Technique

The technique of treatment is not standardized, and good results are obtained by widely varying methods, but one technique which has proved satisfactory in the hands of quite a number of therapists employs repeated small doses of highly filtered x rays—namely, 200 r at 200 kV with 0.5 mm. Cu and 1 mm. Al filter, given once a week for four doses. Re-examination of the part after four weeks will often show absorption of most of the calcium; if not, the course may be repeated. Only a small area is treated, and there should not be any skin reaction or adverse systemic effect.

Three typical cases are reported below—one occurred in the subacromial bursa, one in the tendo Achillis bursa, and one in the soft tissues of the hand. All were of long standing, and with treatment all cleared up completely, both radiologically and clinically, although the cause was quite different in each case.

Illustrative Cases

Case 1.—An area of calcification was found under the deltoid on x-ray examination of this patient, who had had pain and stiffness in the shoulder for five years after falling from a horse. The pain had become continuous and had been accentuated by a course of radiant heat administered by the patient to himself. A single course of treatment was given as above, with relief of pain two days after the first dose, and no return to date (nine months). Radiographs taken four weeks after treatment showed no definite opacity; only some scattered mottling was seen.

Case 2.—A bursitis of the tendo Achillis region followed injury to the heel 12 months ago in this patient, suspected of gonococcal infection. Radiographs showed a definite patch of calcification, and a small sinus formed which discharged a creamy fluid at intervals. After one course of treatment the pain was much easier; but the discharge continued, and radiographs at this stage revealed considerable diminution in size of the patch of calcium, but not complete regression. A second course was therefore given, after which the discharge stopped, pain vanished, and radiographic examination showed complete disappearance of the deposit.

Case 3.—Localized deposits of calcium were found in the hand of this patient, who is suffering from a very low-grade type of Hodgkin's disease. The deposits were palpable and very painful, with some oedema of the surrounding tissues. An attempt was made at surgical removal, but this was unsuccessful, as no discrete deposit was found on exposure of the region involved. After one course the pain had gone and radiographs showed almost complete disappearance of the calcium, so no more treatment was given. The patient is well to date, after one year, but has grown other deposits elsewhere which have not yet been treated.

Comment

In these three examples ossification had not occurred, and it must be emphasized that radiotherapy is efficacious only when unorganized calcium is present; but, nevertheless, in early ossifying lesions x-ray treatment will often prevent the formation of bone from the preliminary calcium deposits. In the elbow region a deposition of calcium occurs before ossification in the antecubital muscles, and in the early stages will disappear if treated with radiation; some American surgeons even recommend the prophylactic irradiation of elbow injuries to prevent subsequent myositis ossificans. Haematomata may be treated in the same way with small doses of x rays and ossification be prevented in most cases. Unfortunately, organized deposits of calcium in the form of biliary and urinary calculi show no response to doses of x rays.

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A post-war programme of measures to reduce road accidents has been published by the Pedestrians' Association (180, Fleet Street, E.C.4). The proposals include better speed control, stricter enforcement of the law, a higher standard of efficiency among drivers, and a safety motor car. The Association takes the view that the 30 m.p.h. in built-up areas is too high a limit for safety and that the limit should be 25 m.p.h. with higher speed limits on main roads outside the built-up areas. Proposals for a safety car include placing the engine at the rear, giving the driver a better view of the road; greater manoeuvrability; a shock-absorbent frame; and flexible upright fenders in front of the leading wheels with a net catcher between them.

Medical Memoranda

General Hypersensitivity to Sulphanilamide after Surface Application

Although the occasional development of general hypersensitivity to sulphathiazole after the application of that drug to skin lesions has been described (*J. Amer. med. Ass.*, 1943, **121**, 406), no mention is made in the Medical Research Council's War Memorandum No. 10 (The Medical Use of Sulphonamides) of a similar occurrence with sulphanilamide. The following case may therefore be of interest.

A telegraphist aged 21 complained on March '8, 1944, of a sore throat of 24 hours' duration. His temperature was 101.6°, pulse 100, and respirations 20. The tonsillar lymph glands were palpable and tender, both tonsils were slightly swollen, and the fauces and oropharynx were injected. He was given 2 g. of sulphanilamide at 8 p.m., to be followed by 1 g. 4-hourly. Next morning his temperature had fallen to 97.4° and his throat felt much better. At 8 p.m., however, 24 hours after sulphanilamide therapy had been started, his total intake being 8 g., the temperature was 103° and a generalized skin rash had developed. It was most marked on the dorsal surfaces of the hands, on the forearms, and on the feet and legs; and it was morbilliform in character, except on the hands, where there were some clear vesicles about the size of a pin-head. The throat was only a little sore and injected. No more sulphanilamide was given and the temperature fell abruptly. It was below normal on the 10th, but was raised, up to 102°, on the following 4 days. The rash faded slowly, and on March 13 it was rather more urticarial than morbilliform. Its distribution had also changed, for it was almost as intense on the front of the chest as on the hands and feet. Ten days later the only abnormality was slight scaling of the skin of the hands, forearms, ankles, and legs, which persisted for a further 3 weeks.

It was found from his previous records that sulphanilamide paste had been applied to an incised wound, about 2 in. long, on the front of the right leg, from Oct. 9 to 12, 1943—i.e., for four days—five months before this illness. The only other occasion on which he had received medical attention since he was a child was in 1940, when he had a cough, for which he was given a "black bottle." Thus there seems to be little doubt that the appearance of pyrexia and a rash after only 24 hours' treatment was due to sensitization by the surface application of the drug.

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Weil's Disease without Jaundice

The name Weil's disease has been criticized on the ground that Weil was not the first person to describe the disease, but alternatives such as spirochaetosis icterohaemorrhagica and spirochaetal jaundice, which lay so much stress on the jaundice, probably result in many cases being misdiagnosed. We have recently had four consecutive cases in which there was no jaundice.

FOUR RECENT CASES

Case 1.—A child aged 4 fell into a brook which was flooded with storm water. The accident occurred in the winter, and was followed immediately by a brief febrile illness which was diagnosed as pulmonary collapse and treated with sulphathiazole. Chest symptoms and signs soon disappeared, but the child remained unwell and refused to eat. On the eleventh day she vomited, and there was an abrupt rise in the temperature to 105°. On admission to hospital two days later her temperature was 103°, her conjunctivae were injected, and there was a trace of albumin in the urine. The serum agglutinated *Leptospira icterohaemorrhagiae*. The acute symptoms rapidly subsided; no other physical signs appeared, and the urine was normal after the first day. Nevertheless, it was some months before the child was really well again, and on several occasions there was a slight rise in the evening temperature.

Case 2.—This case was discovered accidentally after a short febrile illness originally diagnosed as influenza. The patient was a young doctor who worked in one of the Emergency Public Health Service laboratories. He described an abrupt onset of malaise with fever, pains in the limbs, headache, and sore eyes. After six days he had apparently recovered, but realized he still lacked energy. He therefore continued to take his temperature, and a fortnight after the onset of his illness he found it was 100° on two consecutive evenings. The head of his department, who knew there was no epidemic of influenza at the time, insisted on routine agglutination tests on his serum, and the diagnosis of Weil's disease was made in this way. The patient had bathed in the Cherwell four weeks before the illness began—probably too long an interval for infection to have occurred there—but his home was near the river, and rats had been seen there. At this stage there were no objective signs of ill-health, but he was still very easily tired, and it was nearly three months before he felt really fit.

Case 3.—This patient had also been bathing in the Cherwell. He was sent from a boys' harvest camp with a provisional diagnosis of poliomyelitis. Four days before admission he suddenly developed a severe headache and pains in the legs, and on admission his

temperature was 101°, his eyes were inflamed, and there was albuminuria; the calf and thigh muscles were extremely tender, and the deep reflexes were absent. Weil's disease was immediately suspected, and the blood urea was found to be 74 mg. per 100 ml. For four days he was very ill, but then rapidly became convalescent. The albuminuria disappeared and the blood urea fell to normal; but the sedimentation rate, which was 54 mm. per hour on admission, rose to 96 and remained high. For the next four weeks he felt perfectly well so long as he was kept in bed, but on the 40th day there was a transient recrudescence of fever accompanied by albuminuria. At no stage was he jaundiced, nor did the plasma bilirubin rise above 0.4 mg. per 100 ml.

Case 4.—The fourth patient was an airman, aged 22, who was scratched on the leg by a rat. Ten days later he suddenly felt feverish; he complained of headache and pains in the limbs and began to vomit. His temperature was 102°. The fever and symptoms persisted for seven days, when he was admitted to hospital. On admission his temperature was 101° and the conjunctivae were injected; there were no other physical signs and no albuminuria. Three days later he was afebrile and felt much better, but two weeks afterwards he suddenly developed mistiness of vision and was found to have punctate keratitis.

COMMENT

In each of these four cases the diagnosis was confirmed by agglutination of the *Leptospira icterohaemorrhagiae* by the serum in a titre of 1 in 1600 or higher. Since then we have had a fatal case, with intense jaundice and uraemia, in an Italian prisoner who was employed in draining fields. Hitherto the number of non-icteric cases has been estimated at approximately 50%, though Kramer (1934) of Rotterdam reported 73 cases, of which only 28 developed jaundice, and in cases in which meningitis develops jaundice is more commonly absent than present (Lescher, 1944). The low incidence of jaundice in our series suggests that in the past many non-icteric cases have been missed. We think this would be less likely to happen if the name spirochaetal jaundice was not so misleading and if it was not too exclusively regarded as an occupational disease. Weil's disease should be suspected whenever the sudden onset of fever is associated with headache, pains in the limbs, and conjunctivitis. Albuminuria, a rise in the blood urea, and a high sedimentation rate are also characteristic. Once the cause is suspected the diagnosis is easily confirmed by the specific agglutination reaction. Our cases support the saying, "No jaundice, no death," but emphasize the importance of keeping the patient under observation for several weeks and allowing a prolonged convalescence.

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A Case of Fat Embolism

We report a case of fat embolism presenting the unusual features of a delayed onset after operation without any of the premonitory chest signs.

CASE HISTORY

The patient was a prisoner of war, aged 33. In Aug., 1941, he sustained a tangential bomb wound of his right humerus, with a fracture at the junction of the middle and lower thirds. He was admitted to a military hospital on Oct. 5, 1943, with complete non-union of the fracture. There was a well-healed scar on the outer side of his arm, with generalized muscle-wasting, but no evidence of nerve injury.

A bone-graft operation was performed on Oct. 12. The bone ends were freshened and a 4-in. intramedullary bone peg from the left tibia was introduced. A complete shoulder spica was applied. At the close of the operation the patient was somewhat shocked, and one pint of fresh blood was transfused. The early post-operative progress was satisfactory. After 12 days he complained of bleeding from his gums and there was purplish bruising round his left knee and ankle. He was given vitamin C; the stitches were removed from his left leg, which was well healed, and he started to get up and sit in the sun.

Three days later (Oct. 27) he was noisy and irrational at night and incontinent of urine; temperature 98°; pulse 80; no cough, dyspnoea, or cyanosis. The stitches were removed from the right arm via a window in the plaster. The wound healed cleanly, though bruising round the left knee and ankle was more marked. Knee- and ankle-jerks were exaggerated; plantar response was doubtful. There was no evidence of any paralysis. The optic disks appeared normal. Intravenous glucose-saline given. Urine: albumin +; sugar +++; ketones +; fat globules present. Blood sugar, 170 mg. per 100 c.cm.

Next day (Oct. 28) his general condition had deteriorated: temperature 97°; pulse 88. He was kept tranquil only with luminal and morphine. The plaster spica was removed from the back. Examination of the chest revealed moist crepitations at bases only; no sign of consolidation. On the 30th there was a slight improvement. He was quiet all day without a sedative. On Oct. 31 he was rational.

Drip saline was discontinued after infusion of 36 pints in 3½ days. His condition then rapidly improved. A new plaster spica was applied on Nov. 2, and on Nov. 3 he started to get up.

Laboratory Investigations.—The blood and urine examinations are best demonstrated in a table, as follows:

Date	Blood Sugar (mg. per 100 c.cm.)	Urine					
		Albu- min	Sugar	Ketones	Acetone	Fat	Casts, Granular and Hyaline
27/10/43	170	+	++++	+	—	+++	—
28/10/43	160	+	++++	+	—	Not tested	—
29/10/43	150	+	+	—	—	..	—
31/10/43	140	+	Trace	—	—	..	—
1/11/43	140	+	..	—	—	..	—
3/11/43	100	+	—	—	—	—	++
4/11/43	100	+	—	—	—	—	—
13/11/43	—	Trace	—	—	—	—	—
16/11/43	—	—	—	—	—	—	—

The tests employed were: (1) Benedict's test for sugar in the urine. (2) Crocilius-Seifert picric acid method for blood-sugar estimation. (3) Fat in the urine was demonstrated by staining with Sudan III. Globules of fat varied in size from a few to 30-40 microns in diameter. It was also demonstrated indirectly by the "sizzling test." In this test, adopted by Major J. V. Wilson, R.A.M.C., a loopful of fat-containing urine is burnt in a spirit flame and makes a distinct sizzling, which is very striking compared with that of normal urine. (4) No sputum was available for fat-globule staining.

COMMENT

The glycosuria and blood-sugar level cannot be entirely explained by the intravenous glucose-saline, because, while this was maintained approximately constant, the blood sugar and glycosuria progressively diminished. Also, the glucose was given at the rate of 0.12 g. per kg. of body weight per hour, whereas in the experimental animal it can be injected at a rate of 0.9 g. per kg. per hour before it appears in the urine. The glycosuria would therefore seem to be, at least in part, of renal origin.

Evidence of renal damage is afforded by the presence of albuminuria and casts, and may be assumed to be due to fat embolism of the kidneys. Glycosuria might thus have resulted from a selective renal damage comparable to that caused by phloridzin. If it occurs with any constancy in fat embolism it might be a point of diagnostic significance. It was observed in another case of fat embolism occurring in 2 N.Z.C.C.S. in the Western Desert in Nov., 1942, which at necropsy was proved to have extensive fat embolism of the kidneys and other organs. Albuminuria and ketonuria were present, but the clinical features and other circumstances of the case differed considerably from the one under review.

We are indebted to Lieut.-Col. A. Cruickshank, R.A.M.C., for permission to publish this case.

G. ST. J. HALLETT, F.R.C.S., Capt., R.A.M.C.

A. J. M. DRENNAN, M.B., Capt., R.A.M.C.

Torsion of the Gall-bladder

The rarity of the above condition, I hope, warrants its publication; it is the first such case that I have seen in over 30 years of practice.

Miss A., aged 67, in normal health, was reaching up to put a shilling in a slot meter on Feb. 4 when she was seized with acute abdominal pain under the right costal margin. She was not sick and thought it might be appendix trouble, so she starved herself to some extent as her own means of treatment. The pain persisted, and on Feb. 7 she sent for her doctor. At this time the patient had no rise of temperature or pulse rate, and no sickness, but her pain was severe, and a tender lump was palpable below the costal margin.

I was asked to see her on Feb. 8 and found the conditions as above. The patient was transferred to a nursing home on the 9th, and Dr. Shera, the pathologist, kindly did a white count for me, which showed 6,800 leucocytes only. On Feb. 10 I performed a laparotomy, making a Kocher's gall-bladder incision. The transverse colon was adherent to the liver edge; this separated readily with a gauze swab, and immediately the gall-bladder came into the wound with a long pedicle which untwisted easily. It had been lying in a bed formed by coagulated lymph and exudate. I removed the gall-bladder, ligatured the cystic duct with catgut, drained the cavity, and closed the abdomen. The gall-bladder was found to have two medium-sized stones in it, and was tense and full of almost pure blood. There was no infection.

The patient made an uninterrupted recovery, and went home on March 8.

I am greatly indebted to Dr. Downing for allowing me to publish this case, and to Dr. Shera for the blood count.

Eastbourne.

E. WILSON HALL.