although winter outbreaks are not unknown. The curve is thus similar to that of intestinal diseases such as enteric fever or gastro-enteritis, and is in marked contrast to accepted droplet infection such as measles and whooping-cough (see Figs. 4 and 5).

It has been noted that outbreaks of poliomyelitis often occur during abnormally hot weather: a graph of the incidence of poliomyelitis in Cornwall, 1911-49, plotted against the average mean daily temperature recorded at Falmouth for the third quarter of the year, shows that the incidence of the disease has risen above 0.05 per 1,000 on six occasions. These six epidemic years include four of the five highest mean average temperatures recorded for the third quarter in the span of years under consideration (1911, 1921, 1947, and 1949), and the other two epidemic years (1919 and 1945) show an abnormally high August temperature.

Some will argue that at Illogan the epidemiological findings I have recorded suggest droplet infection, as most of the cases were in close contact at school, but it should be remembered that in such a closed community up to 80% of the pupils will be excreting virus, and it is thus easy for children's hands to become contaminated.

The findings at Truro—namely, the shift to an older age group, the sporadic distribution of cases in the city, the lack of any history of contact, the explosive nature of the outbreak together with its sudden cessation with the adequate superchlorination of the water—are suggestive of water-borne infection. No known abortive cases had been reported in Truro before the outbreak, but as a number of paralytic cases had occurred in the surrounding country—particularly Redruth, which is only nine miles away—it is likely that many carriers existed in the neighbourhood, and contamination of the city's emergency water supply, the intake for which was located in meadows used by children as an unofficial playground, was therefore probable. Unfortunately it was not possible to prove the presence of virus in the water by animal passage, but circumstantial evidence was strong enough to warrant superchlorination and boiling of water for domestic use.

Summary

A description is given of the severe epidemic of poliomyelitis which occurred in Cornwall during 1949 (incidence 0.3 per 1,000 of the population), and it is noted that the areas most heavily attacked in that year are among those which escaped the disease in 1947.

Individual cases of interest are those of two expectant mothers who developed poliomyelitis at or about the date of their confinement. In the one, severe paralysis developed four days before delivery, labour was normal, and the baby was unaffected. In the other, paralysis was first noticed 28 days after confinement. The baby, who was breast-fed, had symptoms suggestive of pre-paralytic poliomyelitis three weeks after birth, followed four days later by convulsions, and now has a slight residual weakness of the muscles of the left shoulder girdle.

An exceptionally severe outbreak occurred in the city of Truro (population 12,950), where 20 cases were notified in the short space of 18 days. The high age group of these patients, their sporadic distribution in the city, the lack of history of contact between cases, together with the sudden cessation of the outbreak after superchlorination of the water supply, known to be contaminated, suggest water dissemination of the virus.

The evidence in favour of intestinal spread of poliomyelitis is briefly discussed; the marked dissimilarity between the seasonal incidence curve of the disease and that of known droplet infections, together with the finding that recorded epidemics of poliomyelitis in Cornwall have been associated with exceptionally hot

weather in the third quarter of the year, lends support to this mode of spread.

I wish to thank Dr. R. N. Curnow for his encouragement and for affording me the facilities for carrying out the investigations, the District M.O.H.s for their assistance, Dr. W. H. Bradley for his helpful criticism of this paper, and Dr. F. D. M. Hocking and Sister E. M. Keeling for kindly reproducing many of the diagrams.

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Medical Memoranda

Necrosis After Penicillin

In the case described below aseptic necrosis followed intramuscular injections of penicillin; the condition was associated with thrombophlebitis and severe constitutional disturbance. In view of this experience it is suggested that persistent burning pain at the site of penicillin injections may indicate an idiosyncrasy and make it inadvisable to continue injections.

CASE REPORT

A woman aged 33 with moderately severe glandular and pulmonary tuberculosis was admitted to Harefield Hospital for assessment of her fitness to continue pregnancy. A large glandular swelling developed in the right side of the neck, associated with a leucocytosis of 18,700 (87% polymorphs) and pyrexia. Penicillin injections of 500,000 units in 2 ml. of sterile distilled water six-hourly were started. Most injections were made into the front of the thighs and some into the gluteal muscles. Despite the inclusion of a little 1% procaine in each injection, burning pain was experienced, and redness of the skin and induration resulted. The temperature did not fall, and penicillin therapy was abandoned after five days.

Ten days after the beginning of treatment fluctuant swellings developed in the muscles of both thighs and there was a tender indurated swelling in one buttock. The white cell count was then 30,500 per c.mm. (90% polymorphs). Both thighs were incised and pus was obtained from them. Aerobic and anaerobic cultures of the pus were persistently negative. Fluid from the necrotic tissue was injected into two guinea-pigs intraperitoneally and subcutaneously and neither showed post-mortem evidence of tuberculosis.

The legs continued painful; pus oozed from the wounds, and the surrounding soft tissues were hot and tense, with oedema of the skin and of the legs below the knees. Further

surgery was considered inadvisable. A week after incision of the thighs spontaneous abortion occurred, three days later thrombophlebitis was observed in both antecubital veins at the site of vein punctures, and three days after that left foot-drop occurred. The white cell count was then 38,400 per c.mm. (92% polymorphs). After a further 12 days the skin sloughed in both legs over a circular area of 5 in. (12.5 cm.) diameter in the left leg and 2 in. (5 cm.) diameter in the right; the patient was apyrexial and free from pain. Separation of the sloughs and slow epithelization occurred, the foot-drop recovered, and the white cell count fell to 8,100 per c.mm. Procaine and penicillin intradermal sensitivity tests were negative.

I am indebted to Dr. K. R. Stokes, Medical Director, Harefield Hospital, Middlesex, and Dr. J. C. Roberts for permission to publish this case.

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Adrenocorticotrophic Hormone in Acute Disseminated Lupus Erythematosus

A case of acute disseminated lupus erythematosus is here presented, and its response to treatment with adrenocorticotrophic hormone described.

CASE REPORT

A married woman aged 21 was admitted to hospital on November 28, 1949. She had had no serious illness, but had always been highly strung. Leucodermia was first noted at the age of 6. She gave a month's history of malaise, sweats, fever, and simultaneous painful swelling of the knees, wrists, and proximal interphalangeal joints of the hands. A fortnight before admission a rash appeared over the bridge of the nose and forehead.

On examination she was found to be apprehensive and dyspnoeic on the slightest exertion. Fever was present (100°–102° F.—37.8°–38.9° C.). A papulo-erythematous rash was present over the nose, forehead, and cheeks. The lips were fissured. A painless, shotty enlargement of the glands in the cervical triangles, suboccipital region, and axillae was noted. The spleen was just palpable. The joint condition had subsided. Leucodermia of the trunk and limbs was present.

Her condition steadily deteriorated; and by the end of December the rash, which had in parts become purpuric, eczematous, and encrusted, had spread to involve most of the face and the external surfaces of the pinnae. The scalp and circumoral region were spared. An extensive, painful shallow ulceration of the buccal and pharyngeal mucous membranes had developed. Numerous rhonchi were present in the chest. A patch of exudate and a fresh haemorrhage had appeared in one fundus. There was albumin in the urine. Her fever was swinging from 100 to 104° F. (37.8 to 40° C.) and she appeared very ill.

Leucopenia was present (1,400 per c.mm.—P. 44%, L. 53%. M. 3%; 2,550 per c.mm.—P. 56%, L. 44%); blood haemoglobin at the end of December had fallen to 48% (Haldane); the red cells numbered 2,450,000 per c.mm. (colour index 1), and the platelets 650,000 per c.mm. The value for serum proteins was albumin 2.7 g.%, globulin 1.8 g.%.

The urine repeatedly showed albumin but no casts or red cells. Radiographs of the chest revealed no abnormality. An electrocardiogram showed normal tracings with a sinus tachycardia of 132 a minute. The blood Wassermann and Kahn reactions were negative. The Paul-Bunnell reaction was positive only to a titre of 1 in 8. A throat swab showed no K.L.B. or Vincent's organisms. Three attempts at obtaining bone marrow by aspiration failed. A seven-day course of intramuscular penicillin (60,000 units three-hourly) had no effect of any kind.

On January 8, 1950, A.C.T.H. therapy was begun—5 mg. intramuscularly six-hourly for five days. A dramatic change occurred: the temperature moderated to between 98 and 101° F. (36.7 to 38.3° C.), subjective improvement was remarkable, the appetite returned, and there was a marked euphoria. Fourteen

days after the beginning of A.C.T.H. the oral mucous membrane had completely healed, and the facial rash had been entirely replaced by sound and supple skin which showed pigmentation corresponding to the previously affected parts and a fine superficial branny desquamation. Albuminuria, retinal haemorrhage, and, later, the exudate disappeared. The leucopenia gave way to a polymorphonuclearcytosis (14,250 per c.mm.—P. 96%, L. 4%). Serum proteins were not greatly affected (albumin 2.5 g.%, globulin 2.3 g.%; albumin 2.9 g.%, globulin 2 g.%).

Efforts were made to maintain the improvement by the six-hourly injection of 5 min. (0.3 ml.) of 1 in 1,000 adrenaline, and later by the intravenous injection of T.A.B. (1 million rising to 10 million organisms) at four- to five-day intervals. Despite these measures the fever gradually increased, and after six weeks a return of the facial erythema was noted. Much of the hair of the head has fallen, and the patient is now nearly bald. Leucopenia has reappeared (3,800 per c.mm.—P. 84%, L. 15%, B. 1%). The serum proteins remain unaltered (albumin 2.6 g.%, globulin 2.1 g.%).

COMMENT

The diagnosis of acute disseminated lupus erythematosus is supported by the age and sex of the patient, the preceding history of joint pains, the nature of the rash, the fever, splenomegaly, retinopathy, albuminuria, anaemia, and leucopenia. No striking cardiological abnormalities have been noted. Such are not essential to the diagnosis. Guion and Adams (1943) report six cases that went to necropsy; endocarditis occurred in only one, and this was not diagnosed clinically.

It is of interest that no eosinophils were seen in seven successive white cell counts on this patient, and that we were unsuccessful in obtaining bone-marrow smears despite three separate attempts. Thorn, *et al.* (1949) found a similar eosinopenia in two out of their three cases, and ascribed this to a bone-marrow hypoplasia rather than to excessive adrenocortical activity.

Descriptions of the beneficial effects of A.C.T.H. in acute disseminated lupus erythematosus have been given by Thorn *et al.* (1949) and Elkinton *et al.* (1949). These reports are fully borne out in our case. Subsequent attempts to stimulate the anterior-pituitary-adrenal-cortical system by injections of T.A.B. and adrenaline were disappointing. The initial improvement has not been maintained, and the long-term treatment of this patient has yet to be worked out.

We are greatly indebted to Dr. W. J. Tyndall, of Organon Laboratories, Ltd., for supplying the A.C.T.H. used in this case.

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The annual report (1949) of the department of rheumatic diseases of the West London Hospital is a well-produced booklet containing much information of value. In the introduction Dr. W. S. C. Copeman discusses the work of the department. The relative incidence of rheumatic diseases was the same as in the previous year—osteo-arthritis 30.7%, rheumatoid arthritis 16.4%, non-articular rheumatism 29.4%, lumbar disk protrusion 5%, other conditions 18.5%. The most important event of the year was the establishment of a research unit within the department, and a team has been formed to undertake clinical investigation of steroid and other substances allied chemically to "cortisone." The report contains a number of papers on subjects connected with rheumatism, including three on cortisone and A.C.T.H.