on page lxxx for the triænes, I consulted my colleague Professor Fitzgerald, to whose kindness I am indebted for the following paragraph :—

"If a spicule grow anywhere on the inside of any closed surface, and if it grow chiefly in length, it will, as it becomes longer, press out against the surrounding surface and be forced into a line which will be a geodetic or shortest distance line on the surface, *i.e.*, the same line in which a stretched string *outside* the surface would lie. Now in a sphere such a line would be a part of a plane circle, but in any ellipsoid it would not, unless in very exceptional cases, be a plane curve at all, and in a prolate spheroid it would approximate to a spiral line. Hence when a substance deposits in long spicules inside a surface, or when it deposits in a split, which its deposition elongates within the thickness of a thin film—in either of these two cases it will form a geodetic. A geodetic has the following property, that the plane of any two consecutive elements is perpendicular to the surface on which the goedetic lies, and hence any tendency to deposit in the angle between neighbouring elements would give rise to a ridge perpendicular to the surface. If a growth be forcing its way within the thickness of a thin layer and in so doing splits the layer, it would naturally follow a geodetic. This is seen in the case of a split of a uniform glass ball and of a glass tube, such as a thin test-tube. In the former case the split generally follows a great circle, and in the latter it takes a spiral line, and these are geodetics on these two surfaces. It is plain that the splitting will naturally be perpendicular to the surface, for this is the thinnest direction in the surface, and if we consider an element splitting into a consecutive element, it is obvious from symmetry that the addition to the split will be in the plane of the first element, and of the perpendicular to the surface, *i.e.*, will be in continuation of the plane of the first element which is perpendicular to the surface, and so the split will follow a geodetic, and whatever is depositing in the split and forcing it to continue will deposit in a geodetic."

The growth of the sigmaspire along a geodetic which Professor Fitzgerald suggests is in exact accordance with the facts of observation, and if it be difficult to admit the existence of an actual split in the walls of the scleroblast, it will be probably found that a tendency to split will serve our purpose quite as well.

If the difference in the diameters of the ellipsoid be not very great the ordinary sigmaspire will result, if the growth of the polar diameter is much in excess of the equatorial a toxaspire, and eventually a spirula, will be produced, or the toxaspire may pass into a curved oxea.

The cymba or chela presents a case in which the deposition of opal has occurred along a meridian of a prolate scleroblast, and its ptera would appear to arise by a superficial deposition of silica consequent on an arrest in the general growth of the scleroblast. The position of the ptera is symmetrical, pointing to a symmetrical distribution of tensions in the surface of the scleroblast, and the falx is situated in the plane of the keel and median pteron, as it should be if these have formed along a geodetic.