their destination in the mucous membrane of the urethra and glans penis. The resistant nature of the coats of the corpora allow sufficient pressure to be produced to anæsthetise these as effectually as injection directly into the nerve itself.

The loss of sensation in the preputial mucous membrane, caused by injection into the corpus cavernosum, is so uniformly constant and good as to lead one to think that the nerves which supply the

FIG. 4.

FIG. 5.

Ventral aspect.

urethral mucous membrane also innervate the mucous membrane of the prepuce. The anæsthesia is sufficiently deep to allow of such conditions as papillomata of the glans and adherent prepuce to be dealt with without the slightest pain. To anæsthetise the skin of the prepuce intradermal injections must be made; if phimosis forceps are used they are now applied and 1 per cent. novocain injected intradermally on each side of the forceps as they grasp the prepuce. A small intradermal wheal is first formed and the skin picked up by the needle at the distal end of this and a second injection made producing another wheal, and so on until the whole line of the incision is covered (Fig. 3). About 2 c.cm. will be found necessary. If phimosis forceps are not used the skin is injected intradermally in the same way along the proposed line of section of the skin. The operation is started immediately after the last injection.

One point must be mentioned in connexion with the operation—namely, the securing of vessels. After division of the mucous membrane the ligature round the penis is released and a careful search made for divided vessels. Even if not bleeding at the time the smallest vessel should be tied, for the unavoidable congestion following local anæsthesia in about half an hour may cause quite a tiny vessel to spurt if it has not been secured.

Circumcision after Dorsal Incision.—In this case the same plan is followed of applying a ligature round the penis, band of anæsthesia and injection into the corpora cavernosa penis, the final injections being made intradermally along the lines indicated in Figs. 4 and 5.

After-treatment.—In order to avoid unpleasant tingling when the parts are recovering sensation, the following draught should be given immediately after operation:—

R Liquor morphinæ hydrochlor. ℥ 30. Aq. ad 3ss.

NASAL OBSTRUCTION IN INFANTS

DURING THE FIRST YEAR OF LIFE.¹

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THE evil effects of nasal obstruction and the necessity for its efficient treatment in children and adults are now widely recognised, but concerning infants in the early months of their career there appears to be a consensus of lay and medical opinion that tender age prohibits efficient surgical treatment,

and that a policy of *laissez faire* must be adopted until a more sturdy age is attained. That this policy is wrong I am firmly convinced, for to do nothing in the case of an infant suffering from severe nasal obstruction is to render its chances of reaching a really sturdy age somewhat remote, while surgical treatment is simple and efficient in the majority of cases.

Causes of Infantile Nasal Obstruction.

These may be set forth as follows:—

1. Congenital occlusion of the nostrils, (a) of the anterior nares, by means of a congenital web of skin at the junction of the vestibule with the nasal chamber proper, and (b) of the posterior nares, where a diaphragm consisting of bone, or partly of bone and partly of membrane, may partially or totally obstruct one or both choanæ. These conditions are rarely observed in the infant, for if the occlusion is complete, asphyxia neonatorum will result; if it is partial, it usually escapes attention until later years.

2. Temporary presence of mucous secretion in the nose, and engorgement of the nasal mucosa, during the first few days of life before mouth breathing is established. Hunter Tod records a case of this nature in an infant 12 hours old, who was threatened with death from asphyxia. He sprayed the nostrils with a weak solution of adrenalin hydrochloride, and free nasal breathing was at once established.

3. Congenital syphilis.

4. Mongolism. In mongols, the lumen of the nostrils is diminished, mainly due to depressed nasal bones.

5. Adenoids. This, by far the commonest cause of infantile nasal obstruction, is completely amenable to treatment.

Symptoms.

The symptoms of nasal obstruction in the infant are:—

(a) *Inability to suckle efficiently.*—Directly the mouth closes over the nipple difficulty of breathing through the obstructed nose at once occurs, and the infant has to let go the nipple in order to breathe through the mouth. It also swallows air whilst trying to suck, which makes it sick and gives it attacks of wind. Digestive troubles and malnutrition follow.

(b) *Snoring when asleep and frequent suffocative attacks.*—The mother complains that the infant has to fight for its breath and nearly chokes. Laryngeal spasm, laryngismus stridulus, and night sweats sometimes occur.

(c) *Persistent cough.*—This is reflex, or from spread of catarrh from naso-pharynx downwards.

(d) *Nasal discharge.*—Present in a certain proportion of cases, especially when the nasal obstruction is due to congenital syphilis.

(e) *Convulsions.*—A comparatively rare symptom.

(f) *Otorrhœa*, frequently bilateral, is observed in about 25 per cent. of cases when adenoids are the cause of the nasal obstruction.

Diagnosis.

Nasal obstruction is diagnosed from the presence of the above symptoms, (a) and (b) always being present in a greater or lesser degree. The question will then arise which of the five causes of nasal obstruction in the infant is operative.

Congenital occlusion of the nostrils is very rare, and only cases of partial occlusion survive. In these cases it might be noticed, as in the case recorded by StClair Thomson, that the mother could only nurse the child when it was lying on the obstructed side (so that the patent nostril did not get blocked by gravity). Examination with a probe will reveal the situation and completeness of the obstructing web. The presence of mucous secretion in the nostrils, and engorgement of the nasal mucosa, will cause temporary obstruction only, and this can be immediately relieved by the use of a weak adrenalin spray. In congenital syphilis there will be a muco-purulent, irritating nasal discharge, distinguished by its chronicity, as compared with a simple rhinitis. Typical skin eruptions and other constitutional signs of the disease are usually

¹ A communication read before the Manchester Medical Society.

present. The Wassermann reaction will be positive. A mongol is recognised by its typical appearance.

These four causes of infantile nasal obstruction having been excluded, adenoids may be confidently diagnosed. In the early months of life the post-nasal space is too small to allow of digital examination, so that actual confirmation is impossible.

Treatment.

Treatment varies with the cause. Congenital occlusion of the nostrils causing symptoms of nasal obstruction in the first year of life is extremely rare, so rare that I have never come across a single case, although I have seen a few in older children. Unless causing fairly urgent symptoms, surgical interference should be postponed until the increased size of the parts renders manipulations easier and more certain. The temporary presence of mucous secretion, and engorgement of the nasal mucosa, can be dealt with by the use of a weak adrenalin spray and thorough cleansing of the nostrils with an alkaline nose wash. Congenital syphilis is treated constitutionally in the usual way. In mongols operative measures are contra-indicated, as they exhibit a curious tendency to die under these circumstances, a fact first pointed out to me by Dr. C. P. Lapage.

Adenoids, which cause the great majority of cases of infantile nasal obstruction, should be surgically removed. It is my practice to operate on infants in the first year of life without an anæsthetic, which I consider to be unnecessary and inadvisable, thus the greatest risk is eliminated. The infant is placed on the table, the hands and body being held by a nurse, while an assistant steadies the head. A small Doyen's gag is inserted and the mouth opened. A specially small adenoid curette, of the StClair Thomson cage pattern, is then introduced and passed upwards into the post-nasal space behind the soft palate. A single firm sweep downwards will remove the adenoid pad. Meyer and Phelps have made two special sizes of curette to my order—the smaller one for infants a few weeks old, the larger for the others. There is but little bleeding, and I have never observed any shock. If possible, the operation should be arranged to take place about half an hour before a feed is due.

Results of Operation.

The results of this operation are excellent. It was in 1913 that I realised its value, but in that year and 1914 I can only find the records of four cases. Then came the war and a long absence from England on foreign service. In February, 1919, I resumed work at home, and since that date until the end of 1921 I have removed adenoids in 58 infants during the first year of life. Of these six have been under 1 month old, seven under 2 months, and seven under 3 months. Those cases done in 1919, 1920, and the first two months of 1921, totalling 23, I have recently investigated. One infant had died from an attack of bronchitis two months after operation. The rest were all cured of their symptoms, except in two cases in which slight nasal discharge still persisted. In both these cases, however, the nasal obstruction had been much improved. In six of these cases there had been a suppurative otitis media in one or both ears. In every case the ears were clean and dry.

A NOTE ON THE EFFECT OF BISMUTH ON THE KIDNEYS.

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THE specific effects of arsenic and antimony on spirochætal and certain tropical infections have prompted several investigators to test the properties of the metal bismuth, since the latter occupies a close position in the periodic scale of the elements. Sazerac and Levaditi have recently published an account of their researches which demonstrated the curative action of this metal on rabbits infected by

spirochætal disease and on human cases of syphilis.¹ Their observations have been confirmed and extended by the work of Fournier and Guenot.² On testing the relative merits of various compounds of bismuth, Sazerac and Levaditi selected the tartrobismuthate of sodium as the least toxic. For use in man this compound was prepared according to Cowly's³ method and used as a 10 per cent. suspension in olive oil for intramuscular injection, the dose of the preparation being 2 to 3 c.cm. They established the important

CHART 1.—Daily excretion of urine in c.c.m. + indicates intravenous injection of 2 c.c.m. bismuth compound.

fact that soluble compounds of bismuth are at least ten times as toxic when administered intravenously than when given by intramuscular injection. Subcutaneous injections are, in general, less safe than intramuscular injections. Thus in the rabbit a dose of 50 to 60 mg. per kg. body-weight had no toxic effect when given intramuscularly, but an intravenous injection of only 5 mg. per kg. was fatal.

This recent work has confirmed former observations that the characteristic sign of bismuth poisoning in mild degree is the development of a dark line on the gums, very similar to that of lead.⁴ This may be associated with a gingivitis and in severe cases by a stomatitis, with discoloration and secondary infection by the organisms of Vincent's angina.

Personal Experience.

Before the above observations were published, I had begun work on the same subject and encountered certain toxic effects following the intravenous injection of bismuth, which are not mentioned in the articles quoted. The preparation I used was the liq. bismuthi et ammonii citratis (B.P.), which contains about 9 per cent. of bismuth citrate. This was prepared as aseptically as possible and sterilised by heating it in closed ampoules (each containing 2 c.c.m.) at a temperature of 100° C. for

CHART 2.—+ Indicates intravenous injection of 2 c.c.m. liq. bismuthi et ammon. cit.

over half an hour on three successive days. It may be mentioned here that Fournier and Guenot found this compound as efficacious as the tartrobismuthate in the treatment of syphilis, but that subcutaneous injections were liable to be followed by toxic effects.

Injections of 0.5 or 1 c.c.m. had no general bad effect, but on repetition a black line formed on the gums with sometimes a stomatitis, the condition resembling a mixed effect of lead and of mercury. But intravenous injection, especially when the large dose of 2 c.c.m. was given, gave rise to signs of poisoning. There were nausea or actual vomiting and slight diarrhoea in most patients. But the most striking result was a copious diuresis, unaccompanied by strangury or other signs of vesical irritation.

¹ Sazerac and Levaditi: *Annales de l'Institut Pasteur*, January, 1922.

² Fournier and Guenot: *Ibid.*

³ Cowly: *Chemist and Druggist*, 1913, vol. lxxxii, p. 212.

⁴ *THE LANCET*, 1913, ii., 1039.