

outer and inner faces of the arm bones are quite changed (figs. 6 and 7). The upper portion is occupied by the narrow apophysis, or, in the inner face, by the deep slot, so that the articulating umbo (1) and its corresponding hollow (4) are reduced to small proportions. The lower muscle-field (*w*) is also small as compared with the upper (*w'*). Not less characteristic are the mouth angles with their long-crested, deeply-grooved upper surface (*f*) nearly or quite destitute of a peristomial plate, the nerve being well protected by its extremely deep canal (*u*). The jaws (*c*) are very high, but not long. Their height (fig. 8) gives room for the great vertical oval of tooth papillæ (*d'*) and the numerous but shorter teeth (*d''*). In shape the jaw plate is like a shoe hole perforated for the attaching ligaments; the wider end is uppermost and bears the tooth papillæ. Outside this appears the jaw, at whose upper end is attached, as usual, a fold of the stomach (*st*), and in whose sides are the sockets from which issue the large fleshy mouth tentacles (*rr*).

*Ophiothrix* is the Salmo of echinoderms! Well defined and peculiar as a genus it has a crowd of species, many of which are the despair of the specific zoologist. From the internal skeleton some aid may be got in this direction. Thus *Ophiothrix hirsuta* has a thick disk skin set with small separated scales, each bearing a thorn, or spine. Its young has radial shields proportionately larger and more nearly approaching in the interbrachial spaces. From it the kindred species *Ophiothrix longipeda* is well distinguished by a generally lighter structure; a narrower genital scale, and more slender genital plate; smaller radial shields having over twenty interbrachial radiating scale rows, instead of eight to fourteen as in *Ophiothrix hirsuta*; and, finally, in having the outer horns of the mouth frames shorter and less grooved. *Ophiothrix trilineata* stands near, but has the disk scales large and few. *Ophiothrix augulata* and *Ophiothrix ørstedii* have a similar general structure; but have a close, well-marked imbricated scaling, with about seven radiating interbrachial rows between the radial shields. Their young have proportionately smaller radial shields and the scales wider. *Ophiothrix spiculata* is closely allied, with larger radial shields, however, and the outer horns of the mouth frames much prolonged. *Ophiothrix fragilis*, *O. echinata*, *O. pentaphyllum*, *O. quinquemaculata*, and *O. alopecurus* have a common type. The first free arm-bone has a little hollow lozenge on its upper surface (fig. 5), while in most of the species it has a thin, slightly grooved margin. Then the narrow brachial space between the radial shields is filled by a line of long, thick scales. Finally, there is a large space of wholly naked skin near the mouth shields. The specific differences which I pointed out<sup>1</sup> between the large *Ophiothrix fragilis* of North Europe and the small *Ophiothrix echinata* of the Mediterranean are confirmed. A young of *Ophiothrix fragilis*, had a disk 6 mm. in diameter, whose upper surface was almost wholly filled by contiguous radial shields, while in *Ophiothrix echinata* (disk 8 mm.) there were as many as eight scale rows in each interbrachial space, and the radial shields had the lobed margin of the adult.

<sup>1</sup> Bull. Mus. Comp. Zool., vol. iii., part 10, p. 245.