furnish many varieties of this type. Sometimes the length axis is situated in the division-plane of the cells, as, for instance, in *Thalassiothrix longissima*, one of the characteristic forms in colder seas; at other times division takes place across the elongated cell, as in the genus *Rhizosolenia*, of which there are many species (see Fig. 217). Hair-shaped cells of this kind create a great deal of friction when horizontal, but would sink rapidly when perpendicular, if it were not for the fact that they are either slightly curved, or else their terminal faces are sloping; so that

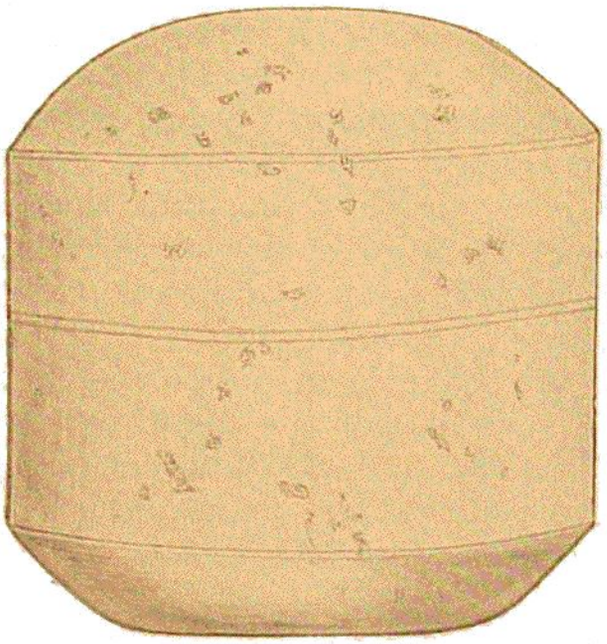

FIG. 215.—*COSCINODISCUS REX* ($\frac{50}{1}$).

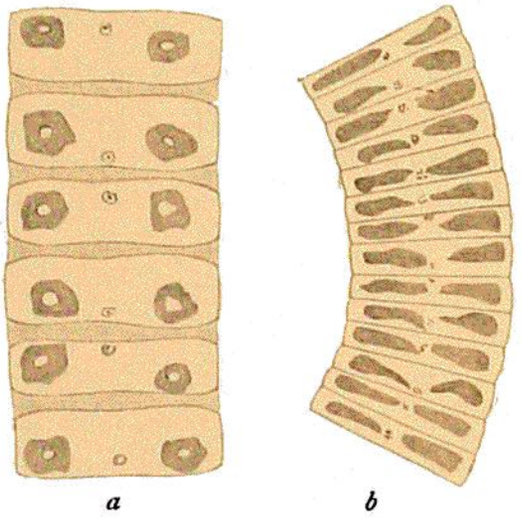

FIG. 216.—PELAGIC DIATOMS OF THE RIBBON-TYPE ($\frac{50}{1}$).
a, Chain of *Navicula vanhöffeni*, the cells connected by a band of mucilage; *b*, part of a chain of *Fragilaria oceanica*.

the resistance of the water soon restores them to an almost horizontal position, and they sink slowly in long spiral sweeps.

(4) *The Branching Type.*—The surface of the cell is enlarged by various kinds of hair-shaped or lamelliform outgrowths. To this type belongs the genus *Chætoceras* with its numerous species (see Fig. 218).

FIG. 217.—PELAGIC DIATOM OF THE HAIR-TYPE, *RHIZOSOLENIA HEBETATA-SEMISPINA*.
a, Entire cell ($\frac{200}{1}$); *b*, end of a cell ($\frac{500}{1}$).

Every cell has four long setiform outgrowths, and the cells are besides nearly always associated in chains, so that these setæ radiate in every direction. When the chain is straight and stiff it is frequently furnished with special terminal setæ, which are stiffer than the others, and act as a sort of steering apparatus.

In addition to the actual outgrowths from the cell many diatoms can secrete long filaments of mucilage from special