prepossessing on account of a receding chin, poor condition of the teeth, and a mild degree of divergent strabismus.

From the age of 13 he was brought up by the Guardians, owing to the disintegration of the home. The impression which he gave at that time was particularly favourable, and he was considered much above the average of the children then in the Home. His school reports were always good, and he showed a special aptitude for carpentry. More than once he was sent on errands to London on account of his ability to find addresses. Later he worked in the office of the Public Assistance Institution. He has earned his own living continuously since leaving school. Unfortunately there has been no opportunity of testing this boy's intelligence by standardized methods.

The younger child has been brought up by the Guardians since the age of 3. Physically he appears somewhat anaemic and is round-shouldered. He has missed a certain amount of school through colds during the winter, otherwise his general health is good. He is considered a very nice little boy; he is quick in response, and amiable and sensible in conversation. The following results were obtained from standardized tests: Binet tests (Stanford revision), 7 years 4 months; Porteus maze test (Vineland revision), 8 years. The chronological age at date of testing was 7 years 7 months. The score is well within normal limits for both tests.

COMMENTARY

The circumstances under which these children were born cannot be considered auspicious. Indeed, it is difficult to imagine conditions which could have been worse from the eugenic point of view. In the parents there is the combination of mental deficiency, insanity, syphilis, inbreeding, and moral depravity (as judged by the outlook of civilized society), and yet the children appear to be normal. The most obvious suggestion to account for the discrepancy would be to postulate some unknown father of high intelligence. There is, however, no reason to suspect the sister of "infidelity" with regard to her brother; she was never seen about with any other man. Further, there is no evidence that she acquired syphilis at any time. It is not likely that the brother was infected from her. Probably he contracted the disease at a period long before they were living together.

Under such circumstances as these the evidence of blood grouping is worthy of consideration. The man's blood group was found to be AB and the woman's A. It follows that this couple could not be the parents of a child of Group O. It also follows that, if a child is found to belong to Groups B or AB, its father is considerably more likely to be the putative man of Group AB than a father selected at random, because of the rarity of the agglutinin B in the general population. In point of fact, the older son belongs to Group B and the younger to Group A. The result of this test, therefore, supports the view that these children are the result of the incestuous union.

It is usually supposed that children with one mentally defective parent are almost certain to be themselves defective—all the more so when both parents are of low mentality, as is the case here. No doubt a proportion of the children of defective parents are themselves certifiable, but the numerical value of this proportion depends on the standard of defect used in making the judgement. In the present case, however, the children appear to be normal on the basis of standards both of behaviour and of scholastic ability.

Mental defect sometimes seems to be caused by rare recessive genes.^{1,2} The effects of such genes are liable to be

manifested in the children of consanguineous unions.³ In this family history consanguinity appears to have the effect of improving the stock in respect of mentality: this phenomenon is shown in the results of the incestuous union and of the cousin marriage of the sister. Perhaps the phenomenon can be accounted for by the presence of rare recessive genes which increase mental ability. It is difficult to think of reasons why environment should have been more favourable to the development of intelligence in the children than in the parents, but this possibility is not excluded.

SUMMARY

A family history has been described in which mentally normal children are the offspring of an incestuous union between a man and woman of low mentality.

My thanks are due to Dr. W. G. Masefield, Dr. W. S. O'Loughlin, Dr. F. Douglas Turner, Miss D. E. Newlyn, and others for their assistance in helping me to collect the facts. The expenses of this investigation were defrayed by the Medical Research Council and the Darwin Trust.

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CONTINUOUS INTRAVENOUS SALINE*

BY

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Until a few months ago our indications¹ for giving saline and other isotonic solutions by the intravenous route were very limited. We recognized that intravenous saline given in a massive single dose (a pint or more) had many times saved life. True, saline and other isotonic solutions are but a poor substitute for whole blood, but occasions arise where urgency forbids the delays inseparable from blood transfusion; indeed, it was in the after-treatment of a sudden severe haemorrhage that the usefulness of giving saline intravenously reached its zenith. A full and immediate dose of intravenous saline has often proved of signal value in obstructive anuria and oliguria² threatening life, especially when preceded by blood-letting. These two conditions practically concluded our indications for administering fluid by the intravenous route. In shock, intestinal obstruction, peritonitis, repeated vomiting, and in the other numerous conditions in which it is imperative to administer fluids by routes other than the mouth, we preferred to give the necessary food rectally or subcutaneously, for the following reason. It is manifestly unphysiological to put into the circulation a pint or more of fluid comparatively suddenly. A common experience after the administration of a pint of saline intravenously to a collapsed patient was that a gratifying improvement in the volume of the pulse was soon noted, but only too often one returned in a couple of hours or so to find that the heart and lungs had become embarrassed, which is what might be expected after suddenly, or comparatively suddenly, overtaxing the vascular system. It was our experience that there was little to choose in this respect between saline and other solutions, such as gum arabic ("gum saline").

* Part of a B.M.A. Lecture given by Hamilton Bailey before the Plymouth Division of the British Medical Association, October 27th, 1933.

The *continuous* introduction of saline, or saline and glucose, by the intravenous route is now possible. The disappointing report that the saline has been returned when it is most required—a report only too frequent when proctoclysis is employed—does not enter the picture here. A slow and continuous intravenous flow approaches the ideal; for we know exactly how much fluid the patient is receiving. The fluid can be given continuously over a period of three to five days, or even longer, and the rate of flow and the amount of fluid to be given can be regulated with mathematical precision. There can be no doubt that the continuous introduction of fluids intravenously promises to become a form of therapeutics capable of tremendous application.

Like those other life-saving procedures—Fowler's position and proctoclysis—the continuous administration of saline intravenously hails from America. In 1924 R. Matas³ advocated a continuous intravenous drip giving 5 per cent. glucose in distilled water into a vein over a period of several days. In 1930 G. A. Hendon⁴ published an excellent communication setting forth the advantages of the method. Later, the writings of J. S. Horsley,⁵ W. E. Gallie and R. I. Harris,⁶ and F. B. Ramsey⁷ added to our knowledge of the subject.

THE TECHNIQUE DESCRIBED

We will assume that the reader is familiar with the process of tying a cannula into the vein. Emphasis will be placed upon those points which ensure success in continuous administration of intravenous fluid.

FIG. 1.—A vein on the back of the hand, preferably the left, can be used. The cannula may be fixed in position by adhesive in this situation. A Carr's splint is useful to keep the hand at rest.

Choice of the Vein.—In general it is best not to use a large vein: one just a little larger than the cannula is ideal. The veins about the elbow are too large, and the impracticability of keeping the elbow extended and at rest for days rules out this favourable site for intravenous injection. Gallie and Harris prefer to use a vein on the back of the hand* (Fig. 1). For obvious reasons it is less irksome for the patient if the cannula is tied into a vein of the lower extremity. A possible disadvantage of employing veins of the lower extremity is that after fluids have been injected into them they are prone to thrombosis. However, experience shows that when isotonic solutions are employed—and particularly when glucose is in a concentration of not more than 5 per cent.—the fear of producing thrombosis is largely theoretical. For extremely ill patients who are restless, or who may become so, we prefer to tie the cannula into the saphena or one of its branches, a handbreadth below the knee, or, better still, when it is accessible, the vein just in front

of the internal malleolus. After infiltration with local anaesthesia the vein is conveniently exposed by a transverse incision.

The Cannula.—It is advisable, but not absolutely essential, to have a special gold-plated cannula, of which there are several types available (Fig. 2). The cannula and the wound should be moist with citrate solution at the time of the introduction.

FIG. 2.—A cannula for venoclysis. It is gold-plated to prevent corrosion. There are two lateral holes (A) in addition to the terminal opening. The collar (B) allows the straight portion of the cannula to be tied into the vein snugly. The sloping neck (C) can be bent to any angle suitable for varying depths of subcutaneous fat in individual cases. The perforations in the wings (D) permit anchoring the apparatus to the skin by means of sutures.

Keeping the Limb at Rest.—If a vein on the dorsum of the hand is used a light anterior splint is employed to immobilize the hand and forearm. When the lower extremity is selected a back splint with a foot-piece usually answers the purpose. In a restless patient a Thomas knee splint (Fig. 3) is a very good method of ensuring that the cannula does not become displaced.

FIG. 3.—The apparatus* in use. In very ill patients who are restless, or may become so, this method of fixing the limb minimizes displacement of the cannula.

Bandages.—It is obvious that even a moderately tight bandage proximal to the cannula may obstruct the vein. The nurse should be warned of this possibility when adjusting the splint. If a Thomas splint is used bandages around the limb are unnecessary, which is an advantage.

Avoiding "Reactions."—The whole apparatus can be sterilized by boiling. Especially when it is new, the

* This apparatus is made by the Genito-Urinary Manufacturing Company.

tubing should be stretched thoroughly along its length, washed through, and then boiled again. In this way chemicals and powder on the inner surface of the tubing are removed. Water used for making the intravenous solution must be freshly distilled. Glucose supplied in sterile ampoules should be employed.

Isotonic Intravenous Solutions.—The fluids most generally used are either normal saline or 5 per cent. glucose in normal saline. Horsley recommends that 10 units of insulin be added for every 500 c.cm. of 5 per cent. glucose injected. This author also praises Ringer's solution, while Gallie prefers Locke's solution. An enterprising firm of druggists should put up in ampoules (1) saline and glucose, (2) Ringer's solution, (3) Locke's solution, (4) saline and 1 per cent. mercurochrome, and all that would be necessary would be to choose the appropriate ampoule and add distilled water. If it is desired to give intravenous medication the appropriate dose is mixed with the fluid, which is poured into the supply flask. Matched citrated blood can likewise be added to the intravenous fluid, and the patient receives a transfusion, and if necessary a re-transfusion, with no more fuss and disturbance than is involved in giving him a drink.

The Temperature of the Fluid.—It is quite unnecessary to be concerned about the temperature of the fluid entering the vein. It is far better to keep the patient warm with hot bottles than to have an elaborate apparatus to maintain the temperature of the fluid in the container. Clearly, by the time any fluid has traversed the tubing it will be about room temperature on entering the vein. To place an electric heating pad upon the limb above the cannula is more rational, and far more effective than trying to maintain the infusion at blood heat.

Rate of Flow.—The average rate of flow for an adult should be about 50 drops per minute—that is, roughly, a quarter of a pint per hour. In cases in which it is necessary the rate can, for the first hour, be increased to 100 drops, after which it can be increased or decreased to suit individual requirements. The nurse should be told to keep a watch for signs of oedema under the eyes or in the limb, which is the signal that the amount of fluid entering the vein should be reduced.

How Long can Venoclysis be Continued?—Three, four, or five days is quite usual. It is not exceptional to have the apparatus working satisfactorily for a week. After the fourth day redness over the vein, extending for a few inches above the site of the injection, may be expected. This should cause no alarm, for it is a chemical phlebitis, which settles down in a few days after the withdrawal of the cannula. The nurse should be warned to keep a watch for this sign. Considerable redness may call for the changing of the cannula to another vein.

CASE REPORT

A girl, aged 9, was admitted to Oldchurch Hospital, Romford, with acute mastoiditis. She had been ill for three weeks, and at the time of admission exhibited signs of meningism.

First Operation.—(J. M. C.) Simple left mastoidectomy performed. The mastoid cells contained pus. One tract led above the lateral sinus, which was exposed. There was then no sign of lateral sinus thrombosis. The following day the child still complained of headache, and her temperature remained in the region of 103° F. During the subsequent five days the patient's condition gave rise to increasing anxiety. The temperature became hectic, reaching 105°, and there were repeated rigors. She became semi-conscious, hollow-eyed, and obviously had not long to live.

Second Operation.—(H. B.) The left internal jugular vein was ligated, and the mastoid wound was then reopened. The needle of an aspirating syringe introduced into the lateral sinus failed to withdraw blood. The lateral sinus was opened and a quantity of soft clot removed. The ends of the sinus were then plugged with gauze soaked with flavine.

Continuous intravenous saline in glucose was commenced, the site of the injection being the internal saphenous vein (see Fig. 3).

Subsequent Progress.—Isotonic saline and glucose venoclysis was maintained at the rate of twenty-five drops per minute for six days. To each pint was added 4 c.cm. of the aqueous solution of 1 per cent. mercurochrome. Improvement was manifest within forty-eight hours. On the sixth day it was noticed that the urine and the faeces were tinted pink. The latter phenomenon is particularly instructive, for it is proof indeed that the bowel has an excretory as well as an absorptive function. By the end of the third week after the second operation the child was convalescent, and the mastoid wound had practically healed.

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CYSTICERCOSIS IN TWIN BROTHERS AGED 13 YEARS

WITH A RADIOLOGICAL STUDY OF THE CALCIFIED
CYSTICERCUS IN TWELVE CASES

BY

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The case recorded below illustrates well the importance of remembering the relation of cysticercosis to epilepsy in the clinical examination of any patient suffering from this symptom.

On September 11th, 1933, a schoolboy was sent to the x-ray department, Millbank Hospital, for a routine examination of the skull, with the following short clinical notes: "History of fits since infancy, also history of injury to skull over right frontal bone. He has slight adiposity. ? Any bony abnormality pituitary fossa." Examination of the radiographs showed a normal skull with nine small circular opacities similar to those caused by calcified cysticerci. The boy was sent for, and came from school to be radiographed again. Examination of radiographs of the limbs revealed the presence of twenty-three calcified cysticerci of various shapes, the longest measuring 23 mm. Further investigation of the history elicited the facts that the family went to India in January, 1926, and returned to this country in June, 1928. The boy has had six fits, the first at 18 months, the second at 3½ years, the third at 11 years, in August, 1931, one in May, 1932, and two recently in 1933. The fits are of a mild type with "stiffening of the muscles" of the left side, followed by unconsciousness. The tongue has not been bitten. Some of the fits have been accompanied by incontinence of faeces and urine. Excitement appears to determine the onset of a fit, but the boy is apparently able to "pull himself together" and ward off the attack. He has never had a tapeworm. No nodules have been observed, and none is palpable at present. In 1929 he was in hospital with rheumatic fever, which left no complications. His twin brother had a "tapeworm" on board ship on the journey home, which was treated and "cured" in 1929 (species is unknown). The twin has never had any fits nor have any nodules been noticed, and none is palpable at present. Radiographic examination of this twin showed a calcification over the root of the neck on the right side, which in appearance exactly resembles a calcified cysticercus (Shape No. 7, see figure). Placental infestation has been suggested in the literature, and is a possibility in view of the normal motility of the oncosphere. The mother was radiographed with negative results.

COMMENTARY

It was a curious coincidence to come upon such a case during the investigation of epilepsy in soldiers. The radiopacities in the skull are so small that they might easily