longer was threefold that for controls. Certain of the increases were not so impressive as expected. Some of these dusts (Czechoslovak, tarred road, silica, iron oxide) are under suspicion as causes of lung tumours in man.

Heredity, age, the so-called carcinogenic agents, and some dusts are definite factors in the experimental development of lung tumours in mice. Efforts to inhibit lung tumours with alumina or calcium carbonate were unsuccessful.

The dusts produced about a fourfold increase in the incidence of hyperplasia of lymph tissue in the lungs and a threefold increase for tracheo-bronchial lymph glands. There was also an increase in most experiments in the incidence of the pneumonias.

Silicotic nodules were produced in the tracheo-bronchial lymph glands of mice breathing an amorphous silica; this confirms the first (Campbell, 1940, 1941) demonstration of silicosis produced without the crystal unit of quartz.

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ISOLATED FRACTURE OF THE CARPAL CUNEIFORM

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During the past two years 580 cases of injuries to the wrist have been seen at this hospital, and 20 of these have been fractures of the carpal cuneiform. The condition has been referred to by Kellogg Speed (1925), and an article by F. Deneke (1911) included the bibliography up to that date. The latter author described 3 cases, in each of which there was a fracture of the styloid process of the ulna.

Aetiology.—The condition arises as a result of a fall on the outstretched hand. Of the 20 cases seen at this hospital none was due to direct injury, and 3 had an associated fracture of the lower end of the radius. The observations by previous writers, including Kellogg Speed, that isolated fracture of the cuneiform is a rare condition do not, therefore, appear to be accurate.

Physical Signs.—The patient complains of pain over the ulnar aspect of the dorsum of the wrist. All movements are painful, particularly ulnar deviation. There is always considerable swelling, and a localized point of tenderness can be felt directly over the cuneiform.

X-ray Appearances.—No abnormality will be present in the antero-posterior view unless there is an associated fracture of the proximal row of carpal bones or of the lower end of the radius or ulna. In the lateral view three clearly

defined types of fracture may be recognized: (1) an area extending through two-thirds of the cuneiform at its dorsal aspect, with radiating cracks or fissures through the bone; (2) a small flake of bone avulsed from the dorsum with considerable separation; and (3) a small flake fracture with no separation.

Pathology.—In those cases in which the injury was sustained by a fall on the palm of the outstretched hand a fairly large area of the dorsum of the cuneiform was fractured, for in the dorsiflexed position the cuneiform is compressed between the pisiform and the lower end of the ulna, giving rise to a typical fracture extending through the bone. Radiographs taken in dorsiflexion show the situation of these bones in relation one to another (Fig. 1). The force may, however, be so applied that the cuneiform is momentarily dislocated backwards, and the strong ligaments passing between it and the semilunar avulse a flake of bone without an associated compression fracture. Case 2 illustrates this point. A radiograph showed not only a small flake fracture of the cuneiform but also a posterior marginal fracture of the lower end of the radius, a condition caused only by a fall on the outstretched palm. This patient located the tenderness not on the ulnar collateral ligament but between the cuneiform and the semilunar. When, however, the patient falls on to the back of the hand, only small flake fractures of the cuneiform are seen in the

FIG. 1.—Radiograph showing wrist in dorsiflexion. It will be seen that a fall on the wrist in that position compresses the cuneiform between the pisiform and the lower end of the ulna.

radiograph. When the wrist is violently plantar-flexed the ulnar collateral ligament is strained, and either a flake of bone is removed from the cuneiform or the ligament itself is torn. It has been observed, also, that a fracture of the cuneiform always accompanies a perilunar dislocation of the carpus, where all the bones of the wrist, with the exception of the semilunar, are dislocated backwards and outwards, and as a result flakes of bone are torn from the cuneiform by the ligaments which bind it to the semilunar. Wittek (according to Deneke) himself fell on his outstretched hand and sustained a fracture of the cuneiform. The condition was not diagnosed at the time, and he suffered considerable disability lasting for more than a year.

Treatment.—Immobilization in plaster-of-Paris for three weeks is followed by no recurrence of the symptoms, and union takes place rapidly.

Illustrative Cases

Case 1.—The patient, a housewife aged 65, fell in the street on to the palm of her hand. On admission to hospital there

was swelling of the dorsum of the wrist, all movements being painful, but particularly ulnar deviation when the wrist was dorsiflexed. A radiograph showed a fracture of the cuneiform involving two-thirds of the bone (Fig. 2).

FIG. 2.—Case 1. Showing fracture of the cuneiform involving two-thirds of the bone.

(Figs. 4 and 5). There were physical signs similar to those described in the two preceding cases.

Case 2.—The patient, a housewife aged 51, slipped and fell on to her left wrist. On admission to hospital she complained of pain in the wrist, and there was a point of maximal tenderness between the cuneiform and the semilunar. A radiograph showed a small flake fracture of the dorsum of the cuneiform and a posterior marginal fracture of the lower end of the radius (Fig. 3).

Case 3.—The patient, a man aged 31, fell 20 feet from a roof. On admission to hospital he did not remember anything about the accident. He sustained a fracture of the transverse process of the second, third, and fourth lumbar vertebrae and a flake fracture, with considerable separation, of the dorsum of the left cuneiform

FIG. 3.—Case 2. Showing small flake fracture of the cuneiform and a posterior marginal fracture of the lower end of the radius.

FIGS. 4 and 5.—Case 3. Showing flake fracture of cuneiform with considerable separation of fragment.

Summary

Three cases of isolated fracture of the carpal cuneiform have been described.

Seventeen cases of isolated fracture of the cuneiform and 3 cases associated with fracture of the lower end of the radius have been seen at this hospital in the past two years. These observations are not in accordance with those previously described.

The condition may be easily overlooked: no evidence of fracture will be seen in any of the antero-posterior views described, and unless the fracture is recognized from the lateral radiograph considerable disability follows failure to immobilize the wrist in plaster-of-Paris.

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Medical Memoranda

Bacteriological Standards in the Investigation of Enteric Convalescents

Although there has been a decided decrease in the incidence of enteric fever during the last fifty years, isolated cases continue to occur and even large outbreaks are occasionally reported. Since unsuspected carriers are often responsible for the dissemination of infection, it would be desirable to institute a more searching bacteriological examination of enteric convalescents than is in vogue in most hospitals. The inadequacy of the common practice of assuming that a patient is free from infection following negative results from cultures of three specimens of both stool and urine obtained at weekly intervals is demonstrated in the history of the following case.

CASE REPORT

The patient, a youth aged 18, was taken ill on June 19, 1939, with malaise and sore throat, and at the end of a week he developed diarrhoea and complained of generalized aches. He was admitted to hospital on June 27 as a suspected case of typhoid fever. On examination the face was flushed, the tongue lightly furred, and a few rose-coloured spots were present on the trunk. The abdomen was soft, and on deep inspiration the edge of the spleen could be palpated. The temperature was 102° and the pulse 120. The stools were loose but of normal colour. A Widal test performed on the day after admission showed agglutination of a suspension of *B. typhosus* in a 1 in 50 dilution. On the following day a repetition of the test yielded a rise in the titre to 1 in 250, thus confirming the diagnosis. During the ensuing two weeks the patient remained very ill, with a temperature varying from 99° to 102°, and complained of occasional attacks of pain in the right hypochondrium. At these times there was also tenderness on pressure and slight rigidity of the musculature in that region. Three weeks from the onset of symptoms the pulse rate and temperature returned to normal, but convalescence was interrupted by a period of irregular pyrexia which lasted for five days. Slight tenderness over the gall-bladder was the only sign present at this stage. Subsequently improvement was rapid. Specimens of faeces and urine were cultured at weekly intervals and proved negative on three consecutive occasions. Wilson and Blair's selective medium was used. Following these results he was discharged from hospital on August 21, 1939.