feel that there is a need today for one which is accurately defined, widely accepted, and reasonably descriptive, so that we can describe those water and electrolyte abnormalities which modern knowledge enables us to diagnose from the history and clinical and biochemical findings.

Tyrone County Hospital, Omagh. W. S. DAVIS.

CANCER RESEARCH

SIR,—The time surely has come for a protest against the present methods of cancer research. The large sums of money expended on the upkeep of the ever-expanding wilderness which laboratory workers are creating would surely be better spent in building hospitals for patients suffering from malignant disease. It is useless for anyone who has no knowledge of cancer as it is encountered clinically to endeavour to find the cause by experiments on animals.

After long years of research, which have proved absolutely fruitless, it is high time that the laboratory method of investigation was abandoned. In fact, quite a number of these laboratory workers have no medical qualifications, while several are not specially interested in cancer as a human disease. Let us get back to the bedside and learn the earliest symptoms of cancer so that we may operate early and prolong the patient's life at least, if we cannot actually cure him.

Edinburgh. JAMES BURNET.

SHOE DESIGN AND THE GREAT TOE

SIR,—In this correspondence particular emphasis has been laid on the effect of shoe shape on the hallux. In my store we have perhaps an unusual opportunity for observing the effect of shoes on the development of children's feet, for we have a wide variety of British, Canadian, and American shoes. Also we see infants before the weight-bearing stage and adolescents going through the transition from children's to adults' footwear.

I suggest that no conclusive relation between the development of a foot and the shoes it wears can be obtained unless the condition of the foot at birth and before weight-bearing is known. More and more we are encouraging parents to let us see their infants' feet before they wear any kind of shoe so that we may be forewarned of possible difficulties that may be the result of intra-uterine distortion of the leg and foot and of noting the presence of any inherited characteristics.

Apart from infants born with a degree of hallux valgus, there does seem to be some connection between even a mild degree of forefoot varus and subsequent realignment of the hallux when the forefoot varus persists. We do not usually refer to this condition as a metatarsus varus, because it is really a complete "distortion" of the whole forefoot and mid-tarsal section of the foot.

There are two schools of thought regarding what, if anything, can and should be done about this type of foot, which we see in ever-increasing numbers. One practice is to put the foot into a shoe having a similarly "inswung" forepart; this seems to be a definite trend among British shoe-designers. The other view is that by stretching the foot in abduction and wearing shoes designed to provide the same amount of traction, the foot will revert to its normal alignment and consequently be less susceptible later to the influences of "out-swung" shoes.

Our experience of both methods is that the "inswung" shoe merely encourages the adducted position of the forefoot at a time when the foot is beginning to "set." When the child can no longer obtain such shoes, the change to conventional "outswung" is even more drastic, and distortion of the phalanges seem unavoidable. Even if manipulation of the adducted forefoot is not carried out, the wearing of straight-lasted shoes, designed to direct the forefoot in a straight line, starting from the heel forward through the midtarsal section and finally at the head of the first metatarsal, gives some assurance that by the age of four the basic structure of the foot is as close as possible to what is generally accepted as "normal."

That shoes do influence foot shape appears inescapable. The question seems to be "how much minor distortion of the toes can be tolerated without causing dysfunction?" It is unrealistic to assume that the public will ever accept the principle of "sensible" shoes for any worth-while period.

I would like to mention the tremendous following here in Canada for the work of Mr. Denis Browne. I wish that more attention was given to minor congenital foot abnormalities attributed to intra-uterine pressures. If these conditions were recognised from the start, and measures taken to correct them, a large proportion of foot and shoe troubles would disappear.

Kiddies' Shoeland,
North Vancouver,
British Columbia. ROY ARNOLD.

HALLUCINOGENIC DRUGS

SIR,—Professor Elkes and his colleagues have called attention in their letter of April 2 to the dangers of treatment with lysergic acid diethylamide (LSD 25). Little has been published about the delayed reactions, the report by Sandison et al.[1] being a notable exception. I should therefore like to record my interim findings of some of the phenomena. Although they are based on limited experience, they may serve as a warning, and the problems involved call urgently for investigation.

The 8 patients in this series received LSD orally in doses of 50–500 γ while fasting. An interval of at least seven days separated doses after the trial ones. Patients were allowed to react with the minimum of interference necessary to prevent injury or accident. Accounts of experiences were obtained late on the day of administration in some cases, but it was found better to get written reports later and supplement them by oral discussion.

Experience during the acute phase followed the usual pattern, but personal experience was dominant, colouring even the early toxic hallucinatory patterns; sometimes dream-like situations were acted out violently, leading on from dreams before treatment began, and calling for protective measures.

Experiences more than twenty-four hours after the administration of LSD could be grouped as follows:

(1) *Mood swings* similar to those under acute drug treatment occurred two or three days later. It was not always possible to correlate these with environmental events. Both depression and euphoria occurred, the latter being often the less obvious and insidious in its effects.

(2) *Regression to childish behaviour* without other changes—e.g., playing boats in the bath with the soap-dish for a quarter of an hour before realising that this was unusual. This was noted first nearly a week after taking any drugs.

(3) *Visual hallucinations* took several forms: (*a*) *Regression to childhood:* visual hallucinations, solid and coloured, of objects detached from their context—e.g., a stepladder, or an elephant sitting on a tub. These sometimes later built up into complete episodes, and were dated on the completion of the episode. (*b*) *Complete episodes*, with auditory and visual hallucinations, usually growing from (*a*), and accompanied by appropriate affect. Development of experience had a compulsory quality, directing the attention, and excluding all else. (*c*) *Hallucinations of fantasy*, comparable to dreams, particularly some "archetypes." (*d*) *Hallucinations of small animals*—crabs, cats, and insects. (*e*) *Hallucinations of thought contents* in images—e.g., a parade of various suicidal implements.

It is doubtful whether (*d*) and (*e*) were due to LSD. (*d*) was more like the familiar toxic type of hallucination, and occurred after heavy sedation with barbiturates and insomnia. (The patient insists that the hallucinations were similar to those in acute LSD intoxication.) They did not clear up with 'Parenterovite,' while the motor symptoms of barbiturate overdose did. (*e*) occurred in a hysteric who had previously demonstrated a considerable capacity for visual projection. In general it has been considered safer to accept as part of the LSD reaction, only experiences clearly related to personal experiences, continuing previous dream material, or events in the acute intoxication.

1. Sandison, R. A., Spencer, A. M., Whitelaw, J. D. A. *J. ment. Sci.* 1954, **100**, 491.

(4) *Auditory hallucinations* have been included above as a part of complete episodes. Another form is the hearing of music, often later related to emotions associated with earlier experiences.

(5) *Body image and time changes.*—It was difficult to separate the feeling that the body was smaller from the idea that the age was younger. In some cases age seemed different without the sensation of bodily change; in others both were changed—i.e., the patient felt smaller, age two, and could not talk to adults. But I have not yet seen a regression to childish speech and behaviour.

(6) *Illusions and misinterpretations* are mixed with hallucination, and may lead into it. Objects change in shape, and become meaningful images of past events; or change into hallucinations of associated ideas. Thus a pair of stork vases changed into babies. Other experiences were more within normal range—e.g., a plant against a shed appeared in the dark like a white unicorn.

(7) *Somatic changes* included subjective sensations of swelling of the hands. Erythema of the fingers, previously noted in one patient, changed in character as relevant material emerged. Objectively, swelling and discoloration of one knuckle followed an hallucinatory experience of violence by the mother (this was confirmed by the patient's husband).

(8) *Time and space.*—Quite early in treatment one patient recognised that her judgment of speed was unreliable, and she would not cross roads when vehicles were in sight. This persisted for long periods. At least during the more violent phase of abreaction time was indefinite. Preoccupation or absentmindedness may persist for weeks; a patient may allow a bus to draw up and depart, and then realise that she has missed it.

As for the time relation of delayed reactions in relation to the ingestion of the drug they may continue the next day, but in 1 case they were entirely inhibited for five days.

Mood swings may occur at any point in treatment, even with lower doses. Hallucinations and related experiences have been noted only after repeated heavy doses. They have been sporadic after 300 γ or higher doses, the lowest point at which continuous abreaction occurred was after a total of 1000 γ in three doses, following a break in treatment of three weeks. Continuous abreaction has followed 1200 γ in three doses after a break of several weeks. The continuous reaction may occur without preliminary and more brief delayed reactions. In one case a further 1000 γ in three doses was needed to establish a continuous reaction.

In 1 case reactions continued for three weeks; treatment with chlorpromazine was then started, and it appeared to control further reaction. It is important to bear in mind that the patient's statement that reactions have ceased is not reliable: they may begin again after an apparent return to normal. I could not at present put a limit to the time during which delayed reactions may appear.

The factors which may affect delayed reactions include:

(*a*) *Interference.*—Over-solicitous attention during the acute phase upset 2 patients who "could not let themselves go." Both had reactions next day similar to those they would have had, but they controlled these to some extent. In the light of this experience it may be necessary to reconsider results obtained by inquiry and tests during acute intoxication.

(*b*) *Voluntary control.*—A patient apparently managed to inhibit all reactions for five days after her last dose, to prove that she was fit to go home. Others report that they can exert a limited control after the acute intoxication is over, in company, but must let go later. Hallucinations are often overwhelming; they can be prevented to some extent by other occupations, but recur in intervals of relaxation, and so interfere with sleep.

(*c*) *Dosage.*—2 patients who had continuous reactions had prolonged treatment with doses of 200–400 γ over several weeks. The total doses were 4250 γ and 1900 γ respectively. But both had a break of three or more weeks during treatment.

In the management of delayed reactions, heavy sedation with barbiturates proved useless for stopping the process, though it appeared to "cushion" some of the experiences. This was possibly due to these patients having previously had prolonged barbiturate narcosis, and also barbiturates as sedatives at other times.

Paraldehyde (5 ml. intramuscularly) gave some sleep, but it was inadequate alone or with bromide. Methylpentynol ('Oblivon') gave rather better results with bromide. Potassium bromide (gr. 20 t.d.s.) appeared useful as a basic sedative. The best results were obtained with chlorpromazine (50 mg. intramuscularly) (a personal communication from Dr. Sandison suggested this, since chlorpromazine reverses electro-encephalogram changes due to LSD). We have not yet been able to demonstrate this effect in the E.E.G., but we are not yet sure that E.E.G. changes persist in the delayed continuous reaction.

It may be useful to summarise the possible dangers:

(1) In mood swings the dangers of depression are obvious; and euphoria may be also embarrassing.

(2) Time and space distortion are an obvious danger in traffic.

(3) Hallucinations are perilous out of doors and socially embarrassing.

(4) Insomnia is a great difficulty; reactions are particularly likely to occur when relaxing for sleep.

(5) Impulsive behaviour, wandering, and absentmindedness may all create difficulty.

Rainhill Hospital,
near Liverpool. H. ASTLEY COOPER.

Obituary

HARRY JAMES RAE

M.C., M.A., M.B. Aberd., D.P.H.

Dr. Rae, who was formerly medical officer of health of the city and counties of Aberdeen and Kincardine, died in his home in Aberdeen on May 7, at the age of 69.

He was born in Woodside, Aberdeen, and he graduated M.A. from the University of Aberdeen in 1907, and M.B. with honours four years later. After graduation he was appointed resident to Mr. John Scott Riddell, at the Aberdeen Royal Infirmary, and the help and guidance he gave to the students on his ward is still remembered. He took the D.P.H. in 1914, but before he was fairly launched on a public-health career, he joined the R.A.M.C. For his work with a field ambulance in Palestine he was awarded the military cross and was mentioned in despatches.

After he was demobilised he resumed his work as tuberculosis officer in Aberdeenshire, later succeeding Dr. Watt as county M.O.H. In 1929 he was appointed medical officer of health of the City of Aberdeen in succession to John Parlane Kinloch who had been appointed chief medical officer to the Department of Health for Scotland. In 1930 Rae became medical officer also of the county of Kincardine. He was also part-time lecturer in public health at the University of Aberdeen, a post which medical officers of health of the city have always held.

Thanks to his organising ability and foresight all the first-aid posts were ready in these north-east towns before the outbreak of war in 1939; and his organisation never broke down during the eighteen months of heavy raiding in 1940–41.

When the Royal Family were spending their annual holiday on Deeside in 1941 he supervised the immunisation against diphtheria of Princess Elizabeth and Princess Margaret. He was made an honorary physician to King George VI and later to the Queen.

After his retirement in 1952 he found time and interest for fresh responsibilities. For the past two years he had been visitor and inspector in public health and social medicine to the universities and medical schools for the General Medical Council. He was also a past president of the Royal Sanitary Association of Scotland and a member of the town council of Aberdeen.

A. U. W. writes: "The medical practitioners in the north-east of Scotland—especially those of the older groups—were saddened by the death of Dr. H. J. Rae.