

KONGLIGA SVENSKA
VETENSKAPS-AKADEMIEN
H A N D L I N G A R.

NY FÖLJD.

TRETIONDEFJERDE BANDET.

STOCKHOLM
KUNGL. BOKTRYCKERIET. P. A. NORSTEDT & SÖNER
1901

INNEHÅLL

AF TRETIONDEFJERDE BANDET.

1.	CLEVE, P. T.	Notes on some Atlantic Plankton-organisms. With VIII plates ... sid.	1— 22.
2.		The Plankton of the North Sea, the English Channel and the Skagerack in 1899	1— 77.
3.		Report on the Plankton collected by the Swedish expedition to Greenland in 1899	1— 22.
4.	SJÖSTEDT, Y.	Monographie der Termiten Afrikas. Mit 9 Tafeln	1—236.
5.	FRIES, R. E.	Beiträge zur Kenntniss der Süd-Amerikanischen Anonaceen. Mit 7 Tafeln	1— 59.
6.	LINDMAN, C. A. M.	Beiträge zur Gramineenflora Süd-Amerikas. Mit 15 Tafeln..	1— 52.
7.	MALME, G. O.	Die Asclepiadaceen des Regnellschen Herbars. Mit 8 Tafeln.....	1—102.
8.	LINDSTRÖM, G.	Researches on the visual organs of the Trilobites. With 8 plates.	1— 86.

REPORT
ON
THE PLANKTON

COLLECTED BY
THE SWEDISH EXPEDITION TO GREENLAND IN 1899

BY
P. T. CLEVE.

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STOCKHOLM
KUNGL. BOKTRYCKERIET. P. A. NORSTEDT & SÖNER
1900

The Swedish expedition to Greenland in 1899 under the direction of Prof. A. G. NATHORST paid considerable attention to hydrographical researches. Not only the physical properties and the chemical composition of the water were examined, where the vessel »Antarctic» passed, but also a considerable number of samples of plankton were collected, both from the surface and at certain stations from more or less considerable depths. The hydrographical work has been carried out by the hydrographer of the expedition Dr. F. ÅKER-BLOM, who furnished me with all the hydrographical data mentioned in the following. All the samples of plankton were delivered to me for examination. In carrying out that work I had for some determinations the advantage of the assistance of Prof. G. O. SARS (all schizopoda, some amphipoda and copepoda) and of Mr. JOH. GUNNAR ANDERSSON (ostracoda), for which I tender these gentlemen my best thanks.

1. Samples collected in May.

The route of the »Antarctic» was from Skagen towards S. Norway, above the deep »Norske Rende» and the 200-metre plateau to midway between Norway and the Shetlands.

In the Skagerak water of 34,83 to 25,92 p. m. salinity prevailed and contained chiefly *tripos-plankton*. Towards Norway and above the deep »Norske Rende» the salinity varied from 23,52 to 34,94 p. m. and contained *northern neritic plankton* (represented by *Chaetoceros constrictus*, *Leptocylindrus danicus*, *Thalassiothrix Frauenfeldii*, *Calanus finmarchicus* and *Evadne Nordmannii*) besides *tripos-plankton*. Above the 200-metre plateau there prevailed water of 35 p. m. salinity containing in abundance *Phaeocystis Pouchetii*, thus a facies of *Chaeto-plankton* (C β).

The latter kind of water had a considerable thickness, as is proved by the deep sea hauls made at 61° 16' N. 1° 18' E., which shew that the same kind of water and of plankton occurred at least to the depth of 100 metre.

The samples contained the species mentioned in Table I.

Besides there were found some rarer forms, viz:

<i>Fritillaria borealis</i> LOHM. 10 +, 11 r.	<i>Centropages typicus</i> KRÖYER 6 +.
<i>Oikopleura</i> (dioica FOL?) 1 r, 6 c, 11 ecc.	<i>Oithona plumifera</i> BAIRD 18 rr.
<i>Acartia longiremis</i> LILLJEB. 1 r, 2 r, 8 r.	<i>Podon Leuckarti</i> G. O. SARS. 1 r, 10 rr, 11 r.
<i>Centropages hamatus</i> LILLJEB. 6 +, 8 r.	<i>Sagitta bipunctata</i> QUOI & GAIM. 1 r, 6 +.

<i>Globigerina</i> 11 r.	<i>Chaetoceros scolopendra</i> CL. 12 r.
<i>Ceratium</i> (tripos var.) <i>bucephalum</i> CL. 10 rr, 18 r.	<i>C. teres</i> CL. 12 r, 15 r, 16 r.
<i>C. lineatum</i> EHB. 4 r.	<i>Coscinodiscus concinnus</i> W. SM. 2 r, 6 +, 9 r.
<i>Dinophysis acuta</i> EHB. 7 r, 10 rr.	<i>Lauderia annulata</i> CL. 11 r.
<i>Peridinium divergens</i> EHB. 10 rr.	<i>Nitzschia seriata</i> CL. 3 r.
<i>Xanthidium hystrix</i> CL. 1 rr.	<i>Rhizosolenia alata</i> BTW. 11 rr.
<i>Cerataulina Bergonii</i> H. PER. 8 rr, 17 rr.	<i>R. gracillima</i> CL. 8 +, 9 rr.
<i>Chaetoceros atlanticus</i> CL. 2 r.	<i>R. obtusa</i> HENSEN 12 r, 14 r, 18 r.
<i>C. borealis</i> var <i>Brightwellii</i> CL. 12 r.	<i>R. semispina</i> HENSEN 5 c, 13 r, 14 r.
<i>C. constrictus</i> GRUN. 3 cc, 5 +, 15 r, 18 r,	<i>R. Shrubsolei</i> CL 9 rr.
<i>C. contortus</i> SCHÜTT. 3 +.	<i>R. Stolterfothii</i> H. PER. 10 rr.
<i>C. curvisetus</i> CL. 5 r.	<i>Thalassiotrix Frauenfeldii</i> GRUN. 3 c, 5 c.
<i>C. danicus</i> CL. 3 cc, 5 cc.	<i>T. longissima</i> CL. & GRUN, 6 r.

2. Samples collected in June.

The route was over the northern slope of the 200 metre plateau towards the Norwegian depth to the channel between Iceland and Jan Mayen and, after a short stay at this island, north thereof towards E. Greenland.

There prevailed in the surface, above of the 200 metre plateau, *tricho-plankton*, containing *Calanus finmarchicus*, *Rhizosolenia semispina*, and *Chaetoceros criophilus*. Above the deepest part of the Norwegian depth there ruled 35 p. m. water (3,9 to 4,6 temp.), with typical *chæto-plankton*, that contained *Collozoum inerme* abundantly at some spots. The water of 34 p. m. salinity (3,43 to — 0,35 temp.) in the channel between Iceland and Jan Mayen contained sparingly *tricho-plankton*. Round San Mayen there ruled also 34 p. m. water, containing chiefly *Phæocystis Pouchetii* (*Cβ* or perhaps more correctly *T*).

The hydrographical data and the plankton-contents have been registered on Table II, from which I have excluded some sterile, or nearly sterile samples, viz:

Number 9—6 VI. 67° 35' N. 6° 19' W. Temp. 0,75.	Sal. 33,81. Contained <i>Phæocystis Pouchetii</i> r.
Sal. 34,93. Contained <i>Globigerina</i> +.	<i>Chaetoceros criophilus</i> r.
» 12—8 IV. 68° 21' N. 12° 9' W. Temp. 0,25.	Number 31—29 VI. 73° 51' N. 7° 15' W. Temp.
Sal. 34,72. Contained <i>Oithona similis</i> r, <i>Globigerina</i> r, <i>Rhizosolenia gracillima</i> rr.	— 0,5. Sal. 33,78. Contained <i>Melosira hyperborea</i> +, <i>Rhizosolenia semispina</i> r.
» 13—8 VI. 69° 9' N. 13° 10' W. Temp.	» 32—30 VI. 74° 28' N. 13° 24' W. Temp.
— 0,35. Sal. 34,81. Contained <i>Parathemisto obliqua</i> +, <i>Oithona similis</i> +.	— 0,5. Sal. 33,66. Sterile.
» 16—9 VI. 69° 54' N. 13° 30' W. Temp. 0,2.	» 33—30 VI. 74° 33' N. 14° 35' W. Temp.
Sal. 34,83. Contained <i>Phæocystis Pouchetii</i> r.	+ 0,3. Sal. 32,75. Contained <i>Calanus finmarchicus</i> +, <i>C. hyperboreus</i> r, <i>Clione limacina</i> r.
» 29—26 VI. 72° 39' N. 5° 26' W. Temp. 1,15.	

The following species have been omitted:

<i>Parathemisto obliqua</i> KRÖYER 17 r,	<i>Pseudocalanus elongatus</i> BOECK. 6 and 11 r.
<i>Acartia Clausii</i> GIESBR. 1 and 2 +.	<i>Temora longicornis</i> O. F. MÜLL. 2 +.
<i>Calanus hyperboreus</i> KRÖYER 18 rr.	<i>Krohnia hamata</i> MOEB. 6 r.

<i>Clione limacina</i> PHILIPS. 74° N. 14° 30' W.	<i>Dinophysis Vanhöffenii</i> OSTF. 1 r.
<i>Beroë cucumis</i> FABR. 70° 55' N. 8° 30' W. and 74° N. 14° 30' W.	<i>Peridinium Michaëlis</i> EHB. 1 rr.
<i>Cyrtarocythis (dentic. var.) media</i> BRANDT 15 r, 30 +.	<i>P. ovatum</i> POUCH. 1 r.
<i>Ptychoocythis obtusa</i> BRANDT. 15 r.	<i>P. pallidum</i> OSTF. 1 r.
<i>Collozoum inerme</i> J. MÜLL. 4, 5, 6 cc.	<i>P. pellucidum</i> BERGH. 30 r.
<i>Halosphaera</i> (small). 14 r.	<i>Bacteriastrum delicatulum</i> CL. 1 r.
<i>Ceratium furca</i> DUJ. 1 r.	<i>Chatoceros diadema</i> EHB. 25 and 27 r.
<i>C. fasus</i> DUJ. 1, 2 r.	<i>C. furciletus</i> BAIL. 26 r.
<i>C. lineatum</i> EHB. 1 r.	<i>C. (borealis var.?) solitarius</i> CL. 5 r.
<i>C. (trip. var.) longipes</i> BAIL. 1 r, 2 c, 5 r.	<i>Rhizosolenia styliiformis</i> BTW. 3 r.
<i>C. tripos</i> NITZSCH. 2 r.	<i>Thalassiosira gelatinosa</i> HENSEN. 14 r.
	<i>T. gravis</i> CL. 10 +, 27 r.

During the passage towards Jan Mayen plankton from deeper water-strata was collected at 4 stations by means of hauls from different depths. The stations were so chosen, that the slope from the 200 metre plateau towards the northwest was first examined, then the region with a depth between 1,000 and 3,000 metre and finally the deepest region. It is seen from the Table III that *Calanus finmarchicus* occurred abundantly in nearly all samples. But there is a remarkable difference between the plankton from the station *D* and the others, therein that all samples from the said station, situated at the N.E. of the Färöes, contained in great abundance *chæto-plankton*. On both sides of this station the bulk of the plankton was composed of *Calanus finmarchicus* and is thus to be classified as *tricho-plankton*.

As is seen from tables II and III *Calanus* did not to any great extent occur at the surface, but the *chæto-plankton* of the station *D* appeared at the surface from 64° 35' N. 1° 29' W. to 66° 55' N. 2° 55' W. The water containing *chæto-plankton* seems to have, as a mighty tongue, forced its way through a bed of water containing *tricho-plankton*.

The plankton from all the stations contain a small amount of species of southern origin. Above the slope from the 200 metre plateau we meet with some species which characterize the *tripos-plankton*. Especially interesting was the extremely rare occurrence of such a southern species as *Ceratium reticulatum* on 25 m. at the station *B*. The samples from the station *D* contained *Globigerina*, *Collozoum inerme* and rarely some other species of the temperate Atlantic. It is remarkable that these southern forms appear to occur chiefly in the deeper strata, as is clearly seen, especially at the station *C*, where a thick-walled form of *Globigerina* occurred in abundance. *Oncaea minuta* and *O. conifera*, noted from the Mediterranean (the latter also from W. Greenland), are extremely rare in the surface water of the temperate Atlantic, but of these at least the former occurs so constantly in the *tricho-plankton* of the northern Atlantic that I consider it as probably belonging to the named type, and that its occurrence in the Mediterranean may be accounted for by the influence of water of arctic origin. That such water goes so far as to the Azores and the coasts of the Spanish Peninsula I have shewn in another paper. It is thus not improbable that such water also may pass through the strait of Gibraltar. The occurrence of *Calanus finmarchicus* in the Mediterranean strongly corroborates this hypothesis.

Some rarer forms have been excluded from the Table III, viz:

<i>Thysanoessa longicaudata</i> KRÖYER (fide G. O. SARS.)	<i>P. pallidum</i> OSTENF. St. B. 400.
St. C. 200 r; Stat. E. 200 r.	<i>Pterosphara Möbii</i> JÖRGENS. St. B. 10 r; St C. 10 r.
<i>Euthemisto libellula</i> MANDT. St. E. 100 and 200 r.	<i>Xanthidium multispinosum</i> MOEB. St. B. 100 r.
<i>Acartia Clausii</i> GIESBR. St. B. 100 r.	<i>Chaetoceros borealis</i> var. <i>Brightwellii</i> CL. St. B. 150 r.
<i>A. longiremis</i> LILLJEB. St. B. 0 r.	<i>C. borealis</i> var. <i>solitaria</i> CL. St. E. 0 r.
<i>Metridia hibernica</i> BRADY & ROBT. St. B. 100 and 150 r.	<i>C. scolopendra</i> CL. St. D. 0 r.
<i>Conchoecia borealis</i> G. O. SARS. St. E. 200 r (fide G. ANDERSSON).	<i>C. teres</i> CL. St. D. 150 r.
<i>C. elegans</i> G. O. SARS. St. E. 500 r (fide G. ANDERSSON).	<i>Corethron hystrix</i> HENSEN. St. E. 0 r.
<i>Cyrtarocydis denticulata</i> EHB. St. B. 0 and 150 r; St. D. 100 +.	<i>Rhizosolenia alata</i> BTW. St. D. 550 r.
<i>Acanthometron quadrifolium</i> HKL. St. B. 400 rr.	<i>R. obtusa</i> HENSEN. St. D. 25 r.
<i>Acanthonia Mülleri</i> HKL. St. B. 100 r.	<i>Thalassiosira gelatinosa</i> HENSEN. St. D. 200 r.
<i>Ceratium reticulatum</i> POUCHET. St. B. 25 rr.	<i>Chiridius armatus</i> (BOECK) G. O. SARS, is according to Prof. G. O. SARS the same as <i>Euchaeta armata</i> BOECK. The determination is after comparison with specimens from Lofoten, kindly sent by Prof. SARS.
<i>Peridinium oceanicum</i> VANH. St. B. 25 and 50 r.	

3. Samples collected in July.

During July the »Antarctic» passed the region of drift-ice, close to the east coast of Greenland, between 74° 29' and 70° 31' N. The plankton from the surface was, as could be expected, as a rule scarce. The temperature of the water varied from 1,1 to — 0,9, and the salinity from 7,78 to 32,87. The organisms, which constitute the plankton, were as a rule *arctic* species, but *southern forms* also occurred to a small extent. Among the *arctic* forms a considerable percentage consist of *neritic* or brackish water forms.

As *arctic oceanic* forms I consider the following:

<i>Fritillaria borealis</i> LOHM. rr.	<i>C. borealis</i> BTW. rr.
<i>Beroë</i> 74° 34' N. 18° W. (fide T. S. ARFWIDSON).	var. <i>Brightwellii</i> rr.
<i>Cyrtarocydis gigantea</i> BRANDT rr	<i>C. decipiens</i> CL., in most samples, r to c.
<i>Phaeocystis Pouchetii</i> LAGH. rr.	<i>Coscinodiscus oculus iridis</i> EHB., in most samples, r to c.
<i>Chaetoceros atlanticus</i> rr.	<i>Thalassiosira gravaida</i> CL., as a rule not rare.

As *arctic*, more or less *neritic*, forms I consider the following:

<i>Clione limacina</i> PHIPPS: 71° 30' N. 21° W. and 72° 28' N. 21° 48' W. (fide T. S. ARFWIDSON).	<i>Chaetoceros Granii</i> CL. rr.
<i>Limacina helicina</i> PHIPPS: 73° 28' N. 21° 48' W. (fide T. S. ARFWIDSON); 74° N. 14° 30' W. r.	<i>C. septentrionalis</i> OESTR. rr.
<i>Ptychocydis obtusa</i> BRANDT rr.	<i>C. socialis</i> LAUDER, common at some spots.
<i>Tintinnus minutus</i> BRANDT rr.	<i>C. teres</i> CL. rr.
<i>Ceratium longipes</i> BAIL. rr.	<i>Coscinodiscus radiatus</i> EHB.
<i>Peridinium ovatum</i> POUCH. rr.	<i>Eucampia grönlantica</i> CL. rr.
<i>P. pellucidum</i> BERGH rr.	<i>Fragilaria oceanica</i> CL. rare to very abundant.
<i>Amphiprora hyperborea</i> GRUN. rr.	<i>Lauderia fragilis</i> GRAN. rr.
<i>Chaetoceros bottnicus</i> CL. rr.	<i>Melosira (nummuloides</i> var.) <i>hyperborea</i> GRUN. rr.
<i>C. furcellatus</i> BAIL. r to c.	<i>Navicula septentrionalis</i> OESTR. rr.
	<i>Nitzschia frigida</i> GRUN. rr.
	<i>Thalassiosira Nordenskiöldii</i> CL. r.

As derived from the *temperate Atlantic* I consider the following species:

Oithona plumifera BAIRD, at 70° 31' N. 21° 18' W. *Acanthonia tetracopa* J. MÜLLER. Very rare at 73° 42' N. 19° 55' W.

O. similis CLAUS, as the preceding.

Litholophus ligurinus HKL. as the preceding.

In the region of the E. Greenland some deep sea hauls were carried out from the depths of 180 to 280 metres. The plankton thus obtained was a decidedly *arctic* one, as will be seen from the following list. But there occurred also, although very sparingly, some southern forms as *Oithona similis*, *Microsetella atlantica*, *Collozoum inerme*, *Litholophus ligurinus* and *Globigerina*.

Date	5	24	27 ¹			
Lat. N.	74° 15'	72° 28'	71° 30'	71° 30'	71° 30'	71° 30'
Long. W.	18° 15'	21° 48'	21°	21°	21°	21°
Depth.	280	180	50	200	225	260
Temperature	—	—	— 1,65	— 1,0	— 0,54	— 0,1
Salinity.	—	—	33,61	34,59	34,71	33,01
Euthemisto libellula MANDT.	—	rr	—	—	—	—
Parathemisto obliqua KRÖYER	—	rr	r	—	—	—
Boreophausia inermis KRÖYER (fide G. O. SARS)	—	r	—	—	r	—
Calanus finmarchicus GUNN.	cc	cc	c	+	c	c
C. hyperboreus KRÖYER	c	c	—	+	c	+
Chiridius armatus BOECK.	+	—	—	—	rr	—
Euchaeta norvegica BOECK.	r	r	—	—	—	r
Metridia longa LUBB.	c	c	—	r	+	c
Microsetella atlantica BRADY & ROBT.	—	rr	—	—	r	—
Oithona similis CLAUS	—	r	r	r	r	r
Oncaea conifera GIESBR.	—	—	—	—	rr	rr
O. minuta GIESBR.	—	rr	—	—	rr	r
Pseudocalanus elongatus BOECK.	r	—	—	—	—	—
Conchoecia borealis G. O. SARS (fide G. ANDERSSON)	—	—	—	—	—	r
C. elegans G. O. SARS (fide G. ANDERSSON)	+	—	—	—	—	—
Clione limacina PHIPPS	—	—	r	—	—	—
Limacina helicina PHIPPS	r	rr	r	r	rr	r
Krohnia hamata MOEB.	r	—	—	—	r	r
Sagitta arctica AURIV.	r	+	—	—	rr	r
Aglantha digitale FABR.	r	—	—	—	—	—
Botryopyle setosa CL.	—	rr	—	—	rr	—
Collozoum inerme J. MÜLL.	—	—	—	—	rr	—
Litholophus ligurinus HKL.	—	rr	—	r	—	—
Globigerina (pachyderma)	—	rr	—	—	r	—
Chaetoceros atlanticus CL.	—	rr	—	—	—	r
C. borealis BTW.	—	rr	—	—	—	—
C. criophilus CASTR.	—	—	r	—	—	—
C. decipiens CL.	—	r	r	—	r	—
Coscinodiscus oculus iridis EHB.	r	+	r	—	r	r
Encampia grönländica CL.	—	—	—	rr	—	—
Fragilaria oceanica CL.	—	c	—	rr	r	r
Rhizosolenia semispina HENSEN	—	—	r	—	r	—
Thalassiosira gravis CL.	—	r	—	—	r	—

¹ Surface sterile. — There were found in some samples rare specimens of a large *Oikopleura*.

The plankton is essentially the same as was found in the deeper strata in the S.E. above the slope of the 200 metre plateau towards the Norwegian depth. Thus the same kind of plankton ruled on the greater depths of the northern Atlantic from Greenland to the Scotch and Norwegian coast banks. Most characteristic forms are *Calanus hyperboreus*, *Chiridius armatus*, *Euchata norvegica*, *Metridia longa*, *Oncaea conifera*, *O. minuta*, *Conchoecia borealis*, *C. elegans*, *Krohnia hamata* and *Sagitta arctica*.

4. Samples collected in August.

During that month the »Antaretic» visited the fjords of E. Greenland, between 71° and 73° N. and there were collected a smaller number of samples, the examination of which gave the following result.

Date.	7	8	8	8	9	9	10	13	14	18	25
Lat. N.	70° 50'	71° 12'	71° 30'	71° 55'	73° 10'	73° 21'	73° 9'	73° 9'	73° 5'	72° 45'	73° 29'
Long. W.	22° 31'	20° 21'	19° 48'	19° 51'	22° 19'	24° 22'	27° 14'	27° 15'	24° 47'	22° 59'	24° 43'
Temperature	7,1	2,7	2,2	2,0	3,4	2,4	4,0	6,5	5,85	6,55	5,55
Salinity	—	30,10	29,98	29,33	26,39	29,57	—	22,08	23,03	—	20,90
Euthemisto libellula MANDT	—	—	—	—	—	r	—	—	—	—	—
Pseudalibrotos littorales KRÖYER (fide G. O. SARS)	—	—	—	—	—	rr	—	—	—	—	—
Calanus finmarchicus GUNN.	—	—	—	c	—	c	c	c	—	r	r
Oithona similis CLAUS	cc	—	—	—	r	—	—	—	—	—	—
Clione limacina PHIPPS.	+	—	—	—	—	—	—	—	—	—	—
Limacina helicina PHIPPS.	r	—	—	—	—	—	—	—	—	—	—
Cyttarocylis gigantea BRANDT	—	—	—	—	+	r	—	—	—	—	—
Ptychoeclis arctica BRANDT	r	—	—	—	—	—	—	—	—	—	—
Ceratium arcticum EHB.	c	r	—	—	r	—	—	—	r	—	r
Peridinium ovatum POUCHET	r	rr	rr	—	—	—	—	—	—	—	—
P. pellucidum BERGH.	—	rr	rr	—	—	—	—	—	—	—	—
Dinobryum pellucidum LEVANDER	—	ccc	r	+	—	—	—	—	—	—	—
Chaetoceros borealis BTW.	—	—	—	—	—	—	—	—	r	—	—
var. Brightwelli CL.	—	—	—	—	—	—	—	—	r	—	—
C. criophilus CASTR.	—	—	—	—	r	r	—	—	—	—	—
C. decipiens CL.	c	r	—	—	r	—	+	—	r	—	r
Coscinodiscus oculus iridis EHB.	—	—	r	—	r	r	—	—	r	—	—

The above list shews a very poor plankton, in part from the intrusion of oceanic water, containing *Oithona similis*, *Chaetoceros decipiens* and *Ceratium arcticum*.

Outside the fjords some samples were collected during the last days of August at 73° 15' N. 21° 25' W. (temp. 4,35, sal. 28,64) and at 72° 28' N. 16° 13' W. (temp. 1,1, sal. 29,00). The first named was sterile, the latter contained *Oithona similis* r and *Limacina helicina* c.

5. Samples collected in September.

The »Antarctic» left Greenland early in September and returned by the same route it had taken on going out. Samples were collected during the whole voyage both from the surface and from the deeper layers, the latter at the same stations as in June and July.

The contents of the samples from the surface have been catalogized in the following table:

Number	1	5	6	7	8	9	10	11	12	13	14	15	16	17
Date	1	3	3	3	3	4	4	4	5	5	6	6	7	9
Lat. N.	71° 14'	68° 45'	68° 22'	68° 12'	67° 58'	67° 14'	66° 51'	66° 40'	65° 59'	65° 55'	65° 20'	65°	62° 19'	60° 7'
Long.	14° 37' W.	10° W.	8° 10' W.	7° 20' W.	6° 25' W.	4° 5' W.	3° 42' W.	2° 55' W.	2° 24' W.	2° 21' W.	2° W.	2° 40' W.	0° 40' E.	3° 14' E.
Temp.	4,4	6,4	6,85	7,1	7,3	8,6	8,15	9,2	9,65	9,7	9,75	10,0	12,0	13,35
Sal.	31,51	34,62	34,62	34,65	34,65	35,06	34,83	35,03	35,07	35,12	34,96	35,01	35,20	33,08
Anomalocera Patersonii TEMPLT.	—	—	—	—	—	—	—	—	—	—	—	—	r	c
Calanus finmarchicus GUNN.	—	ccc	c	ccc	+	—	ccc	ccc	ccc	ccc	ccc	+	c	+
Oithona similis CLAUS.	rr	—	r	—	—	+	r	r	cc	ccc	cc	—	—	c
Limacina helicina PHIPPS.	ccc	—	—	—	—	—	—	—	—	—	—	—	—	—
Sagitta arctica AURIV.	—	—	—	—	—	—	r	r	—	—	—	—	—	—
S. bipunctata QUOI & GAIM.	—	—	—	—	—	—	—	—	r	+	—	—	—	—
Aglantha digitale O. F. MÜLL.	—	—	—	—	—	—	—	r	—	—	—	r	r	—
Cyttarocypris gigantea BRANDT.	—	—	—	—	—	r	—	—	r	—	—	—	—	—
Globigerina	—	—	r	—	—	r	+	+	r	r	r	r	—	—
Acanthometron quadrifolium HKL.	—	—	—	—	—	—	—	r	r	r	r	—	c	+
Ceratium arcticum EHB.	rr	r	c	—	—	—	r	—	—	—	—	—	—	—
C. fusus DUJ.	—	—	—	—	—	—	—	r	rr	—	r	—	c	r
C. longipes BAIL.	—	—	r	—	c	cc	r	r	r	r	+	—	—	—
C. macroceros EHB.	—	—	—	—	—	r	—	—	r	r	r	—	cc	cc
Halosphæra (small form)	—	—	—	—	—	—	—	r	rr	r	—	—	+	—
Chaetoceros volans SCHÜTT.	—	—	—	—	—	—	—	—	—	—	r	ccc	—	—
Rhizosolenia gracillima CL.	—	—	—	—	—	—	—	r	—	+	—	—	cc	—
Plankton-type	Ng	T	T	T	Ns.	Ns. (S.)	T. (S.)	T. (S.)	T. S.	T. S.	T. S.	S. T.	Tr.Nm.	Tr.

From this table some sterile or poor samples have been left out, viz:

Sept. 1th. 71° 33' N. 15° 10' W. (temp. 1,25, sal. 29,48). Contained some few specimens of *Oithona similis* and *Chaetoceros dicipiens*.

Sept. 2nd. 69° 21' N. 12° 35' W. (temp. 6,1, sal. 34,69). Contained abundantly *Pseudocalanus elongatus*, and some rare specimens of *Parathemisto obliqua*, *Calanus finmarchicus* and *Chaetoceros dicipiens*.

Sept. 2nd. 69° 40' N. 12° 50' W. (temp. 6,1, sal. 34,65). Contained some rare specimens of *Calanus finmarchicus*.

Sept. 2nd. 69° 59' N. 13° 13' W. (temp. 6,2, sal. 34,65). Contained some few specimens of *Eutthemisto libellula*.

From the above list the following rarer forms have been excluded:

<i>Acartia Clausii</i> GIESBR. 16 r.	<i>Acanthochiasma Krohnii</i> HKL. 16 r.
<i>Centropages typicus</i> KRÖYER 17 r.	<i>Collozoum inerme</i> J. MÜLL. 6 r.
<i>Metridia hibernica</i> BRADY & ROBERTS. 16 r.	<i>Litolophus ligurinus</i> HKL. 14 r.
<i>Microsetella atlantica</i> BRADY & ROBERTS. 8 r.	<i>Ceratium furca</i> DUJ. 16 r.
<i>Temora longicornis</i> O. F. MÜLL. 17 r.	<i>C. tripos</i> NITZSCH. 16 +, 17 r.
<i>Evadne Nordmanni</i> LOVÉN. 8 r.	<i>Coscinodiscus oculus iridis</i> EHB. 9 r.
<i>Acanthochiasma fusiforme</i> HKL. 12 r.	<i>Rizosolenia styliiformis</i> BTW. 5 and 6 r.

Near the east coast of Greenland water of a low salinity (31,51) containing chiefly *Limacina helicina* prevailed. S. of Jan Mayen the salinity increased to somewhat more than 34 p. m., but the water was practically sterile. First at 68° 45' N. 10° W. *Calanus finmarchicus* appeared in abundance and continued so across the whole northern Atlantic, with the exception of the space 67°—68° N. 4°—6° W., where the water contained the neritic *Ceratium longipes*, probably derived from Iceland.

If the plankton of the northern Atlantic in the spring be compared with that of the autumn, it becomes immediately apparent that great changes had occurred. *Calanus finmarchicus* was of little importance in the plankton that ruled during the spring on the surface, but occurred abundantly in the deeper layers. When it occurred so abundantly in September near the surface, it may be assumed that the deeper strata had during the summer ascended to the surface. The great mass of *Chaetoceros decipiens*, that occurred in the spring above the Norwegian Depth had in September disappeared completely. On the other hand this species occurred in September more or less abundantly from the N. of Spitzbergen to Beeren Island, so it may be assumed that the water containing *chaetoplankton* migrated during the summer towards Spitzbergen.

The *Phaeocystis Pouchetii*, that prevailed during the spring both in the east above the 200 metre plateau and in the west round Jan Mayen, had in September disappeared. Its place had in the autumn been taken above the 200 metre plateau by *tripos-plankton*. Round Jan Mayen the water was nearly sterile.

The examination of the deep-sea hauls shews that the state at the station *G*, which corresponds to the station *E* in June, had not been much changed, *Calanus finmarchicus* being at both stations the most important species. But the more striking is the difference of the plankton taken at the stations *H*, *I*, *J*, which correspond to the stations *D*, *C*, *B* in June. In fact, there exists not the slightest resemblance. In June there occurred the same kind of *tricho-plankton* as at the station *G*, but in September the southern *Rhizosolenia gracillima* constituted almost alone the bulk of the plankton. This species was found abundantly both at Plymouth and in the Färöe Channel already in July and August. To judge from observations in 1898 this species had advanced from the Bay of Biscay and the region between the Azores and the European coast. The named species enters regularly during the summer the plankton of the Baltic current of the Skagerak and in enormous quantities, but I never saw it abundantly in the North Sea, for which reason it seems not improbable that it arrives in the Skagerak through the »Norske Rende». This species appears in the Skagerak usually in May, and in case the plankton at the stations

H, I, J should be the same as appears in May in the Skagerak, the current would require about seven months.

At the station *K*, that corresponds to *A* (May 31th), the plankton is now typical *tripos-plankton*, but in May there prevailed *chaeto-plankton*, that contained mainly *Phaeocystis Pouchetii*.

The great changes, which occurred in the northern Atlantic since the spring, can be summarized in the following manner:

1. In the western regions the deeper strata, containing *Calanus finmarchicus*, had come to the surface.

2. In the eastern regions the water, containing in the spring *arctic species*, migrated towards Spitzbergen and became replaced by water from the *temperate eastern* Atlantic.

Tak

Number	1	2	3	4	5	
Date	26	27	27	28	28	
Latitude N.	57° 49'	57° 53'	57° 50'	57° 35'	57° 35'	5
Longitude E.	9° 21' E.	7° 52'	6° 58'	4° 58'	4° 25'	3
Depth in metre	0	0	0	0	0	
Temperature	8,2	9,35	10,15	8,9	8,3	
Salinity	34,83	25,92	23,52	32,62	34,94	4
Acartia Clausii GIESBR.	+	c	—	—	—	
Anomalocera Patersonii TEMPLT.	—	—	—	r	—	
Calanus finmarchiens GUNN.	—	—	—	cc	—	
Oithona similis CLAUS	c	+	—	+	+	
Pseudocalanus elongatus BOECK	c	—	—	+	—	
Temora longicornis O. F. MÜLL.	—	—	—	+	—	
Evadne Nordmanni LOVÉN	r	c	—	cc	+	
Halosphæra (large form)	—	—	—	—	—	
Ceratium furca DUJ.	r	r	r	r	r	
C. fusus DUJ.	r	r	—	r	—	
C. longipes BAIL.	—	+	+	ccc	+	
C. macroceros EHB.	r	+	—	c	r	
C. tripos NITZSCH	cc	ccc	+	+	+	
Peridinium depressum BAIL.	—	—	—	r	—	
Phæocystis Pouchetii LAGERH.	—	—	—	—	—	
Chaetoceros borealis BTW.	—	—	—	—	—	
C. debilis CL.	—	—	—	—	—	
C. decipiens CL.	—	r	+	—	r	
C. hiemalis CL.	—	r	c	—	c	
Leptocylindrus daucus CL.	—	—	cc	—	c	
Rhizosolenia styliformis BTW.	+	—	—	—	—	
Plankton-type	Tp.	Tp.	Ns.	Ns.	Ns.	

Ty.

7	8	9	10	11	12	13	14	15	16	17	18
29	29	30	30	31	31	31	31	31	31	31	31
57° 48'	58° 1'	59° 13'	60° 14'	60° 47'	61° 21'	61° 16'	61° 16'	61° 16'	61° 16'	61° 16'	61° 16'
2° 45'	2° 37'	1° 50'	1° 9'	1° 9'	1° 10'	1° 18'	1° 18'	1° 18'	1° 18'	1° 18'	1° 18'
0	0	0	0	0	0	0	0	10	30	50	100
8,85	8,55	8,45	8,9	8,1	8,7	8,52	8,40	8,12	7,68	7,35	7,35
35,20	35,20	35,00	35,25	35,37	35,25	35,39	35,37	35,37	35,34	35,34	35,34
r	+	—	—	—	—	—	—	r	—	—	r
rr	—	—	—	—	—	—	—	—	—	—	rr
—	+	—	+	—	—	r	—	r	—	r	r
—	—	—	e	—	—	—	—	—	r	—	r
—	+	—	+	—	—	—	—	r	—	r	—
—	—	—	r	—	—	—	—	—	—	—	—
+	r	e	e	—	—	—	—	—	—	—	—
r	—	—	rr	—	—	—	r	—	—	—	rr
r	e	e	+	—	—	r	—	—	—	—	—
r	—	e	r	—	—	—	—	—	—	—	—
cc	cc	cc	cc	—	+	r	—	—	—	—	—
—	—	rr	—	—	—	—	—	—	—	—	—
e	e	cc	e	—	r	—	—	—	—	—	—
—	e	e	e	—	r	—	—	—	r	—	—
ccc	cc	—	c	ccc	ccc	ccc	ccc	ccc	ccc	ccc	ccc
—	+	—	r	r	r	r	—	r	—	r	r
—	—	—	—	—	—	r	r	r	—	r	r
—	—	—	—	—	r	—	—	—	r	r	r
—	—	—	—	—	—	—	—	—	—	—	—
—	—	rr	—	—	—	—	—	—	—	—	—
r	r	—	r	+	—	rr	r	—	rr	r	r

s. (Tp.)

Cβ. Ns.

Cβ. Ns. Tp.

Ns. Tp.

Ns. Tp.

Cβ.

Cβ.

Cβ.

Cβ.

Cβ.

Cβ.

Cβ.

Cβ.

Tab

Number	1	2	3	4	5	6	7	8
Date	1	1	4	4	4	4	5	6
Latitude N.	62° 21'	62° 35'	67° 46'	66° 21'	66° 33'	66° 36'	66° 55'	67° 39'
Longitude	0° 37' E.	0° 35' E.	2° 44' W.	2° 32' W.	2° 39' W.	2° 42' W.	2° 55' W.	6° 21' W.
Temperature	9,05	8,95	1,45	3,9	4,65	3,7	4,4	4,45
Salinity	35,36	35,36	34,67	35,00	35,10	35,01	35,12	34,96
Euthemisto libellula MANDT	—	—	—	c	—	r	c	r
Calanus finmarchicus GUNN.	+	cc	—	r	r	r	—	—
Oithona similis CLAUS.	r	c	—	r	—	—	—	+
Cyttarocilis (dentic. v.) gigantea BRANDT.	—	cc	—	+	r	—	r	—
Globigerina	—	—	—	r	+	r	—	+
Ceratium arcticum EHB.	—	—	—	+	r	rr	—	—
Phaeocystis Pouchetii LAGH.	—	—	—	—	—	—	—	—
Chaetoceros atlanticus CL.	—	—	—	+	r	r	—	—
C. borealis BTW.	r	r	r	r	r	r	—	—
C. criophilus CASTR.	—	—	cc	—	—	—	—	cc
C. decipiens CL.	r	r	—	cc	ccc	ccc	c	+
Coscinodiscus oculus iridis EHB.	—	—	—	—	r	r	—	—
C. radiatus EHB.	r	—	—	—	r	—	—	—
Rhizosolenia obtusa HENSEN	—	—	r	—	—	—	—	c
R. semispina HENSEN	ccc	—	r	r	—	—	—	c
Thalassiothrix longissima CL. & GRUN.	—	—	r	r	—	rr	—	r
Plankton type	T.	T.	T.	C.	C.	C.	C.	T.

¹ The sign Cβ. is perhaps to be changed for T., as the salinity agrees better with T. than with C.

Surface.

	14	15	17	18	19	20	21	22, 23	24	25	26	27	28	30
	9	9	11	15	16	16	20	21	24	24	24	25	25	26
	69° 25'	69° 50'	71° 8'	70° 55'	71° 10'	71° 9'	71°	71°	71°	71° 33'	71° 53'	72° 20'	72° 50'	73° 3'
N.	13° 4' W.	13° 26' W.	9° 40'	8° 30' W.	7° 56' W.	8° 7' W.	8° 52' W.	8° 52' W.	8° 52' W.	9° 30' W.	9° 45' W.	6° 45' W.	5° 40' W.	4° 30' W.
	0	0,1	0,9	0,7	0,9	1,0	2,0	1,7	1,85	1,2	0,75	2,5	0,25	— 0,5
G	34,83	34,84	34,88	34,94	34,76	34,77	—	—	34,83	33,83	33,69	34,77	33,20	32,92
e	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
e	—	—	—	—	—	—	—	r	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
r	r	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
+	+	ccc	e	e	r	+	ccc	e	ccc	+	e	+	—	—
—	—	—	r	—	+	r	—	rr	r	e	rr	r	r	+
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
cc	cc	r	r	—	r	r	—	—	—	e	+	r	r	e
r	r	—	r	+	—	r	r	rr	r	e	—	r	r	r
—	—	—	r	—	—	—	—	—	r	—	—	—	—	—
r	r	+	—	—	—	—	—	rr	—	—	—	—	—	—
e	e	—	—	—	—	—	—	—	—	r	—	—	—	r
e	e	—	r	r	+	r	—	rr	r	e	+	r	r	+
—	—	rr	—	—	—	—	—	—	—	—	—	—	—	—
T.	T.	C _β .	C _β .	C _β .	T.	(C _β .)	C _β .	C _β .	C _β .	T. C _β .	C _β .	(C _β)	(T.)	T. ¹

Table III.

		Station B. (Bottom 667 m.)										
Date		1										
Latitude N.		62° 15' N.								6		
Longitude		0° 37' E.										
Depth in metre (haul to 0 from)		0	10	25	50	100	150	200	400	0	10	25
Temperature		8,70	8,63	8,45	7,50	6,97	6,00	5,4	1,4	7,01	6,92	6,42
Salinity		35,41	35,37	35,39	35,35	35,34	35,29	35,25	35,01	34,98	34,81	34,96
Parathemisto ohlivia KRÖYER	—	—	—	—	—	—	—	—	—	—	—	—
Calanus finmarchicus GUNN.	—	c	ccc	ccc	ccc	ccc	cc	ccc	cc	c	ccc	ccc
C. hyperboreus KRÖYER	—	—	—	—	—	—	—	—	—	—	—	—
Chiridius armatus BOECK	—	—	—	—	—	—	—	—	—	—	—	—
Euchaeta norvegica BOECK	—	—	—	—	—	—	r	—	—	—	—	—
Metridia longa LUBBOCK	—	—	—	—	—	—	—	—	—	—	—	—
Microsetella atlantica BIARD & ROETS	—	—	—	—	—	rr	—	rr	r	—	—	—
Oithona plumifera BAIRD	—	—	—	—	—	—	r	rr	—	—	—	—
O. similis CLAUS	r	r	+	+	c	c	c	c	+	+	—	+
Oncaea conifera GIESBR.	—	—	—	—	rr	—	r	rr	rr	—	—	—
O. minuta GIESBR.	—	r	rr	r	r	—	r	r	r	+	rr	r
Pseudocalanus elongatus BOECK	—	—	rr	—	—	—	r	rr	—	—	—	—
Krohnia hamata MÖBIUS	—	—	—	—	—	—	r	—	—	—	—	—
Sagitta arctica AURIV.	—	—	—	—	—	—	—	—	—	—	—	—
Aglantha digitale O. F. MÜLL.	—	—	—	—	—	—	—	—	—	—	—	—
Cyttarocylis gigantea BRANDT	—	—	r	rr	r	—	r	r	r	rr	—	—
Acanthonia tetracopa J. MÜLL.	—	—	rr	—	—	—	—	rr	—	—	—	—
Collozoum inermis J. MÜLL.	—	—	—	—	—	—	—	—	—	—	—	—
Litholophus ligurinus HKL.	r	—	rr	rr	—	—	r	—	rr	—	—	—
Plectophora arachnoides CLAP. & LACHM.	—	—	rr	—	—	—	rr	rr	—	—	—	—
Globigerina (pachyderma)	—	r	—	—	—	—	—	—	—	—	—	—
Ceratium (trip. var.) arcticum EHB.	—	r	—	—	—	—	—	—	—	+	rr	—
C. furca DUJ.	—	r	+	r	r	r	r	c	r	—	—	—
C. fusus DUJ.	r	r	r	r	r	r	r	r	r	—	—	—
C. (trip. var.) longipes BAILL.	r	—	+	r	r	—	r	r	r	rr	—	—
C. tripos NITZSCH	—	r	+	—	—	—	r	r	r	—	—	—
Diplopsalis lenticula BERGH	—	—	—	—	—	—	r	rr	r	—	—	—
Peridinium depressum BAILL.	—	—	—	—	—	—	—	—	—	r	r	—
Phaeocystis Pouchetii LAGH.	—	—	—	—	—	—	—	—	—	—	—	—
Chaetoceros atlanticus CL.	r	—	—	—	—	r	—	—	—	+	r	—
C. borealis BTW.	c	r	—	r	r	r	r	r	—	r	—	—
C. debilis CL.	—	—	—	—	—	—	—	—	r	—	—	—
C. decipiens CL.	c	r	rr	r	r	r	r	r	r	cc	+	r
Coscinodiscus oculus iridis EHB.	r	—	—	—	—	—	—	r	—	r	c	r
C. radatus EHB.	—	r	rr	—	—	—	—	—	—	+	+	—
Rizosolenia styliformis BTW.	—	rr	—	—	—	—	—	—	—	—	—	—
Talassiothrix longissima CL. & GRUN.	—	—	—	—	—	—	—	—	rr	—	rr	—
Plankton-type	C.	T.	T.	T.	T.	T.	T.	T.	T.	C.	T.	T.

Sea Hauls.

Station D (bottom 2,800 m.).			Station E (bottom 3,500 m.).															
3											5							
64° 35' N.											66° 53' N.							
1° 29' W.											2° 52' W.							
150	200	450	0	10	25	50	100	150	200	550	0	25	50	100	150	200	500	25
3,0	2,4	0,8	5,46	—	5,36	4,92	4,68	3,3	2,95	0,5	4,12	3,97	3,90	3,22	2,73	2,50	—	—
34,96	34,97	35,03	35,06	—	35,06	35,12	35,03	34,96	34,98	35,01	35,06	35,06	35,08	35,06	35,03	35,05	35,01	—
—	+	—	—	—	—	—	+	+	+	r	—	—	—	r	r	—	r	—
c	ccc	ccc	c	c	c	c	c	c	c	cc	—	cc	c	ccc	ccc	c	c	ccc
r	+	r	—	—	—	—	—	—	—	+	—	r	+	r	+	c	c	c
—	—	—	—	—	—	—	—	—	—	rr	—	—	—	—	—	—	r	—
—	rr	—	—	—	—	—	—	—	—	rr	—	—	—	—	—	rr	+	—
—	—	r	—	—	—	—	—	—	—	r	—	—	—	—	—	rr	cc	—
—	rr	—	—	—	—	rr	—	—	—	rr	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	rr	r	—	—	—	—	—	—	—	—
+	c	+	r	r	r	c	r	r	r	+	—	r	r	rr	r	—	r	—
r	+	r	+	—	—	—	r	r	r	r	—	—	—	—	r	r	r	—
+	+	+	r	r	r	rr	r	r	+	r	—	—	—	rr	r	—	+	—
+	—	—	+	+	+	+	c	+	c	c	—	—	—	r	+	rr	+	—
r	+	—	—	—	—	—	r	r	r	r	—	—	—	r	r	r	r	—
—	—	—	—	—	—	—	—	—	—	r	—	—	—	—	—	+	+	—
—	—	r	—	—	—	—	—	—	—	—	—	—	—	—	—	—	r	—
—	—	r	r	r	r	r	r	r	—	r	r	—	—	—	—	—	—	—
—	rr	rr	—	—	—	rr	—	rr	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	r	r	r	r	r	r	—	—	—	r	r	r	r	—
r	—	rr	—	—	—	—	r	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	c	c	—	—	r	rr	r	—	r	+	+	—	—	r	r	+	+	—
—	rr	—	r	r	rr	r	r	+	rr	—	r	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	r	rr	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
r	—	—	—	r	—	—	—	r	rr	r	r	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	c	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	rr	—	—	r	—	—	—	—	r	—	—	—	—	—	—	—	—
—	—	—	+	+	—	r	—	—	r	—	—	—	—	—	—	—	—	—
—	—	—	+	c	c	c	c	c	cc	+	c	r	—	—	—	—	—	—
—	—	—	c	ccc	cc	cc	c	cc	cc	cc	—	—	—	—	—	—	—	—
—	—	—	+	—	r	+	—	+	r	+	—	—	—	—	—	—	—	—
+	r	r	ccc	ccc	ccc	cc	cc	cc	ccc	cc	cc	—	rr	rr	—	—	—	—
—	+	c	—	—	r	—	—	—	+	r	r	—	—	—	—	—	—	—
+	c	—	+	+	r	+	+	+	+	r	—	—	—	—	—	—	—	—
—	—	—	r	—	—	—	—	—	—	—	r	r	rr	—	—	—	—	—
—	rr	—	—	r	rr	rr	rr	rr	rr	rr	r	—	—	—	—	—	—	—
T. S.	T. S.	T. S.	C.	C.	C.	C.	C.	C.	C.	C.	C.	T.	T.	T.	T.	T.	T.	T.

Table IV. September 37

Date	Station G.						
	4						
Latitude N.	66° 52'						
Longitude	2° 55' W.						
Depth in metre	0	25	50	100	167	300	5
Temperature	8.61	8.11	7.08	2.95	2.44	1.94	0
Salinity	34.86	34.88	34.94	35.06	35.06	35.12	3
Boreophausia inermis KRÖYER (fide G. O. Sars)	—	—	r	r	r	r	—
Nyctiphanes norvegicus M. Sars (fide G. O. Sars)	—	—	—	—	—	—	—
Thysanoessa longicaudata KRÖYER (fide G. O. Sars)	—	—	r	—	—	—	—
Parathemisto obliqua KRÖYER	—	—	—	rr	—	r	—
Acartia Clausii GIESBR.	—	—	—	—	—	—	—
Calanus finmarchicus GUNN.	ccc	ccc	ccc	ccc	ccc	ccc	c
Centropages typicus KRÖYER	—	—	—	—	—	—	—
Euchaeta norvegica BOECK	—	—	—	+	r	r	—
Metridia hibernica BRADY & ROBERTS	—	—	—	—	—	—	—
M. longa LUBB.	—	—	—	—	rr	r	—
Microsetella atlantica BRADY & ROBERTS	—	—	—	—	r	r	—
Oithona plumifera BAIRD.	—	—	—	—	—	rr	—
O. similis CLAUS	—	r	rr	—	+	+	—
Oncaea minuta GIESBR.	—	—	—	—	—	rr	—
Paracalanus parvus CLAUS	—	—	—	—	—	—	—
Pseudocalanus elongatus BOECK	—	—	—	—	—	r	—
Temora longicornis O. F. MÜLL.	—	—	—	—	—	—	—
Conchoecia elegans G. O. Sars	—	—	—	—	—	rr	r
Krohnia hamata MOEBIUS	—	r	+	+	—	+	—
Sagitta arctica AURIV.	—	r	—	—	r	+	—
S. bipunctata QUOI & GAIM.	—	r	—	—	—	—	—
Salpa sp.	—	—	—	—	—	—	—
Arachnactis albida N. Sars	—	—	—	—	—	—	—
Aglantha digitale O. F. MÜLL.	—	—	—	—	—	—	—
Tiara pileata L. AGASS	—	—	—	—	—	—	—
Acanthometron elasticum HKL.	—	—	—	—	—	rr	—
A. quadrifolium HKL.	—	—	—	—	—	—	—
Collozoum inermis J. MÜLL.	—	—	—	—	—	—	—
Globigerina	—	—	—	—	—	—	—
Halosphaera (small)	—	—	—	—	—	—	—
Ceratium arcticum EHB.	—	—	—	—	rr	+	—
C. (trip. var.) bucephalum CL.	—	—	—	—	—	—	—
C. furca DCJ.	—	—	—	—	—	—	—
C. fusus DCJ.	—	—	—	—	—	—	—

Table IV. September

Station G.							
<i>Date</i>	4						
<i>Latitude N.</i>	66° 52'						
<i>Longitude</i>	2° 55' W.						
<i>Depth in metre</i>	0	25	50	100	167	300	
<i>Temperature</i>	8.61	8.11	7.08	2.95	2.44	1.94	
<i>Salinity</i>	34.86	34.88	34.94	35.06	35.06	35.12	
<i>C. (trip. var.) macroceros</i> EHB.	—	—	—	—	—	—	
<i>C. tripos</i> NITZSCH.	—	—	—	—	—	—	
<i>Peridinium depressum</i> BAIL.	—	—	—	—	rr	r	
<i>P. ovatum</i> POUCHET	—	—	—	—	—	—	
<i>Nanthidium multispinosum</i> MOEB.	—	—	—	—	—	—	
<i>Chaetoceros volans</i> SCHÜTT	—	—	—	—	—	—	
<i>Rhizosolenia alata</i> BTW.	—	—	—	—	—	—	
<i>R. gracillima</i> CL.	—	—	—	—	—	—	
<i>R. styliformis</i> BTW.	—	—	—	—	—	—	
<i>Plankton-type</i>	T.	T.	T.	T.	T.	T.	

Dep-Sea Hauls.

Station H.				Station I.				Station J.				Station K.			
6				7				8				8			
64° 34'				63° 28'				62° 17'				61° 15'			
1° 30' W.				0° 32' E.				0° 37' E.				1° 19' E.			
0	25	50	100	0	25	50	100	0	25	50	100	0	25	50	100
0,87	10,25	7,77	6,67	11,24	10,40	8,86	7,82	11,65	10,60	9,90	9,43	12,79	12,76	9,71	8,70
0,04	35,20	35,39	35,41	35,34	35,34	35,46	35,46	35,34	35,46	35,45	35,51	35,34	35,34	35,46	35,41
—	—	—	—	r	—	—	—	—	—	—	—	ccc	cc	cc	cc
—	—	—	—	—	—	—	—	—	—	—	r	c	c	+	c
—	—	—	—	—	—	—	—	—	—	—	—	—	—	r	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	rr
—	—	—	—	—	—	—	—	—	—	—	—	—	r	—	—
rr	—	—	—	—	—	—	—	—	—	—	rr	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	r	—	—	—	—
c	c	cc	+	cc	ccc	ccc	ccc	ccc	ccc	ccc	ccc	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	rr	—	—
s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	TP	TP.	TP.	TP.