(Fig. 249), which had not been met with subsequently. The whole structure of this diatom shows that it, too, is most probably a neritic form, and it must therefore have a wider distribution than was commonly supposed.[1]

As we neared the coast banks of Europe we found the number of species growing distinctly less, though on the other hand the quantity of the plankton increased.

Law of production of organic substance in the sea.

The plants of the sea like those of the land build up all the organic substance which forms the chemical foundation of life. If we wish to know clearly when and how and under what conditions vigorous production takes place, or what prevents the development of an exuberant plant-life, we must first acquire the means of estimating the amount of vegetation in the different parts of the sea.

Hensen.

Hensen was the first to take up this problem, the solution of which depends on three assumptions: (1) it is absolutely essential to have apparatus that can capture all the organisms living in a specified quantity of water, (2) the plankton must be supposed to be uniformly distributed in the sea, so that the catch represents a reasonably extensive area; and (3) a scientific examination of the catch must supply a really correct picture of the amount of plants and their capacity of production.

Hensen's net.

The apparatus employed by Hensen and his assistants consisted of extremely fine straining-cloth, with meshes 0.04 to 0.05 mm. in diameter. He made the mouth of his net small in proportion to the filtering silk surface, to ensure as far as possible the immediate filtering of all water that came in through the opening, his object in this being to ascertain approximately how much water was filtered, when the net was drawn through the sea for a calculated distance. Experiments showed that in

[1] As illustrating a haul on this section I append a list of the species found in the closing net at Station 81 (lat. 48° 2′ N., long. 39° 55′ W.), from a depth of 50 metres to the surface :—

Diatoms: *Coscinodiscus excentricus*, *Euodia cuneiformis*, *Planktoniella sol*, *Coscinosira æstrupi*, *Thalassiosira subtilis*, *Corethron criophilum*, *Rhizosolenia styliformis*, *R. shrubsolei*, *R. fragillima*, *R. alata*, *R. semispina*, *Bacteriastrum delicatulum*, *B. elongatum*, *Chætoceras atlanticum*, *C. boreale*, *C. mediterraneum*, *C. peruvianum*, *C. criophilum*, *C. decipiens*, *C. contortum*, *C. schüttii*, *C. curvisetum*, *C. laciniosum*, *C. furcellatum* (a resting-spore), *Thalassiothrix longissima*, *T. nitzschioides*, *Nitzschia seriata*.

Peridineæ: *Ceratium lineatum*, *C. candelabrum*, *C. pentagonum*, *C. gravidum*, *C. fusus*, *C. pennatum*, *C. tripos*, *C. azoricum*, *C. gibberum*, *C. platycorne*, *C. arcticum*, *C. intermedium*, *C. macroceros*, *Protoceratium reticulatum*, *Peridinium oceanicum*, *P. depressum*, *P. divergens*, *P. conicum*, *P. ovatum*, *P. tristylum*, and some others, *Diplopsalis lenticula*, *Pyrophacus horologium*, *Goniodoma polyedricum*, *Gonyaulax polygramma*, *Podolampas elegans*, *P. palmipes*, *Oxytoxum scolopax*, *O. diploconus*, *Ptychodiscus carinatus*, *Dinophysis acuta*, *D. schüttii*, *D. rotundata*.

Flagellates: *Phæocystis poucheti*.

Silicoflagellates: *Dictyocha fibula*.

Chlorophyceæ: *Halosphæra viridis*.

Cyanophyceæ: *Trichodesmium thiebaulti*.