

animal for adapting itself to the variations in outer conditions, are dependent on the intensity with which the moults proceed. In this the explanation might perhaps be sought as to the phenomenon which, of all those connected with seasonal variations, has always appeared to me the most puzzling. It is easily understood why the organisms in spring, when the rate of sinking rises, transform their bodies so that the floating power becomes greater; but in all the earlier researches I did not see for a long time how to explain why these floating apparatus when once formed are again drawn in towards winter. Their formation in spring is necessary, and may well be thought of as brought about through selection, but I was unable to see any necessity for their being drawn in in autumn. If it were possible to show, however, that the body is only transformed during and soon after the moults, and that the frequency of the latter is dependent on outer conditions—first and foremost on temperature, so that they proceed most rapidly and frequently at high and increasing temperatures, more slowly and rarely at lower and decreasing—the explanation would also be found here of the phenomenon that the Cladocera are transformed in spring but in autumn cease transforming. Thus the return to the common race would not occur because the organisms no more “needed” floating apparatus and therefore drew them in, but for the very simple reason that the organisms when the moulting processes ceased were practically not able to transform themselves.

The very peculiar fact that the seasonal variations do not proceed gradually but by a sudden change, which occurs in all plankton at the same period (May, June), when the temperature is at 12–14° C., and is completed in the course of two to three weeks, *makes us understand that the seasonal variations really may be of the greatest significance for the plankton organisms.*

2. *Local Variation.*—We are now able to understand how the seasonal variations take place, and how the plankton organisms of the fresh water are able, by means of variations in the body form, to follow the variations in the buoyancy power of the fresh water.

The investigations on which my results have been based were not carried out in a single lake, but in many, so that I was able not only to follow the seasonal variations in many lakes, but also to study the local variation of the plankton organisms.

These studies gave the following, very peculiar, main results. Although the seasonal variations, which have everywhere the same object, proceed on parallel lines in different localities, considerable differences may nevertheless assert themselves both with respect to the amount of variation in each locality and with respect to details in the manner in which the organism meets the demands for variation in