have spinal anaesthesia "because their pals had had it," in preference to a general anaesthetic.

Disadvantages.

These are mostly attributable to lack of experience, the more practised one becomes in the technique the less do the disadvantages become. The main one, however, is the limitation of the sphere of the operation to parts of the body below the nipple line.

COMMINUTED FRACTURE OF THE HUMERUS PRODUCED BY MUSCULAR ACTION.

BY

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(With Special Plate.)

THE interest of the following case lies in the fact that there can be no doubt that the fracture was due to sudden and forcible contraction of the deltoid.

Corporal A. B., aged 33, was admitted to the hospital on April 26th, 1916, having sustained a fracture of the right humerus.

The accident had occurred half an hour previously. He was being instructed with a squad of other men in throwing hand grenades. The grenades are known as

owing to sepsis, it took two months to heal. No disability of the arm resulted.

X-ray photos showed the fracture to be comminuted. There was a spiral fracture of the shaft, and apparently three fragments. In the lateral view a portion of the shaft at about the middle of the bone was separated and lying loose. The upper fragment, into which the deltoid was inserted, was abducted.

Operation.

On May 1st a free incision was made on the outer aspect of the arm, and after considerable trouble, caused by the thickness of the muscles, the site of the fracture was exposed. It was not found possible to plate the fragments, and accordingly two stout silver wires were passed round the humerus after first detaching the musculo-spiral nerve from its groove and holding it aside.

On completion of the operation the fragments were found to be rigidly held together by the wires. The arm was put up on a triangular splint. At the time of the operation no osteomyelitis or other disease of the bone could be detected. Early massage, movements, and electrical treatment were employed, and good union and function resulted.

On June 10th—a month and a half after the accident—the patient suddenly died under an anaesthetic, which was being administered in order to break down a few adhesions in the elbow-joint. *Post-mortem* examination showed fatty changes in the myocardium and well-marked healed tubercle of the apex of each lung. Examination of the fracture revealed good union, and

Anterior view.

RIGHT HUMERUS.

Posterior view.

Internal view.

RIGHT HUMERUS.

External view.

"Mills," and were being used empty. They are about the size of a duck's egg, made of steel, and weigh just over two pounds. They should be thrown by an action somewhat similar to that of bowling in cricket. This man, however, not understanding the method, raised the grenade up to and behind his shoulder, as in the first position for "chucking it," as one would do in throwing a stone, and he did this suddenly and with a jerk. He felt his arm break, and it and the grenade, which had not yet left his hand, dropped. The officer in charge of the party saw the accident happen, as did several other men, and there is no question as to this having been the exact method of its occurrence. The patient was an exceedingly muscular man, with thirteen years' service, who had never had any serious illness nor previously broken a bone. He went to the front in December, 1914, and in January, 1916, was wounded by shrapnel in the right elbow. The wound was superficial, and no fragments penetrated, although,

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no evidence whatever of any disease of the bone, nor was any necrosis present.

It was found that there were four fragments, the largest of which was the upper one, into which the deltoid was inserted. The fragments were well held together by the wires, even after the specimen removed at the *post-mortem* examination had been boiled.

We have published this case, as it must be rare to find an instance of comminuted fracture of the humerus produced by muscular action and to have the opportunity of examining it, whilst still recent, *post-mortem*.

Drawings made by one of us of the *post-mortem* specimen are appended, as are also the radiograms taken at the time of the accident and after wiring. (See Special Plate.)

The *post-mortem* specimen may be seen in the War Office collection at the Museum of the Royal College of Surgeons.