

colour, growing upon *Myxilla paucispinata*, nobis. These patches present a fairly even surface, but are marked with minute oval spots of a much lighter colour; these spots at first sight look like pits in the surface, but on minute examination each is found to be caused by the presence of a subdermal cavity covered over by a very thin *dermal membrane* pierced with numerous *pores*; the pores are thus arranged in definite pore-areas, each of which is about 0·45 mm. in diameter. The pores themselves are oval openings about 0·07 mm. in diameter, reducing the dermal membrane in the pore-areas to a mere network. The dermal membrane and also the deeper parts of the sponge are heavily loaded with very numerous, minute, round cells of a blackish-green colour, each about 0·004 mm. in diameter; it is to these cells that the dark colour of the sponge is undoubtedly due. *Oscula* not observed, possibly some of the pores mentioned are exhalent openings.

*Skeleton*.—Consisting of brushes or wisps of small stylote spicules running more or less vertically from the base to the surface of the sponge.

*Spicules*.—(a) *Megasclera*; smooth, straight styli or subtylostyli (Pl. XIX. figs. 9, 9'), sharply but only fairly gradually pointed, and usually with several slight bulbous inflations along the shaft (polytylote); size about 0·3 by 0·0063 mm. (b) *Microsclera*; these constitute by far the most noteworthy and characteristic feature of the species, being of extraordinary size and of equally remarkable and very beautiful form. They are isochelæ, and as the shape is sufficiently illustrated by the figures (Pl. XIX. figs. 9a, 9b) we shall not enter into a description of it in this place; the full-grown spicule measures about 0·1 mm. in length. In addition to these there are numerous much smaller spicules of rather different shape (Pl. XIX. fig. 9c), being a great deal shorter and much broader in proportion to their length; length commonly about 0·044 mm. Still smaller ones (Pl. XIX. fig. 9d) occur, which look just like the minute, slender isochelæ of the ordinary "*Amphilectus*" type; length about 0·015 mm. Although it is quite possible that there may be here at least two different kinds of microsclera, yet we are inclined to regard the two smaller forms as young stages of the large one. If this view be correct, then, from the absence of a complete series of intermediate sizes, we must conclude that the microsclera are produced periodically in batches.

The chief points of interest in this sponge concern its microsclera and their large size, especially when compared with the small size of the megasclera. It must, however, be borne in mind that the specimens may be merely young, encrusting stages of some sponge of which the adult is yet unknown. It will be seen by comparison of fig. 9, &c., Pl. XIX., with fig. 8, &c., Pl. XXIII., that *Phelloderma radiatum*, nobis, comes very close to the present species as regards spiculation; it is possible that *Esperiopsis pulchella* is a young form of some species of *Phelloderma*, but there is not sufficient evidence to justify us in placing it in that genus.

*Locality*.—Station 192, September 26, 1874; lat. 5° 49' 15" S., long. 132° 14' 15" E.; south-west of New Guinea; depth, 140 fathoms; bottom, blue mud.