

menon, it struck me as very peculiar. In *D. hyalina* it was extremely striking to see this very same race in the course of only two to three weeks (May, June) everywhere changing into slender forms with pointed heads, the external appearance of which, moreover, was in every lake quite different. But still more remarkable was it to see how all these various summer races, when autumn came, slowly dropped their racial characters and in winter ended in the same clumsy, round-headed form common to all lakes. What means have we now to understand the sudden appearance of the very many summer races in spring, and to understand the appearance of the common winter race?

The occurrence of the numerous local races is favoured by the *frequent monogonic reproduction* in plankton organisms (asexual formation of auxospores in Diatoms; not constant and regular conjugation, but mainly reproduction by partition in *Ceratium*; conspicuous tendency to acycly in *Rotifera* and *Cladocera*). Directions of variation once begun can therefore continue undisturbed; no crossing from conjugation, and consequent disturbance and interruption in the directions of variation commenced, takes place. Resting-stages, resting-cysts, resting-eggs, etc., which as a rule are also the means of distribution of the species, are lost with the falling out of digonic reproduction. In this way the races are separated; each locality becomes an exclusive world to them; they do not receive any impulses from without, and the racial characters can be preserved over great areas.

The main causes of the disappearance of the sexual reproduction of the plankton organisms may be sought for in the fact that the production of the resting-stages, and especially their thick, chitinous skeletons, made so great claims on the mother-organisms that their organisation came into conflict with the demands made by the outer conditions; *i.e.*, in many localities the resting-stages made the mother-organisms too heavy. The result would be then, that the individuals forming resting-stages would sink down into deeper layers and perish. We are therefore able to understand the disappearance of resting-stages through selection.

How are we further able to understand that all the numerous summer races fall back into one and the same winter race? To understand this phenomenon we must look beyond the boundaries of the small country in which these investigations have been carried out, and go back to other periods in the life-history of our globe.

On comparing my own with the investigations of others in arctic alpine lakes, I was able to show in 1905, and later in 1906, that *seasonal variations are restricted to the low-lying lakes of the temperate zone, and are absent from the arctic, alpine, and North European lakes* in which the temperature did not for some time remain over about 12–16° C.,