in the hand. The

muscles of the left were therefore compared with those of the right hand, and were found to be somewhat less bulky.

Five months later I saw him in consultation with Mr. Tubby, who pointed out that not only had F. E. wasting of the deltoid and generally of the muscles of the whole of the left upper extremity, but that he was the subject of *congenital* asymmetry of the whole of the left side.

I again reported that he was fit for work, and prior to the re-hearing by the Court I took very careful measurements. The circumference of the left hand, measured at the root of the thumb, was half an inch smaller than a corresponding measurement of the right side. The left upper arm and left forearm were both half an inch less in circumference than the right. The left leg was three-quarters of an inch shorter than the right. The circumference round the largest part of the left calf was half an inch less than the right. On the left side the measurement from the anterior superior spinous process to the lower part of the malleolus was half an inch less than the right. In short, he was typically asymmetrical, and the condition was obviously congenital.

He said he was left-handed, but his right hand was a quarter of an inch broader than the left in circumference. When asked to show with a pole how he shovelled coal, he did so in a right-handed fashion! He resolutely declined even to try to lift an empty coal-scuttle. His left side clearly was congenitally undeveloped, but he was obviously fit for ordinary work.

The case came for review before the County Court Judge, who was, as before, assisted by a medical assessor, not, however, the gentleman who so acted on the first occasion. An award for the compensation to continue was again the result. The second medical referee advised, as the first had already done, that the man had median nerve paralysis, and was only fit for light work; but the Judge, owing to the difficulty of getting light work, made an order for the continuance of the former payments.

I was therefore in the unhappy position of having twice advised that F. E. had no paralysis of the median nerve, and that he was fit for work. On both occasions my opinion was upset, not only by the Judge, but by two different medical assessors. Each hearing had probably cost from £20 to £25.

I was confident, however, that F. E. did not then suffer from median nerve paralysis, and never had; that the Judge was in error; and that the two medical referees were mistaken. I determined to see the thing through.

The medical examination had on each occasion taken place in a retiring-room of the Court where there was, of course, no means of electrically, or otherwise, testing the reactions of the ulnar and median nerves. The medical referee in each case relied on F. E.'s statements as to loss of sensation, etc. I therefore arranged for him to be sent to the electrical department of the hospital to which the second medical assessor was attached. An elaborate electric

testing by a specialist in electro-therapeutics (nominated by the medical referee) of all the muscles of the forearm and hand proved that there was no paralysis, no reaction of degeneration, and therefore no median or ulnar paralysis! F. E.'s success at the two arbitration proceedings is easily accounted for. He had been tested so often and so assiduously by cotton-wool for loss of sensation by his own doctor (who also up to a point firmly believed in him) that he knew exactly what was expected of him, and he persisted in saying that a small part of the skin of the front of his forefinger and the front of his thumb were insensitive to light touch by cotton-wool. Upon this one alleged physical sign, associated as it was with an unrecognized congenital asymmetry, he had duped two medical assessors and one Judge twice!

Five months later I saw him again with his own doctor. He now stated that lately he suffered from giddiness, for which he had had medical treatment, but admitted that he had not mentioned the accident or the paralysis to his last doctor.

He also complained of his old troubles, and of pain in his left hand. When asked to grip, he would scarcely make any attempt, and when asked to lift a small coal-scuttle, weighing  $34\frac{1}{2}$  pounds, with his left hand, he professed himself wholly unable to do so. I instructed him to grasp the handle of the coal-scuttle, and, catching hold of his elbow, I told him we would pull together. He then lifted the coal-scuttle from the ground. Now, as the power of *grasp* lies, of course, in the muscles of the forearm, it is impossible for anyone by merely taking hold of his elbow to assist in closing the fingers; yet he grasped the handle of the coal-scuttle and raised it from the ground, thus proving conclusively that he had in fact the power of grasp which he was so anxious to prove he had not. I electrically tested all the muscles of his left forearm, and demonstrated to his doctor that each finger responded to the electrical stimulus, and that the muscles and nerves were normal except for the congenital asymmetry. It was apparent that, assuming he had neuritis of the median nerve, with consequent loss of power of the muscles of the forearm, long prior to the date of this examination the reaction of degeneration must have taken place. The electrical test, however, as on a former occasion, incontestably proved the absence of this valuable diagnostic sign.

For the third time I advised that F. E. had not median nerve paralysis, and recommended an application to the Court to review. The Judge, after hearing my evidence, and after a further examination by the medical referee, terminated the award.

Had I been less persistent or less self-confident, or had the Shipping Federation shown less reliance on my judgment, F. E. would have been eating the bread of idleness still. He returned to work soon after the third hearing.

**Simultaneous Contraction of Flexors and Extensors.**—When flexion takes place at a joint, the extensors to some extent are

brought into action. This is to steady the movement, otherwise finely co-ordinated action could not be obtained. That the extensors do participate in flexion at the wrist is proved by the fact that when there is complete paralysis of the extensors of the wrist flexion is found to be very weak, although the flexors have not suffered.

A somewhat unusual and often a very intractable condition of the hand is sometimes seen in men who, as a result of an injury to one of the digits, have allowed the interphalangeal joints to become stiff. The affection is difficult to recognize and appreciate. It is brought about by the patient flexing the extended fingers from the knuckle-joints, and then voluntarily or involuntarily *at the same time* tightly contracting *both* the flexors and extensors of the forearm. When this is done, it is mechanically impossible to flex the interphalangeal joints, as in making a fist (Fig. 18). If the hand is put in the position of Fig. 19, and the whole of the muscles of the forearm are brought into play, exactly what is meant will be observed.



FIG. 18. — NORMAL FLEXION  
OF METACARPAL PHALANGEAL  
JOINTS.



FIG. 19. — ABNORMAL FLEXION  
OF METACARPAL PHALANGEAL  
JOINTS.

If this simultaneous action of both the flexors and extensors is involuntary, as is not infrequently the case, it is a difficult condition to deal with; for the patient each time he is examined goes through the pantomime of strenuously attempting to close his fist, whilst he as strenuously opposes the movement. My experience is that when this habit has been acquired in the case of ignorant working-men who have some sort of provision awaiting them in the event of incapacity, strange as it may appear, the condition is practically incurable. What it may be after the battle is fought and damages have been awarded, I do not know, but I have experience of two cases

which have successfully run the gauntlet of arbitration proceedings.

F. F., a carman, whilst taking a horse out of the shafts, had the palm of his hand torn by a strap. Nineteen weeks later—long after the wound had healed—when he was sent to me for examination, he stated he was unable to close his fist, and that he feared the disablement would be permanent.

He deliberately held his hand in the claw-like position above described, and alleged his inability to close his thumb and forefinger. There was nothing to prevent him closing his whole hand if he wished. It was somewhat stiff from want of use, for which work was the best cure. My opinion was confirmed by an independent examination conducted by a surgeon. Ten weeks later he still maintained that he could not use his hand. When asked to close his fist, he purposely used the flexor and extensor muscles together. The fingers were stained with tobacco-juice. The case was settled by the payment of £40 and 6 guineas costs!

The best method of treating a condition of this sort is first of all to explain to the patient what he is doing, and next, to gain his confidence, to ask him to allow himself to be blindfolded whilst the whole forearm is gently but firmly stroked from the elbow to the tips of the fingers until all spasm is relaxed. Then place in his hand a small rod some 4 inches long and three-quarters of an inch in diameter, and induce him to allow the phalanges to close on it. After the fingers have been folded over it and gradually made to grasp it, it is replaced by others of gradually decreasing thickness, whilst the muscles of the forearm are gently kneaded. An honest and sensible man, when he sees what he really can do, will practise for himself, and very soon overcome the disability; not so the ignorant or dishonest. A conscientious, energetic masseur, or masseuse, with a very little instruction is often extremely useful in this class of case.

I believe that careful, assiduous, painstaking massage and passive movements, conducted by an intelligent masseur, would in most cases overcome this difficulty, more especially if these movements were preceded by immersion in the Whirlpool Bath, or in hot water where the former is not accessible, for half an hour.

**Alleged Inability to Flex the Digits.**—A good test for estimating alleged inability to close the fist is to ask the patient

to bare his forearm and partially flex the fingers on the palm. The examiner then interlocks them with the fingers of his own hand, asking the examinee to close his fist, thereby squeezing the examiner's fingers. It is now explained to him that an attempt is to be made by the examiner forcibly to straighten his fingers, and that he is to resist the attempt. Not infrequently no attempt is made, and the fingers are straightened without any force whatever.

The examiner's free hand is then placed upon the flexors of the patient's forearm, and it is pointed out to him that it is quite evident he is making no attempt, as his muscles are not hardening. The effect is often remarkable. The flexors are tightened, and sometimes it is impossible to straighten the fingers. If this manœuvre is carried out early in the examination, it is as a rule more successful than after a patient has begun to be suspicious that he is giving himself away. The device is a valuable one, since it is difficult to convince a lay arbitrator that a man can close his fist when he says he cannot.

If this experiment is entirely unsuccessful, a mild galvanic current applied to the forearm, more especially if Erb's motor points are stimulated (see diagrams, pp. 497 to 501), is of use. It is a mistake to think that there is much difficulty in doing this, and that the exact spots must always be stimulated. If the current is fairly strong, the individual flexors can often be stimulated by merely moving the electrode in the vicinity of the points indicated in the diagram.

When the muscles can be demonstrated to contract under electrical stimulus it is the best proof that they are functionally active.

It is a good plan at this stage to describe to the examinee in very simple language the anatomical arrangements, and to point out that one knows when he is not even attempting to close his fist from what one sees and feels taking place in the forearm. When the experiment is repeated, the lesson has had its effect. In nine cases out of ten, the malingerer resists, but after repeated experiments, accompanied by firm exhortation and a display of omniscience, the grasping power of the hand improves marvellously.

*History.*—C. H. stated that, after being at work heaving up ashes on board ship, he found a blister on the palm of his left hand, was taken

to hospital at a foreign port, was operated on, and remained there two and a half months.

Twenty-five months after the accident, he was sent to me complaining that he had no strength in his hand, that he could not do any hard work on account of it, and had "slight pain from contraction of the thumb."

The case originally was one of septic poison in the palm of the left hand, which apparently healed up with some degree of stiffness, and impaired movement of the thumb. The company's medical examiner reported that the man was malingering, and when the company's application came before the Judge for review, he referred the dispute to the medical referee, who, sixteen and a half months after the accident, reported that the present condition was "feebleness of grasp, with slight swelling, tenderness of the palm, especially of scar-tissue, the result of suppurative processes and of operations following a septic inflammation of the hands, and wasting of the muscles controlling movement of the thumb." The medical referee stated as his opinion "that by gradual and progressive exercise C. H. could be enabled to do his ordinary work as fireman on board ship, and that probably such treatment ought to be extended over a period of four to six months from the present time."

Eight months later, the company's doctor reported that he found some of the muscles of the thumb wasted, due in his opinion to want of use, and that he considered the patient quite capable of doing his ordinary work if he wished to do so.

*Examination.*—From inspection of this man's hand, I formed the opinion that there was really nothing the matter with it. The following experiments were made :

1. He was induced to hang by both hands on to a trapeze, and was suspended with both his feet off the ground by means of a block and tackle, and so continued to hang for some time holding on by both hands.

2. In case it might be contended that he was really hanging to the trapeze by the strength of the right, uninjured hand alone, a cross-bar was placed loosely through the triangle of the trapeze itself, and he was instructed to hold on to each end of the cross-bar. He did so, and was again lifted off his feet by the block and tackle ; it was obvious that he was using equal strength with both hands, for had he not done so the loose bar would have at once slipped sideways through the triangle, instead of which he maintained it equably.

3. He was then weighed, and found to weigh 10 stone 11 pounds, so that with the left, the injured, hand he suspended a weight of 5 stone 5½ pounds.

4. He was then asked to lift a gipsy coal-scuttle full of coal. This he did, and the weight of it was 30 pounds.

5. He was asked to grasp the fingers of the examiner's hand tightly with his left hand, and to resist his fingers being straightened. At first he obviously let go voluntarily, allowing the fingers to be straightened with ease ; but when it was pointed out to him that it was

apparent he was letting go, he tightened his fingers so that they could scarcely be straightened.

6. When asked to bend his left elbow and resist extension of his arm, he did so with such strength that it could not be straightened.

7. He was asked to close his fist tightly, the examiner meanwhile directing his attention to the swelling of the muscles of the forearm which close the fist. At first he did it in such a half-hearted manner that the muscles did not swell up, but upon insistence he closed both fists tightly, and one could feel that the muscles of both arms were equally firm.

The only sequela of this claimant's accident was a linear scar in front of his hand. This was not tender, and the skilful surgical treatment employed had prevented the Dupuytren's contraction which so frequently follows injury to the palm.

There was slight want of use of the muscles which draw the thumb towards the palm of the hand. This claimant was proved to be a powerful, able-bodied malingeringer, and probably had been fit for work for many months.

It was pointed out to him that he was able to suspend a weight of  $5\frac{1}{2}$  stone with his injured hand alone, that he could lift 30 pounds, and that it was preposterous for him to say he could not work. He was exhorted to take his courage in both hands and start work. His reply was: "I do not suppose they would take me now at my age [forty-two]; they do not take men over forty."

A month later, on the application for review of the case, at the County Court, an award was given for the employers.

**Simple Tests are Best.**—Not infrequently very simple tests are of the utmost use, but it is important to recognize that usually the method of applying the test determines its success or failure. Very often, for instance, when a patient comes into the room, he will reciprocate a hearty grasp of the hand, but will absolutely refuse to grasp one's hand firmly during the subsequent examination.

C. I., whilst in the act of scrubbing a floor, had the misfortune to run a needle deeply into the palm of her right hand. An insurance company, for whom I act, paid half-wages for two years, and then sent her to me for examination. Immediately upon entering the room, and before the examination had commenced, the woman was asked to close the fingers of the injured hand, and to resist my forcibly opening her fist, and this she did without complaint, demonstrating that she had no pain or loss of power. But later on in the examination, and upon a subsequent examination two months later, she complained bitterly of the most intense pain when the hand was touched, however lightly. An X-ray photograph proved that the needle was still in the hand, but lying parallel to, and snugly embedded between, the bones of the palm of the hand, in which position it was

hardly possible for it to cause pain. An unsuccessful attempt had been made by a surgeon to remove it.

C. I. was obviously in a very highly strung, nervous, and excitable condition, and the opinion I formed was that she had got the *idea* of the presence of the needle in her hand on her mind, and that this was making her ill. As work was the only cure for this condition, I recommended that her weekly allowance should be stopped, as she would then be compelled to take up her old employment again. This was, of course, contested, and at the trial much medical evidence was given. It was noticeable that, although two doctors were called to support her contention that the presence of the needle accounted for her nervous condition, her own family doctor was not put in the witness-box. The Judge, after considering the matter for two months, decided in favour of the insurance company, and stopped payment. A month after his decision, one of the medical men who had given evidence in opposition to my view, kindly informed me that to his surprise he had learned that the applicant had just had a serious operation for a large cancer in another part of her body, from which she was undoubtedly suffering at the time of the trial. Six weeks later I learned that she had recovered from the operation for cancer, had returned to work with the needle still in the same part of her hand, proving, as I had contended at the trial, that its presence was not the obstacle to work.

It will be noticed that, whilst the applicant in this case resisted my forcibly opening her fist *early* in the examination, at subsequent examinations she complained bitterly when the hand was even touched.

It turned out that this was a point of the utmost importance in the case, for the judgment which the insurance company ultimately obtained in their favour hinged upon this one incident. The Judge, in adjourning the case for his consideration, remarked that if he decided to accept this part of the evidence he must find for the company.

A useful method of testing whether a patient is really using the flexors of his fingers is to ask him to grasp firmly a small round vial, the outside surface of which has been oiled. If this is suddenly pulled sideways from his grasp, the fingers will, if he is malingering, remain open.

Some cases present extreme difficulty, not so much on account of the precise knowledge required or determining the question to be solved, but on account of the fraud which so often complicates cases of genuine accident. Cases are constantly cropping up in the Courts, of which I may cite the following as an illustration :

C. J. met with an accident to the back of her hand, and was away from work for three or four days. On examination four weeks afterwards, there was loss of power of flexion of the terminal joint of the middle finger of the same hand, and it was evident that the tendon which bends the joint had been torn, a somewhat serious injury from the employer's point of view, inasmuch as nothing but an immediate operation could cure it. She was very emphatic that this injury had happened at the same time as the trifling injury which she undoubtedly did sustain to the back of her hand. Upon very careful inquiry, it transpired that she had not noticed anything amiss with the middle finger at the time of the accident to the back of her hand, nor had she mentioned the former to her doctor within the first forty-eight hours. If the finger had been injured at the time, it meant that the tendons had been forcibly torn across. I refused to believe that this happened at the time of the accident for which she was claiming compensation, for it could not have happened without causing immediate and severe pain. It was obviously an old-standing injury, which she wished to make her employers pay for. At my suggestion careful inquiries were made, and independent evidence was forthcoming that the facts were as I thought. The woman still protested, and upon my informing her that no further payment would be made in connection with this injury, she said she thought it was "very unjust." Finally, she said she would not trouble about it; and, as her own doctor had advised her to go back to work that day, she proposed to do so.

Many medico-legal examinations degenerate into a matter of the workman pitting his wits against those of the medical examiner. In the case about to be related, for example, the manœuvre of pretending to assist in lifting a gipsy coal-scuttle conclusively settled a case which would otherwise have been somewhat difficult to expose.

C. M., aged twenty-two, whilst working as a trimmer on board ship, was struck by an iron splinter on the little finger of the right hand. Three weeks later the finger had to be amputated at the second joint. After ten weeks, the wound having healed, he was certified by the shipping company's doctor as fit for work. He then complained that the stump of the little finger became black and painful, that he could not straighten it or the ring-finger, and that the pain ran right up his arm. An independent medical man examined the hand, and reported that he was quite able to work, that he made no complaint of firm pressure on the alleged painful stump when his attention was held in another direction, and that although he said he could not grasp a ruler, he was ultimately induced to do so quite firmly. The employers stopped compensation. At the subsequent arbitration proceedings the medical referee, who sat with the Judge, expressed the opinion that the man was wholly disabled. Compensation was continued, with the result that the successful applicant became so much worse that he could not even sign his name !

*Examination.*—Eight months after the amputation he was sent to me for examination, with a view to an application being made for the termination of the award. At this time he appeared to have dropped his contention with regard to the amputated finger, resting his complaint chiefly on the ring-finger. While engaged in conversation, he allowed firm pressure on the stump without complaint. There was a slight tendency to Dupuytren's contraction of the ring-finger, the result of a previous accident ; this had left a scar in the palm of the



FIG. 20.

hand. He admitted that the scar was present prior to the accident to the little finger, and was in no way connected with it. He tried to make one believe that when the fist was closed, the ring-finger could not be closed as tightly as the other fingers, and that there was no power of grasp in that finger. He appeared to be a curious mixture of simplicity and artfulness, and it was some time before I was able to prove that he was affecting a disability which did not exist. As an evidence of his astuteness, I may mention that he informed me that his solicitor had told him he had better attend alone at my house, but he had explained that it would be wiser for him to come with his employer's officer in order that he might "get some information out of him." This seemed suspicious of a desire for a lump sum.

On applying a current of electricity to the forearm, stimulating the flexor muscles of the ring-finger, they acted at once, irrespective of his volition, showing that the nervous and muscular tissues were intact and in order. He was induced to close his fist and resist it being opened ; it was only after repeated trials that he forgot himself, and grasped tightly with the alleged powerless ring-finger as well as the others.

On being requested to lift by the semicircular handle a gipsy coal-scuttle, weighing 28 pounds, he at first refused even to try, but after considerable insistence was persuaded to make a serious effort. He complained that the brass handle hurt the front of the ring-finger. After the handle had been covered with cotton-wool, he was induced to hook it up with the ring-finger alone, but even then declined to try to lift the scuttle off the ground. I said we would try it together, and applying both my hands to his forearm, whilst he kept the ring-finger acting as a hook, we pulled together, lifting the scuttle off the ground. It is obvious that my assistance was merely a pretence, inasmuch as, although I did help to pull, I could not possibly help him in keeping bent the ring-finger, upon which the whole weight was suspended. His remark after this performance, "But you helped me," showed that he had been deliberately pretending incapacity.

*Result.*—Six weeks later, as the applicant did not appear at the hearing, the Judge terminated the compensation, but it was arranged

that the case might come on again for trial a fortnight later. Meanwhile the applicant was said to have heard of a job, which he decided to take, and abandoned his claim three days before the date appointed for the further hearing.

Hemiplegia is seldom feigned. The following table may be of some assistance in differentiating organic from functional hemiplegia, and from malingering.

## ORGANIC AND FUNCTIONAL HEMIPLEGIA.

|                                | <i>Organic Hemiplegia.</i>                                                                                      | <i>Functional Hemiplegia.</i>                                                                                                                   |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Distribution of paralysis      | Usually face, arm, and leg.                                                                                     | Face very rarely affected.                                                                                                                      |
| Knee-jerks -                   | Increased.                                                                                                      | Normal or increased.                                                                                                                            |
| Superficial abdominal reflexes | Frequently lost on paralyzed side.                                                                              | Present.                                                                                                                                        |
| Plantar reflexes               | Extensor response (Babinski sign).                                                                              | Flexor response or absence of reflex.                                                                                                           |
| Ankle clonus -                 | Present.                                                                                                        | Absent or a pseudo-clonus.                                                                                                                      |
| Rigidity -                     | Present in later stages.                                                                                        | May be present or absent.                                                                                                                       |
| Contractures -                 | Present in later stages: obey anatomical laws, in which flexors and adductors overcome extensors and abductors. | Irregular spasmodic contractures may occur— <i>e.g.</i> , inversion of foot.                                                                    |
| Gait -                         | Leg swung round from hip.                                                                                       | Leg dragged behind as if it were a log.                                                                                                         |
| Anæsthesia -                   | Severe cases may be accompanied by hemianæsthesia.                                                              | Hemianæsthesia common, taking whole of one-half of the body: at other times it may be the typical glove or stocking anæsthesia of an arm or leg |
| Visual fields -                | Hemianopia may occur when there is hemianæsthesia.                                                              | Crossed amblyopia with more contraction of field of vision on anæsthetic side.                                                                  |
| Electrical reactions           | Reaction of degeneration present.                                                                               | Absent.                                                                                                                                         |

A somewhat unusual case of fraud of a particularly clever nature came under my observation not long ago. No credit is due to me for having discovered it, inasmuch as the information was vouchsafed by a fellow-patient in the hospital where the impostor was under treatment.

F. G., a man aged twenty-eight, who had been four years in the public service, complained that his left hand became blue at times, and that it felt cold. The condition was diagnosed as erythromelalgia. As the blueness, etc., persisted at intervals, he was sent to a hospital, where he received electric treatment. Whilst in hospital the unusual symptoms excited much interest, some sympathy, many theories, and an anonymous letter which ran as follows:

"I wish to put you behind the scenes with regard to the man you are now treating in this hospital, who is supposed to have hurt his shoulder whilst at work. Perhaps, like some other doctors, you cannot understand his case exactly. Let me explain something to you, and then you can get at the root of it all. This patient by a simple twist of the shoulder can put the same in and out of socket at will without the least trouble, this no doubt causing compression of the blood-vessels; hence the root of supposed trouble. You can satisfy yourself of this by noting height of shoulder, position of blade-bone in back, etc., when examining. You will also find patient is able to twist and turn arm in any position when in or out of socket. You will find this perhaps a rare and strange incident, but all the same a fact. Perhaps a talk of operating on his trouble will soon cause you to lose your patient.

*Cause* : Supposed injury whilst on duty.

*Effect* : Invalided and pension.

"This is no idle communication. Trusting you will treat this in absolute confidence is the wish of—A LOVER OF JUSTICE."

The suggestion that the communication was to be treated as confidential was as naïve as it was anonymous. I tried to get the patient to dislocate the shoulder for my benefit, but he professed the most profound innocence. He was, however, discharged from the hospital, and ordered to resume duty. The fact that he resigned his position in the public service a few weeks afterwards gives colour to the suggestion that he desired to leave the service, and that his illness was an attempt to obtain a pension for life.

I made careful inquiry as to his after-history, which was not one of invalidism or idleness.

**Dupuytren's Contraction.**—It occasionally happens that Dupuytren's contraction is said to have been the result of recent injury. It should be remembered that the disease is always a slow and insidious one, that it is painless in its course, and takes months or years to fully develop. A well-marked Dupuytren's contraction noticeable a few weeks

or months after an injury cannot possibly be due to it, though such an allegation is frequently made. In all such cases attention should be directed to the other hand, where a commencing Dupuytren's contraction will often be found; this will greatly assist in elucidating the cause.

In the Law Courts the disabling effect of Dupuytren's contraction is always made the most of. The analysis of thirty-five advanced cases of the disease published in a report presented to the Home Office in 1912 is of interest. It was found that in the majority of these cases the working capacity was either not affected at all, or so slightly as to be immaterial; and in many of the others, although the condition was well marked, the effect was but slight. It by no means necessarily follows, therefore, that because a man has even advanced Dupuytren's contraction his wage-earning capacity is reduced.

**Description.**—This disease is a contraction of one or more fingers into the palm of the hand. It is caused by a slow inflammation and cicatricial contraction and hypertrophy of the palmar fascia and skin over it.

The bands of which the palmar fascia are composed slowly contract, and pull down the affected finger. First the metacarpal phalangeal and then the first interphalangeal joint bends, so that the finger is eventually drawn tightly down on to the palm of the hand, and cannot be straightened again. The lesion has nothing to do with the tendons themselves, which lie perfectly free in their grooves; indeed, if the offending bands are cut away, the finger can immediately be straightened out.

**Fingers Affected.**—The condition is found in the little and ring fingers almost equally. The middle finger is also in a considerable proportion of cases involved, and much more rarely the index finger and thumb. Sixty-one per cent. of cases have both hands affected. Where one hand only is affected, the right is almost twice as commonly affected as the left.

**Diagnosis.**—As a rule Dupuytren's contraction is obvious and unmistakable. The average case shows the little and ring fingers drawn down to the palm of the hand, the middle finger less markedly flexed, the index and thumb free. The

palm is creased into oblique folds, and the tense fascial bands can be felt under the skin when attempts are made to straighten the finger.

It may be confounded with contraction of the tendon, such as might occur after injuries or burns, in which case relaxation of the finger can be obtained by flexion of the wrist. Certain cases of paralysis of the ulnar nerve also present the appearance of mild Dupuytren's contraction of the little and ring fingers. In such cases there is no resistance to the passive extension of the digits affected.

There is, however, sometimes a history of a definite injury, such as a cut or a blow on the palm of the hand, forming the starting-point of the disease. In a very small proportion of cases the disease appears to be congenital, but in these congenital cases the contraction is mainly at the interphalangeal joint, and not at the metacarpal phalangeal joint, as is generally the case.

**Cause.**—There seem to be two or three causes at work, the most usual being repeated or chronic localized pressure on the palms of the hands when in a constrained position, such as would be found in a man handling levers, sailors pulling oars and ropes, and so forth. Arlidge states that the condition is not very uncommon with carpenters and miners, and is "caused in the former by the manner in which they hold and work chisels and some other tools, and in the latter by the pressure and chafing of the end of the handle of the small and short picks used in dislodging coal."

The investigations of Dr. E. L. Collis and Mr. Robert Eatock, embodied in the Report of the Inquiry on Dupuytren's Contraction, referred to above, throw much doubt on the old idea that this complaint is dependent on a gouty diathesis.

They state that in the course of this inquiry "an old man, aged seventy-nine, and his five sons were seen at work; in this family the father had both hands involved, and three of the sons, aged respectively fifty-six, fifty-four, and forty-seven, each had one hand involved; but the only member of the family who complained of gout was unaffected, a man aged fifty. If gout is a predisposing cause, the one member of a family with such a predisposition to the condition could hardly have escaped."

Luff considers the malady to be an occupational, localized fibrositis. "It is," he says, "frequently ascribed to gout, but, according to my experience, the condition has no connection with that disease. Certainly I have never seen any gouty deposits in the thickened tissues, nor is the affection common among gouty subjects."

There is undoubtedly a strong hereditary influence in a certain number of cases. It is almost entirely confined to males, usually of middle age.

**Amount of Incapacity after Amputation of Digits.**—Too often the surgery of the digits is looked upon as a trivial matter; whereas it is by no means a trifle for a working-man to be incapacitated for months, and the loss of even a small percentage of the grasping power of his hand is a matter of considerable importance to him.

It is unfortunate that at our large hospitals minor surgery, especially in relation to the digits, is as a rule left to house surgeons, who, though competent to perform amputation where necessary, may lack the judgment which is essential for deciding how much of the member should be removed. It is obviously unwise to preserve, merely for the sake of preserving it, an ankylosed or a distorted finger, yet this is frequently done. Many instances occur in which the lower phalanx of a finger is left, which becomes merely an impediment to the effective use of the remaining portion of the hand. The end of the stump may be tender, and the other fingers are instinctively used to protect the useless appendage, and thus their proper functions are quite unnecessarily interfered with. In every case it is essential that the patient's occupation should be inquired into, and the operation performed in such a way as to insure that the minimum amount of disability shall arise from the injury sustained.

Painton has pointed out the uselessness of preserving as much bone tissue as possible, regardless of a long train of bony exfoliation, which always prevents work for weeks or months, and in the end leaves a useless member, a proceeding which is the result of inexperience or lack of forethought.

It is astonishing how much good and useful work can be done, by those who really desire to do it, even when the hand is seriously maimed by the loss of one or more digits.

Recently I took occasion to visit the docks, and was shown three stevedores hard at work. The first had his terminal joint missing from the index finger; the second was without the terminal joint of the middle finger; and the third had had the first and second phalanges of the first finger amputated. All volunteered the information that they were perfectly well and quite able to work.

The following illustrations (Figs. 21 to 39) are drawn from actual cases which have come under my observation; the first fifteen were injured prior to the passing of the Workmen's Compensation Act, 1906, and therefore there was every reason why the undoubted disabilities arising from the accident should be overcome by the workmen's own exertions.

The last four (Figs. 36 to 39) are even more interesting, as showing the unfortunate effect which the Workmen's Compensation Act has had in repressing that spirit of self-help which is essential to success in any sphere of life. The decisions were those of County Court Judges, now on the Bench, some of whom may recognize them. The judicial decisions as to the working capacity of the cases is very interesting when compared with that shown by the illustrations of the fifteen cases where necessity compelled return to work, and with it self-reliance and self-respect.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 21.

A. B., doctor's chauffeur. Lost top of thumb at two years of age.



FIG. 22.

C. D.—Lost finger at three years of age. For five years has worked as tramway employee at average wage of £2 2s. per week.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 23.

E. F.—Finger amputated in 1889 ; has  
driven a tramcar ever since.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 24.

G. H., stoker, aged forty-four ; now  
earning 34s. a week. Thumb  
amputated when seven years old.

INJURY BEFORE THE PASSING OF THE WORKMEN'S COMPENSATION ACT.



FIG. 25.

I. J.—Injury to both hands. Machinist (wood-cutting) working for building  
contractors. Average wages £2 8s. per week.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.

FIG. 26.

K. L., stevedore, whom I saw at work  
for a firm of steamship owners.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.

FIG. 27.

M. N., stevedore, whom I saw at work  
for a firm of steamship owners.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.

FIG. 28.

O. P.—Injury fourteen years ago.  
Average wage as carman 28s. per  
week. Has been accepted as  
motorman. Can suspend his weight  
(12 stone 4 pounds) with left hand  
only.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.

FIG. 29.

Q. R., machine-saw worker in saw  
mills. Earning full wages.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 30.

S. T., engineer's pattern-maker. Wages £2 4s. per week. Accident happened ten years ago; only seven weeks absent from work on account of accident.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 31.

U. V.—Has been tram-driver for nine years, and in receipt of £1 19s. per week. Forefinger taken off by press-cutting machine when sixteen years of age.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 32.

W. X., stevedore, whom I saw working for a firm of steamship owners.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 33.

Y. Z., paper-cutting machine worker.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 34.

B. A., flusher, earning 32s. 8d. per week. Lost finger twenty-five years ago. Been thirteen years in present occupation.

INJURY BEFORE THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.

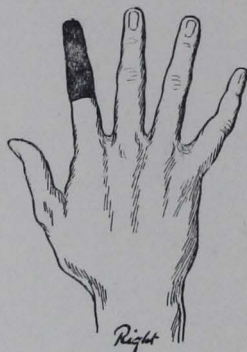


FIG. 35.

B. B., lost finger at fourteen years of age; only away seven days in consequence. Now earning 32s. a week.

INJURY AFTER THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 36.

B. C., deck hand. When examined a year after accident, alleged pain at amputated stump. If stump painful as alleged there would have been considerable wasting of forearm, which there was not. Refused to allow manipulation of stump. Undoubted malingerer. Certain proportion of alleged sensitiveness mental, he having schooled himself into belief stump tender.

At County Court action Judge reduced compensation from 12s. 6d. to 7s. 5d. a week.

INJURY AFTER THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 37.

B. D., tailor. Total limitation of terminal phalanx (half of which was amputated) and some loss of sensation. Could learn to sew with thumb and middle finger.

Had there been no Workmen's Compensation Act he would have been at work nearly a year ago. Case settled by payment of £151.

INJURY AFTER THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 38.

B. E., female worker with cardboard-cutting machine. Examined nine weeks after accident: free movement, no disability. Seventeen days later at County Court action Judge awarded claimant £40.

INJURY AFTER THE PASSING OF THE  
WORKMEN'S COMPENSATION ACT.



FIG. 39.

B. F.—Left thumb torn off at level of metacarpal phalangeal joint; head of metacarpal removed. A month after accident suspended his weight (12 stone) on a trapeze. Consulted solicitor; would not attempt any work, although it was arranged he should not use a heavy barrow. Firm pressure on stump elicited no complaint. Notwithstanding the fact that a navvy who had also lost his thumb, but who was doing hard pick and shovel work at the bottom of a well 30 feet deep, gave evidence in Court as to his ability to work with the same disability, the Judge made award in favour of the claimant for 15s. per week.

## CHAPTER XVII

### EXAMINATION OF THE LOWER EXTREMITIES

WITH regard to the lower limbs, the difficulties of exposing simulated lack of power are much greater than is the case with the upper extremity, and it is fortunate that they are, on the whole, less often complained of.

For the purpose of examining the lower extremities, the patient should be placed on a couch and movements against resistance carefully tested. The power of flexing the hip-joint is elicited by asking him to draw the knee up to the abdomen. When this is done, the *psaos* and *iliacus muscles* and other flexors of the hip are tested by forcibly extending the limb whilst he is asked to resist. The *hamstrings* are tested by asking the patient to flex his knee against resistance. The *quadriceps extensor* is tested by asking him to straighten his knee while the examiner resists by pressing in the front of the shin.

The calf muscles are mostly concerned in extending the ankle-joint. These are tested by dorsiflexing the ankle, and directing the patient to push the examiner's hand away with the sole of the foot.

**The Anterior Group of Extensors of the Ankle.**—These *flex* the ankle-joint and *extend* the tarsal joints and toes. They are tested by fully extending the ankle-joint and flexing the toes, and instructing the patient to straighten his toes and bend his ankle-joint, whilst the examiner resists these movements. Having discovered the movements in which the alleged lack of power is evidenced, ask the patient to exert or make use of the weak muscles to the limit of his capacity.

The claimant's gait should be carefully watched; he should be induced to balance himself on his toes only, in the fashion of a ballet-dancer. A large number of persons suffering from

alleged disabilities of their lower extremities can assume a tiptoe position when their boots and stockings are removed, and maintain it for a very considerable time; and this may be prolonged if they are allowed to steady themselves by placing the tips of the middle fingers of each hand on those of the examiner. Not infrequently I have induced an impostor, when in this attitude, to steady himself on the terminal phalanges of the alleged injured extremity alone by inducing him to lift the *sound* foot from the ground and to place it on the up-turned toe of my boot. In this position he supports the whole weight of his body on the forepart of his injured extremity.

A limp which is obviously feigned may often be detected by the very simple procedure of inducing the simulant to walk on tiptoes, when he not infrequently forgets to limp.

C. Q. sustained a fracture of the left leg, owing to the end of a sling of railway metals suddenly swinging round and striking him.

Seven and a half months later he was sent to me for an opinion as to his fitness to resume his ordinary work. His employers had had frequent opportunities of seeing this man personally when he called for his compensation (13s. 6d. a week), and it appeared to them that he was fit for work; they also had a confirmatory report from one of their medical officers.

*Examination.*—He complained that he was unfit for anything but light work, because, although admittedly the bone had firmly united, he was still “too weak.” He looked a strong, able-bodied man, the picture of health. On examination, I found that the leg had been very well set, union was perfect; there were the remains of some thickening, but the circumferences of both legs at knee and ankle were the same. It seemed preposterous for this man to suggest that he was in any way affected as the result of the accident. That he was in possession of full use of his limbs was evidenced by the fact that I caused him to stand on the tips of the toes of both feet (after the style of ballet-dancers), which he did for a considerable period, even turning right round whilst thus balancing himself. I then steadied him slightly with my hands, and he stood for some time on the fore part of his left foot alone, and yet he told me he was too weak to work.

He informed me that he had seen another doctor only the day before, who had told him it would be a year before he could do full work. It transpired that C. Q. was then doing light work for his cousin, a barge-owner, the duties consisting of “cleaning the shores,” for which he received 15s. a week.

*Result.*—Here was a man who was manifestly abusing his privileges under the Workmen’s Compensation Act. As the result of my report C. Q. returned to his work.

When loss of power in one leg is alleged, ask the patient to kneel on the floor and then get up. Watch which knee he puts down first, and upon which leg he levers himself up. Occasionally he may be induced to use, or of his own accord uses, the limb alleged to have been injured, and with apparent ease and painlessness supports his whole weight upon it in the act of rising from the kneeling position, which is significant.

Similarly, a man who complains that one leg is powerless, but whose boots (presuming they are not a new pair) are equally worn down, is certainly not telling the truth.

In injuries of the foot or leg, the presence or absence of flat-foot is a matter of very great moment, and the curve of the arch should always be compared with that of the other foot. After an injury to the foot there is often a slight degree of inversion or eversion; this also should be noted.

In a case where shortening of a leg is believed to be congenital, confirmation of the diagnosis is obtained if the pelvis tilts to that side, and the backbone bends to the opposite. This is Nature's well-known device to keep the body as near the perpendicular as the unequal limbs will permit.

Frequently talipes varus, valgus, and equinus are simulated, or if present grossly exaggerated; and it is often difficult to determine the exact degree of malformation, but great assistance can always be obtained by the simple expedient of critically examining the amount of wear upon the soles and heels of the boots of both feet.

F. I.—Recently a soldier persisted in keeping his bare foot in a position of talipes equinus, and nothing would induce him to put his foot flat on the ground. Indeed, he stoutly insisted that it was impossible to do so, and upon my forcing his heel to the ground he staggered and almost fell. Finding he would not relax his gastrocnemius, which he was obviously keeping contracted, I adopted the very simple expedient of sending him for his boots, when both soles and both heels were found to be equally worn! This ended the case, and he walked away cured.

**Knee.**—Injury to a working-man's knee-joint always gives rise to anxiety, and, if permanent, it is a very serious matter for him. Fraudulent attempts to claim compensation for permanent incapacity on account of injury in this region are common,

C. N. struck his right knee-joint whilst at work, injuring it ; two weeks later he was declared by his employer's doctor to be fit for work. At the end of a subsequent five weeks he was sent by his employers to another doctor, who declared him fit for light work, which he was offered, but declined. A fortnight later he was sent to a third medical man, who declared him fit for work on the level. He was supplied with an elastic knee-cap, but declined to do any work, and stated that he was permanently disabled, and would never work again. He was, after ten months, sent to me for examination and report. There were no signs of disease of any kind in his right knee-joint, and as there was no muscular wasting, it was evident that he had not been trying to save his knee-joint. When he was undressed I was able, without causing pain, to bend his knee so that his calf touched the back of his thigh. When asked to stand upon his toes, he did so on the extreme joint of each great toe after the fashion affected by professional dancers, and this he did without complaining of any pain.

He had the knack of making the muscles of the right knee-joint quiver when he walked, but when it was pointed out to him that this was obviously intentional, and wholly unnecessary, it ceased ; indeed, he subsequently walked up and down my consulting-room, quite naturally, without any lameness. He complained that he could not work because his knee "gave way" ; when asked to voluntarily make his knee give way, in order that I might observe actually what happened, to my surprise he jerked back his knee-joint, making the whole knee stiff. I had expected him to bend his knee and fall on the floor. Now, it is quite obvious that if the movement he described to me did occur while he was at work—which, by the way, from a surgical point of view, is impossible—then it could not possibly do any harm, even if he were on the rigging of a ship. This man was a sailor. I gave as my opinion that he was perfectly well, and was fit for any work that a sailor should be asked to do. His weekly payments were stopped ; his solicitor withdrew proceedings, and nothing more was heard of the case. This man was off work for ten months for a trifling injury ; he had been shamming most of the time, and I think firmer treatment at the initial stages would have been the truest kindness.

It will be noted that this man saw three medical examiners separately. No. 1 said he was fit for work. No. 2 said that he was fit for "light work." No. 3 hedged, saying he was fit for "work on the level." Finally, the employer or his representative supplied an elastic stocking. Now, the knee-joint was injured or it was not ; either the man was fit to work or he was not. A considerable experience of this class of cases has taught me that they require firm treatment : a strong line is best for all concerned.

A slightly flexed position is the most comfortable one for the knee-joint, and this position is, as a rule, assumed when either sitting or lying. More especially is this the case if the knee-joint is the subject of pain or swelling. Occasionally a malingerer keeps his knee rigid, as if in a vice. The idea seems to be

to impress the examiner that there is an entire absence of all movement, and that the condition is correspondingly serious.

The following case of simulated stiffness of the knee-joint was disproved by a simple device:

C. P. was condemned by a house-surgeon to wear for many weeks a back splint for an alleged stiff right knee. I removed the splint, and directed her to sit down and take off her right boot; meanwhile I eagerly plied her with questions as to exactly what happened at the moment of the accident—whether the company's servants had been becomingly polite, what she said, what they said, and so forth—all of which was no business of mine. It was intensely interesting to her, however. She forgot the present and lived in the past, removing her boot in the usual way as she spoke—*i.e.*, she crossed her legs and bent her knee!

Alleged pain in the knee-joint, especially when attributed to acute synovitis or a slipped semilunar cartilage, may be proved to be false or exaggerated, as follows: the knee-joint is semiflexed, and the patient's attention drawn away from it to the ankle-joint; then the foot is freely abducted and adducted, and if the patient complains of no pain at the knee, it is obvious that the rotation of the head of the tibia produced by the ankle movement has not strained the knee-joint, as it would if the knee were the seat of inflammation or of a dislocation.

A frequent cause of recurrence of mild but genuine attacks of synovitis, often associated with effusion, is a partial dislocation of the internal semilunar cartilage. An equally common, though not so often recognized, condition is the presence of a fringe of hypertrophied synovial membrane becoming lodged, as the result of an injury, between the articular surfaces of the femur and tibia. Hypertrophied fringes are very common after middle age, and, although they are often associated with a considerable amount of local creaking, cause as a rule little or no inconvenience, unless a small portion becomes nipped as just described.

Romer points out that as the fluid of an acute synovitis subsides, and as the joint gradually straightens, hypertrophied fringes are sometimes caught between the condyles of the femur and the articular surface of the tibia. He shows that the proper treatment for the reduction of these fringes and that of a displaced internal semilunar cartilage is the same—*viz.*, full flexion of the knee-joint, firm pressure with the thumbs on

the painful spot, a slight lateral movement, and a sharp straightening of the leg.

F. J., an engineering mechanic, aged sixty-two, was carrying a plank, when his right leg slipped in a motor pit, and the plank dropped on the patella of his left knee. His right leg was admittedly unhurt. He continued work that day, but did not resume work afterwards. A doctor was called in, who attended the man for four months. The leg was bandaged for several weeks, and subsequently put in splints, the suggestion being that an internal semilunar cartilage had been displaced. The man having removed to the neighbourhood of Cambridge, he was sent by a doctor to a local hospital to have adhesions, which had formed in his knee-joint, broken down under an anæsthetic. Stiffness or fixation of the knee-joint is the inevitable result of want of use. An anæsthetic was administered, and movement of the joint restored. He, however, did not attend for after-treatment, with the result that the operation was of course entirely unsuccessful.

*Examination.*—Five and a half months after the accident he was sent to me for examination. There was then no question of a displaced cartilage, but there were undoubted adhesions round the joint. He alleged that the knee got jammed so that he could not put his weight on it, and that there was very severe pain and weakness in the joint. It appeared that he had suffered from a similar injury to the right knee thirty-eight years before, and had been off work a year and nine months in consequence.

The circumferential measurements of the left knee exactly corresponded to those of the right. He complained bitterly when I first touched the internal condyle, but, when informed that the examination *must* take place, he allowed free manipulation with comparatively little protest. The movements of the joint were limited, but not nearly to the extent he represented, because I was able to bend the knee to a right angle and straighten it almost in a line with the thigh-bone. The claimant repeatedly said that his leg was “locked.” As it was important to settle this point, I directed him to undress and walk about until the leg locked. He soon got tired of this, and said that “it only partially locked.” When requested to walk about till it partially locked, he explained that what he called “locking” was really pain! It was obvious there could have been no locking, as there was no displaced cartilage.

I formed the opinion that he had made up his mind that his incapacity from this injury would last at least as long as in the case of the former injury. As, unfortunately, the lack of after-treatment after the forcible breaking down of the adhesions had permitted adhesions to reappear, I recommended treatment in a London hospital where passive movements and massage could be carried out. I judged that, with the co-operation of the patient, he should be well in a fortnight.

After showing much unwillingness and making many stipula-

tions, he was finally induced, eleven weeks later, to enter a hospital. Soon after his entrance it was found that, by holding his knee stiff, he was preventing treatment by the masseur. The diagnosis was that there was some indefinite organic lesion, but I urged the desirability of giving the functional theory a fair trial. Later the case was found to improve under massage, but there was still failure to get the leg straight. Two months after his admission I again examined him in consultation with the hospital surgeon. We found the left knee still semiflexed, and there were bitter complaints of pain on the inner side of the knee even when lightly touched. The surgeon suggested that under an anæsthetic the leg should be forcibly stretched and put in plaster. The patient having consented, the operation was performed in my presence. For no apparent reason, the man took three-quarters of an hour to anæsthetize, and eventually only very incomplete anæsthesia and relaxation of the muscles were produced. Nevertheless the leg was almost straightened. Except for some slight evidence of old thickening of the synovial membrane, there was nothing to account for the semiflexed condition in which the leg had been kept. The surgeon still thought that there might be some condition due to a former dislocation of the internal semilunar cartilage, a contention which it was, of course, impossible to disprove. My view was that the man had had at one time some synovitis; that he had got into the habit of keeping the knee bent; that it had been bent for so long that it could not be straightened without some pain and inconvenience; that he was so sensitive to pain that he would not submit to that process; and that he was largely influenced in his mental attitude by the knowledge that while the condition obtained he could not work, and must necessarily receive compensation. I then believed that, having regard to the measures taken, there was a good prospect of a favourable termination to a case which otherwise would be hopeless.

Unfortunately, while in hospital the man suddenly died, sixteen days after the operation. I attended the post-mortem examination, at which it was found that all the organs were fairly healthy with the exception of the heart, which evidenced extreme fatty degeneration, and was undoubtedly the cause of syncope resulting in death.

With regard to the left knee-joint, on the post-mortem table it assumed an absolutely straight position! On cutting into the knee-joint, the cartilages were found to be healthy, and neither were displaced nor ruptured. The joint was normal in every way, except that there was a small spot of commencing rheumatoid arthritis on the inner condyle; the right knee also showed a similar but smaller spot on the external condyle of the femur.

The post-mortem therefore demonstrated that there had been no organic basis for the trouble we had been dealing with.

The case is an extremely important one, for it is seldom indeed that one has the opportunity of verifying at a post-mortem examination the diagnosis of simulated or functional disease. In this case both the honorary hospital physician under whose care this man was,

and the honorary consulting surgeon who operated, persistently maintained that I was—indeed, must be—mistaken, until they saw at the post-mortem examination the undeniable proof that the knee-joint was normal.

Another point is, How far did F. J.'s conduct cause or precipitate his death? It is, of course, impossible to tell how long the fatty condition of the heart had existed, but I think there can be little doubt that his abstention from work for nearly eleven months, for an injury which was probably never anything more than a trifling disability, indirectly caused his death.

I am confident that those who have not the courage of their convictions, and do not compel working-men with slight disabilities to return to work, do the recipients of their supposed generosity much grievous injury mentally and morally, and in this case, apparently, the effect was much more serious and regrettable. How far the prolonged idleness, the rest in bed, the anæsthetic, the operation—all of which were really unnecessary—acted as predisposing causes of the fatal issue it is impossible to say.

Although invited to go into the witness-box and differentiate between the importance of the various causes, I declined to do so; for however culpable F. J. may have been in his conduct, such conduct was consequent upon his accident, which obviously had a remote and indirect influence on the fatal issue. I therefore advised that it was a case for reasonable compromise.

The result of the following case gave me a special pleasure, for the man who was an employee endeavoured to influence me by referring to his acquaintance or intimacy with a public man, of whom he supposed I should stand in awe. The statement *did* influence me, but not in the way intended.

C. O., after being for four weeks on the sick-list, complained of being still unable to work, owing to an injury to his knee. No abnormality being found, he was told to resume duty at once. As he did not do so, he was again sent to me a few days later. Still nothing could be found; he stated, however, that his knee swelled when he walked. Having measured his knee, I sent him out to walk for two hours. On his return no swelling was discovered by measurement. He was told to resume work forthwith, which he did.

**Sciatica.**—It is well to remember that when sciatica is fraudulently alleged it is generally by people who have had an attack from which recovery has taken place, and who therefore know the symptoms.

This disease, even when of long duration, does not produce very obvious atrophy, although, as a rule, there is *some* generalized wasting. In true sciatica the space between the trochanter major and the tuberosity of the ischium, where the nerve finds

its exit from the pelvis, is, as a rule, exquisitely tender. The popliteal space, also, is not infrequently tender, but it is well to remember that hypersensitiveness is limited to the exit of the nerve from bony foramina, the other parts being, in a genuine case, only slightly or not at all hypersensitive.

A genuine sufferer from sciatica stands with his hip and his knee flexed, the result being that the pelvis on that side is lowered. In walking the limb is spared as much as possible, and the hip is still kept flexed. If asked to sit on the floor, he will let himself down very carefully on the sound buttock. On the floor he supports himself with his arm, or sits only on the sound half of his body. In slight cases these postural peculiarities may not be obvious at first sight, but some of them will be found on careful observation.

If an inflamed sciatic nerve is put on the stretch, the pain is increased. When, therefore, the patient is put in a sitting position, the sciatic nerve is already at its full normal stretch at the hip-joint; and if the knee is then extended and the ankle flexed, it is made sufficiently taut to produce pain if sciatica is present, although, of course, this movement can be made normally without pain.

If the whole leg is now flexed upon the body, the sciatic nerve is so stretched as to be distinctly painful if sciatica is present. If sciatica is being feigned, these movements at once arouse the suspicion of the patient, and even at the preliminary stages of the test exclamations of pain are elicited long before any tension is made on the nerve.

I have been able to satisfy myself of the absence of any real sciatica by the very simple process of asking the patient to straighten his knee, and raise the sole of his foot to the level of my hand, whilst inquiring sympathetically as to whether the sole of the foot was sensitive to pin-pricks. If no pain is complained of in this position (that is, with the knee extended and the ankle and hip flexed), then one may say that no sciatica is present.

A table setting out the differential diagnosis between organic and functional hemiplegia will be found on p. 317.

## CHAPTER XVIII

### ASYMMETRY

It is important in medico-legal work to recognize the existence of developmental asymmetry, and to differentiate it from conditions resulting from disease, such as wasting of a limb. Such symptoms as backache, sciatica, and general weakness, are sometimes due to a shortening of one side of the body, which causes an undue strain on certain joints and ligaments. This strain has passed unnoticed while the patient was in good health prior to his accident, and his attention is first called to it when the debilitated condition which ensues from an accident occurs. The sufferer naturally attributes his symptoms entirely to his accident, and may continue to be disabled by it for a long time, whereas the use of proper remedies to overcome deformities—such as a cork sole to his boot—would speedily result in relief of his pain.

**Unsuspected Frequency.**—Asymmetry is very much more common than is generally supposed. One authority found, as the result of an examination of a large number of limbs, that only in some 12 per cent. of the patients were the limbs of the same length on the two sides, the differences varying from  $\frac{1}{8}$  to 1 inch. Young, who measured a large number of boys, found 70 per cent. of them to have unequal limbs, the great majority being shorter on the right side. These cases were exclusive of those having any disease which might account for the shortening, such as infantile paralysis, flat-foot, genu valgum, coxa vara and valga, and congenital dislocation of the hip.

**Causes.**—How asymmetry arises is difficult to explain. It is, apparently, a congenital defect, and it has been noted that where the father and mother have both been shorter on

one side—say the right—the child is apt to have the same defect even more markedly. It is, therefore, probably hereditary in most cases. It may possibly be due to the artery of the smaller limb being not so large as its fellow. Another explanation is that it is set up by a faulty habit. A child who persistently stands at ease on one leg will be apt to have that leg compressed, shortened, and smaller than the limb on the other side.

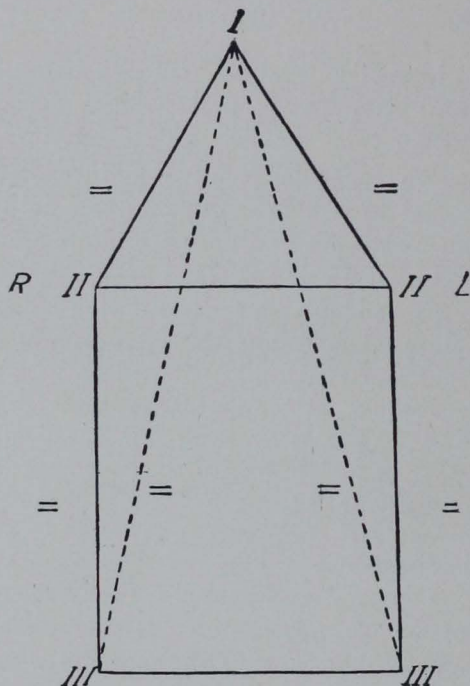


FIG. 40 —TO DEMONSTRATE MEASUREMENTS FOR SYMMETRY AND ASYMMETRY.

*R.*, Right ; *L.*, left ; *I.*, centre of sternal notch ; *II.*, anterior superior spines ; *III.*, internal malleoli ; = represents equality of measurements.

**Method of Measurement.**—Tubby, who has gone into this matter very thoroughly in his work on “Deformities, including Diseases of the Bones and Joints,” has generously put at my disposal the figures which demonstrate his method of measurement. To his chapter on Asymmetry I am indebted for much which appears in the following few pages.

He points out that the figures are highly diagrammatic, and that they do not pretend to any accuracy in the proportional measurement of the trunk, pelvis, etc. When viewing the patient from behind, which, of course, is necessary in examining for asymmetry, the figures must be reversed.

The method of measurement about to be described is the best for discovering in which part of the body shortening has really taken place.

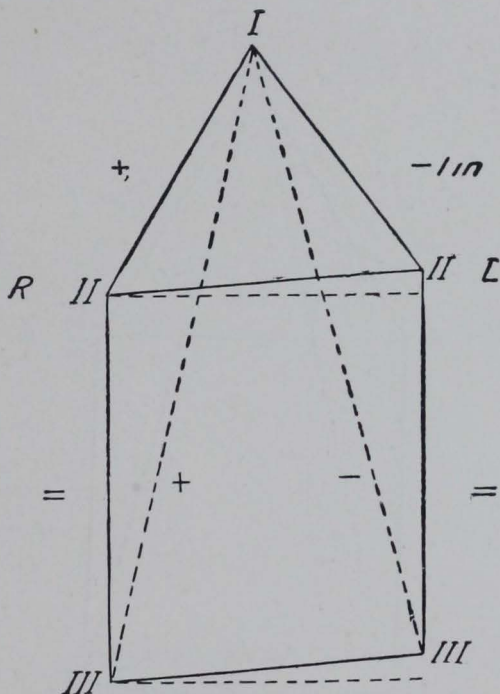


FIG. 41.—SIMPLE ASYMMETRY.

The left half of the trunk is smaller than the right, but the legs are equal.

On each side of the body three measurements are taken: The first from the sternal notch to each internal malleolus (see Fig. 40, dotted lines *I.* to *III.*, and *I.* to *III.*); the second from the sternal notch to each anterior superior spine (see Fig. 40, *I.* to *L. II.*, and *I.* to *R. II.*); and the third from the anterior superior spines to each internal malleolus (see Fig. 40, *L. II.* to *III.*, and *R. II.* to *III.*). This method of measurement is recommended for all examinations where legal questions are involved.

**Importance of Recognition in Accident Claims.**—Often the question of fitness or otherwise for work turns upon the alleged shortness of one limb compared with the corresponding limb. The legs may, as is shown in Fig. 41, be of equal length when measured accurately from each anterior superior spinous process to the corresponding malleolus, yet, owing to one side of the trunk being smaller than the other, there is considerable deformity, which is probably congenital.

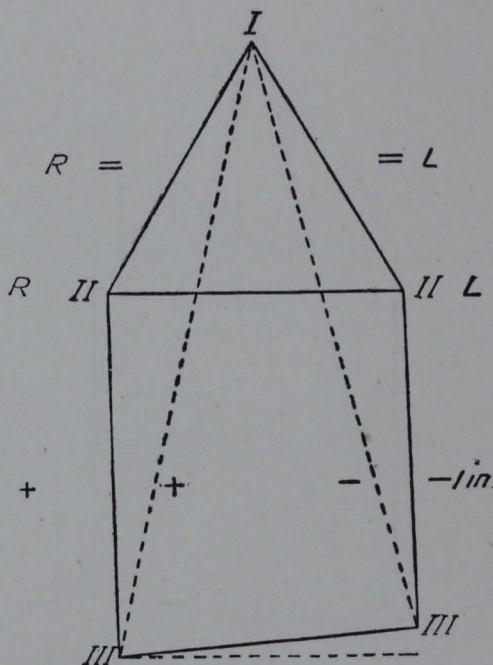


FIG. 42.—SIMPLE ASYMMETRY.

The sides of the trunk are equal, but the left leg is shorter than the right.

A very common condition, as illustrated in Fig. 42, met with as the result of fracture of the thigh or leg bones, is one where each side of the trunk is equal, but one leg is shorter than the other.

The condition just described in Fig. 42—namely, that of simple shortening of one limb, is not infrequently complicated by the trunk on the same side also being smaller than the trunk on the opposite side (see Fig. 43), thus producing

a condition of asymmetry of the whole of one side of the body. It is not difficult to see that in a case of this sort a comparatively slight shortening, as the result of an accident to one limb, might readily *appear*, on account of the trunk deformity, to be much more than it really is.

If the defect in the body was always on one side only, the difficulty in detection would not be great. Sometimes the

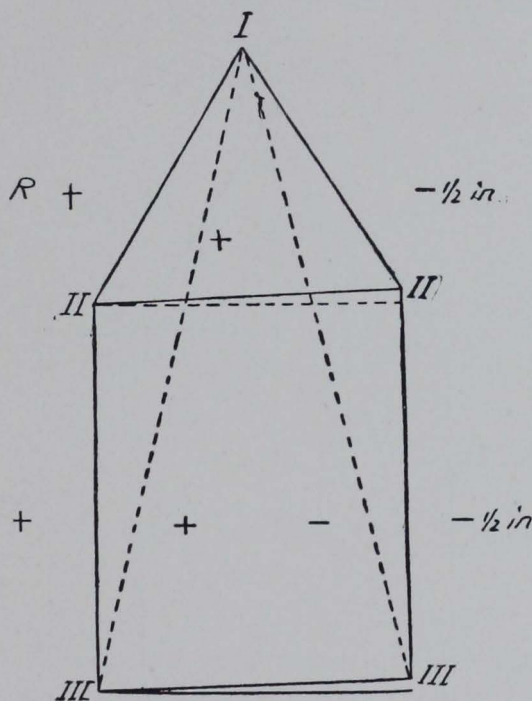


FIG. 43.—SIMPLE ASYMMETRY.

The left side of the trunk is smaller than the right; the left leg is shorter than the right. Though the shortening of the left leg is only  $\frac{1}{2}$  inch, if the limb is measured from the sternal notch it would appear to be 1 inch.

right side of the trunk may be longer than the left, but the right leg may be shorter. If the shortness of the right leg exactly compensates for the lengthening of the trunk on the right side, the asymmetry will not be apparent. In the diagram on p. 342 the trunk on the right side is 1 inch longer than the left, but the right leg is  $\frac{1}{2}$  inch short, the combination resulting in the whole of the right side being the longer by  $\frac{1}{2}$  inch.

It occasionally happens, however, that the difference in measurement from the sternal notch to the right and to the left anterior superior spinous process is entirely nullified by a difference in the length of the legs, so that as the net result, when measurements are taken from the sternal notch to the right and left internal malleolus, it is found that one whole side is *not* shorter than the other. This is called "compensated crossed asymmetry" (see Fig. 45).

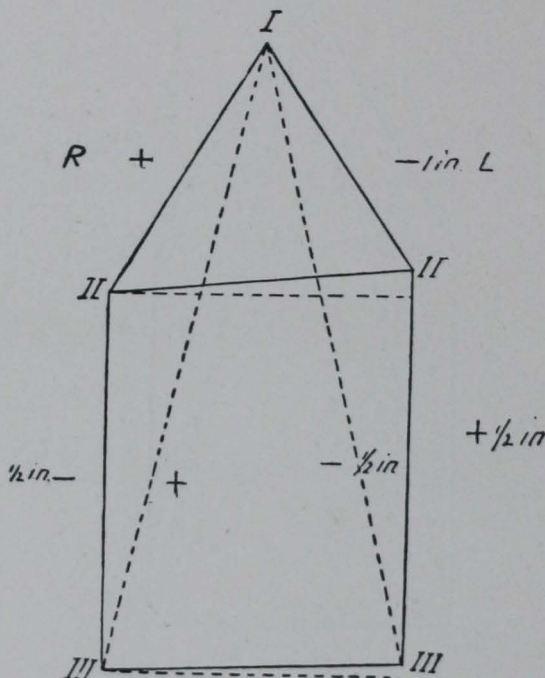


FIG. 44.—CROSSED ASYMMETRY, NON-COMPENSATED.

The right side of the trunk is longer than the left, but the right leg is shorter than the left, and the compensation is not complete—i.e., *R. I. to III.* is greater than *L. I. to III.*

Besides differences in length, it is quite common to find very considerable difference in the circumferential measurements of the limbs, this being much more the case in the arms than the legs. Rawitsch, who took measurements of 500 soldiers in all classes of society, found that in only 25 per cent. were the arms equal in measurement. He took three measurements :

1. The shoulder, which was taken by getting the patient to put his arms out horizontally, and then carrying the tape vertically round the shoulder under the axilla.
  2. The arm, at the middle point.
  3. The forearm, at its point of greatest circumference.
- He found that—

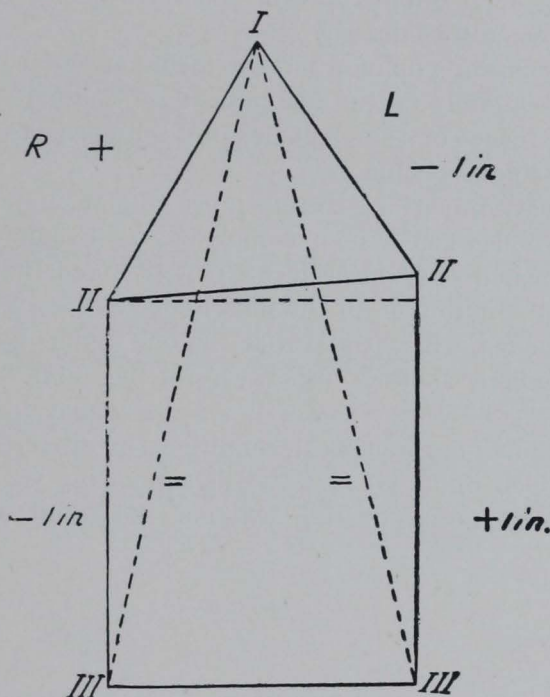


FIG. 45.—CROSSED ASYMMETRY, COMPENSATED.

$R. I. \text{ to } III. = L. I. \text{ to } III.$ , but  $R. I. \text{ to } II. > L. I. \text{ to } II.$ , and  $R. II. \text{ to } III. < L. II. \text{ to } III.$

Of the arms :

In 27.6 per cent. they were the same in measurement.

In 3 per cent. the left arm was bigger than the right.

In 13.8 per cent. a difference of  $\frac{1}{2}$  to  $\frac{3}{4}$  inch in favour of the right.

In 26 per cent. a difference of  $\frac{3}{8}$  inch.

In 29.6 per cent. a difference of less than  $\frac{3}{8}$  inch.

Of the forearms :

In 22.4 per cent. the measurements were identical.

In 1.4 per cent. the left was greater than the right.

In 10 per cent. a difference of  $\frac{1}{2}$  to  $\frac{3}{4}$  inch in favour of the right.

In 25.4 per cent. a difference of  $\frac{3}{8}$  inch.

In 40.8 per cent. a difference of less than  $\frac{3}{8}$  inch.

Rawitsch concludes from his measurements that a difference of  $\frac{3}{8}$  to  $\frac{3}{4}$  inch round the arm and forearm is not indicative of any anomaly or disease.

In the author's opinion measurements at the shoulder-joint, however carefully taken, are useless. So much depends upon the prominence of the great pectoral muscle in front and the latissimus dorsi behind.

It is very important to remember these asymmetrical conditions; and when a man complains, for example, that one arm is wasted after an accident, if it is found that there is a general diminution of all the muscles, that there is no sensory or trophic disturbance, and that the one limb is not markedly colder or bluer than the other, careful measurement *should be taken of the whole body*, when it may be found that there are corresponding asymmetrical conditions in other parts of the body, which would go far towards supporting the contention that the supposed wasting was not the result of injury or disease.