whose skeleton is made up of isolated scattered tangential siliceous fragments). The enormous deposits of Radiolarian skeletons in the deep sea of to-day, which constitute the Radiolarian ooze, consist, like the fossil Polycystine marls, almost exclusively of the shells of SPUMELLARIA and NASSELLARIA, though here the acanthin skeletons of the ACANTHARIA may be present in very small numbers, and the silicate skeletons of the PHÆODARIA, which offer more resistance to the solvent action of sea-water, somewhat more abundantly. Calcareous skeletons do not occur in the Radiolaria (see note D).

A. The pure siliceous skeletons of the Polycystina were first recognised in 1838 by Ehrenberg in chalky marls (L. N. 2, p. 117). Since the two legions ACANTHARIA and PHÆODARIA were entirely unknown to Ehrenberg, his name Polycystina has reference only to the SPUMELLARIA and NASSELLARIA.

B. The silicate skeleton of the PHÆODARIA was formerly taken by me for a purely siliceous one. When I described the first PHÆODARIA in my Monograph in 1862, I was only acquainted with five genera and seven species, whilst the number of PHÆODARIA here described from the Challenger amounts to eighty-four genera and four hundred and sixty-five species. In the great majority of these (though not in all) the skeleton becomes more or less intensely stained by carmine, and is also more or less charred at a red heat, in some even becoming of a blackish-brown. In many PHÆODARIA, furthermore, the hollow skeletal tubes are destroyed by the continued action of heat. They are also, for the most part, strongly acted upon, or even destroyed by boiling caustic alkalis, whilst boiling mineral acids have no effect upon them. The best method of cleaning the skeletons of PHÆODARIA from their soft parts is to heat them in concentrated sulphuric acid, and then add a drop of fuming nitric acid; in this they are not dissolved even on prolonged heating. From these facts it would appear that the skeletons of the PHÆODARIA consist of a compound of organic substance and silica, or a "carbonic silicate." The more intimate composition yet remains to be discovered, as also the manifold differences which the various families of PHÆODARIA seem to show in respect of its composition. The small skeletal fragments of the Dictyochida (the only remains of PHÆODARIA which occur as fossils) appear to consist of pure silica.

C. The acanthin skeleton of the ACANTHARIA was first described as such in my Monograph (1862, pp. 30–32). Johannes Müller, the discoverer of this legion, took them for siliceous skeletons and defined the Acanthometra as "Radiolaria without lattice-shell, but with siliceous radial spines" (L. N. 12, p. 46). I formerly supposed that the acanthin skeletons in some of the ACANTHARIA were partially or wholly metamorphosed into siliceous skeletons, but, according to the investigations of R. Hertwig, this does not appear to be the case; he showed that the skeletons of the most varied Acanthometra and Acanthophracta are completely dissolved under the longer or shorter action of acids, and supposes that in all ACANTHARIA, without exception, the skeleton is composed of acanthin (1879, L. N. 33, p. 120). Quite recently Brandt has found that the acanthin spines dissolve not only in acids, alkalis, and "liquor conservativus" (as I had shown), but also in solutions of carbonate of soda (1 per cent.), and even of common salt (10 to 20 per cent.); he concludes from this that they consist of an albuminoid substance (vitellin) (L. N. 38, p. 400). I am unable to share this view, for I have never been able to see some of the most important reactions of albumen in any of the skeletons which I have examined, such for example as the xanthoproteic reaction, the red coloration with Millon's test, &c. They do not become