

a simple aerosol of water may reduce the viscosity of mucus. Mucus dried to the point of crusting will not imbibe moisture unless first broken down by chemical action.

Two kinds of "mucolytic" solutions for administration as aerosols have been used. The first contains a detergent, glycerin, and sodium bicarbonate. There is no evidence that such a solution affects the viscosity of mucus *in vitro*, and no controlled trials of its effect in man have ever been published. The only theoretical advantage of the solution over water is that it forms a more stable aerosol which may carry more water into the bronchi. The second type of solution contains trypsin, which is claimed to be specifically mucolytic. Trypsin is, in fact, a proteolytic enzyme which will damage the mucosa if used in sufficient concentration to affect dried mucus. Even premalignant changes in bronchial mucosa have been reported after the use of purified trypsin.¹ Lastly, trypsin is a foreign protein and its repeated use leads to sensitization.

No safe specific mucolytic agent has yet been discovered. In its absence prevention of viscid secretions is better than treatment. This is best done by ensuring an adequate fluid intake, eschewing atropine-like drugs, and by increasing the water saturation of inspired air.

REFERENCE

- ¹ Farber, S. M., Pharr, S. L., Traut, H. F., Wood, D. A., and Gorman, R. D., *Lab. Invest.*, 1954, 3, 33.

Athlete's Foot in a School

Q.—*What is the best method of dealing with an outbreak of athlete's foot in a secondary boys' school? Should the use of shower baths be prohibited in school?*

A.—Shower-bath floors favour the epidemic spread of fungous infection of feet. The regular scrubbing of such floors with fungicidal detergents and the wearing of slippers reduces the risk. Regular washing of feet, the wearing of cotton socks which are regularly boiled, and the use of dusting powder for the toes and feet are also important prophylactic measures.

It is important first to find the causative fungus by culture, for some are curable and others incurable. Infection by *Trichophyton rubrum*, which is becoming more common in this country, is very difficult to eradicate.

Benzoic and salicylic acid ointment or lotion (3% of each) at night and a fungicidal powder (undecylenic acid types) by day are a good method of treatment. There are, however, many other effective fungicides, including the mercurials and dyes. Brilliant green ($\frac{1}{2}$ %) and perchloride of mercury ($\frac{1}{2}$ %) in spirit is also effective, but stains clothes. The presence or absence of infection in the nails is important, and, if present, it may be necessary temporarily to remove the nails. Disinfection of socks and shoes by formalinization is also wise.

Involution of the Uterus and Oestrogens

Q.—*Does the exhibition of oestrogens during the puerperium, to suppress lactation, delay involution of the uterus?*

A.—No.

Inheritance of Friedreich's Ataxia

Q.—*How is Friedreich's ataxia inherited? A woman, whose twin brother died from the condition at the age of 23, wishes to marry. What is the prognosis regarding her life and the chance of her children being affected?*

A.—The clinical conditions labelled Friedreich's ataxia are not homogeneous. The great majority of those with early onset behave as if due to one or more recessive genes, and the illness is usually uniform within families and independent of sex. Much more rarely, dominant genes may give a somewhat similar clinical picture, these types showing much more variation of expression within families. While, therefore, it is probable that the gene concerned in the present patient's family is recessive and that there is little chance that she will develop the condition or will have affected

children (assuming she does not marry a near relation), a careful family history should be taken and an expert neurological examination made of the patient herself and of her parents for minimal signs of the disease.

NOTES AND COMMENTS

Functional Ciliary Spasm.—Dr. THOMSON HENDERSON (Hursley, Hants) writes: May I comment on your expert's explanation on functional ciliary spasm ("Any Questions?" July 28, p. 254), which, while orthodox in conception, is, when analysed, incapable of realization? According to established convention the vascular choroid functions as a counterweight to the lens and the unstriated ciliary muscle is actuated by a single nerve. If these two tissues were able to function in such a manner they would be absolutely unique in the whole range of the animal kingdom. Nowhere can a vascular structure be found subjected to constant stress or unstriated muscle actuated except by two nerves and functioning accordingly. The physiological function of unstriated muscle is to contract into a phase of rest, such as is appreciated by every human being on emptying the bladder. Thus it is that the contracted unstriated fibres support the zonular curvature and maintain the lens flattened. As discussed in my book *Principles of Ophthalmology* (p. 132), asthenia from whatever cause results in diminution of the general tonus of the body. The neuromuscular mechanism, that maintains the body erect, sags, the individual stoops, and the atonic stomach dilates. Similarly, the atonic ciliary muscle is unable to support the lens traction and likewise sags. The zonular curvature is lowered and lenticular myopic refraction induced. This sequence of events is the very opposite of the so-called spasm, and its treatment is essentially constitutional.

OUR EXPERT replies: Although the precise action of the ciliary muscle has been debated for many years it is now widely accepted that the action of both portions of the ciliary muscle is to slacken the suspensory ligament of the lens, causing the lens to become more convex. Furthermore, the circular fibres act directly as a sphincter which diminishes the circumference of the ring formed by the ciliary body and hence also aids in relaxing the suspensory ligament of the lens. It is interesting to compare the unstriated muscle of the urinary bladder with that of the ciliary body, but surely the neuromuscular mechanism of a hollow viscus such as the bladder is a very different matter. Whatever objection may be raised to the orthodox explanation of the action of the ciliary muscle, it still remains a fact, which can be proved by mere observation, that in functional ciliary spasm of any appreciable degree there is an accompanying spasm of the medial recti. If the process causing the "over accommodation" were atonic in nature then one would hardly expect an accompanying contraction of the synergic medial recti muscles.

Prolonged Constipation in Children.—Mr. E. W. GODDING (Westminster Laboratories, Ltd., London, N.W.1) writes: As manufacturers of the "senokot" standardized senna preparations discussed by Mr. H. Reid and your expert ("Any Questions?" August 11, p. 374), may we comment on the question of costs? Your expert is correct in saying that two drams (7 ml.) of liquid paraffin daily and a tablet of senokot daily is about one penny a week, in either case, but for prolonged constipation the comparison may be very different. While liquid paraffin has to be given indefinitely, senokot dosage is required at less frequent intervals, and usually dosage can be gradually reduced and eventually discontinued.

Correction.—In the Epidemiological Table in the *Journal* of August 18 (p. 426) the number of deaths in the first year of life in the 17 principal towns of Scotland should have been shown as 21, and the deaths at all ages (excluding stillbirths) as 482; these numbers were inadvertently transposed.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Antilog, Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Director, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London*.

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London*.

B.M.A. SCOTTISH OFFICE: 7, Drumshugh Gardens, Edinburgh.