

frequent in childhood than in other age groups," implying that head injuries may cause the infection to spread to the meninges.

#### Vagotomy

**Q.**—*What are the effects of vagotomy? How is a "medical" vagotomy performed?*

**A.**—The secretion of acid in the stomach is controlled partly by a hormone and partly by the parasympathetic nervous system through the vagus nerves. It has been shown that complete section of the vagi considerably reduces both acid secretion and the motility of the stomach. Beneficial results can therefore be expected in cases of duodenal ulcer, particularly where severe pain is a leading feature.

The vagi can be cut either above or below the diaphragm. Owing to anatomical abnormalities complete section is not always possible below the diaphragm and a transpleural approach is more certain, but this has the disadvantage that the lesion in the duodenum cannot be inspected. In practice an abdominal route is usually used, and by pulling on the oesophagus the nerves are severed as high as possible.

The reduction in gastric motility leads to gastric retention, and the operation is contraindicated if there is any narrowing of the duodenum. Movement of the small intestine is increased, and chronic diarrhoea may follow the operation. Pyloric narrowing may require a gastro-enterostomy to be combined with the vagotomy, and conversely vagotomy may be tried on patients who have recurrent ulceration following a short-circuit. In this way the formidable operation of gastrectomy following gastro-enterostomy may be avoided.

Belladonna paralyses the nerve endings of the vagus, and if given in sufficient quantity will reduce the secretion of hydrochloric acid. Starting with 5 minims (0.3 ml.) thrice daily, the dose should be increased by a minim at a time until the largest dose that the patient can tolerate without side-effects is given. Dryness of the mouth and blurring of vision are the principal side-effects which often militate against the successful use of belladonna. A less toxic preparation is atropine methyl nitrate in doses of 5 mg.

#### Faecal Incontinence in Childhood

**Q.**—*What are the likely causes of faecal incontinence of recent origin in a boy of 8 years? How should the condition be treated?*

**A.**—Probably the commonest cause is gross constipation, but in this case the incontinence is always associated with diarrhoea, due to local irritation caused by the hard scybala. The diagnosis can often be made on the history of the child's not having had a motion for several days at a time, and then having watery motions with incontinence. It is confirmed readily by rectal examination during the phase of diarrhoea, when the rectum is found to be enormously distended and loaded with hard faeces. On abdominal palpation hard faecal masses can also often be felt. Constipation of this degree is usually a behaviour problem, of which the commonest cause is undue concentration by the parents on the child's bowels. All the child's motions are inspected to see if they are "adequate," and he is compelled to stay in the lavatory if the product does not come up to the parents' desires. Occasionally the constipation may be due to a painful local lesion, such as anal fissure. If there is no associated diarrhoea, the faecal incontinence is again almost certainly a behaviour problem. It may be due to the treatment described above, but it is more likely to be due to an emotional disturbance of recent onset, such as jealousy of a new baby, domestic unhappiness, or worries at school, either because of difficulties in a particular subject or with a particular teacher, or because of bullying. The problem is perpetuated by punishment of the child in the form of smacking or of efforts to shame him.

The treatment must be directed towards the cause, and can only be very briefly outlined here. The first essential is to deal with the parental attitudes and anxieties. On no account must the child be punished or shamed for the incontinence. His greatest need is love, security, and encouragement. If the incontinence is due to hard scybala, these must be removed by saline purgatives and daily enemas, but it is essential to stop

these as soon as that has been achieved. The child must then be left to look after his own bowel actions without any anxiety being shown about their sufficiency. If there is no constipation, the precipitating cause must be discovered by a really careful history in order to determine exactly what happened just before the onset of the incontinence, and in particular what is going on in the home or school to upset the child. There is no place for drugs, other than the saline purgatives mentioned above, in the treatment of the condition.

#### Sensitivity to Antibiotics

**Q.**—*(1) What concentration of an antibiotic should be used to determine the sensitivity of an organism? (2) What relation has the in vitro sensitivity of the organism to the serum concentration of antibiotic necessary for successful therapy?*

**A.**—(1) To obtain accurate information about the sensitivity of an organism to an antibiotic, it is necessary to use not one but a series of different concentrations of the antibiotic in separate tubes of culture medium. The result of such a test may be to show that the organism is inhibited by, for example, 0.02 unit of penicillin per ml., but not by 0.01. The various agar diffusion methods yield similar information; although this can be expressed only approximately in the same terms.

(2) The outcome of treatment certainly depends on whether the concentration found inhibitory *in vitro* is attained and indeed somewhat exceeded in the blood in consequence of the dosage given. Although this has been more or less self-evident since the earliest therapeutic use of penicillin, the fact that *in vitro* results are directly applicable to conditions *in vivo* has recently been experimentally proved by Eagle, Fleischman, and Musselman (*J. Bact.*, 1950, 59, 625). They inoculated mice and rabbits with pneumococci, one hour previously having administered different doses of a slowly absorbed procaine-penicillin preparation giving sustained blood levels which were accurately determined. The doses required to save half the animals were those giving serum concentrations two to five times greater than the minimum effective concentration *in vitro*. This two- to five-fold difference is accounted for by plasma binding and by the concentration gradient between the blood and tissue fluids: in other words, the concentrations active *in vitro* and *in vivo* are evidently about the same.

The same considerations apply to sensitivity tests with other antibiotics, although the techniques differ owing to such factors as the instability of "aureomycin" or the marked dependence of the action of streptomycin on the size of the inoculum and the composition of the medium.

#### NOTES AND COMMENTS

**Rectal Prolapse.**—Mr. J. R. M. WHIGHAM (London) writes: With regard to rectal prolapse ("Any Questions?" November 18, p. 1184), I think the operation recommended by R. R. Graham (*Ann. Surg.*, 1942, 115, 1007) is worth a mention. The principle of the method is based on the assumption that a complete rectal prolapse is essentially a sliding hernia of the anterior wall of the rectum. The rectum is approached from above, the peritoneal sac is removed, and the anatomical defect in the pelvic fascia repaired. I have found the results satisfactory and the operation well borne even in a patient as old as the one mentioned.

**Correction.**—In our report of Mr. Brock Chisholm's statement to the press (*Journal*, November 4, p. 1049) it was said that two Ethiopian medical students were studying medicine in the Sudan. We understand that this is not the case. Two Ethiopian undergraduate medical students are studying in the Lebanon and two in Egypt. Five nurses from Ethiopia are studying under W.H.O. Fellowships in Uganda.

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