

The largest forms hitherto discovered are from tropical or subtropical surface waters, *e.g.*, *Ethmodisci*, Castracane = *Coscinodiscus gazellæ*, Janisch, *Coscinodiscus imperator*, Janisch, *Coscinodiscus praetor*, Grove, *Coscinodiscus nobilis*, Grun., *Coscinodiscus sol*, Wallich. The most delicate species are especially tropical or subtropical, *e.g.*, the peripheral rotate rim of *Coscinodiscus sol*, many *Rhizosoleniæ*, and *Chaetocerotidæ*; this applies equally to the degree of tenuity of the siliceous test as a whole, to the nature of its ornamentation as determined by the difficulty of microscopical resolution, and to the siliceous appendages when present.¹ This great development of Diatoms at the surface of

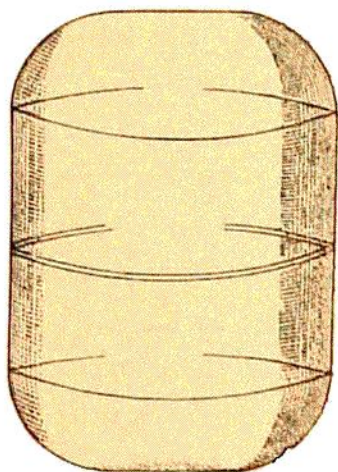


FIG. 28.—Frustule of *Ethmodiscus wyvilleanus*, Castracane (42).

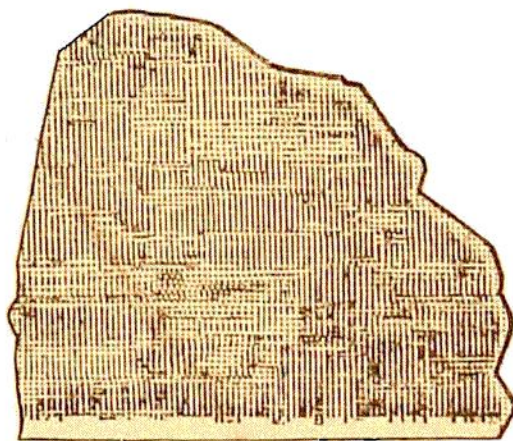


FIG. 29.—Portion of Frustule of *Ethmodiscus* sp. (44).

the sea takes place especially in brackish water, or in sea-water where the salinity is relatively low, as, for instance, in the Antarctic and Arctic Oceans, and in estuaries or off the mouths of great rivers. In the warm and salter waters of the ocean Diatoms are less abundant, and the frustules as a rule are much thinner than in the colder and less salt waters of the polar regions or in the warm brackish waters off continental shores in the tropics.

In deep-sea deposits the remains of these pelagic Diatoms can generally be detected if a considerable quantity of the deposit be carefully examined. In some Pteropod and Globigerina Oozes and Coral Muds, however, no trace of Diatoms have been observed after the removal of the carbonate of lime from a large sample and a subsequent careful examination of the residue; they are also extremely rare in, or absent from, some of the deep-sea clays. In terrigenous muds, especially when near the mouths of great rivers, they frequently occur in great abundance.

¹ Mr. John Rattray, M.A., F.R.S.E., a diatomist who has examined many of the Challenger deposits, says in an MS. letter to Mr. Murray:—"No dead tests are to be considered absolutely indestructible in time. Delicate *Chaetocerotidæ* are not found in oceanic deposits nor in geological strata. *Coscinodisci* disrupt along lines passing through, and not between, the hexagonal markings; the extremities of a *Rhizosolenia* separate from the more destructible, spirally-ornamented, intermediate, cylindrical areas, and are alone preserved. In any one oceanic deposit, where the degree of solvent power must be the same for all forms, the degree of persistence varies directly as the strength of the siliceous parts, *e.g.*, cingula are less persistent than valves. On comparing the same species from widely-separated areas, the balance of evidence goes to show that more robust forms occur in more polar areas, and more delicate ones in more equatorial areas. The differences observable are slight, but specimens of *Coscinodiscus lentiginosus*, *Coscinodiscus subtilis*, &c., point to their real existence."