March and May, and that they occur in rather smaller quantities from June to August. From September to October there is again a maximum, but from then onwards they decrease rapidly and reach their minimum between December and January. It is not surprising that the plankton is scanty during the dark period of the year, but the unmistakable secondary minimum in the summer months must be due to some special cause, which it should be possible to discover by studying carefully the whole year round the variations in quantity and the fluctuations in the outward conditions of existence. It struck me that the factors at work might be analogous to those which cause the differences in production met with in different regions of the great oceans.

Method of estimating the quantity of plankton.

To ascertain the quantity of plankton present we employed the method introduced by Sedgwick and Rafter for drinking-water tests in North America, which has been described by Whipple. A litre of water is filtered through a fine grade of sand, and the algæ that collect on its surface are rinsed off. To the rinsed-off water containing the algæ, filtered water is added until the whole comes to exactly 10 c.c. We then transfer 1 c.c. of this with a pipette to a counting-chamber 5 cm. long, 2 cm. broad, and 1 mm. high, which exactly holds it. For examination we use a microscope which magnifies to 40 or 50 times the natural size. A thorough knowledge of the species is requisite to enable us to enumerate them correctly. When counting species represented by many individuals we require a micrometer, with a larger or smaller number of millimetre squares marked off by lines, placed in the eyepiece of the microscope.

We soon found that our task was more difficult than we had at first imagined. The quantity of plankton fluctuated greatly in the course of short periods of time, yet the variations could not be ascribed directly to conditions of existence, since these remained fairly constant. The temperature in the surface-layers rose steadily during March to May from 1.5° C. to 6.3° C., the quantity of chlorine was about 16 per thousand, and according to Nathansohn the quantity of free ammonia in filtered samples of sea-water was between 0.0175 mg. and 0.031 mg. per litre, and of ammonia in organic combined form between 0.105 mg. and 0.217 mg. per litre. Of nitrates and nitrites he only found infinitesimal quantities up to 0.009 mg., set down as ammonia. *Chætoceras constrictum*, one of the commonest diatoms in the spring plankton of the Christiania fjord, furnished the following