TABLE I

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Stocking . .	+	+	+	+	+	+
Pure nylon . .	—	—	—	—	—	—

TABLE II.—Dyes. 1% Aqueous Solution

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Blue	±	—	—	—	—	—
Yellow . . .	+	+	+	+	+	+
Red	±	—	—	±	±	—
Black	—	—	—	+	—	—
Anthraquinone dye	—	—	—	—	±	—

TABLE III

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Paraphenylenediamine 0.1% . .	—	—	—	+	—	—
Procaine 1%	—	—	—	—	—	—
Sulphanilamide 5%	—	—	—	—	—	—
Liq. azorubri 1%	—	—	—	—	—	—
Benzocaine 2%	—	—	—	—	—	—

The yellow dye was the cause in the five cases with dermatitis from ordinary nylon stockings. The patient with trouble from black nylon stockings (Case 4) reacted to the black dye as well as the yellow one.

All the patients were tested for cross-sensitivity to procaine, sulphanilamide, liquor azorubri, paraphenylenediamine, and benzocaine. The only positive was Case 4, who reacted to paraphenylenediamine.

Another possible cause of dermatitis from nylon stockings is the coating of synthetic resin used to give the so-called "snag" finish. Outbreaks of dermatitis resulting from the resin fabric finish used on a synthetic silk substitute fibre have been reported from Canada and the U.S.A. (Schwartz *et al.*, 1940). These resins are usually of the urea formaldehyde or melamine formaldehyde type. Our patients were tested to these resins (1% in soft paraffin) with negative results. The reason why these known sensitizers do not often cause dermatitis is almost certainly the fact that they are so readily removed by washing.

Turning to the practical aspects, one may ask if any substitute is available. We have been unable to find a brand of nylon stockings incorporating anthraquinone dyes. However, one manufacturer has agreed to make such stockings at our request. Patch tests to these dyes were negative in our patients, and they have all been wearing this type of stocking without developing any further trouble.

Not all black nylon is dyed with azo dyes. Instead a logwood dye is used by some firms. The patient with dermatitis from black nylon stockings can wear stockings treated in this way.

Summary

Six cases of dermatitis from nylon stockings are presented. All showed a similar and characteristic pattern.

The dermatitis was traced to an azo dye. An alternative dye was well tolerated.

We are grateful to Dr. F. R. Bettley and Dr. R. H. Meara, who kindly allowed us to investigate two of their patients. We wish to acknowledge help and advice from Mr. Symons, chief chemist of Kayser Bondor Ltd., Baldock, Herts, and also of Imperial Chemical Industries.

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A FORM OF INTERSEXUALITY

BY

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In 1938 Broster *et al.* described several degrees of intersexuality and discussed the methods of control, especially in relation to the masculinizing effects of the adrenal cortex, its role as a bisexual accessory sex organ, and its relationship to the pituitary gland.

More recently the difficult question of sex determination in children has been advanced by more than a decade, from puberty to infancy, by the discovery by Barr (1955), of Canada, of the female speck of chromatin lying in relation to the nucleus of skin cells. The method offers a very high degree of accuracy, for in only one test—that of a hermaphrodite with bilateral ovotestes—did his result not conform to the predominant sex of the patient.

The diagnosis at an early age lies between: (1) The adrenal pseudohermaphrodite with adrenal hyperplasia, a high ketosteroid excretion, uterus, tubes, and impaired ovaries. (2) The true hermaphrodite, with either ovotestes or an ovary on one side and a testis on the other, uterus, and tubes. (3) The intersex with uterus, tubes, and embryonic testes in the position of the ovaries. (4) The cryptorchid with abdominal testes in various stages of maturity and descent, but with absent uterus. All these have hypospadias with an enlarged phallus.

This clinical generalization reflects a persistence to a varying degree of the foetal sexually undifferentiated condition.

Up to the 50 mm. (about the 11th week) stage of the human embryo the development of the male and female external genitalia is identical. In the female the external genitalia remain in a relatively undifferentiated state, while in the male the developing process is continued to its final form. From the walls of the cloaca and urogenital sinus the urethral plate grows forwards (Glenister, 1954). It gives rise to a groove bounded on either side by two urethral folds. In hypospadias these folds, in various stages of fusion, run forwards, diverging slightly to reach the under surface of the glans of a malformed phallus.

In the female these folds remain apart to form the labia minora, whereas in the male they fuse along the ventral aspect of the phallus, leaving a median raphe on the surface. The urethra may open along any part of its course. Boys with this form of anatomy may be brought up erroneously as girls.

It is obvious, however, that two extreme forms of hypospadias can be recognized. One predominantly female, with an open urethral groove and enlarged clitoris; and the other predominantly male, with a partly fused urethral groove and a small flexed penis with prepuce. To the former type the adrenal pseudohermaphrodites tend to conform, whereas the three cases under review belong to the latter.

In 1952 I was sent a child (Case 1) and made a diagnosis of the more common condition—adrenal pseudohermaphroditism. The only difference was that the clitoris was more penile in its development. It came as a surprise that the ketosteroid excretion was within normal limits and not raised as it should have been. A

diagnosis of some form of intersex was now made, but normal adrenals, a uterus, and ovaries were found. Barr subsequently reported the female type of chromosome. This patient was quite new to our previous experience when two others of a similar type were investigated with similar results, except that in one (Case 3) other congenital deformities were present.

Case 1

On May 28, 1952, a child aged 3 years 11 months, the second of three children, an older sister and younger brother being normal, was seen (Mr. R. L. Canney and Dr. B. H. D. Robinson). The mother had recently noticed a considerable gain in weight and a large clitoris. The patient looked fit, with normal development for her age and a large head. A large clitoris, more penile in type, with a prepuce lay curved down between the labia with hypospadias, the urethra opening at the anterior aspect of a urogenital sinus. The sella was normal and the bone age 3. The psyche was normally feminine and the electroencephalogram normal for a child of 5. The ketosteroid excretion was 1.9 mg. a day, and 0.8 mg. a day on June 30, 1954.

The adrenals were hyperplastic but not unduly enlarged, with what felt like a nodule in the left; a small uterus with tubes and normal ovaries were present on biopsy. The enlarged clitoris was amputated.

The chromosome pattern (Barr) was female.

Case 2

An infant aged 1 year 11 months was seen on May 12, 1955 (Dr. J. W. Gibb). Owing to two previous miscarriages between the 18th and 20th weeks, ending in foetal death, the mother had been given stilboestrol and had developed toxæmia of pregnancy at the seventh month. One aunt suffered from a goitre; the father and another aunt suffered from Huntington's chorea, from which the aunt died.

The child had an enlarged clitoris, noticed at birth, which was growing in size (Fig. 1). She was a nice friendly healthy-looking child, big for her age. Except for a proclivity for climbing, her behaviour was normally feminine. There were a

FIG. 1.—Case 2. Photograph showing enlarged clitoris

mons, labia major but no labia minora, a large penile clitoris with foreskin bent down between the labia, and a cleft scrotum rather than a true hypospadias. The urethral opening was situated in front of the urogenital sinus. Laparotomy on August 22 confirmed a tiny uterus with tubes and ovaries, containing a few cysts of follicular origin. The adrenals were within normal limits and the ketosteroids less than 1 mg. in 24 hours. Although ossification in the foot was advanced, the navicular and medial cuneiform being present, the bone age was normal.

Professor Barr reported a normal female chromosomal pattern.

Case 3

This patient, aged 7 months (Dr. G. T. Newton), the third child in a family, was born with congenital absence of the left thumb, an imperforate anus, and enlarged clitoris (Fig. 2). She was registered as a boy. The presentation was a breech

and the mother developed albuminuria. There was a tendency to dwarfism, mental retardation, and hydrocephalus, with double incontinence.

On admission into hospital a rectovaginal fistula was found. The posterior vaginal wall was deficient below and opened into the rectum, forming a common cloacal cavity. A dimple was present at the site of the anus. A small phimotic penile type of clitoris showed an external urethral pit $\frac{1}{2}$ in. (1.3 cm.) long, which emitted a few drops of fluid on firm pressure over the bladder. The scrotum was well formed and resembled labia majora. The true urethral orifice was located just within the anterior urogenital outlet. There were no true hypospadias and no labia minora. On digital examination under anaesthesia the vaginal and rectal compartments were clearly felt communicating for about 1 in. (2.5 cm.) from the outlet. A cervix could be felt in the vaginal dome. There was marked spasm between the posterior wall of the deficient vagina and the rectum. The colon was visibly distended and its coils were full of inspissated faeces, and bouts of vomiting coincided with periods of partial obstruction.

A poor prognosis was given, with the added risk of urinary infection and the possibility later of renal rickets. The child was admitted to Charing Cross Hospital for colonic clearance and lavage on two occasions, and the mother was instructed how to carry on. At the end of 1953 definite improvement began to occur.

Except for the blood urea, which rose from 44 mg. in 1952 to 70 mg. in 1953, routine tests showed nothing of importance. A barium enema confirmed a mild but definite megacolon, and radiography revealed signs of arrested growth in the lower ends of the femurs and upper ends of the tibiae, and a sacral abnormality—the first segment wider on the left side and a gap between the third and fourth segments. There was a gas level in the bladder.

Laparotomy on May 16, 1952, revealed normal adrenals and Fallopian tubes attached to a small bicornuate uterus, with ovaries showing oogenesis and follicular cysts. Professor Barr's skin biopsy report was female nuclei.

By June 1, 1954, further progress had taken place in her general condition, a *Bact. coli* cystitis yielded to antibiotic treatment, and the blood urea had returned to 41 mg. per 100 ml. An

operation was performed on May 20, 1955. Through a transverse perineal incision the rectum was dissected off the posterior wall of the vagina, pulled through what remained of an anal sphincter, and its margins were firmly stitched to the edges of the skin incision made over the anal dimple. The posterior vaginal wall was sewn down to the original transverse incision. The wound healed by primary intention, the vaginal and rectal cavities being firmly separated. At a later date the phallus was removed.

On November 3, 1955, the ketosteroid excretion was 1.6 mg. a day, which is normal for her age.

Comment

In discussing these three patients it would be unwise to speculate on the mode of origin of their condition, except to emphasize the fact that it is not primarily adrenal. The

FIG. 2.—Case 3. Photograph taken at 4½ years.

same difficulty confronts us in the diagnosis of other clinical conditions with almost identical symptoms. For instance, Cushing's syndrome associated either with pituitary basophilism or with adrenocortical hyperplasia and carcinoma; isosexual precocity in children, due either to hypothalamic tumour (among other causes) or to carcinoma, usually of a solitary adrenal gland.

The ketosteroid test has proved a great boon in differentiating the adrenal lesion in these allied conditions. It is remarkable that these children, essentially female, should tend to exhibit external genitalia of a degree more advanced than their sisters with adrenal virilism, and only their future development will show whether it is only a local manifestation or is part of a more general somatic change. They add further food for thought in this obscure, unnatural, and distressing episcene problem.

These three girls appear to be the juvenile form of a female pseudohermaphrodite brought up as a boy and described by Armstrong in the *British Medical Journal* of May 14, 1955, page 1175.

Summary

Three cases of intersexuality are described—girls with hypospadias of non-adrenal origin.

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USE OF M/2 SODIUM LACTATE IN MULTIPLE ADAMS-STOKES ATTACKS

BY

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The prognosis for a patient suffering from multiple Morgagni-Adams-Stokes attacks is notoriously bad. Such attacks are often seen during a change-over from partial to complete A.V. block, but once a stable complete heart-block is established the outlook tends to improve. When, however, multiple Morgagni-Adams-Stokes attacks arise in a patient known to have had a stable idioventricular rhythm it must indicate a further stage of myocardial degeneration with little chance of recovery.

Many drugs have been used to increase idioventricular rates and to diminish the frequency of Adams-Stokes attacks when these result from ventricular asystole. These include adrenaline, isopropylnoradrenaline, ephedrine, thyroid extract, barium chloride, and atropine (White, 1951). In recent years artificial electrical pacemakers have been introduced with some success (Douglas and Wagner, 1955; Chandler and Rosenbaum, 1955). None of these measures is very dependable. Bellet *et al.* (1955) reported on the beneficial effects of intravenous sodium lactate (molar and half-molar strength) solutions in restoring ventricular beating during repeated Adams-Stokes seizures and increasing the ventricular rate in complete A.V. heart-block.

The case reported here is, we feel, of interest because of the apparently clear-cut relation between the administration of sodium lactate and the cessation of Adams-Stokes attacks.

Case Report

A 76-year-old man was admitted to hospital on July 30, 1955, having for the previous two days suffered from dizziness on standing. Examination revealed a regular heart rate of 17 a minute and a blood pressure of 150/60. There were no signs of heart failure. The heart sounds were not abnormal, nor were any murmurs present. Examination of

FIG. 1.—Effect of sodium lactate on frequency of Adams-Stokes attacks.

FIG. 2.—Effect of M/2 sodium lactate.

the respiratory system suggested moderate emphysema. No abnormality was found on abdominal or neurological examination. An electrocardiogram confirmed the presence of a complete A.V. dissociation and a slow idioventricular rhythm.

Shortly after admission the heart rate fell to 12 a minute. Isopropylnoradrenaline, 10 mg., was administered sublingually and oral ephedrine, $\frac{1}{2}$ gr. (32 mg.), four times daily was begun. These measures increased the heart rate to about 25 a minute, but the ephedrine had to be discontinued, as it appeared to be causing the patient to vomit. On the fourth day he began to have typical Adams-Stokes seizures. An electrocardiogram obtained in an attack confirmed that these were due to ventricular asystole. In each seizure the cardiac arrest lasted approximately 20 seconds. There was an interval of 15 seconds between the cessation of the heart beat and the beginning of the convulsive movements.

By next day there had been 29 attacks, and it was decided to try the effect of sodium lactate intravenously. Only M/6 sodium lactate was available, and 1 pint (570 ml.) of this was given over two hours, followed by a second pint five hours later. The cardiac rate was not affected by this treatment; neither was there any very significant reduction in Adams-Stokes seizures.

On the following day the Adams-Stokes attacks were becoming very much more frequent, and 200 ml. of M/2 sodium lactate was given intravenously over a period of 20 minutes. This resulted in a dramatic cessation of attacks.