undernourished owing to anorexia, and one of whom had sprue. They found a decrease in all glandular activity, and concluded that the functional activity of the pituitary gland may be greatly impaired by starvation. This functional hypopituitarism was reversed in one case by refeeding.

In children the results of underfeeding afford a direct contrast to the changes noted in obese children. Undernourished children are small and thin, and skeletal and sexual maturation may be retarded. Signs of decreased pituitary activity can result, in children, from malnutrition, the intensity of the signs being roughly proportional to the degree of undernutrition (Talbot *et al.*, 1952).

Speculation

There is abundant evidence that undernutrition produces hypopituitarism. The converse, that overnutrition produces hyperpituitarism, would explain the observations made on obese children. Increased growth, earlier puberty, and increased adrenocortical activity could be explained on the basis of this hypothesis. The change in 17-ketogenic steroid excretion described in this paper might be due to an alteration in pituitary activity resulting from the change from overnutrition to undernutrition.

This hypothesis might reconcile the views of those who consider obesity in childhood to be entirely nutritional in origin and those who consider the condition to be an endocrine disorder.

Summary

The case histories are recorded of four patients—children and adolescents—who suffered from obesity. Each patient initially had a raised urinary excretion of 17-ketogenic steroid, which became normal after weight reduction due to dietary restriction. In one patient this phenomenon was observed on two occasions. Obesity in childhood is briefly discussed, and it is suggested that overnutrition may produce functional hyperpituitarism.

I am grateful to Dr. Arthur Jordan, director, department of biochemistry, United Sheffield Hospitals, for his assistance and advice. I thank Dr. A. P. M. Page, Dr. M. W. Arthurton, and Professor G. M. Wilson for permitting me to borrow case records and allowing me to publish them. I am grateful to my chief, Dr. T. E. Gumpert, for allowing me to publish details of cases I have seen on his wards, and for his useful criticism; and I thank Dr. D. V. Hubble for his advice.

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A recent publication from the Ministry of Fuel and Power summarizes pneumoconiosis statistics obtained from the Ministry of Pensions and National Insurance and the National Coal Board. It is *Digest of Pneumoconiosis Statistics, 1956* (H.M.S.O., 3s.). The introduction summarizes the legislation relating to pneumoconiosis, describes the administrative procedures, and gives explanatory comments on them and on the tables. The statistics cover Scotland as well as England and Wales.

GUSTATORY SWEATING AND PILOMOTION

BY

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It has been known for some years that pathological gustatory sweating may follow cervical sympathectomy, but the phenomenon has not been satisfactorily explained. In the case reported here, accidental operative damage to the sympathetic was followed by gustatory sweating and gustatory pilomotion, a condition not hitherto recorded. An explanation of these symptoms is put forward.

Case Report

A woman developed pulmonary tuberculosis in 1946 at the age of 21. In 1947 she had a three-stage thoracoplasty on the left side, in which the upper eight ribs were removed. The presence of many adhesions made the operation difficult. The disease has now been inactive for several years.

She first noticed gustatory sweating in 1948. Since then it has gradually increased in intensity. Sweating begins at once when she eats chocolate, certain sweets, fruit cake, Swiss roll, pickles, or cheese. It is confined to the left side, and is so profuse on the neck and shoulder that she often has to wipe the skin. She also has goose-skin in the same areas; this is accompanied by a tingling sensation.

When seen in 1956, she appeared healthy, though thin. An incomplete Horner's syndrome was present on the left side, with the left pupil smaller than the right. In the fasting state, sweating was detected by Wada's (1950) method on the left side of the face and neck, but not on the right. This sweating was much less than that evoked by the foods mentioned.

Indirect heating by immersion of the legs in warm water caused her to sweat considerably on the normal side, but very little on the left side of the face and neck and the left shoulder and arm. Finger and hand plethysmography showed that the vessels of the right hand constricted sharply in response to nervous stimuli, such as a sudden noise; on the left side no constriction occurred.

The taste of chocolate induced sweating and pilomotion within half a minute. Sweating could be detected by Wada's (1950) method on the whole of the left arm, except on the palm, but was much less intense than on the left side of the neck and shoulder. Goose-skin was observed as far down as the middle of the forearm. Proximally, on the neck and shoulder, it appeared in an almost continuous sheet; distally it was patchy and less intense. Occlusion of the arterial supply to the arm by a pneumatic cuff prevented neither sweating nor the development of goose-skin below the cuff in response to the taste of chocolate. Pressure on the carotid sinus did not cause pilomotion or an increase in sweating.

Discussion

The absence of thermal sweating on the left side of the face and neck and the left arm shows that the sweat glands in these areas have lost their normal innervation. That the gustatory sweating and pilomotion is not due to a substance reaching the skin by the blood stream is shown by the fact that arterial occlusion did not prevent sweating or pilomotion, and this suggests that a nervous mechanism is responsible. Haxton's (1948) observation that gustatory sweating can be temporarily abolished by procaine infiltration of the region of the cervico-thoracic ganglion points in the same direction.

The simplest explanation of this patient's symptoms appears to be that suggested by Murray and Thompson

(1957). They have shown in cats that section of pre- or post-ganglionic sympathetic fibres is followed by the growth of sprouts from neighbouring axons. The stimulus leading to sprout formation is probably a humoral agent released by adjacent degenerating nerve fibres (Edds, 1953). These sprouts may reinnervate the denervated structures, provided that they are of the same type (cholinergic or adrenergic) as the axon they are replacing. It was found, for example, that sprouts originating from the vagus can reinnervate ganglion cells in the cervical sympathetic that have lost their afferent (pre-ganglionic) fibres. Murray and Thompson (1957) suggest that a similar ingrowth of sprouts from the vagus could explain the gustatory sweating that may follow cervical sympathectomy in man. The pilomotion observed in this patient is an important piece of evidence, because it is mediated by adrenergic fibres, while sweating is mediated by cholinergic fibres. It is highly unlikely that the cholinergic vagus fibres could make a functional connexion with structures innervated by adrenergic fibres. It is probable, therefore, that reinnervation has occurred proximal to the ganglion, since all pre-ganglionic fibres are cholinergic. Reinnervation at this level, by sprouts from the vagus, would explain the simultaneous occurrence of sweating and pilomotion in response to gustatory stimuli. No change in the post-ganglionic fibres need then be postulated.

No satisfactory explanation has so far been found for the gustatory sweating and flushing that often follows disease or injury in the parotid or submandibular region (Goatcher, 1954; Young, 1956). The work of Murray and Thompson (1957) now suggests that in these cases denervated sweat glands and perhaps vasodilator receptors have been reinnervated by sprouts from neighbouring cholinergic fibres.

Gustatory pilomotion has not been described before, presumably because goose-skin is very difficult to detect on the face. It seems possible that the tingling which in many patients accompanies gustatory sweating results from pilomotor activity that fails to produce visible goose-skin.

Summary

A case is reported of gustatory sweating and pilomotion following operative damage to the sympathetic. It is suggested that sprouts have grown out from the vagus and made connexions with sympathetic ganglion cells whose normal pre-ganglionic afferent fibres have been divided.

I am grateful to Dr. A. C. Dornhorst for his help with the investigations and to Dr. P. J. D. Heaf for drawing my attention to this patient.

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Six American women medical scientists will leave during the second week in May for a one-month tour of medical institutions in the Soviet Union. Preliminary arrangements for the trip have been completed by the National Academy of Sciences in co-operation with the Rockefeller Foundation, the American Medical Association, and the American Medical Women's Association. The visit is the result of an exchange agreement entered into by the U.S. Department of State and the Soviet Union. Last October six women scientists from the U.S.S.R. spent a month in the United States visiting medical institutions in six cities in the East and Middle West. The delegation will be headed by Dr. HELEN B. TAUSSIG, of Johns Hopkins University Hospital, a paediatrician known specially for her work on cardiac disease in children.

VOLVULUS OF CAECUM COMPLICATING NON-ROTATION OF MIDGUT

A CASE SIMULATING REVERSED ROTATION

BY

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Non-rotation of the midgut is an uncommon anomaly in which the second stage of rotation completely fails to occur. The midgut returns to the abdomen during the tenth week of foetal life in the same relative position that it occupied while in the umbilical cord; the small intestine remains largely to the right of the midline and the large intestine to the left, with the terminal ileum entering the right aspect of the caecum. The condition has been well described by Dott (1923) in his classic paper on the anomalies of intestinal rotation.

The importance of non-rotation stems mainly from the fact that the mesentery of the midgut in these cases often fails to develop any secondary adhesion to the posterior abdominal wall, or does so in an incomplete and irregular manner. As a result of this deficient fixation, massive torsion of the midgut loop is apt to occur, particularly during the neonatal period, resulting in the well-known condition of volvulus neonatorum. A lesser degree of volvulus, confined in its effects to the caecum or ileo-caecal region, appears to be an uncommon complication of non-rotation, and reference to the readily available literature has revealed record of only four such cases (Rixford, 1920; Bulman, 1924; Carter, 1938; River and Reed, 1942). The following case is of particular interest on account of the volvulus having occurred in such a manner as to give a close simulation of the rare anomaly of reversed rotation.

Case Report

A married woman of 37 was admitted to Kingston Hospital as an emergency case on May 6, 1956. For some 20 hours previously she had had severe central abdominal pain, colicky at first, but later becoming continuous. She had been nauseated, but had not vomited. Flatus had not been passed since the onset of the pain, and her abdomen had become noticeably distended. Since childhood she had been subject to recurrent attacks of similar pain, but these had never before lasted more than an hour or two, nor been of the severity of the present attack. She had always had a tendency to constipation.

On examination her general condition was good, though she was clearly in considerable pain. Her temperature was 99° F. (37.2° C.), pulse 60, B.P. 110/80. The abdomen was moderately distended and showed generalized tenderness but no rigidity. The bowel sounds were obstructive in character. There was some guarding in the lower abdomen, where a centrally placed, soft, ill-defined tympanitic swelling some 8 in. (20 cm.) in diameter was palpable. There were no other significant findings on physical examination. A straight x-ray film of the abdomen showed gross gaseous distension with a very large fluid level in the pelvis. A diagnosis of acute obstruction of the large intestine, probably due to volvulus, was made.

Operation.—Under general anaesthesia the previously noted swelling was readily visible and palpable, extending from the pubis to well above the umbilicus. A right paramedian incision was made, and the swelling was found to be a grossly distended but viable caecum and ascending colon. It was readily delivered out of the wound, and on following up the distended ascending colon the latter was found to