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i.

PLANKTON COLLECTED AT IRISH LIGHT STATIONS
IN 1904.

BY

LEWIS HENRY GOUGH, PH.D., PLYMOUTH,
*Assistant Naturalist to the Marine Biological Association of
the United Kingdom.*

INTRODUCTION.

The results of townettings taken regularly every fortnight in 1904 at Skulmartin, South Arklow and Coningbeg Lightships, and at Fastnet Lighthouse, are shown on the following tables.

All the samples were taken in the same way, and with similar apparatus. The nets used each have an opening of 18 inches diameter, the bags are 36 inches long, conical and truncated at the ends; the diameter of the cod-end is $2\frac{1}{2}$ inches. The nets themselves are made of two grades of silk, the front 18 inches are of silk with 50 meshes to the inch, the hinder 18 being of silk with 180 meshes to the inch. This arrangement enables the net to catch the zooplankton and phytoplankton equally well. The samples were taken from the Light stations, using the movement of the tide to capture the plankton. Each sample represents half an hour's tide-flow through the nets. To ensure greater comparability the samples were always taken at spring-tides, at the same state of the tides, so that, for each station, the samples are taken from water coming from the same direction.

It is perhaps too early, before another year's results have been obtained, to discuss in detail the changes, seasonal or otherwise, in the plankton at the different stations; a comparison of the stations *inter se*, however, produces interesting results.

According to the general character of the plankton, the stations under consideration can easily be arranged into two groups—
Fisheries, Ireland, Sci. Invest., 1904, VI., [Published, April, 1906].

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Fastnet and Coningbeg on the one side, Skulmartin and South Arklow on the other. The material taken at Fastnet and Coningbeg was very similar, almost always consisting nearly entirely of zooplankton, *Calanus finmarchicus* and *Metridia lucens* forming the bulk of the samples; the phytoplankton from these stations was always poor in species and in quantity. A noticeable fact is the generally discontinuous range of the species during the year. In contrast to this, the plankton taken at South Arklow and Skulmartin usually showed a smaller quantity of zooplankton, the bulk of the samples always being less than that from Coningbeg or Fastnet. At the same time, the phytoplankton was usually richer, especially in individuals, the range of several of the species being much more continuous.

It is often a noticeable fact that when the plankton is specially rich in copepods, the phytoplankton is correspondingly poor. Samples containing very large quantities of zooplankton seem further to be most often met with in positions similar to those of Coningbeg or Fastnet; as for instance, in the most western portions of the English Channel, on the border between the open ocean and the enclosed or coastal waters. In the case of the discontinuous range in time of some of the species of phytoplankton, the position again seems to be an important factor. This is especially the case with neritic diatoms, such as *Biddulphia mobiliensis*. In some places it appears to be a seasonal species, whose period of vegetation falls in the winter and early spring, for instance, at Coningbeg and Fastnet; in other localities it is found for a much longer period, and in places where the factors which go to make the plankton assume a neritic character are most evident, it becomes a perennial, as at South Arklow and Skulmartin. This is also the case to a greater or lesser degree with several other neritic organisms, such as species of *Guinardia*, *Hyalodiscus*, *Coscinodiscus*, and *Bacillaria*. In a similar way among the Copepoda neritic species which appear to be seasonal at some places, are perennial at others, for instance, *Temora longicornis*; but in this case there is a great difference. *Temora* is usually commoner during the warmer part of the year, disappearing in winter more or less at stations nearer the ocean, but being fairly constant at sheltered places far from its influence. This is specially noticeable in the English Channel, where it spreads far to the west in summer, but is restricted to the east in winter.

As will be seen from the tables, *Muggiaea atlantica* was observed first at South Arklow, then at Coningbeg, and then at Fastnet. In this connection it is interesting to observe that the shoals of *Muggiaea* probably struck the Irish Coast after having travelled through the English Channel, which they entered at Ushant in May. As I have dealt with the migrations of *Muggiaea in extenso* in another paper on the subject (*Publications de Circonstance*, No. 29, *Conseil Permanent International pour l'Exploration de la Mer*), further reference is unnecessary here.

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The *Pasiphaë* referred to in the Tables for South Arklow and Skulmartin was probably *P. sivado*, Risso.* It appears to occur there at times in great quantities, as many as 7 or 8 full-grown specimens having been taken in single townettings (in 1905).

Since these tables were printed, Professor H. H. Gran's paper "Diatomaceen" has appeared in "Nordisches Plankton." According to this paper, the *Thalassiothrix curvata* and *T. Frauenfeldi* mentioned in the following tables should be *Thalassiothrix nitzschoides*, Grun.

For the rest, I leave the Tables to speak for themselves. The signs used there are the same as are recommended by the Central Bureau of the Conseil Permanent International pour l'Exploration de la Mer: they are—

rr. very rare.

r. rare.

+ moderately numerous.

c. common.

cc. very common.

* *P. sivado* is hardly represented in published records from the seas between England and Ireland. Adults are, however, common in Lambay Deep, and the young have often been taken by the *Helga* in other parts of the Irish Sea — E. W. L. H.

