

enormous part the plankton plays as fundamental food-material for the animal life in the water. To assume that the waters of the past did not contain the same fundamental food-material would lead to the most absurd consequences.

The reason for this food-material having on the whole remained unchanged from the oldest times until now is, in part, that it has been in a less degree than any other community exposed to complete extinction and new formation consequent upon the great convulsions of the earth; in part also, because of its powers of spreading, by means of which it would be able to recapture the areas from which it had been driven at any time.

That this community has contributed much towards the formation of the crust of the earth (limestone, petroleum, etc.) is certainly incontestable; that its particular forms have not been able to persist permanently owing to their delicate skeletons, upon which their occurrence as plankton organisms always depends, is by no means unnatural. In several cases, however, it has been supposed that either the plankton organisms or forms nearly related occurred in very old deposits. Thus, the blue-green algæ *Girwanella problematica* (Silurian), which together with other Cyanophyceæ are said to form the oolitic structure of rocks (Ordovician age in the Girvan strata); the *Peridinium pyrophorum* described by Ehrenberg from cretaceous rocks, which seems hardly to be distinguished from *Peridinium divergens* of the present day; *Coccospheres* and *Rhabdospheres* in the Lias deposits; the large Diatom deposits from the tertiary and cretaceous series, but curiously enough not from earlier deposits (see Seward, 1898, p. 117)—all these indicate that it is only to the lack of investigations and the nature of the material that our slight knowledge of fresh-water plankton in earlier times is due.

Further, it must be remembered that numerous forms of the bottom and littoral fauna and flora to which the plankton organisms are related are extremely old forms. We need only mention the Ostracoda of the palæozoic times. Nothing in the structure of the Daphniæ justifies us in considering these as much younger than the Ostracoda, their nearest relatives. That the Daphniæ appear only in the upper Miocene mud deposits from the old lakes in the Egerer and Falkenauer basin is certainly due, in part, to the preservation of these forms being much more difficult, and in part to the ehippia having been misunderstood (see also Brehm and Zederbauer, 1906b, p. 477).

If future researches raise the hypothesis that the fresh-water plankton of the world is collectively a cosmopolitan community to a scientific theory, the explanation of this should be sought for in the immense age of this community. With this view in mind, we may