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APPENDIX, No. VI.

- i. Plankton collected at Irish Light Stations in 1904, by LEWIS HENRY GOUGH, Ph.D.
- ii. Hydrographical Observations at Irish Light Stations, 1904.

i.

PLANKTON COLLECTED AT IRISH LIGHT STATIONS
IN 1904.

BY

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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.

PLANKTON COLLECTED AT

IRISH LIGHT STATIONS, 1904.

Lat. 54° 32' N., Long. 5° 25' W. 20 Fathoms.

April.	May.			June.	
30. 7.40 a.m.	16. 8.0 a.m.	30. 8.30 a.m.	15. 8.15 a.m.	28. 3.10 p.m.	
r	r	r	r	r	
r	r	r	r	r	
..	..	+	..	+	
+	r	+	r	r	
..	
..	
r	..	..	..	..
..	r	..	..	..
c	+	c	..	r	
..	..	+	c	c	
..	..	..	rr	r cum sporid.	
..	r	r	..	..
..	..	r	..	..
..	..	..	..	r	
..	..	c	..	..
..	
..	r	r	r	r	
..	+	r	r	r	
..	r	+	..	..
..	
..	..	r	..	r	
..	
..	
..	r	+	..	..
r	r	r	..	rr	
c	+	..	..	r	
..	
..	..	..	rr	r	
c	+	+	+	+	
..	
..	

July.		August.		September.		October.		November.		December.		Species No.
13. 7.30 a.m.	28. 8.45 p.m.	12. 8.10 p.m.	27. 8.25 p.m.	12. 9.0 p.m.	26. 8.45 p.m.	10. 8.10 p.m.	25. 8.0 p.m.	8. 8.15 p.m.	24. 7.40 a.m.	8. 7.55 a.m.	23. 8.15 p.m.	
13	14	15	16	17	18	19	20	21	22	23	24	
..	..	..	..	..	rr	..	..	..	..	..	..	DIATOMACEAE.
rr	rr	..	..	+	r	+	r	r	r	+	..	Achnanthes sp. 1
cc	rr	rr	..	..	r	..	+	..	..	..	..	Actinoptychus undulatus, Ehb. 2
r	rr	..	rr	r	rr	..	..	..	..	..	..	Asterionella glacialis, Castr. 3
..	..	..	..	..	..	..	..	rr	..	r	..	Bacillaria paradoxa, (Gmel.), Gran. 4
..	..	..	..	..	..	..	..	..	..	..	..	Bellerochea malleus, (Btw.), V. Heurck. 5
..	..	..	..	..	..	..	..	..	..	..	..	Biddulphia alternans (Bail.), V. Heurck. 6
..	..	..	..	..	..	..	..	..	..	..	..	— aurita, (Lyng.) Breb. 7
..	..	..	..	..	..	..	..	..	..	..	..	— favus, (Ehb.), V. Heurck. 8
r	r	r	+	r	+	+	+	+	c	c	c	— mobiliensis, Bail. 9
+	rr	..	..	..	..	..	..	..	r	..	..	Cerataulina Bergoni, Pérag. 10
r	..	rr	..	..	..	..	..	..	..	..	..	Chaetoceras constrictum, Gran. 11
..	..	..	..	..	..	..	..	..	..	..	..	— contortum, Schütt. 12
..	..	..	..	..	..	..	..	..	..	..	..	— convolutum, Castr. 13
r	..	..	..	..	..	..	..	..	..	..	..	— crinitum, Schütt. 14
+	..	rr	..	rr	..	rr	..	..	..	..	..	— curvisetum, Cleve. 15
..	..	..	..	..	..	..	..	..	..	..	..	— danicum, Cleve. 16
r	..	..	..	..	..	..	..	..	..	..	..	— debile, Cleve. 17
+	..	rr	rr	r	+	+	+	+	+	r	+	— decipiens, Cleve. 18
..	..	..	..	..	..	..	..	..	..	..	..	— diadema (Ehb.), Gran. 19
..	..	..	..	..	..	..	..	..	..	r	..	— didymum (Ehb.), Cleve. 20
..	..	..	..	..	..	..	..	..	..	..	..	— Jacinosum, Schütt. 21
..	..	..	..	r	..	..	..	r	r	..	..	— Schützi, Cleve. 22
..	..	..	..	..	..	..	..	..	..	..	..	— scolopendra, Cleve. 23
..	..	r	..	..	..	..	..	..	..	..	..	Coscinodiscus concinnus, W. Sm. 24
..	..	..	r	r	r	r	+	+	+	c	c	— excentricus, Ehb. 25
..	..	..	..	..	..	..	rr	r	r	..	..	— Grani, Gough. 26
..	..	..	..	..	r	+	+	..	..	..	..	— oculus iridis, Ehb. 27
+	r	+	+	+	c	c	c	+	+	c	c	— radiatus, Ehb. 28
rr	..	..	..	..	..	..	..	..	..	..	..	Coscosira polychorda, Gran. 29
r	r	+	+	r	c	+	+	r	r	..	r	Ditylum Brightwelli, West. 30

SKULMARTIN LIGHTSHIP—continued.

Species No.	—	Jan.	Feb.		March.			April.		May.		June.		July
		22. 10.30 a.m.	3. 8.20 a.m.	16. 8.0 a.m.	3. 8.30 a.m.	18. 8.30 a.m.	31. 7.30 a.m.	15. 6.30 a.m.	30. 7.40 a.m.	16. 8.0 a.m.	30. 8.30 a.m.	15. 8.15 a.m.	28. 3.10 p.m.	13. 7.30 a.m.
	DIATOMACEAE—con. :	I	2	3	4	5	6	7	8	9	10	11	12	13
31	<i>Eucampia zoodiacus</i> , Ehb.,	..	..	..	..	..	..	..	..	..	..	r	..	..
32	<i>Fragillaria c. f. oceanica</i> , Gran,	..	..	..	..	..	..	..	..	..	..	r	+	r
33	<i>Guinardia flaccida</i> , Pér., ..	rr	rr	..	..	r	rr	..	..	..	r	r	+	+
34	<i>Hyalodiscus stelliger</i> , Bail.,	+	+	c	c	r	r	+	r	r	r	r	r	+
35	<i>Isthmia sp.</i> , ..	r	..	r	r	..	..	+	..	rr	..	+	rr	r
36	<i>Lauderia borealis</i> , Gran, ..	..	..	..	..	r	r	+	..	..	+	rr	..	..
37	<i>Leptocylindrus danicus</i> , Cleve,	..	..	..	..	..	..	..	..	..	..	..	..	..
38	<i>Navicula membranacea</i> , Cleve,	..	..	..	..	..	..	..	..	..	..	..	..	..
39	<i>Nitzschia seriata</i> , Cleve, ..	..	..	..	..	..	..	..	..	..	..	..	..	..
40	<i>Paralia sulcata</i> (Ehb.), Cleve,	c	c	+	+	+	+	+	+	+	r	r	r	..
41	<i>Pleurosigma sp.</i> , ..	+	r	r	+	+	+	r	..	r	..	rr	..	..
42	<i>Rhizosolenia alata</i> , Btw., ..	..	..	..	..	..	..	..	..	..	..	..	..	rr
43	— <i>delicatula</i> , Cleve, ..	..	..	..	..	..	..	..	rr	..	..	..	+	c
44	— <i>semispina</i> , Hensen, ..	..	..	..	..	..	..	..	..	..	r	rr	..	rr
45	— <i>setigera</i> , Btw., ..	..	..	..	..	rr	rr	rr	rr	r	..	..	r	+
46	— <i>Shrubsolei</i> , Cleve, ..	rr	..	..	rr	r	rr	r	..	..	+	+	rr	r
47	— <i>Stolterfothi</i> , Pér., ..	..	..	..	..	..	..	..	..	..	..	rr	..	c
48	<i>Skeletonema costatum</i> (Grev.), Cleve,	..	..	rr	..	..	+	+	c	r	r	..	..	c
49	<i>Stephanopyxis turris</i> , Grev.,	..	..	..	..	..	..	..	..	..	..	..	..	..
50	<i>Streptotheca tamesis</i> (Shr.). Cleve,	+	r	+	+	+	+	+	..	..	+	..	..	..
51	<i>Thalassiosira gravida</i> , Cleve,	..	..	..	..	..	..	r	r	..	r	..	..	..
52	— <i>Nordenskiöldi</i> , Cleve, ..	..	..	..	..	..	..	..	r	r	c	..	..	..
53	<i>Thalassiothrix curvata</i> , Castr.,	..	r	+	+	+	+	..	r	..	..	..	..	..
54	— <i>Frauenfeldi</i> , Grun., ..	r	r	+	+	+	+	r	+	..	..	..	r	..
	PERIDINIDAE.													
55	<i>Ceratium furca</i> , Clap. & Lachm.,	c	..	+	+	+	+	..	..	..	..	rr	..	..
56	— <i>fuscus</i> (Ehb.), Duj., ..	r	..	r	..	..	r	..	..	..	..	..	r	..
57	— <i>horridum</i> Cleve, ..	..	..	..	..	..	..	..	..	..	..	..	..	..
58	— <i>longipes</i> (Bail), Cleve,	r	..	..	..	..	..	..	..	..	..	..	..	..
59	— <i>tripos</i> (O. F. Müll., Vanhöffen,	..	..	..	..	..	..	..	..	..	..	..	..	..
60	<i>Dinophysis acuminata</i> , Clap. & Lachm.,	..	..	..	..	..	..	..	..	..	..	..	..	..
61	— <i>rotundata</i> , Clap. & Lachm.,	..	..	..	..	..	..	..	..	..	..	..	..	..

IRISH LIGHT STATIONS, 1904—continued.

Lat. 54° 32' N., Long. 5° 25' W. 20 Fathoms.

July.		August.		September.		October.		November.		December.		Species No.
13. 7.30 a.m.	28. 8.45 p.m.	12. 8.10 p.m.	27. 8.25 p.m.	12. 9.0 p.m.	26. 8.45 p.m.	10. 8.10 p.m.	25. 8.0 p.m.	8. 8.15 p.m.	24. 7.40 a.m.	8. 7.55 a.m.	23. 8.15 p.m.	
13	14	15	16	17	18	19	20	21	22	23	24	DIATOMACEAE—con.:
..	..	..	..	..	rr	..	r	..	r	..	..	<i>Eucampia zoodiacus</i> , Ehb. 31
r	..	..	..	..	..	..	..	..	..	..	..	<i>Fragillaria c. f. oceanica</i> , Gran. 32
+	+	c	+	+	+	..	rr	..	rr	r	r	<i>Guinardia flaccida</i> , Pér. 33
+	+	+	+	c	+	c	c	c	+	r	r	<i>Hyalodiscus stelliger</i> , Bail. 34
r	..	+	+	+	r	+	r	r	+	+	r	<i>Isthmia</i> sp. 35
..	..	r	r	+	r	+	r	..	rr	..	..	<i>Lauderia borealis</i> , Gran. 36
..	..	..	rr	..	..	..	..	..	..	..	..	<i>Leptocylindrus danicus</i> , Cleve. 37
..	..	..	..	..	r	..	..	..	..	..	..	<i>Navicula membranacea</i> , Cleve. 38
..	..	r	..	..	r	..	..	..	..	..	..	<i>Nitzschia seriata</i> , Cleve. 39
..	r	+	+	+	+	+	r	+	+	r	+	<i>Paralia sulcata</i> (Ehb.), Cleve. 40
..	..	rr	+	r	rr	r	r	r	r	r	r	<i>Pleurosigma</i> sp. 41
rr	..	..	..	..	..	..	..	..	..	..	..	<i>Rhizosolenia alata</i> , Btw. 42
c	+	+	rr	..	..	..	..	..	..	..	..	— <i>delicatula</i> , Cleve. 43
rr	..	..	..	..	..	..	..	..	..	..	..	— <i>semispina</i> , Hensen. 44
+	r	rr	r	r	r	+	r	r	..	..	r	— <i>setigera</i> , Btw. 45
r	rr	r	..	..	..	..	..	rr	..	rr	..	— <i>Shrubsolei</i> , Cleve. 46
c	r	c	..	..	r	r	r	..	..	..	..	— <i>Stolterfothi</i> , Pér. 47
c	rr	rr	rr	..	..	..	..	..	..	..	..	<i>Skeletonema costatum</i> (Grev.), Cleve. 48
..	..	..	..	..	rr	..	..	..	..	..	..	<i>Stephanopyxis turris</i> , Grev. 49
..	..	..	rr	..	+	+	c	+	+	+	+	<i>Streptotheca tamesis</i> (Shr.), Cleve. 50
rr	..	rr	rr	rr	..	..	..	..	..	..	..	<i>Thalassiosira gravida</i> , Cleve. 51
..	..	..	..	..	..	..	..	..	..	..	..	— <i>Nordenskiöldi</i> , Cleve. 52
..	..	..	..	..	..	..	..	r	..	..	..	<i>Thalassiosira curvata</i> , Castr. 53
r	..	rr	r	r	r	..	r	r	..	r	..	— <i>Frauenfeldi</i> , Grun. 54
..	..	..	..	..	..	..	..	..	..	..	..	PERIDINIDAE.
..	r	r	+	+	+	+	+	r	r	..	+	<i>Ceratium furca</i> , Clap & Lachm. 55
..	..	..	..	r	r	..	r	..	r	r	r	— <i>fuscus</i> , (Ehb.), Duj. 56
..	..	..	..	..	..	..	rr	..	..	..	..	— <i>horridum</i> , Cleve. 57
..	rr	r	..	r	r	+	+	+	c	c	c	— <i>longipes</i> (Bail.), Cleve. 58
rr	..	..	..	..	..	..	..	..	..	..	..	— <i>tripos</i> (O. F. Müll.), Vanhöffen. 59
..	..	rr	..	..	..	..	..	..	..	..	..	<i>Dinophysis acuminata</i> , Clap. & Lachm. 60
..	rr	..	..	..	..	..	..	..	..	..	..	— <i>rotundata</i> , Clap. & Lachm. 61

SKULMARTIN LIGHTSHIP—continued.

Species No.	—	Jan.	Feb.			March.			April.		May.		June.		July.		
		22. 10.30 a.m.	3. 8.20 a.m.	16. 8.0 a.m.	3. 8.30 a.m.	18. 8.30 a.m.	31. 7.30 a.m.	15. 6.30 a.m.	30. 7.40 a.m.	16. 8.0 a.m.	30. 8.30 a.m.	15. 8.15 a.m.	21. 3.30 p.m.	13 7.30 a.m.	28 8.45 p.m.		
PERIDINIDAE—con. r																	
62	<i>Diplopsalis lenticula</i> , Bergh,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	rr	r
63	<i>Peridinium conicum</i> , Gran, ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
64	— <i>depressum</i> , Bail., ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
65	— <i>globulus</i> , Stein, ..	..	..	..	..	..	..	rr?	..	..	..	..	..	..	..	..	..
66	— <i>ovatum</i> , (Pouch.) Schütt.,	r	r	r	rr	..	..	..	..	..	r	..	..	..	..	..	..
67	— <i>pallidum</i> , Ostenf., ..	r	r	..	+	..	..	..	..	..	..	rr	..	..	..	rr	rr
68	— <i>pentagonum</i> , Gran, ..	..	..	..	..	..	..	..	..	..	..	rr	..	..	..	+	r
69	<i>Prorocentrum micans</i> , Ehb.,	..	..	rr	..	..	rr	..	..	..	..	..	..	..	..	rr	..
FLAGELLATAE.																	
70	<i>Dinobryon pellucidum</i> , Lev.,	..	rr	r	+	?	rr	..	r	..	..	..	..	..	..	..	..
PROTOCOCCOIDEAE.																	
71	<i>Halosphaera viridis</i> , Schmitz,	..	..	..	r	..	..	..	r	..	..	..	..	..	..	..	..
72	<i>Hexasterias problematica</i> , Cleve.	..	..	with 7 processes. r	..	..	with 7 processes. r	..	..	..	with 7 processes. r	..	..	..	..	..	..
73	<i>Trochiscia Clevei</i> , Lemm., ..	..	..	..	r	..	r	r	..	..	..	rr	..	..	..	..	..
74	— <i>paucispinosa</i> (Cleve), Lemm.	r	..	r	..	..	..	..	..	..	..	..	..	..	..	..	..
SILICOFAGELLATAE.																	
75	<i>Dictyocha fibula</i> , Ehb., ..	..	..	rr	rr	..	..	r	..	..	..	..	..	..	..	..	..
76	<i>Distephanus speculum</i> (Ehb.) Haekkel,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
INCERTAE SEDIS.																	
77	"Umrindete Cyste," Hensen,	r	..	r	..	..	..	r	..	..	..	..	..	..	..	..	..
78	"Barbierbeckenstatoblast," Hensen.	..	..	r	r	r	+	c	r	..	..	r	..	..	..	..	..
PROTOZOA.																	
79	<i>Cyttarocyclus serrata</i> , (Mob.) Brandt.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
80	<i>Tintinnopsis beroidea</i> , Stein,	..	rr	rr	rr	rr	rr	..	..	..	r	rr	..	..	..	..	..
81	— <i>campanula</i> (Ehb.), Da- day,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

SKULMARTIN LIGHTSHIP—continued.

Species No.	—	Jan.	Feb.			March.			April.		May.		June.		July.	
		22. 10.30 a.m.	3. 8.20 a.m.	16. 8.0 a.m.	3. 8.30 a.m.	18. 8.30 a.m.	31. 7.30 a.m.	15. 6.30 a.m.	30. 7.40 a.m.	16. 8.0 a.m.	30. 8.30 a.m.	15. 8.15 a.m.	28. 3.10 p.m.	13. 7.30 a.m.	28. 8.45 p.m.	
COELENTERATA.																
82	<i>Corymorpha nutans</i> , Sars, ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
83	<i>Dipurena halterata</i> , Forbes,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
84	<i>Hybocodon prolifer</i> , Agassiz,	..	..	..	..	..	..	..	r	r	+	..	..	..	..	..
85	<i>Margellium octopunctatum</i> , Sars,	..	..	..	..	..	..	..	..	..	r	..	..	..	..	..
86	<i>Sarsia</i> sp., ..	..	..	..	..	..	..	..	+	+	..	..	..	..	..	..
87	<i>Obelia</i> sp., ..	..	..	..	..	..	..	rr	..	..	..	..	..	..	..	..
88	<i>Phialidium cymbalodium</i> , E. T. B.,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
89	— <i>temporarium</i> , E. T. B.,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
90	<i>Beroe ovata</i> , Bosc.,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
91	<i>Pleurobrachia pileus</i> , Fabr.,	..	..	..	..	..	..	..	..	..	+	..	..	c	..	..
ECHINODERMATA.																
92	Ophiurid juv., ..	..	..	..	..	..	..	r	..	..	..	..	..	..	..	..
VERMES.																
93	Polychaete larvae, ..	r	..	..	..	..	..	..	r	r	r	..	..	..	..	..
94	<i>Sagitta bipunctata</i> , Q. et G.,	rr	+	cc	+	rr	..	..	..	..	..	rr	..	..	..	..
95	<i>Tomopteris helgolandica</i> Greef,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
96	Terebellid larvae, ..	..	..	..	..	..	..	..	..	..	..	r	..	..	..	..
COPEPODA.																
97	<i>Acartia Clausi</i> (Giesbr.), ..	+	r	+	c	c	r	..	+	r	r	c	c	..	..	..
98	— <i>longiremis</i> , Lillj.,	..	..	..	..	..	..	..	r	..	..	..	..	..	..	..
99	<i>Alteutha bopyroides</i> , Claus,	..	..	..	rr	..	..	..	..	..	..	..	..	rr	..	..
100	<i>Anomalocera Pattersoni</i> , R. Temp.,	..	..	..	..	..	..	..	..	..	..	cc	+	..	..	..
101	<i>Bradyidius armatus</i> , Vanhöffen,	..	..	..	..	..	r	..	..	r	..	..	..	..	..	..
102	<i>Calanus finmarchicus</i> , Gunn.,	+	+	+	+	+	..	r	+	+	r	r	c	..	..	..
103	<i>Centropages hamatus</i> (Lillj.),	..	..	..	..	..	r	+	+	+	..	c	c	..	..	..
104	— <i>typicus</i> , Kröyer,	..	..	..	..	..	..	..	..	..	..	..	c	..	..	..
105	<i>Diaixis pygmaea</i> , Scott,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
106	<i>Dorypygus</i> sp., ..	..	..	..	rr	..	..	..	..	..	..	..	..	..	..	..
107	<i>Haemocera Danae</i> , Clap., ..	..	..	..	..	..	..	..	..	rr	..	..	..	..	..	..
108	<i>Isias clavipes</i> (Boeck),	..	..	..	..	..	..	..	..	..	..	rr	..	..	..	..
109	<i>Labidocera Wollastoni</i> , (Lubb.),	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

IRISH LIGHT STATIONS, 1904—continued.

Lat. 54° 32' N., Long. 5° 25' W. 20 Fathoms.

July.		August.		September.		October.		November.		December.		Species No.
13.	28.	12.	27.	12.	26.	10.	25.	8.	24.	8.	23.	
7.30 a.m.	8.45 p.m.	8.10 p.m.	8.25 p.m.	9.0 p.m.	8.45 p.m.	8.10 p.m.	8.0 p.m.	8.15 p.m.	7.40 a.m.	7.55 a.m.	8.15 p.m.	
13	14	15	16	17	18	19	20	21	22	23	24	COELENTERATA.
+	+	r	..	..	..	..	..	..	..	..	..	<i>Corymorpha nutans</i> , Sars. 82
..	..	rr	rr	..	..	..	..	..	..	..	..	<i>Dipurena halterata</i> , Forbes. 83
..	..	..	..	..	..	..	..	..	..	..	..	<i>Hybocodon prolifer</i> , Agassiz. 84
..	..	..	..	..	..	..	..	..	..	..	..	<i>Margellium octopunctatum</i> , Sars. 85
+	+	r	..	..	..	..	..	..	..	..	..	<i>Sarsia</i> sp. 86
rr	+	..	..	..	..	..	..	..	..	..	..	<i>Obelia</i> sp. 87
r	r	..	..	..	..	..	..	..	..	..	..	<i>Phialidium cymbalodium</i> , E. T. B. 88
..	..	..	..	r	r	..	..	..	..	..	..	— <i>temporarium</i> , E. T. B. 89
rr	..	..	..	rr	..	+	..	..	..	..	..	<i>Beroe ovata</i> , Bosc. 90
+	c	c	c	+	+	c	c	+	..	r	..	<i>Pleurobrachia pileus</i> , Fabr. 91
..	..	..	..	..	..	..	..	..	..	..	..	ECHINODERMATA.
..	..	..	..	..	..	..	..	..	..	..	..	<i>Ophiurid</i> juv. 92
..	..	..	r	r	r	r	..	..	..	..	..	VERMES.
..	c	cc	cc	cc	cc	cc	cc	cc	c	+	+	<i>Polychaete</i> larvae. 93
..	..	..	rr	rr	+	+	r	r	..	..	r	<i>Sagitta bipunctata</i> , Q. et G. 94
..	..	..	..	..	..	..	..	..	..	..	..	<i>Tomopteris helgolandica</i> Greef. 95
..	..	..	..	..	..	..	..	..	..	..	..	<i>Terebellid</i> larvae. 96
+	+	+	+	c	c	c	c	c	c	c	c	COPEPODA.
..	..	..	..	..	..	..	..	..	..	..	..	<i>Acartia Clausi</i> (Giesbr.). 97
..	..	..	..	..	..	..	..	..	..	..	..	— <i>longiremis</i> , Lillj. 98
..	r	+	+	r	..	..	..	..	..	..	..	<i>Alteutha bopyroides</i> , Claus. 99
..	r	c	+	+	+	..	..	..	..	..	..	<i>Anomalocera Pattersoni</i> , R. Temp. 100
..	..	..	..	..	..	r	r	..	..	..	..	<i>Bradyidius armatus</i> , Vanhøffen. 101
r	+	c	cc	cc	c	cc	c	+	c	c	c	<i>Calanus finmarchicus</i> , Gunn. 102
..	c	c	..	rr	r	+	..	..	..	..	..	<i>Centropages hamatus</i> (Lillj.) 103
+	+	..	..	..	r	+	..	..	..	..	..	— <i>typicus</i> , Krøyer. 104
..	..	..	..	..	..	..	..	..	rr	..	..	<i>Diaixis pygmaea</i> , Scott. 105
..	..	..	..	..	..	..	..	..	..	..	..	<i>Dorypygus</i> sp. 106
..	..	..	..	..	..	..	..	..	..	..	..	<i>Haemocera Danae</i> , Clap. 107
..	+	c	c	c	c	+	r	..	..	..	..	<i>Isias clavipes</i> (Boeck). 108
..	..	..	rr	..	+	..	..	..	..	..	..	<i>Labidocera Wollastoni</i> , (Lubb.). 109

SKULMARTIN LIGHTSHIP—continued.

Species No.	—	Jan.	February.			March.			April.		May.		June.	
		22. 10.30 a.m.	3. 8.20 a.m.	16. 8.0 a.m.	3. 8.30 a.m.	18. 8.30 a.m.	31. 7.30 a.m.	15. 6.30 a.m.	30. 7.40 a.m.	16. 8.0 a.m.	30. 8.30 a.m.	15. 8.15 a.m.	28. 3.10 p.m.	
	COPEPODA—con.:	1	2	3	4	5	6	7	8	9	10	11	12	
110	<i>Longipedia coronata</i> , Claus,	..	r	..	..	..	..	r	..	..	..	..	..
111	<i>Metridia lucens</i> , Boeck, ..	..	..	..	..	..	..	..	..	..	..	..	+
112	<i>Monstrilla</i> sp., ..	..	..	..	..	..	..	..	..	..	..	..	..
113	<i>Oithona nana</i> , Giesbr., ..	r	..	..	rr	..	..	..	..	..	..	..	..
114	— <i>similis</i> , Claus, ..	..	..	..	r	r	..	..	..	..	..	..	r
115	<i>Paracalanus parvus</i> , Claus, ..	..	..	..	..	..	..	..	..	..	+	..	..
116	<i>Parapontella brevicornis</i> , Lubb., ..	..	..	..	..	..	..	..	..	..	..	..	r
117	<i>Pseudocalanus elongatus</i> , Giesbr.,	c	c	c	c	c	c	c	c	c	c	c	c	
118	<i>Temora longicornis</i> (O. F. Müller),	..	..	..	..	..	+	+	+	+	+	c	c
	CRUSTACEA (cetera).													
119	<i>Evadne Nordmanni</i> , Lovén,	..	..	..	..	..	..	..	..	..	..	r	..
120	<i>Podon intermedius</i> , Lillj., ..	..	..	..	..	..	..	..	..	..	..	r	..
121	<i>Eurydice</i> sp., ..	..	..	..	..	..	..	..	..	..	..	..	..
122	Hyperiid, juv., ..	..	..	..	..	..	..	..	..	..	..	..	..
123	<i>Anchialus agilis</i> , Sars, ..	..	..	..	..	..	..	..	..	..	..	..	..
124	<i>Schistomysis ornata</i> , Sars, ..	..	..	..	..	..	..	..	..	..	..	..	..
125	<i>Siriella crassipes</i> , Sars, ..	..	..	..	..	..	..	..	..	..	..	..	..
126	<i>Nyctiphanes Couchi</i> , Bell, ..	..	..	..	..	..	..	..	..	..	..	..	..
127	Cirriped larvae, ..	..	..	..	..	r	c	c	c	+	+	..	+
128	Cypris stage larvae, ..	..	..	..	..	..	rr	+	+	r	..	+	+
129	Nauplius and metanauplius, ..	r	r	r	r	r	r	+	+	+	+	r	r	
130	Zoea, ..	..	..	..	r	r	+	+	..	..	..	+	+
131	Megalopa, ..	..	..	..	..	..	..	..	..	..	..	..	..
132	Caridid larvae, ..	..	..	..	..	..	..	..	..	..	..	..	..
133	<i>Pasiphae</i> sp. juv., ..	..	..	..	..	..	..	..	..	..	..	..	..
	MOLLUSCA.													
134	Gastropod larvae, ..	..	..	..	+	+	r	+	+	r	r	..	..
135	Lamellibranchiate larvae, ..	r	1	..	+	+	+	+	+	r	r	..	..
	TUNICATA.													
136	<i>Oikopleura dioica</i> , Fol., ..	..	..	..	+	+	..	..	+	+	c	+	..
	VERTEBRATA.													
137	Teleostei, ova et larvae ..	..	..	..	r	+	+	c	+	c	..	+	c

IRISH LIGHT STATIONS, 1904—continued.

Lat. 54° 32' N., Long. 5° 25' W. 20 Fathoms.

July.		August.		September.		October.		November.		December.		Species No.
13. 7.30 a.m.	28. 8.45 p.m.	12. 8.10 p.m.	27. 8.25 p.m.	12. 9.0 p.m.	26. 8.45 p.m.	10. 8.10 p.m.	25. 8.0 p.m.	8. 8.15 p.m.	24. 7.40 a.m.	8. 7.55 a.m.	23. 8.15 p.m.	
13	14	15	16	17	18	19	20	21	22	23	24	COPEPODA—cont.:
..	r	r	r	r	+	..	..	..	..	..	..	Longipedia coronata, Claus. 110
..	c	c	+	+	+	c	?	..	..	..	..	Metridia lucens, Boeck. 111
..	II	r	..	..	r	..	..	..	..	..	..	Monstrilla sp. 112
..	..	..	..	..	..	..	..	..	..	..	..	Oithona nana, Giesbr. 113
..	..	..	r	..	..	..	..	..	+	..	..	— similis, Claus. 114
..	..	..	..	..	c	r	?	..	..	..	..	Paracalanus parvus, Claus. 115
..	r	+	c	+	+	+	r	..	..	..	..	Parapontella brevicornis, Lubb. 116
r	c	cc	cc	cc	cc	c	c	c	+	c	c	Pseudocalanus elongatus, Giesbr. 117
+	c	c	c	c	c	c	+	..	..	..	..	Temora longicornis (O. F. Müller). 118
..	..	..	..	..	..	..	..	..	..	..	..	CRUSTACEA (cetera).
..	..	..	..	..	..	..	..	..	..	..	..	Evadne Nordmanni, Lovén. 119
II	..	..	..	..	..	..	..	..	..	..	..	Podon intermedius, Lillj. 120
..	..	II	r	..	..	..	..	..	..	..	..	Eurydice sp. 121
..	..	..	r	..	..	+	..	..	..	..	..	Hyperiid, juv. 122
..	..	..	..	r	..	r	..	..	..	..	..	Anchialus agilis, Sars. 123
..	..	..	..	r	..	r	..	..	..	..	..	Schistomysis ornata, Sars. 124
..	..	..	..	r	..	..	..	..	..	..	..	Siriella crassipes, Sars. 125
..	..	..	..	+	..	r	..	r	..	..	..	Nyctiphanes Couchi, Bell. 126
r	..	..	..	..	..	II	..	..	..	..	..	Cirriped larvae. 127
..	r	..	..	..	..	..	..	..	..	..	..	Cypris stage larvae. 128
+	+	+	+	+	+	+	+	+	+	r	r	Nauplius and Metanauplius. 129
+	+	+	+	+	+	+	..	r	..	..	..	Zoea. 130
..	..	+	+	c	c	r	r	..	..	..	..	Megalopa. 131
..	r	+	+	+	+	+	+	..	..	..	..	Caridid larvae. 132
..	..	..	..	..	..	..	..	II	..	..	+	Pasiphae sp. juv. 133
..	r	r	r	r	r	r	+	..	..	..	r	MOLLUSCA.
..	..	..	r	r	r	r	+	..	..	r	r	Gastropod larvae. 134
..	..	..	r	r	r	r	+	..	..	r	r	Lamellibranchiate larvae. 135
r	r	+	II	II	r	II	II	..	..	..	..	TUNICATA.
..	..	..	..	..	..	..	..	..	..	..	..	Oikopleura dioica, Fol. 136
+	+	r	r	..	..	r	..	..	..	..	..	VERTEBRATA.
..	..	..	..	..	..	..	..	..	..	..	..	Teleostei, ova et larvae. 137

SOUTH ARKLOW LIGHTSHIP.

Species No.	—	Feb.		March.		April.			May.		June.		July.	
		1. 7.30 a.m.	17. 8.45 a.m.	3. 8.23 a.m.	18. 9.35 p.m.	2. 8.30 a.m.	16. 7.50 a.m.	29. 7.0 a.m.	16. 8.30 a.m.	29. 7.0 a.m.	14. 8.30 a.m.	13. 7.0 a.m.	27. 7.0 a.m.	
	DIATOMACEAE.	1	2	3	4	5	6	7	8	9	10	11	12	
1	<i>Achnanthes</i> sp., ..	..	..	r	..	c	r	r	r	r	..	..	..
2	<i>Actinoptychus undulatus</i> , Ehbg.,	c	c	c	+	+	+	c	+	c	+	c	r	
3	<i>Asterionella glacialis</i> , Castr.,	..	rr	rr	r	rr	rr	r	r	+	..	..	..
4	<i>Bacillaria paradoxa</i> (Gmel.), Grun.,	r	+	+	..	c	c	c	r	r	r	r	r	
5	<i>Bellerophia malleus</i> , (Btw.), v. Heurck.,	..	rr	..	..	r	..	r	r	..	..	..	..
6	<i>Biddulphia alternans</i> , (Bail.), v. Heurck.,	..	..	..	..	..	..	..	..	..	..	..	..
7	— <i>aurita</i> , (Lyngb.), Bréb.,	..	..	r	r	r	+	+	r	..	..	..	..
8	— <i>favus</i> , (Ehbg.), v. Heurck.,	..	..	..	..	..	..	..	..	..	..	..	..
9	— <i>granulata</i> , Roper, ..	..	..	..	rr	..	..	r	r	rr	..	..	..
10	— <i>mobiliensis</i> , Bail, ..	+	+	+	r	+	+	c	r	c	+	r	rr	
11	<i>Cerataulina Bergoni</i> , Pérég.,	..	..	..	..	..	r	..	..	..	..	..	..
12	<i>Chaetoceras curvisetum</i> , Cleve,	..	rr	..	..	..	..	..	..	..	..	..	..
13	— <i>danicum</i> , Cleve, ..	..	..	..	..	r	..	..	..	rr	..	..	..
14	— <i>debile</i> (?), Cleve, ..	..	..	..	..	..	..	..	..	..	..	..	..
15	— <i>decipiens</i> , Cleve, ..	r	r	r	r	..	r	r	..	r	r	..	..
16	— <i>densum</i> , Cleve, ..	..	..	..	..	..	..	..	..	..	..	..	..
17	— <i>didymum</i> (Ehbg.), Cleve,	rr	..	..	..	..	..	..	..	..	..	..	..
18	— <i>laciniosum</i> , Schütt, ..	..	..	..	..	..	..	..	..	rr	..	..	..
19	— <i>Schütti</i> , Cleve, ..	..	rr	..	..	..	..	..	..	..	..	..	..
20	<i>Corethron hystrix</i> , Hensen,	..	..	..	..	..	..	r	..	..	..	..	..
21	<i>Coscinodiscus concinnus</i> , W. Sm.,	r	r	r	r	+	+	c	r	r	..	rr	..	
22	— <i>excentricus</i> , Ehbg., ..	c	c	c	c	c	c]	c	+	+	r	+	r	
23	— <i>radiatus</i> , Ehbg., ..	c	c	c	c	cc	c	c	c	c	c	c	+	
24	<i>Ditylum Brightwelli</i> , West.,	..	r	..	..	rr	..	+	+	+	+	..	..
25	<i>Fragillaria c.f. oceanica</i> , Gran,	..	rr	r	..	..	..	..	..	..	..	..	..
26	<i>Guinardia flaccida</i> , Pérég., ..	r	r	..	..	..	rr	rr	..	rr	+	+	+
27	<i>Hyalodiscus stelliger</i> , Bail.,	c	c	c	c	c	r	c	+	c	+	+	r	
28	<i>Lauderia borealis</i> , Gran, ..	..	..	..	..	..	+	r	+	c	r	..	..
29	<i>Lithodesmium undulatum</i> , Ehbg.,	..	rr	..	..	..	..	..	..	..	..	..	..
30	<i>Navicula membranacea</i> , Cleve,	..	..	..	..	..	..	..	..	..	..	..	..
31	<i>Paralia sulcata</i> , (Ehbg.), Cleve,	+	+	c	+	+	+	+	+	+	+	+	+	

IRISH LIGHT STATIONS, 1904—continued.

Lat. 52° 40' N., Long. 5° 56' W. 26 Fathoms.

August.		September.		October.		November.		December.		Species No.
12.	28.	9.	24.	10.	26.	7.	23.	7.	22.	
8.0 a.m.	8.40 a.m.	7.0 a.m.	7.34 p.m.	8.0 a.m.	8.10 a.m.	6.50 p.m.	7.0 p.m.	7.10 p.m.	6.45 a.m.	
13	14	15	16	17	18	19	20	21	22	
DIATOMACEAE.										
..	..	..	..	..	..	..	..	..	..	Achnanthes sp. 1
r	..	..	rr	r	+	c	c	c	c	Actinoptychus undulatus, Ehb. 2
..	..	..	..	..	+	r	..	..	r	Asterionella glacialis, Castr. 3
r	..	..	..	r	+	+	+	r	r	Bacillaria paradoxa (Gmel.), Grun. 4
r	+	r	r	+	+	+	r	rr	..	Bellerochea malleus, (Btw.), v. Heurck. 5
..	..	..	..	..	r	r	r	r	r	Biddulphia alternans, (Bail.), v. Heurck. 6
..	..	..	..	..	..	..	..	..	..	— aurita (Lyngb.), Bréb. 7
..	..	..	..	..	..	..	rr	..	..	— *favus, (Ehbg.), v. Heurck. 8
..	..	..	..	..	r	..	..	..	..	— granulata, Roper. 9
+	+	+	r	r	+	r	+	r	+	— mobiliensis, Bail. 10
..	..	..	..	..	..	..	..	..	..	Cerataulina Bergoni, Pér. 11
..	..	..	..	..	..	..	..	..	..	Chaetoceras curvisetum, Cleve. 12
..	..	..	..	..	r	..	..	..	..	— danicum, Cleve. 13
..	..	..	..	..	..	..	..	rr	..	— debile (?), Cleve. 14
..	..	..	..	rr	r	..	..	r	..	— decipiens, Cleve. 15
r	..	..	..	..	..	..	..	..	..	— densum, Cleve. 16
..	..	..	..	..	..	..	..	..	..	— didymum, (Ehbg.), Cleve. 17
..	..	..	..	..	..	..	..	..	..	— lacinosum, Schütt. 18
..	..	..	..	..	..	..	..	..	..	— Schütt., Cleve. 19
..	..	..	..	..	..	..	..	..	..	Corethron Mystrix, Hensen. 20
..	..	..	..	..	..	..	..	..	..	Coscinodiscus concinnus, W. Sm. 21
r	rr	rr	..	r	r	+	+	+	c	— excentricus, Ehb. 22
+	c	+	+	+	c	c	+	+	+	— radiatus, Ehb. 23
..	..	..	..	r	..	..	..	..	rr	Ditylum Brightwelli, West. 24
..	..	..	..	..	..	..	..	..	..	Fragillaria c.f. oceanica, Gran. 25
+	+	+	+	+	+	+	+	rr	rr.	Guinardia flaccida Pér. 26
+	+	+	r	+	+	c	c	+	c	Hyalodiscus, stelliger, Bail. 27
..	..	..	..	r	+	+	r	r	r	Lauderia borealis, Gran. 28
..	..	..	..	..	..	..	..	..	..	Lithodesmium undulatum, Ehb. 29
..	..	..	..	r	r	r	..	..	..	Navicula membranacea, Cleve. 30
+	+	+	r	+	+	+	..	+	+	Paralia sulcata, (Ehbg.), Cleve. 31

*B. favus is not a plankton organism.

