Some films were made from swabs taken from the nose, and in these diplococci were seen.

On the next day, Tuesday, January 29th, the mouth was dry, and in a foul condition. The temperature had fallen to 99.2°.

Urine acid, deposit of urates. No reduction of Fehling, and no trace of albumen.

Lumbar puncture was performed, and 4 drachms of clear fluid were obtained in which a meningococcus was seen; the cells were almost entirely finely granular polynuclear; a few intracellular diplococci were seen.

On the same date 120,000,000 meningococcus vaccine was injected; on this and on subsequent occasions of injection considerable oedema and hyperaemia of the tissues round the site of injection were caused. The number here given in connexion with the vaccine is that of the microbes contained in the dose administered.

During the next eleven days, from Wednesday, January 30th, to Saturday, February 9th, the temperature remained in the same condition—that is, varying from 100° to 103° or 104°; whenever the latter figure was reached (for example, on the nights of February 2nd, 3rd, and 4th) the child was carefully sponged, after which the temperature always fell again.

She was usually restless at night during this period and irritable at all times.

An ice-bag for the head was begun on February 5th. Chloral was given on three nights; calomel was given twice, and mist. hyd. c. cret. on several occasions.

Lumbar puncture was performed on January 31st, February 5th, and February 8th; the amount of fluid obtained on each occasion and the results of examination will be found in the table given below.

Meningococcus vaccine (20,000,000) was injected on February 7th.

After February 9th the temperature fell by lysis, until on February 16th and 17th it varied from 97° to 98.6°. The child was still irritable and restless at night; the knee-jerks were brisk, but not easily obtained. On the latter two or three days of the fall of temperature the child was much better and slept a good deal during the day as well as the night; she had no headache and sat up and played with her toys.

During this period lumbar puncture was performed twice and on February 14th vaccine (143,000,000) was injected.

The optic discs were examined twice (January 30th and February 16th) up to this time, and beyond slight hyperaemia of the left disc and a suspicion of haemorrhage (not verified at second examination) of the right no abnormalities were found.

From February 17th onwards, until March 6th, there was a period of sudden changes of temperature; three times lumbar puncture was performed when the temperature rose to between 102° and 103° on February 18th, March 1st and 5th, and each time fluid was obtained, as shown in the accompanying table. Vaccine was injected (71,000,000) on February 26th. On February 21st, soon after the first relapse, a sudden rise

of temperature was checked by sponging and followed by a rapid fall.

During this period the knee-jerks were still brisk, plantar reflex was flexor and ankle clonus not obtained.

Aspirin, 15 grains, were given on March 2nd.

On March 8th vaccine was injected (32,000,000), and from that date the temperature was subnormal.

On March 15th the child was moved into another ward with other children, and since then the temperature has been irregular but about normal.

On March 23rd vaccine (64,000,000) was injected and aspirin, 5 grains given.

Patient got up first on March 29th, and left the hospital quite well towards the end of April. Knee-jerks brisk; nothing abnormal in chest or abdomen; optic discs normal; mental condition unimpaired.

Summary of Chief Features of the Case.—Temperature continually above normal for the first eighteen days, mainly between 101° and 104°. The removal of fluid by lumbar puncture always relieved symptoms. The child usually slept for eight or ten hours after each puncture. There were two well-marked relapses. There was no diarrhoea, purgatives being necessary on several occasions. No important treatment was given beyond vaccine and lumbar puncture; the vaccine was prepared from organisms cultivated from the fluid withdrawn by lumbar puncture. The diplococcus was present in seven out of the nine specimens of fluid withdrawn. Injection of the vaccine caused oedema and hyperaemia of tissues around injection site.

A Lecture

CIRCUMCISION AS A RITE AND AS A SURGICAL OPERATION.

DELIVERED AT THE MIDDLESEX HOSPITAL,

By J. BLAND-SUTTON, F.R.C.S.,

SURGEON TO THE HOSPITAL.

CIRCUMCISION may be described as the most ancient as well as the simplest operation in surgery, but it differs from all other recognized surgical procedures in possessing among many races and tribes of men a ceremonial value. In this lecture it will be considered from the religious, the ethnic, and clinical standpoints.

I do not think an apology is needed for devoting a lecture to this simple and common operation, especially when such great masters as Botticelli and Fra Bartolommeo considered it worthy their high art to represent the performance of circumcision.

Among the magnificent frescoes on the wall of the Sistine Chapel there is one representing Zipporah, the wife of Moses, circumcising her son with a sharp stone, according to the description contained in Exodus iv. 25.

The earliest mention of the rite of circumcision occurs in Genesis xvii, when Abram's name was changed to Abraham, and God made a covenant with him that he should be fruitful and multiply. The sign of this covenant was circumcision, and the instructions in regard to it are very explicit: "Every man child among you shall be circumcised," and that there should be no mistake in the meaning of the term the following verse runs: "And ye shall be circumcised in the flesh of your foreskin," and the age at which the rite should be performed is deliberately fixed for the eighth day after birth. Abraham, it should be remembered, was 99 when he submitted himself to the operation.

There has been much quibbling in regard to circumcision as to whether it should be regarded as an ordinance for cleanliness or a purely religious rite; the text, however, is very clear; it was to ensure fruitful coitus in order that the seed of Abraham should multiply according to the covenant. A long foreskin is a recognized hindrance to convenient coitus. Apart from any consideration as to the rite of circumcision being instituted for the mere purpose of cleanliness, the Jews must have regarded it as a sacrament, for in many of the Old Testament narratives "uncircumcised" is used as a term of contempt, and nowhere with more force than by Ezekiel xxxii. 17-32, from which it would be inferred that the place for the wicked is among the uncircumcised in the nether pit (hell).

One of the most dramatic events connected with circumcision in the Old Testament is the massacre of the Hivites by Simeon and Levi three days after they had been circumcised in order to make Shechem an eligible husband for

Lumbar Puncture and Results.

No	Date.	Temperature Before.	Temperature After.	Characters of Fluid.
1	Jan. 28th	101.2°	101.0°	5v. very turbid. Large number of cells, chiefly polymorphonuclear. Many intracellular Gram-negative diplococci present.
2	Jan. 27th	101.4°	102.0°	No fluid obtained.
3	Jan. 29th	101.8°	100.4°	5iv. clear. Cells entirely polymorphonuclear. A few intracellular Gram-negative diplococci seen.
4	Jan. 31st	103.0°	99.8°	5j. very turbid. Meningococcus and <i>Staphylococcus albus</i> present.
5	Feb. 5th	103.8°	98.6°	5ij. opalescent. Sterile. Many cells present.
6	Feb. 8th	103.8°	100.2°	5ix. almost clear. Pure culture of meningococcus. Pus cells abundant, but very few intracellular diplococci.
7	Feb. 11th	101.4°	99.8°	5j. opalescent. Polymorphonuclear cells and a few intracellular diplococci. Pure culture of meningococcus obtained.
8	Feb. 15th	98.4°	98.0°	No fluid obtained.
9	Feb. 18th	101.2°	99.0°	5j. clear fluid.
10	March 1st	102.0°	100.0°	5j. clear. Sterile.
11	March 5th	101.2°	97.4°	5vij. opalescent. Sterile. Polymorphonuclear cells.

Dinah the daughter of Jacob (Genesis xxxiv). I have often regarded this as the most cunning plot ever played by the crafty Israelites, outdoing in this respect Saul when he desired a hundred but received from David two hundred Philistine foreskins as a dowry for his daughter Michal (1 Sam. xviii. 25-27).

Notwithstanding the determined manner in which this quasi-religious rite appears to have been enforced in the early history of the Jews, it fell into abeyance whilst this band of emancipated slaves wandered in the desert, for it was revived by Joshua (v. 3-7). Burton, in a footnote in the *Arabian Nights*, has calculated the weight of prepuces removed on that occasion. Although the Jews treated their uncircumcised neighbours with contempt, there was one period in their history when some of them were ashamed of their circumcision, and there is a curious passage in the first Maccabean Book, Chapter i. 15, which runs: "And made themselves uncircumcised and forsook the holy covenant and joined themselves to the heathen." This passage has puzzled many writers, and it is a curious problem to surgeons, for it is difficult to understand how such a condition could be brought about.

It is strange also that even the rite of circumcision should lead to persecution, for in this same chapter (verses 60 and 61) we read that at the time when Antiochus set up the fashions of the Gentiles in Jerusalem and spoiled the temple, two women were put to death who had caused to be (or had) circumcised their children. The mode of their execution was particularly brutal—"And they hanged the infants about their necks, and rifled their houses, and slew them that had circumcised them." In the Second Book of Maccabees the matter runs thus:—"For there were two women brought who had circumcised their children, whom they had openly led round about the city, the babes hanging at their breasts, they cast them down headlong from the wall" (vi. 10).

Among the Jews to-day circumcision is performed on the eighth day after birth and is regarded as a sort of domestic feast-day; but only men are allowed to witness the actual performance of the rite.

Among Mohammedans, circumcision is performed as a rite about the thirteenth year; there is no recommendation or commandment regarding it in the Koran, but on inquiry I find that the Arabs practised circumcision before the advent of Mohammed. The Mohammedan Arabs profess to trace their origin to Ishmael, the son of Abram by his Egyptian concubine Hagar, and the choice of time accords with the age at which he was circumcised, namely, the thirteenth year (Genesis xvii. 25); but there is no exact practice in this matter, for in Egypt circumcision is performed on boys of seven or eight years and later. The ceremony is attended with great show, the boy being conducted through the streets in gaudy attire, attended by a procession, musicians, and the barber who carries out the rite. Wallace, in his interesting account of Java (*Malay Archipelago*), describes a circumcision festival at Modjo-agong which lasted five days. The two boys circumcised were about fourteen years of age, and the operation was performed by two priests on a bench in front of the house in the open air, before the assembled crowd.

Circumcision among Jews and Mohammedans is clearly a quasi-religious rite and had the same origin. The diffusion of the Jews throughout the civilised world after the destruction of Jerusalem, and the spread of Mohammedans in the East has made civilised man familiar with the rite. Circumcision, however, has an ethnic as well as a religious aspect, and this needs consideration in regard to the practice of this rite among savage and uncivilised tribes in Australia, the South Sea Islands and the East Coast of Africa. Howitt (*The Native Tribes of South-East Australia*) has made careful observations of the tribal customs in this region, and shows that it is an initiation ceremony and is performed often with a complicated ritual when the lads are near the period of puberty. It belongs to the same kind of custom which includes the knocking out of an incisor tooth, which is a sign that the boy has now become a man. The ritual accompanying the performance of circumcision varies widely among the different tribes, and in one of the tribes "the medicine-man who operates swallows the prepuce with some water." In most instances the foreskin is cut off with a piece of sharpened quartz.

Circumcision is practised in British East Africa, and

Fleet Surgeon Beadnell states (*BRITISH MEDICAL JOURNAL*, 1905, i, 964) that "circumcision and clitoridectomy among the Masai and Kavirondos are great ceremonial events extending over a period of many months, and occurring but once every six or seven years." He gives a detailed account of the operation, and states that "the foreskin is carefully preserved, as it is believed that any one stealing it can cause the boy's death." This appears to indicate that the custom has a totemic significance. Among the Jews the amputated foreskin is usually ceremoniously burnt. The same writer states that he was informed "by an officer who accompanied the Brass River expedition on the West Coast of Africa that he saw outside one of the native villages a tree from which were suspended numerous recently-amputated foreskins." This would suggest that the part after removal is regarded as a totem, or at any rate as a propitiatory offering to an imaginary deity. In regard to this, it may be mentioned that some writers, in reference to certain passages in Jeremiah (chap. iv, ver. 4, and ix, ver. 25-26), would regard circumcision among the Jews as in the nature of a representative sacrifice. This is not probable, for the Jews are especially enjoined in Leviticus xix. 27-28, to avoid rounding their beards, cutting their flesh, or printing marks on their skin (tattooing, etc.).

Spencer and Gillen, in their interesting book on *The Northern Tribes of Central Australia* (1904), in describing initiation ceremonies through which "youths must pass before they are admitted to the ranks of men and allowed to see, or take part in, any of the performances which are regarded as sacred," state that the two most important ceremonies are circumcision and subincision. These anthropologists, after the most painstaking inquiries, came to the conclusion that the native has no idea what these ceremonies mean; no one is allowed to have a wife until he has passed through these rites, and the women look with contempt upon those who have not done so. Spencer and Gillen state that these ceremonies have no relation to procreation, for the simple reason that the natives one and all in these tribes believe that the child is the direct result of the entrance into the mother of an ancestral spirit-individual. They have no idea of procreation as being directly associated with sexual intercourse, and firmly believe that children can be born without this taking place. They believe the spirit to be very minute, about the size of a grain of sand, and that it enters the woman through the navel and grows within her into the child.

That these natives should perform circumcision and other initiation ceremonies as a more or less sacred rite without understanding its meaning is by no means inconceivable. I have been assured that many Hindus who worship Shiva under the form of the lingam, which is merely a vertical stone column with a conical end representing in a rude fashion the penis, but symbolical of the procreative power in animal nature, do not really understand the meaning of the lingam itself.

A study of anthropological writings makes it certain that circumcision is very widely practised by civilized and by uncivilized races and tribes of men throughout the world. In many it certainly has a religious aspect, as in Jews and Mohammedans; a quasi-religious but undetermined meaning among many savage races in regions as wide apart as Australia and the West and East Coasts of the African continent. It is said to be practised in Central America, but the principles on which it is based are unknown to me. In some of the Solomon Islands and in the Fiji, as will be described later, slitting of the prepuce and circumcision are necessities on account of hereditary phimosis.

CIRCUMCISION FROM THE SURGICAL POINT OF VIEW.

The skin covering the anterior two-thirds of the penis differs from that of the adjacent part of the trunk in being glabrous, thin, and free from fat, but it is in the white races of men more pigmented than skin elsewhere; moreover it is movable and distensible. At the end of the penis it doubles upon itself and forms a loose fold, known as the prepuce, investing the glans penis. The inner layer of this fold becomes directly attached to the constricted portion of the penis known as the neck or cervix; immediately in front of this attachment is the rounded projecting border of the glans known as the corona glandis, and the epithelial covering of the prepuce is continued from the cervix over the corona, and after

investing the glans penis is continuous with that of the urethra at the slightly projecting vertical folds which guard its terminal orifice.

At the free margin of the prepuce the skin changes its appearance, becoming thin and moist, resembling mucous membrane. At the groove or cervix and along the posterior border of the corona there are numerous modified sebaceous glands (glands of Tyson; glandulae odoriferae). The lubricating matter which facilitates the gliding of the prepuce over the glans is furnished by the desquamating epithelium of the glans and the corresponding surface of the prepuce mixed with the secretion furnished by Tyson's glands. From the corona to the urethra the preputial skin is again modified, for it contains no glands, but is beset with large vascular and nervous papillae, and it adheres intimately and immovably to the tissue of that portion of the corpus spongiosum which forms the glans.

The median fold of the prepuce which connects the glans below the urethral orifice with the under border of the penis is known as the fraenum of the prepuce.

Thus in normal conditions the terminal portion (glans) of the penis has a complete investment of loose hairless skin, with an orifice allowing the free escape of urine.

The function of the prepuce is to serve as a sheath for the protection of the delicate nerve-endings (or end-organs) in the skin covering the glans penis which are concerned in sexual sensations. The natural elasticity of the preputial skin causes it to contract as the glans penis retracts within it after erection.

The prepuce is liable to a variety of malformations and morbid conditions, but in this lecture our attention will be mainly centred on those conditions which are concerned with circumcision.

In the ordinary way the prepuce is long enough to invest the glans penis completely, but variations from this normal condition may occur in the direction of deficiency and excess. The rarer variation is deficiency, and occasionally boys are born with a prepuce insufficient to cover the glans, and in some instances it is so short that the glans is as completely uncovered as if circumcision had been performed. There is a curious defect of the prepuce associated with the milder degrees of hypospadias in which the cutaneous hood completely covers the dorsal aspect of the glans, but remains, as it were, unfastened below, and the fraenum is absent.

PHIMOSIS.

The common abnormality of the prepuce is redundancy, and the tubular process of skin may stretch for an inch or more like a miniature proboscis in front of the penis; but mere abnormal elongation of the prepuce does not in itself constitute a nuisance so long as this skin-fold can

be easily and painlessly retracted to allow the parts to be freed from the retained smegma and kept clean. In many long foreskins, and in many short ones also, the terminal orifice is too small to allow of its retraction, and the gland is practically muzzled by its prepuce—a condition exactly expressed by the term *phimosis*. It is to remedy this condition that surgeons recommend and perform the operation of circumcision, which means removal of the foreskin, and it

Fig. 1.—Section through the anterior end of the fetal penis, showing the ring of solid epithelium which differentiates, by subsequent desquamation and delamination, prepuce and glans penis. (2 in. objective)

is advised for a variety of reasons, some of which we will consider.

Phimosis is of two kinds—congenital and acquired. Congenital phimosis is very common, and it may be due to an abnormally long foreskin with a narrow orifice, or to persistence of the adhesion between the foreskin and the epithelium of the glans penis, which is normal in boys at birth, but which usually spontaneously disappears. This temporary union is accounted for by

the mode in which the prepuce originates. Mr. J. Strickland Goodall has devoted some attention to this matter, and describes the development of the prepuce in the following manner: When first formed, the penis has no prepuce, and the anterior end of the penis is imperforate. The prepuce is subsequently differentiated by an ingrowth of the surface epithelium, which extends into the substance of the organ and appears in section as an imperfect ring or horseshoe-shaped epithelial structure (Fig. 1). This ring is incomplete ventrally, the gap representing the fraenum, the tissue external to the epithelial ingrowth becoming the prepuce, while the part internal to it represents the glans. As development proceeds, the central cells of this ingrown epithelium degenerate so that the preputial tissue becomes separated off from the glans, the outer layer forming the epithelial lining of the prepuce, the inner layers the covering epithelium of the glans penis. It must be noted that the epithelium does not grow back into the substance of the penis uniformly, but grows back fastest at the sides (Fig. 2). The desquamation leading to delamination and the subsequent differentiation of the prepuce usually appears to begin latero-posteriorly. Many (if not all) of the sensory end-organs of the prepuce (and possibly some of the glans itself) are developed from this ingrown surface epithelium. The glands of the prepuce and penis are relatively late formations, and are not functionally active till long after the prepuce is differentiated; the glands in the skin covering of the penis appear first towards its root, and are developed before the prepuce is separated or the smegma glands formed.

The so-called adherent prepuce of the infant is due to an organic connexion between the glans penis and the non-differentiated preputial tissues, and results from the ingrowing epithelium above described not desquamating at the usual time, and is really in the nature of an arrested development.

Berry Hart, in an excellent "Contribution to the Morphology of the Human Urinogenital Tract,"¹ has also described this mode of origin of the prepuce of the penis and clitoris. He further points out that this epithelial-plug formation with subsequent central breaking down is seen in the development, not only of the prepuce, but also in the formation of the anus, the lower third of the vagina, and in sweat glands.² The disadvantages of a narrow preputial orifice, especially when the foreskin is abnormally long, are many. Chief among them is the difficulty the child experiences in voiding urine; this leads to retention and straining efforts, and if the inguinal canals are weak, this straining will produce an inguinal hernia, or lead to prolapse of the rectum. It is a fact that a hernia in a child will occasionally disappear after circumcision.

Apart from these matters, the dribbling of urine through a narrow preputial orifice will cause much irritation of the marginal skin which makes the infant peevish and fretful, and may lead to reflex disturbances which retard its healthy development.

Fig. 2.—Section through the anterior end of the fetal penis, showing that the epithelial plug grows backwards faster at the sides.

Fig. 3.—Section showing central desquamation beginning in the posterior part of the epithelial ingrowth and leading to delamination with the formation of the movable prepuce. (3 objective).

In many instances a prepuce is sufficiently loose to allow of retraction, but if it becomes inflamed or swollen from any cause, such as irritation, or in sexual employment, it

Fig. 4.—Section showing organic (cellular) nature of adhesion between prepuce and glans penis in the fetus.

will swell to such an extent that the man is unable to reduce it over the glans penis and it remains retracted; this condition is known as *paraphimosis*, and the swollen prepuce forms a red ring or collar immediately behind the corona, strangulating the penis. In severe forms of paraphimosis the condition is serious, for, if unrelieved, it ends either by ulceration of the constricting preputial ring, or by gangrene of the glans penis. These consequences are rare, for with patience and perseverance, the surgeon usually effects reduction by means of his thumbs and fingers—a very effectual and simple, though painful method of relief.

It is wise to recommend a patient, young or old, who has had paraphimosis, to be circumcised, in order to prevent the recurrence of such a painful and unpleasant condition.

In rarer cases the preputial orifice may be so narrow that the urine after escaping from the urethra will distend the prepuce like a balloon, and then issue as a fine jet through it. This sort of thing often causes mirth to the boy's companions, but will exercise a baneful influence by leading to sacculation of the bladder, dilatation of the ureters, and hydronephrosis.

The Museum of Charing Cross Hospital contains a prepuce removed from a man 35 years of age with an orifice so narrow that when the urine escaped from the urethra it ballooned the prepuce to the size of an orange, and it was then expelled by squeezing. Micturition required fifteen minutes. The patient had a congenital phimosis, and at the age of 33 years contracted soft sores at the margin of the prepuce, and these gradually caused the narrowing. Mr. Waterhouse relieved the condition by circumcision.

When the urine is retained between the prepuce and the glans penis it sets up much irritation and occasionally inflammation of the prepuce (balanitis), and in rare examples concretions or calculi will form in this situation.

Fig. 5.—Preputial calculi; from natives of the Solomon Islands. (Museum St. Thomas's Hospital).

It is not uncommon in circumcising children to find on peeling the prepuce from the glans in the neighbourhood of the corona small, rounded, pearly bodies composed of smegma and epithelium; it is easy to understand that if urine had free access to and was retained by a prepuce with an unusually narrow orifice, such bodies would form the nuclei of urinary calculi. This actually happens, but in this country, at any rate, preputial calculi appear to be very rare. It is, however, certain that severe degrees of congenital phimosis do lead to the formation of preputial calculi, and cases have been described in which a calculus as large as a sparrow's egg was removed from the preputial sac of a child (Foster, 1880). There are facts which support the opinion

that phimosis may be hereditary, and the following notes are interesting in this direction:

Mr. B. Corney, who was an emigration medical officer in Fiji, states that nearly all the natives of the Solomon Islands have congenital phimosis, and in about one and a half per cent. the preputial orifice is no larger than a pin's head; a few of the tribes remedy this by slitting up the prepuce, usually with a sharp shell.

In the Island of Malakula all the tribes except one at the north-east corner slit up the prepuce, and in this tribe as a result of congenital phimosis, balanitis (non-specific), caused by want of cleanliness and consequent irritation is very common. The Fijians, a much superior race, all circumcise or slit.

As a consequence of congenital phimosis in the natives of the Solomon Islands, if they remain uncircumcised or are not slit, calculi form under the prepuce, and Corney sent to Mr. Crofts, at that time (1884) Surgeon to St. Thomas's Hospital, some preputial calculi which he had removed from two natives, aged 17 and 18 years respectively. The stone from one of the men weighed 1 oz. 110 grains, and in the other case twenty-two calculi were extracted (Figs. 5 and 6). These calculi are preserved in the Museum of St. Thomas's Hospital.³

Fig. 6.—A large preputial calculus; from a native of the Solomon Islands.

ACQUIRED PHIMOSIS.

Many men with a slight degree of phimosis or with a long but retractile prepuce remain uncircumcised, and so long as they are taught to keep the parts clean and carry out the precepts the condition, though inconvenient, may not give rise to serious trouble throughout a long life. There is no question that such a condition is often a hindrance to coitus and leads often to paraphimosis and balanitis, besides rendering the individual more prone to abrasions and slight fissures which may be infected with syphilis; moreover, a long foreskin is certainly a trap for the gonorrhoeal virus. A frequent cause of acquired phimosis is cicatrization of a chancre at the margin of the preputial orifice.

Apart from these evils, the margins of the preputial orifice are apt to be excoriated and fissured in old men whose urine dribbles away from prostatic trouble, or when it is overacid, foul, or diabetic; under these conditions the chronic inflamed prepuce thickens, its under-surface as well as the epithelial covering of the glans thickens, and the surfaces assume the peculiar white appearance characteristic of leucoplakia, which is common on the lingual, buccal, and vulval mucous membrane. Moreover, the thickening of the prepuce leads to narrowing of the preputial orifice, which prevents the proper exposure of the glans; smegma accumulates, the patient is made uncomfortable and often miserable from an irritating and annoying balanitis. Cases are known in which an acquired phimosis of this character has been neglected, and the glans has, in consequence of sloughing of the skin, forced its way through the dorsal portion of the prepuce. All the discomforts of acquired phimosis may be remedied by circumcision even in octogenarians. The preputial irritation sometimes seen in diabetics is better treated by merely slitting up the foreskin under local anaesthesia.

Not the least interesting feature of acquired phimosis in men is the formation of preputial calculi. The concretion, vary greatly in number and in size. One may be present, and as many as 200 have been counted (Vincent); the concretions in this instance are preserved in the Museum of the Royal College of Surgeons. Thirty or forty is not an uncommon number. For example Mr. Annandale removed thirty-six calculi from under the prepuce of a salmon fisher 58 years of age, and Demarquay has collected several interesting cases, including one under Brodie's care containing sixty concretions. Zuckerkandl has reported a curious and rare example of acquired phimosis with unusual consequences. A Slavonian

peasant 50 years of age stepped into a wasp's nest and the insects flew up the wide leg of his trousers and stung his penis and scrotum; as a consequence he had a diffuse cellulitis. Twenty years later he came under the observation of Vujic with an apple-size swelling at the end of his penis, but the preputial opening was so narrowed in consequence of cicatricial contraction that it only admitted a probe. The prepuce was slit up and the space between it and the glans penis found occupied by three stones the size of a dove's egg; their apposed surfaces were faceted and the pressure they had exerted on the glans had caused it to atrophy.⁵

Preputial calculi arise probably in the following way:—Some are minute concretions which find their way from the kidney or bladder along the urethra and are retained under the prepuce, its orifice being too small to allow them to escape. Others, and probably the majority, consist of urates or triple phosphates deposited on a nucleus of smegma; and some are masses of smegma impregnated with phosphates.

It is beyond any doubt that many inconveniences are associated with a non-retractile foreskin in children, in adults, and in elders; it is also, in some circumstances, a menace to health. Mothers often strongly object to have their baby boys circumcised, not only from dislike to subjecting them to a surgical operation, however trivial, but also from a feeling of revulsion in subjecting them to a process which is regarded as a rite in other religious communities. My own experience in this matter has been that when the advantages of circumcision are explained to them, they yield.

Congenital phimosis is common in London, as in a measure may be inferred from the frequency with which circumcision is performed in a large hospital. Mr. Morson ascertained for me that in this hospital (Middlesex), during 1906 fifty-four children were circumcised and twelve adults, three of the men were over fifty years of age. Circumcision of infants is very common in hospitals concerned with children, and I have been informed that at the Hospital for Sick Children, Great Ormond Street, during 1906 this operation was performed on 874 patients.

Occasionally one hears of certain supposed disadvantages of circumcision; it has been urged that the scar left by the operation may ultimately be attacked by cancer. Carefully-observed cases have been reported in which squamous-celled cancer has been found on a circumcision scar, and this may happen to any scar, but the liability is excessively small; an adult with a long, non-retractile, chronically-inflamed prepuce is far more liable to cancer of the penis than one with no prepuce. Cutaneous horns have been seen growing from a scar left by circumcision; but they may grow from any part of the penis, even from the epithelium covering the glans.

In rare cases syphilis and tuberculosis have been communicated to Jewish children as a result of a certain formula in the rite. Infants have died from bleeding and sepsis when the operation has been performed by medical men as well as by the mohel. These things only serve to show that an element of risk pervades all human actions.

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ON THE RADICAL CURE OF URETHRAL STRICTURE BY INTERNAL URETHROTOMY.

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EXCLUDE excision, certain plastic procedures necessarily rare, and a few cases of external urethrotomy, and there has scarcely been any solid advance in the radical cure of urethral stricture for half a century. Yet internal urethrotomy dates back to Heliodorus (1st century). Exceedingly few irrefutable examples of the cure of deep fully-organized annular stricture—the common “stricture”—can be adduced. Partly organized, penile, and segmental strictures are cured every day by the most diverse means.

It is my object to attempt to show that failure was and is due chiefly to the overlooking of “little things.” Is not the secret before our eyes in the healing of the wound in the simple operation of meatotomy and in other places

where epithelium gets fair play in the covering of raw surfaces? Cut a meatal stricture as freely as you like and merely pass round sounds; recontraction to an undesired extent is the rule. A “splice” forms. Pass a flat body—even a loop of wire—with like frequency; contraction does not recur. Epithelium lines the wound flush with the plane of mucous membrane; the building up of new tissue does not outrun the paving of the old.

I claim that the first secret of success is the avoidance of that which is universally courted—the “cicatricial splice,” an offspring of contractile tissue, which in the future will possess all the vices of the parent.

Most urethral strictures will generally heal like meatal if cut properly and wisely treated in the way mentioned or by a process like scabbing. The periurethral deposit, no longer called on to support the tissues round the lumen, which bear the brunt of the urine stream, will disappear.

The anatomy of strictures varies so much that to treat them scientifically we must examine them so. Owing to want of this I assert that strictures are nearly always undercut, overcut, or badly cut. If A. and B. have obstructions $5\frac{1}{2}$ in. down these may not be at the same site owing to the varying length of the penile urethra. That of A. may be prebulbar, that of B. bulbar or post-bulbar. Such difference makes a great difference in regard to treatment and results. Another urethra where incision at the bulb is required measures normally 40 or 45 mm., but the stricture deposit has extended into the corpus spongiosum even beyond this extent, whilst the meatus, or mid-spongy part, measures 24 mm. only. Now we are told if we “cut at all to cut all,” and almost universally that cure depends on the severance of every stricture fibre. There is no instrument, used in England at least, capable of doing such a thing, and no sound was ever passed capable of determining if it were done. A gutter is made and even this is allowed to fill up.

Find out (1) the site of the stricture, (2) its length, (3) the aspect of the urethra it engages, (4) whether it be urethral only or periurethral, (5) inflammatory (hyper-trophic) or sclero-cicatricial.

The instruments I find most helpful are a full set of flat demi-boule sounds, and some of a rhomboid shape for deep examination which will not hitch so much on the layers of the triangular ligament. Both are metal, the former are straight. Straight instruments are usually as easily passed through deep stricture as curved. The sinus of the bulb is filled up, and the surgical path, the roof, is fairly free.

I pass as large a demi-boule as possible down to the stricture and mark the site over its shoulder. Then, if possible, a small one through the stricture, and make it hitch on the posterior aspect of the latter. A finger in the anal canal can pull the tissues over the instrument, can feel where it hitches, and can straighten the curved urethra. Thus site and length are known.

Whoever performs internal urethrotomy should decide (1) how to cut, (2) where to cut, (3) how much to cut, (4) what to do besides, (5) what to do afterwards.

1. Instruments.

Of some sixty urethrotomies not one is perfect. Indeed, otherwise there would not be so many. Some men decry new devices. Urethral surgery stands alone in this, that the patient is at the mercy of the instrument. Not one of the senses comes directly into play. Instruments, therefore, must supplant the senses; they may be simple, but they must be ingenious. Endoscopic section of stricture is a failure.

Urethrotomes are divided into those which cut from before and those which cut from behind. Again, into those which, acting in one of those ways, stretch whilst they cut. Lastly, some cut the roof only, some the floor only, and a few can cut both.

As the anatomy of stricture varies so greatly, it follows that an instrument incapable of adjustment to all needs is defective. An ideal one should be capable of:

1. Stretching the tissues.
2. Cutting roof or floor.
3. Cutting to any depth.
4. Cutting the widest as well as the narrowest contraction.
5. Localizing the lesion it divides.
6. Cutting from before or from behind.

The indications are:

1. To restore the normal axis, thus getting rid of friction in urination.