The right leg, both in the thigh and calf muscles, was affected, and the pain experienced by the patient was severe. He could hardly bear the most gentle pressure. Examination revealed that there was a large nest of these crystal-like structures in the middle third of the tibialis anticus muscle. There were several smaller areas in other parts. I presented the case to several of my medical colleagues for their opinion. They informed me that the condition was quite new to them.

It was decided to make an incision directly over this large nest of crystals and if possible remove them. An incision was made over the area (Captain A. W. T. Whitworth, R.A.M.C., kindly performing the operation), and the aponeurotic sheath of the tibialis anticus muscle was exposed. The crystal-like structures could be felt in a pocket or small cavity below the level of the sheath, and as the surgeon removed the mass he could distinctly feel that the small foreign bodies were hard and brittle. The mass was about the size, including fat and connective tissue, of a marrowfat pea.

This mass was placed on a microscopic slide, but, to our surprise, within two minutes the crystal-like structures had disappeared and only the soft tissue could be felt in the forceps. The piece of tissue was immediately transferred to a test-tube and dispatched to the pathological laboratory for chemical and pathological examination. The following is a copy of the report:—

"The material was found to consist of a mass of fat cells lying in a coarse stroma of connective tissue, fibrin, and some elastic tissue. No crystals were found. No evidence of an old hæmorrhage was discovered. The examination has given no clue to the symptoms observed."

Were these crystals volatile?

Heaton Moor, Stockport.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

BOMB WOUND OF ABDOMEN:

AN EXAMPLE OF PERITONEAL RESISTANCE.

BY D. P. D. WILKIE, M.Ch., F.R.C.S. EDIN.,

ACTING STAFF-SURGEON, R.N.V.R.; R.N. HOSPITAL SHIP,
"ST. MARGARET OF SCOTLAND."

THE following case appears to be worthy of record as illustrating the remarkable power of the peritoneum to resist infection of traumatic origin when the element of shock is successfully combated.

S. H., aged 32, leading seaman, was acting as coxswain of a motor launch at 6 P.M. on August 18th, 1917, in a harbour in the Eastern Mediterranean when a bomb dropped by hostile aircraft exploded 15 yards from the launch. A fragment of bomb, $1\frac{1}{2}$ in. by $\frac{3}{4}$ in. by $\frac{1}{4}$ in., of irregular jagged outline, struck him in the abdomen. Entering in the right half of the epigastrium, it came out in the right flank, and then embedded itself in a wooden bulkhead from which it was recovered later. He was laid on the bottom of the launch bleeding freely, and on lifting up his "flannel" it was seen that numerous coils of intestine had escaped from the posterior wound. At 6.50 P.M. he was brought alongside the hospital ship. It was then seen that between 5 and 6 feet of small intestine had prolapsed and become partially strangulated, the intestine being congested and oedematous, and there being numerous hæmorrhages into the mesentery. A knuckle of transverse colon and omentum projected at the anterior wound. His clothes were soaked with blood and, as the weather was hot, stormy, and dusty, only relatively clean. As he was writhing in pain and tending to force more intestine through the wound he was anaesthetised in the launch, then hoisted inboard and taken to the theatre.

Operation (one hour after injury).—The prolapsed intestine, which was later found to be the upper jejunum, felt thick and sodden but had not lost its normal gloss except in a few places, and although there was obvious soiling it still showed definite though sluggish muscular response to stimulation. The coils were rapidly washed with eusol and covered with swabs out of hot saline. The entrant and exit wounds of the abdominal wall, which were four inches apart, were then joined by an incision. It was then seen that there was but one wound of the parietal peritoneum, 5 inches long; there was no sign of any tear of the intestine or mesentery, but the lower margin of the right lobe of the liver had been lacerated and there were compound fractures of the ninth and tenth ribs in the

anterior axillary line. The hæmorrhage was coming chiefly from the torn intercostal arteries, which were thereupon ligatured. The patient at this stage became somewhat collapsed under the anæsthetic, and therefore only a very perfunctory cleansing of the prolapsed intestine could be carried out before replacing it. No effort was made to empty the peritoneal cavity of blood, but after spreading the omentum below the wound the peritoneum was closed completely. The edges of the wound in the abdominal wall were excised and the wound stitched up, a small rubber drain being left in at its posterior angle. For 48 hours after the operation the patient suffered from abdominal distension and there was generalised abdominal tenderness, but, absorbing large quantities of saline per rectum, he quickly got over the initial shock, and with the help of hypodermic injections of eserine gr. 1/150, small doses of calomel by the mouth, and finally a turpentine enema the bowels were got to move on the third day. From this time onward progress was uneventful; he was on deck on the tenth day, the wound healed per primam, and he returned to duty on his ship six weeks after the injury.

The case is of interest partly from the fact that a jagged fragment of bomb should have torn the parietal peritoneum so extensively without wounding any of the hollow viscera, but chiefly because of the evidence it affords that in dealing with such cases speed and the avoidance of shock are more important factors than elaborate efforts to cleanse the exposed and soiled peritoneal surfaces, and that if the circulation and general condition of the patient can be maintained the peritoneum has wonderful powers of dealing with infection.

I wish to express my thanks to Surgeons W. A. McKerrow and W. G. Wyllie for their skilful help in dealing with the case.

CASE OF THREATENING SEPSIS OF KNEE-JOINT ABORTED BY INJECTION OF FLAVINE.

BY W. HENRY HILLYER, M.D. DURH.

THE following case seems worth reporting as evidence of the value of flavine in cutting short a commencing sepsis where circumstances contra-indicate free incision and drainage.

The patient, a domestic servant, aged 18, first seen on Sept. 29th, 1917, gave a history of sudden pain and swelling of the right knee-joint, commencing the previous evening. Had been perfectly well up to that time—no history of any wound, blow, strain, or other injury. On examination the knee was found greatly swollen, the joint distended with fluid, and all outlines lost. The whole joint was slightly tender and very painful on movement. There was a well-defined acutely tender spot over the inner edge of the head of the tibia, and the general appearance of the joint suggested an acute synovitis such as follows a displacement of a semilunar cartilage, but no evidence of such an injury could be made out. Temperature 104° F.

Under lead fomentations, rest in bed, and sod. salicyl. gr.x. 4tis hor. the swelling subsided considerably, but the tender spot persisted, and the temperature continued to rise to 102° or thereabouts each evening.

On Oct. 4th patient was admitted to the Queen Victoria Cottage Hospital, East Grinstead. The knee was painted with iodine and kept at rest with sandbags, and the sod. sal. continued. Temperature fell on the morning of the 5th and did not rise above 98.6° that day, but on the 6th, 7th, and 8th it rose to 99.4° , 99.0° , and 99.6° , the condition of the joint remaining unchanged.

On Oct. 8th she was seen by Major Cecil Rowntree, consulting surgeon to the hospital, who aspirated the knee-joint and drew off 60 c.c. of turbid flaky fluid, not definitely purulent. He advised keeping the joint absolutely at rest on a McIntyre's splint, continuing the sod. sal. and aspirating at intervals in the hope that it might not be necessary to open the joint. The aspiration greatly relieved the pain and entirely abolished the tender spot over inner edge of head of tibia. Temperature continued to run a hectic course for the next four days, reaching 101° on the 11th and 100.4° on the 12th. On the 13th and 14th it remained normal, but on the 15th it reached 100.6° and on the 16th 100.2° , with return of pain and tenderness and increase of swelling.

On Oct. 16th 40 c.c. of fluid were withdrawn with less marked relief of symptoms, temperature continuing to rise to between 100° and 101° each evening. The fluid was examined by Dr. Cavendish Fletcher, who reported as follows:—"The fluid contains a good deal of pus and a little blood. Bacteria are not numerous, and comprise short Gram-positive bacteria of diphtheroid type. These have not grown in culture. A

search for gonococci and tubercle bacilli has yielded negative results."

On Oct. 21st the joint was aspirated again and 34 c.c. removed. This produced great relief, and the temperature range continued lower, being normal in the mornings and not rising above 99.6° until Oct. 27th, when it ran up to 100.8°, with more swelling than at any time since the first three days.

On Oct. 27th 66 c.c. were drawn off, and the fluid appeared more decidedly purulent and showed large numbers of lymphocytes under the microscope. The temperature remained persistently high, ranging between 99.4° and 101° for the next 48 hours. Major Rowntree then suggested injecting flavine, still wishing to avoid opening the joint if possible. 30 c.c. of fluid were withdrawn and 30 c.c. of flavine (1-1000 in normal saline) were injected. The temperature fell to normal on Oct. 31st, and has not since risen above 99°. Since Nov. 8th it has not risen above normal. All tenderness, pain, and swelling have gradually disappeared. The splint was removed for half an hour daily, and passive movements commenced on Nov. 15th.

On Nov. 22nd the splint was finally removed. The knee was forcibly bent, full flexion being obtained. Some slight adhesions were felt to give way, and movement is now normal.

East Grinstead.

A CASE OF CUTANEOUS ANTHRAX IN MAN PRESENTING MULTIPLE LESIONS.

BY WILLIAM T. G. DAVIDSON, M.B., CH.B. GLASG.,
D.P.H. CAMB.,

SENIOR ASSISTANT PHYSICIAN, CITY OF GLASGOW FEVER HOSPITAL,
RUCHILL.

A SEARCH of the literature has revealed the fact that the occurrence of multiple lesions in cutaneous anthrax is very uncommon. In a series of 65 cases occurring in 1915-16 Coutts¹ does not record any having more than one lesion. Osler and Macrae² state that the lesion is usually single, though two or even three points of inoculation have been observed. According to the "Encyclopædia Medica"³ cases may occur in which two, or even more, malignant pustules may develop simultaneously. The following case, inasmuch as the lesions were multiple and did not occur simultaneously, presents elements of interest, therefore, in those respects.

"A" was employed on an estate in the country, and as he had some previous knowledge as a butcher he was asked to assist at the slaughtering of an animal thought to be suffering from inflammation of the bowels. He assisted to kill, bleed, and skin the animal, the carcass being removed to the dead-meat market. There it was suspected that the cause of the disease was anthrax, and this was subsequently confirmed. Moreover, a dog which had drunk some of the animal's blood and a second cow died later of anthrax.

Meanwhile "A," four days after the slaughtering of the animal, had developed a "pimple" on the back of his left hand. Three days after the appearance of this first lesion another had appeared on the right forearm. Having heard of the diagnosis of the disease in the animal, "A" became alarmed at the possibility of these lesions being anthrax also, and on the following day consulted his own doctor, who advised him to attend the infirmary in the neighbouring town. He attended the infirmary on the same day, when the disease was diagnosed as anthrax, and he was immediately transferred to this hospital.

On admission there was found a well-developed malignant pustule on the dorsum of the left hand, a central depressed necrotic area surrounded by a ring of small vesicles, with considerable inflammatory oedema over the back of the hand. Itchiness was a marked feature, but there was only slight pain, and the lymphatic vessels and glands did not appear to be affected. About halfway up the right forearm and over its anterior and ulnar aspect there was another similar though smaller lesion presenting the same clinical appearances. There was a smarting feeling present, itchiness, only slight pain and very little oedema.

On the day of admission the patient received 20 c.cm. of Sclavo's serum, and both pustules were excised and the wounds dressed with antiseptic dressings. The next morning a small papule had appeared over the anterior and ulnar aspect of the left forearm and about halfway up. This was accompanied by the same symptoms as were present with the other two, and it also was excised.

There was no pyrexia during the course of the illness from the time of admission here, and the general health was unaffected.

From the first two pustules *B. anthracis* was obtained in culture, but in the case of the last one no bacteriological

examination was made, as the excised portion had been, unfortunately, destroyed. The first two lesions were undoubtedly malignant pustules, and it can be fairly definitely assumed that the third was also, because of its characteristic clinical appearance and of the fact that the subjective symptoms were the same in this one as the patient had experienced with the other two.

The patient made an uneventful recovery.

The foregoing case illustrates certain features of malignant pustule which appear, as far as can be ascertained from the literature, to be of rare occurrence in the disease.

The presence of multiple lesions is capable of explanation in several ways.

Direct infection may have occurred in the three places while the patient was in contact with the diseased animal. Lesions produced in this way tend to manifest themselves simultaneously, whereas in this case the lesions did not do so. The clinical appearances of the three lesions showed them to be at different stages of development. The incubation periods of the three pustules would tend to preclude the possibility of direct infection with the bacillus at the same time. According to Muir and Ritchie⁴ and Osler and Macrae² the incubation period of a malignant pustule is from one to three days after infection takes place. In this case the first pustule appeared four days after infection; the second pustule, however, did not appear until seven days, and the third not until nine days after exposure to infection.

A second possibility is that the patient auto-inoculated himself at different times by rubbing and scratching the first lesion on account of the itching, and thereby transferring some of the infection to the other two places. Questioned as regards this, the man appears to have taken considerable precautions to clean his hands and arms after the slaughtering of the animal, washing them thoroughly. When the so-called "pimple" appeared he dressed it with a lysol dressing, and he denies ever having rubbed or scratched the part.

There remains, therefore, only one, and what would appear to be the most likely, mode of infection. After the slaughtering of the animal, at which he worked with his shirt sleeves rolled up to the elbow, he did not remove any of the clothing he had on at the time until seven days afterwards. It is therefore possible that some of the infection, probably in the form of spores, remained on the shirt he wore at the time for several days without producing any effect, until, after gaining entrance through the epidermis by some minute abrasion or cut in the skin, the spores developed rapidly into bacillary form, and produced a second and a third lesion. That this may happen is noted by Allbutt and Rolleston.⁵

The fact of the absence of constitutional symptoms—e.g., pyrexia, &c., and of the general absence of pain, though remarkable under the circumstances and indicative of high resistance to the disease, is by no means uncommon^{6,7} as long as the lesion remains local.

References.—1. Coutts, Dr. F. J. H.: Report to Local Government Board on an Inquiry into Cases of Anthrax (1917). 2. Osler and Macrae: A System of Medicine (1915), p. 644. 3. Encyclopædia Medica (1901) p. 256. 4. Muir and Ritchie: Manual of Bacteriology, 5th edition, p. 342. 5. Allbutt and Rolleston: System of Medicine (1906), vol. ii., part 1, p. 243. 6. Ibid., p. 244. 7. Osler and Macrae, p. 645.

ROYAL SOCIETY OF ARTS LECTURES.—The arrangements for meetings at the Royal Society of Arts (John-street, Adelphi, W.C.) during January and February include a lecture on the Manufacture of Margarine in Great Britain by Sir William G. Watson, chairman of the Maypole Dairy Company, on Jan. 30th; one on the Development of the Mineral Resources of the Empire, by Professor W. Frecheville on Feb. 6th; and one on the Relations between Capital and Labour—Reasonable Hours, Co-partnership, and Efficiency, by Lord Leverhulme on Feb. 13th. The lecture hour in each case will be 4.30 P.M.

DOCTORS OF MILITARY AGE IN IRELAND.—For the past nine months the Cashel board of guardians have been petitioning the Local Government Board to sanction the appointment of Dr. Patrick Stokes as medical officer of the Fethard Dispensary District. Sanction has been refused on the ground that Dr. Stokes is of military age and eligible for service with the R.A.M.C.; he is an international footballer. The guardians have now decided to advertise for a temporary medical officer and have asked the Local Government Board to sanction the appointment of Dr. Stokes as medical officer in charge until the date of the election, at a salary of £4 4s. per week.