complete than after the incomplete excision (Figs. 1 to 8). Both flattening and drooping of the shoulder are more marked, and the posterior pitting is also more evident (see Figs. 1 and 2).

The outline of the upper and outer fibres of the trapezius are kept natural, and the normal level of the shoulder is maintained by these fibres, whose insertion to the acromion is saved.

The chief reasons for the absence of any appreciable flattening and drooping of the shoulder have been already given, but an additional reason may be mentioned. This is the careful preservation of the deltoid as an active muscle. Its acromial fibres are not disturbed, and those normally arising from the spine are fixed to the trapezius; whereas, after complete excision of the scapula, the posterior and external fibres, which form quite two-thirds of the muscle, are deprived of their origin, and therefore waste away from want of use.

The Incision and the Prevention of Severe Haemorrhage.

The T-shaped incision is very satisfactory. It gives a direct approach, and provides comparatively small, well-mourished flaps and efficient drainage at the lower end of the wound; it does not leave much disfigurement; and if its horizontal limb be placed high enough it enables the surgeon to expose and to tie the main vessels at the beginning of the operation. There need be no difficulty in finding the subscapular vessels from the back, so that a separate axillary incision for ligaturing these is superfluous.

For large growths either direct or indirect pressure upon the subclavian artery may be necessary. It is a distinct advantage to leave the rhomboid muscles intact until the posterior aspect of the neck of the scapula has been cleared, for the bone is thus prevented from falling forwards into an awkward position.

CONCLUSIONS.

It may be fairly concluded:

1. That for suitable cases excision of the body of the scapula, with preservation of the processes and glenoid socket, is a much better operation than excision of the whole bone, because it leaves a limb far more perfect from the functional and the artistic points of view.

2. That the operation is especially suitable for innocent growths, which fortunately and frequently leave the processes and the shoulder-joint unaffected.

3. That it may be adopted in preference to complete excision of the scapula for some small and for some slow-growing malignant growths without increasing the immediate risk of death, and probably without increasing the danger of either local or general recurrence.

4. That it may be occasionally suitable for inflammatory diseases of the scapula when the shoulder-joint is unaffected.

5. That it is wise to tie the three main vessels as early as possible in the operation, and that this can be easily done through a suitably-arranged posterior, T-shaped incision.

6. That the success of the operation largely depends upon careful asepsis, the sewing of some of divided muscles together, and the early adoption of systematic active and passive movements of the shoulder.

SIR FREDERICK WILLS has contributed a further sum of £5,000 to the fund for establishing a University at Bristol. This brings his contributions up to a total of £10,000.

CERTAIN optical illusions are so well known that they are practised at times purely for the sake of amusing an audience, and there is almost an infinite variety of ways in which things may be made to appear different to what they really are. Lines, for instance, which are really parallel can readily be made to appear to be convergent or divergent by drawing other lines, and setting them at a certain angle to the originals. Working more or less on this principle, but elaborating it to a high degree, Dr. James Fraser has produced some extremely interesting plates, and has published them with a paper entitled *A New Visual Illusion of Direction*, in the *Journal of Psychology* for January, 1908. The most curious illusions are brought about, and any one interested in the subject should study the paper, but without the plates it is useless to do more than draw attention to it. The figures display the greatest ingenuity of design.

PUNCH FRACTURES.

By HAROLD BURROWS, M.P., B.S. LOND., F.R.C.S. ENG.

LATE SENIOR ASSISTANT SURGEON TO THE SEAMEN'S HOSPITAL, GREENWICH, AND TO THE BOLLINGBROKE HOSPITAL, WANDSWORTH COMMON.

THE object of this paper is to call attention to the frequency with which a metacarpal bone is fractured when a resisting object is struck with the clenched fist.

Little notice has been given to these fractures; and this is curious, because they are common. The fact is, they are usually overlooked—often by the patient, who refrains from seeking advice; occasionally by the doctor, who regards the injury as a "bruise" or a "sprain."

My attention was first drawn to these injuries in the Out-patient Department of the Seamen's Hospital, where I chanced to see several cases within a short time.

The following are the varieties of punch fracture which I have seen: (1) Fracture of the first metacarpal bone, not involving the articular surface; (2) Bennett's fracture;

Fig. 1.—Skiagram of Case I, showing transverse fracture of first metacarpal bone near its base, with forward displacement of the distal fragment.

(3) fracture of the head or shaft of one or more of the metacarpal bones of the fingers; (4) fracture of the base of the fifth metacarpal bone, resembling Bennett's fracture of the thumb.

I.—FRACTURE OF THE FIRST METACARPAL BONE, NOT INVOLVING THE ARTICULAR SURFACE.

In these cases the fracture is usually near the carpal extremity of the bone.

CASE I.

A. B., aged 35. The injury was received by striking another man with the fist, which was clenched in the usual manner. Crepitus and deformity were well marked. It was difficult to retain the fragments in good position. Ultimate result not known.

CASE II.

W. H., aged 35. The deformity of the right thumb was noticed casually in a patient who attended for some other complaint. There is marked deformity, but no disability, except that the patient feels some pain when using a hammer. The lower fragment has been displaced backwards and inwards, and union has occurred in this position, considerable shortening of the metacarpal bone being thus produced. The injury was received some years ago during a fight. At the time there was considerable swelling of the hand, and the patient consulted a doctor, who treated the hand with some lotion and a bandage. The doctor did not say anything about the bone being broken.

II.—BENNETT'S FRACTURE.

I do not possess a skiagram of a Bennett's fracture produced by a blow with the fist clenched, although I

have seen examples. But the skiagram of Case III shows a typical Bennett's fracture, and for illustrative purposes may be useful.

CASE III.

J. G. The patient was admitted with a scalp wound and concussion, having fallen from a cart. The injury to his hand was not observed until he had been in hospital for several days, when he happened to remark that his wrist hurt him, and that he thought it must have been damaged at the time of the accident with the cart. On examination there was found to be a slight amount of swelling about the base of the first metacarpal bone, and pressure in this region caused a sharp pain. But beyond these slight signs there was nothing to suggest the presence of a fracture.

Experience has taught one to suspect that a Bennett's fracture is present in a case where there are swelling and tenderness about the base of the first metacarpal bone following an injury. But I have on two occasions made a diagnosis of Bennett's fracture in error. In the one case the swelling and tenderness were due to arthritis and in the other (Case IV) these signs were due to a fracture of the tuberosity of the metacarpal bone.

Fig. 2.—Skiagram of Case III, showing a typical Bennett's fracture.

CASE IV.

A. G., aged 35, a coster, was thrown off his cart into the road. There was swelling about the base of the metacarpal bone, and pressure on the bone caused acute pain and crepitus. The skiagram shows a fracture of the tuberosity of the first metacarpal bone.

As patients suffering from Bennett's fracture do not, as a rule, seek special advice on this account, it is not easy to get skiagraphs of recent cases. But there is no difficulty in finding old cases. For a while I made it a habit to examine the hands of men attending among my out-patients at the Seamen's Hospital, with the result that a surprisingly large proportion of them were found to have some thickening about the base of the first metacarpal bone, which they attributed to a previous injury, often received while boxing or fighting, sometimes in another manner, such as a fall. Skiagraphs of these cases usually, I think, show the deformity resulting from a Bennett's fracture.

Fig. 3 is a good illustration of an old Bennett's fracture. The patient (Case VI), a pugilist, could not give a specific account of the injury; but in the pursuit of his profession he had often hurt his hands. There are signs of considerable arthritis in the affected carpo-metacarpal joint.

CASE V.

M. M., a middle-aged man, was attending for some trouble not connected with his hand. The deformity, to which I have referred above, was noticed in his right hand. On

questioning him, he replied that he had hurt his thumb twenty years ago. For a few weeks after the injury there had been some disability of the hand. The skiagram shows a condition of the first metacarpal similar to that in Fig. 3.

III.—FRACTURES OF HEAD OR SHAFT OF METACARPAL BONES OF FINGERS.

These fractures appear to be as often overlooked as are those of the first metacarpal. As a rule the displacement of the fragments is small, and probably the periosteum at the seat of fracture is not completely torn through. Such an injury is usually regarded by the patient as a bruise, and if perchance he shows the injured hand to a doctor, the doctor also regards the injury as a mere bruise or "sprained knuckle." I have seen the deformity resulting from this injury in the hand of a doctor. On asking him how it had come about, he said he had hurt his fist some time previously when striking a blow in self-defence. He was unaware that the bone had been broken, but an x-ray

Fig. 3.—Right hand of Case VI; skiagram shows callus resulting from fracture of second metacarpal bone near its head; the first metacarpal shows deformity due to a Bennett's fracture which has healed, and there is consecutive arthritis in the neighbouring carpo-metacarpal joint.

examination showed angular deformity of the bone, which undoubtedly had been caused by a fracture.

CASE VI.

F. W., aged 37, a professional pugilist, came for advice because he could not clench his right fist properly, on account of an injury to the knuckle of the forefinger received in a fight six weeks previously. On examination some thickening was found about the knuckle of the right forefinger, and flexion at this joint was incomplete. There was also an old lateral dislocation of the right thumb at the metacarpo-phalangeal joint. Apparently each thumb has been the seat of a Bennett's fracture at some distant time (see Fig. 3). The dislocation of the thumb was received in a fight in which the opponents clinched. F. W. hit up at his opponent's jaw, but struck his thumb against the opponent's arm instead. He could give no account of the Bennett's fractures, but said he had often had his hands painful after a fight, but he did not take much notice of such things.

CASE VII.

G. F., aged 28, came on account of an injury to his right hand received in a fight. The skiagram shows a fracture of the head of the metacarpal bone of the forefinger.

CASE VIII.

A. F., aged 28, came to the out-patient department of the Seamen's Hospital for some illness unconnected with the old injury to his hand. The skiagram shows an old healed fracture

of the shaft of the metacarpal bone of the left forefinger. The patient, who was a soldier at the time, had hurt his hand some years ago in a fight. Immediately after the injury he showed his hand to the army surgeon, who caused it to be painted with iodine. The patient was not incapacitated by the injury, but continued his work as usual. There is a marked projection on the dorsum of the hand, but there has been little or no lateral displacement of the fragments. I think this is the typical deformity which results from a punch fracture of the shaft of a metacarpal bone. An examination with the fluorescent screen, and even an x-ray photograph, may fail to reveal a fracture of this nature, if the examination be made in the usual way with the hand lying flat on the screen or the photographic plate.

IV.—FRACTURE OF THE BASE OF THE FIFTH METACARPAL BONE

The skiagraph of Case IX is of especial interest, for it shows a fracture which resembles, anatomically, Bennett's fracture of the thumb. It seems possible that this fracture will be found to be fairly common when particular attention has been directed to these cases of punch fracture. I have no note to say how the fracture in Case IX was caused, but believe it was the result of a fight.

Although, as a rule, these "punch" fractures cause little inconvenience of either an immediate or remote nature to the recipient, yet it is of some importance to recognize them. For, in the first place, it is not good surgery to regard a fracture as a bruise, and to dismiss the case without a suspicion of its true character; and, secondly, in those cases in which the fracture involves a joint, osteoarthritic changes may ensue, and it is possible to maintain that these changes are increased, or even caused, by frequent movements of the joint during the period following immediately upon the injury. The skiagraph of Case VI shows well-marked arthritic changes in the right carpo metacarpal joint of the thumb; and I found similar changes in two cases in the *post-mortem* room, in each of which the appearances of an old Bennett's fracture were present.

With regard to treatment, it may be urged that none is required, because permanent disability of any kind is rare even if no treatment is employed. Such a crude rule governs the practice of the present day, but chiefly because a correct diagnosis is not often made. If a recent punch fracture be correctly diagnosed, there are two points which at least should be considered. The first is the desirability of reducing deformity, and the second is the necessity for maintaining rest if the fracture involves a joint. The amount of deformity resulting from a punch fracture varies greatly. Following a Bennett's fracture there is usually some palpable thickening about the base of the first metacarpal, and the tuberosity of the bone is unduly prominent. But it is almost impossible to prevent these effects. The problem is easy of solution, however, when one of the metacarpal bones of the fingers is broken. Here there is commonly an angular projection on the dorsum of the hand marking the position of the fracture; if uncorrected this bony irregularity will form a permanent and manifest record of the combat in which it was produced. As to the means of reducing deformity or maintaining rest nothing need be said, for every surgeon will rely on his own ingenuity.

In conclusion, I should like to thank Mr. C. O. Choyce and the resident medical officers at the Seamen's Hospital, for their very kind co-operation with me in finding and examining these cases of punch fracture, and Mr. Thomas Hart for the most excellent skiagraphs.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL.

CALMETTE'S OPHTHALMO REACTION.

The following observations were made at the Crossley Sanatorium for Consumption during the four months, November, 1907, to February, 1908.

The tuberculin employed was obtained from the Pasteur Institute, Lille. The same pipette was employed for each instillation thus ensuring accurate and identical dosage. All the patients were under precisely similar conditions. All were under observation from hour to hour from the time of instillation. When no reaction was obtained in the first instance, a second instillation was administered after a fortnight's interval. When this also proved

negative, a third instillation was given after a similar interval.

Of 106 cases examined, 2 only failed to give a reaction even after three such instillations.

Of the 104 cases in which a reaction was obtained tubercle bacilli were found in the sputum in 83; of these 78 reacted to the first application, 5 only reacted to the second. These 5 cases were all of an advanced type. In 2 the larynx was secondarily involved, and in 2 others there was morbus coxae in addition to extensive pulmonary lesions.

In 26 cases no tubercle bacilli could be found in the sputum even after repeated examinations; of these, 10 reacted to the first application, 6 to the second, and 5 to the third. Of the 6 cases which only gave a reaction to the second application, 3 were of a very early type and could be considered as being apparently cured, the physical signs being consistent with the existence of healed foci of tuberculosis. One had tuberculosis of the os calcis with slight involvement of the right apex; one had marked lesions in both lungs, and the last of this series was an old case which had been under observation during the past five years. Of the 5 cases which only gave a reaction to the third application all exhibited definite physical signs with lesions of limited extent in one or other apex. The 2 cases which gave no reaction to the tuberculin and in whose sputum no tubercle bacilli could be demonstrated are added.

H. M., aged 18, had all the physical signs and symptoms of bronchiectasis, probably of pneumonic origin.

S. F., aged 13, had previously had a pneumococcal empyema, and was affected with marked scoliosis.

It is doubtful whether any relation exists between the intensity of the reaction on the one hand, and the activity of the disease or the extent of the lesion on the other. We noted, however, that in some cases with physical signs of early or healed lesions the reaction was sluggish, sometimes delayed, and perhaps only positive on the second or third application. In several advanced cases with evidence of marked pleural thickening, and in some cases fluid, the reaction was also delayed until the second or third application, when it developed a severe type.

This is what one would expect, as in these early cases in which the reaction was delayed the disease must have been latent; in the advanced cases such a minute dose of tuberculin was not likely to elicit a response at the first application. It has been universally recognized that in very advanced or moribund cases no reaction is obtainable.

For the facilities afforded to carry out these observations we are indebted to the honorary staff. It is but right to add that most of this work was done by Dr. Radcliffe, late Assistant Medical Officer, and that I have simply put the facts together. For much advice and kind assistance my thanks are due to the Medical Director of the Crossley Sanatorium.

H. F. R. STEPHENS, M.B., B.S. Lond.

Royal Infirmary, Manchester.

I HAVE most carefully read Professor Calmette's article in *International Clinics*, and I have tried the ophthalmic reaction in 200 cases, including both hospital and private patients.

The reaction shows best in twenty-four hours, in some few exceptional cases it appears even after a longer interval than twenty-four hours. Among my cases were many of surgical tuberculous disease (joints or glands). These cases gave a reaction quickly, and the effects were slow in passing away. Patients with coincident disease of the eye or lids reacted violently, and it is interesting to note that in one case of choroiditis said to be syphilitic, one of iritis said to be rheumatic, one of slight conjunctivitis, two of severe corneal ulcer, and one case where the patient was constantly using his eyes all day, the reaction was not only violent, but continued for a period of ten days. These patients complained, in one case bitterly, of the pain and inability to use the eye. Of these patients with eye defects or lesions, two gave no other indication of tuberculosis apart from this ophthalmic reaction.

Two of my patients with T.B. + and with physical signs of pulmonary disease gave no reaction with one application of Calmette's fluid; in one of these cases a repetition of the test caused the reaction to appear. I was able to test five children in the workhouse through the