up organic substance out of carbonic acid. They usually lie in regular order along the cell-wall (Fig. 213, *a*); but if the light becomes too strong for them, they are able to huddle more closely together, either in the middle of the cell or

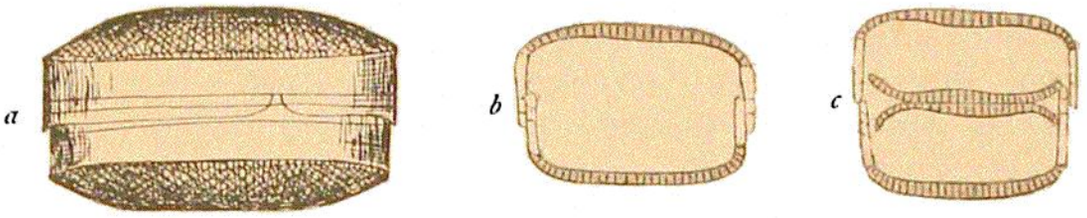

FIG. 212.—CELL-WALL OF A DIATOM (*COSCINODISCUS SUBBULLIENS*), $\frac{300}{1}$.
a, External view; *b*, vertical section; *c*, section in cell-division.

at some point where they can mutually protect each other from the harmful effects of the rays (Fig. 213, *b* and *c*). This has been demonstrated by Schimper. The assimilation of carbonic acid produces a fat oil, which may form into comparatively large drops. Schimper.

Cells are produced by division. The nucleus and protoplasm divide into two parts, the valves are pushed a little apart, and two new valves develop within the old ones. Thus each of the daughter-cells gets one of the valves from the mother-cell and a new valve that joins on to it (see Fig. 212, *c*). When once the valves have acquired their shape they seem incapable of expanding, so that the cell generations will gradually become contracted in the plane in which division takes place. It follows that the cavity of the cell will also be diminished, though at the same time the perpendicular axis of the plane of division is frequently slightly prolonged. Algæ can, however, regenerate their original size, by throwing off their old valves, growing into a larger bladder with a thin expansible skin, and forming within it new valves that are two or three times as large as the old ones. This is the so-called auxospore development (see Fig. 214). Cell division. Auxospore development.

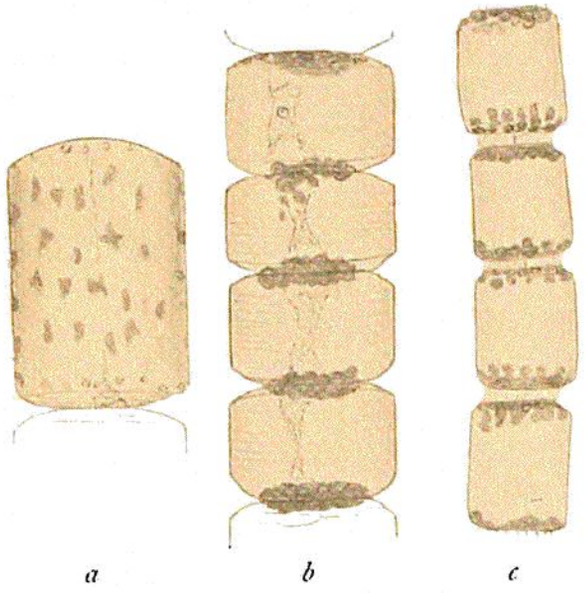

FIG. 213.
a, *b*, *Lauderia annulata*. *a*, Cell with the pigment granules (chromatophores) in normal position, collected early in the morning; *b*, chain from the surface of the sea, 3 P.M., chromatophores congregated at the ends of the cells; *c*, *Detonula schræderi* in the same condition. All $\frac{240}{1}$.

Diatoms occur in quantities over the whole world in both