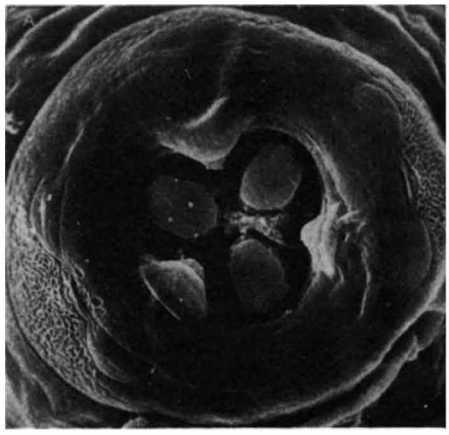
TAXONOMY

Nematode Morphology



THE scanning electron microscope is revealing all to the taxonomist. Fortunately, it usually seems to confirm or extend previous descriptions of species made by eye or with the optical microscope, so that drastic revisions do not usually have to be made. In the case of the parasitic nematode genus *Syphacia*, the scanning electron microscope has made possible the examination of *en face* features which are important taxonomically, as C. G. Ogden now reports (*Bull. Brit. Mus. Nat. Hist.*, Zool, **20**, 253; 1971). Ogden has found that the head in this genus falls into four distinct patterns which may be useful in delimitating groups of species. For example, in *S. citelli*, *S. pallaryi* and *S. transafricana* the lips are reduced in size and have a cuticular thickening giving them a triangular shape as is shown in this illustration of the *en face* view of the head of *S. citelli*.

OBESITY

How Fat Men Respond

from our Experimental Psychology Correspondent

A POSSIBLE clue to the root cause of obesity in man has been provided by the apparently bizarre behaviour of rats with experimentally induced damage of the hypothalamus. For many years it has been known that the syndrome associated with lesions of the centromedial hypothalamus has included overeating up to the stage where the animal has become immensely fat, but with a disinclination to expend any effort for food, and an abnormal finickyness. In a recent issue of *American Psychologist* (**26**, 129; 1971) S. Schachter has drawn an extensive analogy between the widely documented behaviour of these animals and observations of his own and his associates on fat people.

Schachter does not argue that individuals who have a tendency to become fat have a hypothalamic imbalance, though this may be the case. Rather he points to many instances of parallel between the behaviour of fat rats and fat human beings in an attempt to extract some common principle. The principle he infers is that in both cases obesity is produced, and is accompanied by an over-responsiveness to external stimuli and release from control of the internal stimuli reflecting physiological needs that play a major part in regulating body weight at normal levels.

How this apparent dependence on salient external cues affects human eating habits was first shown in an experiment by Nisbett (*Science*, **159**, 1254; 1968) in which fat and normal men who had not eaten lunch were offered (as part of a more elaborate procedure) a plate of one or three sandwiches, and were told that if they wanted more they should help themselves from the refrigerator which contained plenty. The subjects of normal weight ate the same mean number of sandwiches irrespective of how many were on the plate, and this number (approximately two) was significantly greater than the number eaten by fat men when only one was on the plate, and significantly less than the number eaten by fat men when three were on the plate. In one of Schachter's experiments on a similar theme, subjects ostensibly taking part in an experiment which involved filling in questionnaires were offered some nuts while doing it. About half the subjects of normal weight took nuts whether they were shelled or not, but whereas nineteen out of twenty fat subjects ate nuts without shells, only one in twenty fat subjects ate nuts if they had shells on them.

Striking though these experiments are, perhaps even more unexpected is that fat persons are also in some sense more responsive to external stimuli in conditions not related to eating. Fat subjects actually performed faster in a task where a response with right or left hand had to be made respectively to the appearance of the left or right light in display. In a proof-reading task fat subjects made significantly fewer errors than normals under quiet conditions, but were significantly less accurate when working under distracting conditions.

Schachter seems to have made a powerful and surprising case for the idea that fat people seem to react more readily than normals to external stimuli —and that this may have benefits as well as drawbacks. If he is right then, paradoxically, fat people should have less trouble than normal ones in sticking to diets. To keep food out of mind their major problem is to keep it out of sight.

Peyer's Patches and the Thymus in Newborn Mice

SOON after the pioneering work of Miller and of Good and their respective colleagues had established that the thymus in some way regulated the development of the other lymphoid organs and of the immune function, a search began for the mechanism. It was an attractive postulate that a hormone was released from the thymus which in some way affected the capacity of lymphocytes external to the thymus to respond to antigenic stimulus, and some evidence for such a view was adduced (J. F. A. P. Miller and D. Osoba, *Nature*, **199**, 653; 1963). But it was also shown that cells could emerge from a thymus grafted into a neonatally thymectomized mouse and, in spite of some initial scepticism of the scale of this process, it is now widely accepted that there exist substantial numbers of thymus-derived cells in the adult mammal.

Raff, in a now classic series of studies, has shown that the frequency of these cells varies from organ to organ but that (for example) some 60–70 per cent of the lymphocytes in the axillary lymph node of a mouse are of thymic origin. In the Peyer's patches, which are closely associated with the gut, a rather lower figure of around 30 per cent was noted. Of considerable interest in this context is the suggestion of Joel, Hess and Cottier, in next Wednesday's *Nature New Biology*, that in the mouse, within a few days of birth, about 60–75 per cent of the cells present derive from the thymus. These findings are not as might seem at first sight incompatible. Raff's determinations were made on adult mice using the presence of cells with the θ antigen as an indicator of thymic origin whereas Joel and his associates labelled cells inside the thymus with tritiated thymidine and picked them up later in the Peyer's patches by autoradiographic scanning. There is little reason to doubt the validity of both methods, and Joel *et al.* conclude, probably correctly, that their high values relate to a situation in which antigenic stimulation from the intestinal flora is just setting in. The corollary is that once the responses are established relatively fewer thymus-derived cells are involved.

These new findings are of interest in another context in that it has been suggested that the gut-associated lymphoid tissue in the mammal acts as an equivalent to the bursa of Fabricius which in birds is regarded, like the thymus, as a primary lymphoid organ (K. E. Fichtelius, *Exp. Cell Res.*, **46**, 231; 1967).