NOTE ON THE RADULA OF *PYRAZUS PALUSTRIS*.

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At Major Sewell's request I have added to his paper a somewhat more detailed account of the radular teeth of *Pyrazus palustris* and of the changes which take place in their structure with the growth of the shell.

The radula of the Cerithidae has several characteristic features. Its formula is definitely 2, 1, 1, 1, 2. The central is a comparatively small tooth, transverse and sub-oval in shape. Its base is bluntly produced and it has a large central cusp, usually with several smaller denticulations on each side. The laterals have a highly peculiar structure. Each tooth is separated into two parts, a fixed basal plate and a distal free portion which articulates with the former ; the cutting edge bears a large cusp and as a rule several smaller ones. The two marginals on each side are of simpler structure. Each has a membraneous flap along its outer margin and each as a rule has several cusps, one of which may be enlarged on the inner marginal or on both teeth.

In the youngest individuals of *P. palustris* examined (they are in Major Sewell's first group) the teeth are quite normal. The central is small, not very much broader than deep and irregularly oval in outline. It has a blunt central cusp with two smaller denticulations on either side. The laterals are rather more characteristic. The basal plate is elongate and band-shaped (its usual form in the family), while the distal free portion is rather broader than long and much broader than the basal plate. It has, as is usual, a prominent boss at its lower extremity and a large cusp with one small cusp or denticulation on the inner side and three, which diminish in size from within, on the outer side. The marginals are sub-equal and not much longer than the lateral. Each has five denticulations, of which the outermost is rather larger than the others.

The series of drawings which I have had made from six radulae extracted from molluscs of different ages show very clearly what happens in the course of growth. Fig. 11*a* represents the radular teeth of a young individual with a shell about 1 cm. long, fig. *b* that of an individual probably in the second year of life, fig. *c* that of an individual in the third year, while *d, e, f* are from adult or sub-adult individuals of different ages. It will be seen from these figures that three important changes take place : (*i*) the central becomes gradually lower and more transverse and its lateral extremities become pointed and produced ; (*ii*) both parts of the laterals, and especially the distal portion, become relatively wider, and (*iii*) the cusps of all the teeth are reduced in number, the central and laterals becoming unicuspid and the marginals bicuspid. It should be noted that the magnification of fig. 11*d, e, f* is less than that of figs. *a, b, c.*

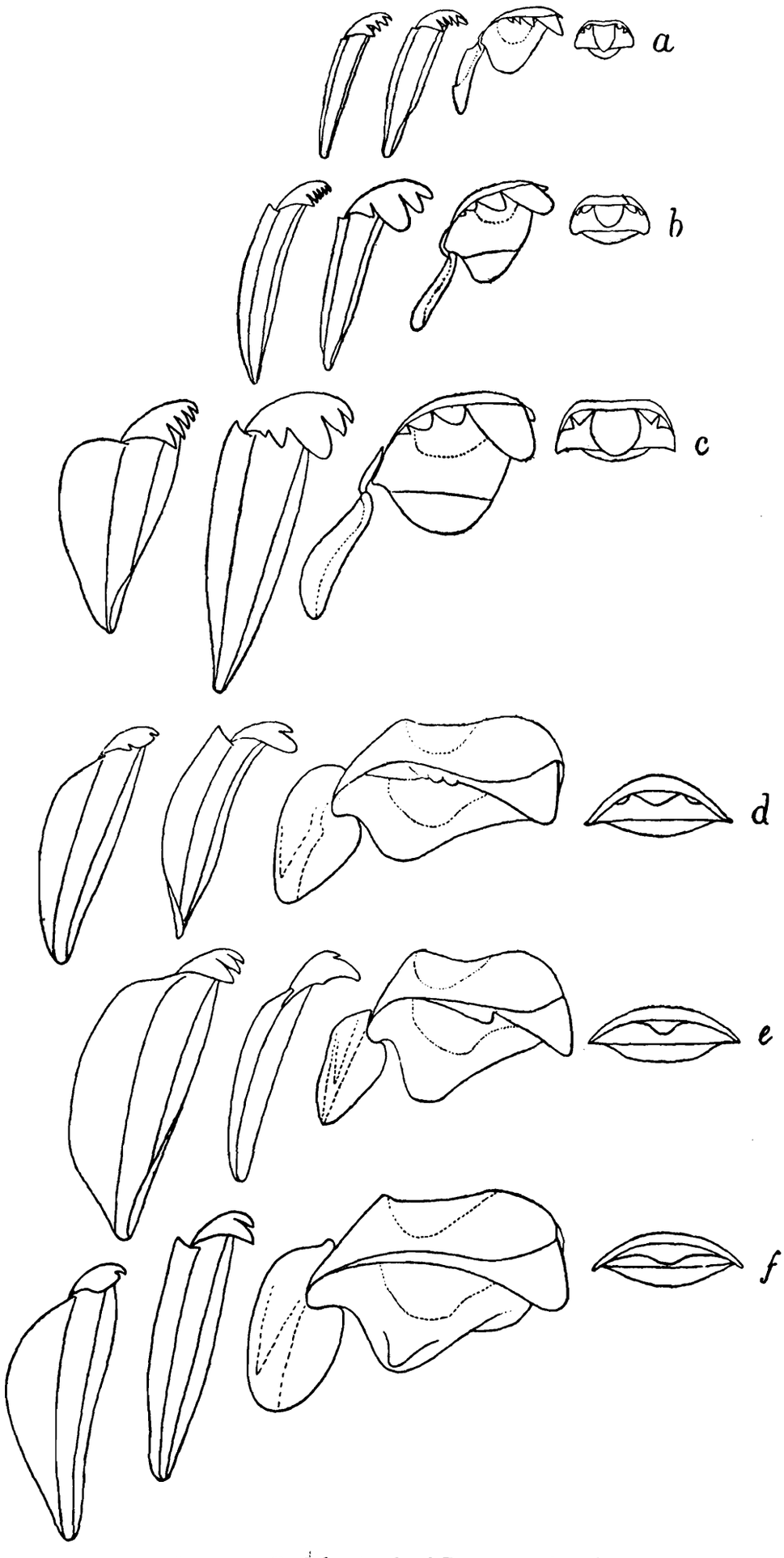

Fig. 11.—Radular teeth of *Pyrazus palustris*.

Except in the central, in which the main cusp is relatively smaller in the adult than it is in the young, the reduction in number of the cusps is accompanied by an increase in relative breadth and evidently comes about by a fusing of the cusps or denticulations rather than by an actual numerical reduction.

There are several points of general interest to be noted. In the first place, the radula of the young of this mollusc is much more like that of other species in the family than is that of the adult. In the second place these radular changes in the course of growth are a specific (or possibly a generic) and not a family character, for no such changes exist in the species of *Telescopium*, *Cerithidea* and *Tympanotonos* examined, though they have been observed in specimens of *P. palustris* from several different localities. Thirdly, Major Sewell has not observed that they are correlated with any change of habits on the part of the mollusc. On this last point, however, further observations are desirable.