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REPORT  
ON  
HYDROGRAPHIC INVESTIGATIONS  
IN THE  
NORTH SEA AND FAEROE-SHETLAND CHANNEL  
DURING THE YEARS 1907-1908.

BY  
A. J. ROBERTSON, D.Sc.

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(WITH 9 PLATES).

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**THE HYDROGRAPHY OF THE NORTH SEA, 1907-1908.**

**THE ABERDEEN-SHETLAND AREA. (Plate I.)**

The material available for the year 1907 over the Aberdeen-Shetland area consists of observations taken during February, May, August and November, and the resulting sections indicate very clearly the changes which took place throughout that year in the volume of Atlantic water entering the North Sea through the channels south of Shetland.

When the February observations were taken, the usual spring inflow from the Atlantic had set in, the whole area northward of Station 3 being at that time flooded by salt water of 35.25 per mille and over. Two tongues of maximum salinity marked the progress of the inflow round the north and south of Shetland respectively. At the more southerly stations the salinity was greatest in the surface layers, indicating the southward movement of Atlantic water towards the Scottish coast.

Three months later, in the second week of May, the distribution of Atlantic water was considerably more extensive, the 35 per mille isohaline having in the meantime moved southwards to within some 20 miles of the Scottish coast. The two tongues of 35.25 per mille water were again in evidence in the neighbourhood of Shetland, where they were separated by a wedge of slightly less saline water in the region of Station 5.

The hydrographic conditions during the spring and early summer of 1907 thus corresponded closely with those existing in previous years since the start of the investigations in 1902, the gradual increase in the Atlantic inflow during the earlier months to a maximum in April or May being now regarded as a well-established seasonal change. If the agreement during 1907 were to continue still further, we should expect to find a diminution in the Atlantic supplies by the time the August observations were taken. In contrast to previous years, however, an even more extensive Atlantic distribution was then shown, the whole area from Station 26 northwards being at that time flooded by water of 35.2 per mille and over, which in the bottom layers penetrated within a few miles of the Scottish coast. We must, accordingly, in the light of former evidence, look upon the summer Atlantic inflow of 1907 as an unusually extensive one, and must recognize further that the period of maximum volume was delayed somewhat beyond the usual time.

When the November observations were taken, the distribution of salt water was particularly scanty over the whole region, no 35.2 per mille water then appearing at any point along the section. The greater portion of the section was, however, still flooded by water exceeding 35 per mille salinity, the value of which remained exceedingly constant over a distance of some 100 miles. The customary winter decrease in the Atlantic inflow was thus shown towards the close of 1907, but the change was more strongly marked than in previous years, probably on account of an unusual distribution having already set in over the surrounding regions.

The conditions shown in the beginning of the following year were, indeed, quite abnormal in character, no water of 35 per mille being at that time present in any part of the section. This is the only occasion since the start of the investigations in the autumn of 1902 in which Atlantic water has been absent from this region, and in which, instead of the normally-occurring extensive distribution of high salinities, the maximum value

found was only 34.88 per mille, some four-tenths less than the normal. As the mean annual variation of salinity during the past five years has rarely exceeded one-tenth per mille over the greater part of this area, the distribution existing during the early part of 1908 was certainly abnormal in character. In place of the usual extensive Atlantic distribution, there then existed a body of fresh water some 50 miles wide, extending northwards beyond Shetland on the one hand and southward beyond Aberdeen on the other, and showing only the smallest variations in temperature and salinity over this distance of some hundreds of miles. As the result of the presence of this fresh-water barrier, the Atlantic inflow south of Shetland was then completely cut off, so that the only supplies of salt water entering the northern area of the North Sea during March, 1908, must have come round the north of Shetland. As we shall see later in studying the conditions at the entrance to the Norwegian Sea, the Atlantic distribution in the region north-east of Shetland was then particularly scanty, being, in fact, between the 61st and 62nd parallels, confined within limits only some 40 miles apart.

This southward movement of fresh water which took place during the early part of 1908 evidently originated in the western area of the Norwegian Sea near the East Icelandic Polar current, which current normally flows along the east coast of Iceland into the regions north of the Faeroes. Only under exceptional circumstances, however, can water of such character penetrate southwards beyond the Faeroe-Shetland Channel, the opposing flow of the northward-moving Atlantic stream being, under normal conditions, sufficiently powerful to prevent it. During the early part of 1908 unusual conditions must, accordingly, have prevailed in the surrounding regions, resulting in the powerful southward movement of Norwegian Sea water and Polar water which was in full force when the March observations were taken.

This fresh-water extension completely surrounded the Shetlands, as shown by the salinity values at 5*a*, 5*b*, 11, 11*a* and 12, but in the absence of observations from the Faeroe-Shetland Channel, we are unable to determine its precise westward limit. It seems probable, however, that it then flooded a great part of the region north of the Channel, deflecting the Atlantic stream largely away from its normal limits, and causing such Atlantic water as did enter the North Sea at that time to assume the form of an under-current. This point will be more fully discussed in dealing with the hydrography of the Faeroe-Shetland Channel.

The hydrographic distribution during March, 1908, thus indicated a complete flooding of the Aberdeen-Shetland area with water of low salinity, which at that time entirely cut off the Atlantic inflow south of Shetland. When the next observations were taken in the beginning of June, the Atlantic flow had once more been resumed, and had displaced this fresh water from all parts of the section. The salinity, however, was still below the normal value over the entire area, corresponding to Atlantic water diluted to a considerable extent. The scanty salt-water distribution which prevailed over the North Sea area during the summer months was apparently partly explained by the conditions of the previous spring, large volumes of fresh water having been swept eastwards on the resumption of the Atlantic inflow south of Shetland, producing a diluting effect over a considerable area of the North Sea.

The salinities over the Aberdeen-Shetland route showed a considerable increase when the August observations were taken, the greater part of the section being then flooded by water exceeding 35.15 per mille. That month apparently marked the period of maximum Atlantic inflow during the year 1908, when the effect, however, was much less marked than in normal years. Within the next few weeks, the salinity showed a marked decrease over the whole area, and by the middle of September water of 35.2 per mille had almost entirely disappeared from the section. The beginning of September may consequently be regarded as the commencement, during that year, of the annual diminution in the Atlantic inflow, which normally continues throughout the winter months. This diminution was marked in an unusual degree by the beginning of the following November, when a great part of the section was flooded by water of less than 35 per mille, which water in the surface layers extended northwards beyond Station 5. East of Shetland, however, the salinity was somewhat higher than in the previous September, the value from surface to bottom remaining constant at 35.23 per mille.

Considerable variations from the normal have thus been found to exist in the hydrographic conditions over the Aberdeen-Shetland area during these two years. In 1907, the full force of the Atlantic inflow was unusually long-continued and its maximum period delayed beyond the normal time; while in 1908, on the other hand, the Atlantic distribution was exceedingly scanty, more especially in the early part of the year, when water of 35 per mille was entirely absent from the section.



## SHETLAND TO NORWAY. (Plate II.)

Two lines of stations extend over the regions east of Shetland and both reach within a short distance of the Norwegian coast. One of these lines, including Stations 5*b*, 6, 7*c*, 7*b*, and 7*a*, follows a more or less easterly course, while the direction of the other (Stations 5*a*, 6, 7, 8) is a somewhat more northerly one. The material available over this area during the year 1907 is limited to a single complete set of observations in May, with a few isolated ones in August and November.

During May, 1907, the greater part of this region was flooded by water of high salinity, marking the southward inflow of Atlantic water into the North Sea. The centre of the flow appeared to lie near Station 6, on either side of which there extended a wedge of salt water of 35.3 per mille. The effect of Continental coast water was clearly marked as the most easterly points investigated, the surface salinity at Station 8 being, in consequence, reduced to 34.12 per mille.

This coastal effect was more clearly shown when the next observations were taken three months later, the fresh-water influence at that time extending westwards beyond Station 7, and the surface salinity at Station 8 having fallen to 33.4 per mille. As usual, however, the effect was mainly confined to the upper layers, the greater part of the section being then still flooded by salt Atlantic water. By the following November, a considerable reduction had taken place in the salinity of the waters near Shetland, but the usual salt Atlantic water was still present in the region of Station 6.

The next observations, taken in March 1908, show that the salt-water distribution east of Shetland, was then particularly small, this being, of course, quite in accordance with the conditions existing at the same time over the Aberdeen-Shetland area, which was then flooded by fresh water from the Norwegian Sea. This Norwegian Sea water extended some distance east of Shetland, so that the Atlantic distribution over these sections was exceedingly scanty. The only water of 35.2 per mille and over was found in the regions of Station 6, where it was entirely confined to a distance of some 20 miles. There still existed, however, a considerable volume of 35 per mille water, which was bounded on the west by the fresh Norwegian Sea water and on the east by water from the Continental coast. The distribution of this latter water then appeared to be more than usually extensive for such an early date, this being probably due to the abnormally small Atlantic inflow which was taking place at that time.

The summer observations for 1908 are limited to a few taken in the beginning of July at Stations 6, 6*a*, 7*a* and 8. The greater part of this area had, by that time, become once more flooded by Atlantic water, on the eastward side of which there extended the usual fresh water from the Continental coast. During the latter part of September, the influence of this coastal water was distributed over a much wider area, its westward extension then reaching within some 60 miles of Shetland. Except in the deeper layers, Atlantic water was then mainly confined to the Shetland side, and the salinities were everywhere reduced considerably below the normal value.

## ENTRANCE FROM NORTH SEA TO NORWEGIAN SEA. (Plate III.)

Observations from this area are available for May and August, 1907 and for March, July and September, 1908. Several new stations, situated well within the fresh-water area off the Norwegian Coast, were worked during the latter year, so that the section over this region now extends from the north-west of Shetland to within some 20 miles of Norway, a distance of about 180 miles.

During May, 1907, the greater part of this area was flooded by salt Atlantic water, marking the continuation of the northward flow from the Faeroe-Shetland channel to the Norwegian Sea. The deeper regions at Station 11*a* were, from 400 metres downwards, flooded by the usual cold bottom Norwegian Sea water of 34.8-34.9 per mille, the temperature at 1,300 metres depth being then  $-0.74^{\circ}\text{C}$ . The hydrographic distribution over the eastward part of the section showed salt Atlantic water underlying a fresher layer which contained a considerable admixture from the Continental coast. The surface salinity at the most easterly point did not, however, fall below 34 per mille.

Except for a more marked fresh-water effect at Station 8, the conditions remained much the same when the next observations were taken three months later. The hydrographic distribution at the more westerly stations was almost identical, and indicated the usual salt waters of the northward-flowing Atlantic Stream overlying the slow southward-moving bottom water, which is in direct connection with the deeper regions of the Norwegian Sea. The surface salinity at Station 8 then fell to 33.4 per

mille, but the westward fresh-water extension was unusually limited for the season and did not reach much beyond that station.

During March, 1908, the westward part of this section was entirely flooded by water from the western area of the Norwegian Sea, which during that month completely washed the Shetlands and extended southwards beyond Aberdeen. As already mentioned, the temperature and salinity of this water remained remarkably uniform over a very large area, the only exception being in the deeper regions north-east of Shetland. Thus at Station 11a, the temperature decreased rapidly from 200 metres downwards, but did not, even at 1,200 metres depth reach such a low limit as is commonly met with in the bottom water, north of the Wyville-Thomson ridge. The following data are of interest, both as showing the peculiar hydrographic distribution during March 1908 and as indicating the considerable changes which may take place within a comparatively short period even at the greatest depths :—

STATION 11a (61° 42' N - 2° W.)

August 1907.			March 1908.		
Depth.	Temp. °C.	Salinity.	Depth.	Temp. °C.	Salinity.
0	10·45	35·26	0	7·25	34·90
100 m.	8·11	35·23	100 m.	6·62	34·81
300 m.	5·54	35·01	300 m.	3·59	34·60
1200 m.	-1·02	34·88	1200 m.	-0·36	34·51

During March, 1908, Stations 11, 11a and 12 were all included within this fresh-water area. It is unfortunate that there are no observations for that month from the Faeroe-Shetland channel, as we are thus unable to determine the westward limit of the water in question. We have already seen that no Atlantic water was at that time entering the North Sea through the channels south of Shetland, and the more northerly inflow round the north of Shetland must, presumably, have sunk between this fresher water and entered in the form of an under-current. The distribution during March 1908 over the region north of Shetland will be more fully discussed when dealing with the hydrography of the Faeroe-Shetland channel.

The July observations did not extend westwards beyond Station 10, but three new stations (8a, 8b and 8c) were worked for the first time during that month. The western part of the section was then flooded by salt Atlantic water, which did not, however, extend eastwards much beyond Station 9. Near the Norwegian coast, there were encountered belts of water of alternately increasing and decreasing salinity, as shown by the surface observations at Stations 8a and 8b. Thus the surface salinity at the latter station was then 33·3 per mille, while at Station 8a, situated some 10 miles to the westward, the value was nearly 2 per mille less.

All the stations were worked in this area during September, 1908, the section for that month thus extending over a distance of about 180 miles. At Station 11a the usual conditions held good, viz., Atlantic water in the surface and Norwegian Sea water in the depths, the temperature at 1,200 metres then falling as low as -1·17°C. The centre of the Atlantic flow then appeared to lie between Stations 9 and 11, where the salinity varied from 35·2 to 35·3 per mille. The usual decrease of salinity was shown on passing towards the Norwegian coast, where the value in the region of Station 8 showed a decrease of more than 2 per mille in a distance of 20 miles.

During the years 1907 and 1908, the hydrographic conditions east and north-east of Shetland were thus much the same as formerly, except during the early part of 1908, when, on account of an abnormal southward movement of fresh water, the Atlantic distribution was particularly scanty. This southward movement originated in the western area of the Norwegian Sea near the East Icelandic Polar current, and resulted in the flooding of the regions south of Shetland with a mixture of Norwegian Sea water and Polar water, which completely cut off the Atlantic inflow between Shetland and Aberdeen. As regards the movements of the Continental inshore waters, our observations for these years are insufficient to determine the period of maximum westward extension. During the year 1908, however, these movements appear to have been more irregular than usual, and their effect was very marked at certain times over the more easterly area near the coast of Norway.



## NORTH-WESTERN AREA. (Plate IV.)

Observations are available from this region for February, May, September and November, 1907, and for March, July and September, 1908, and the resulting sections show that the hydrographic conditions were, during these years, much the same as formerly.

During February, 1907, the greater part of this area was flooded by Atlantic water of moderate salinity, the maximum value being found in the vicinity of Station 25. As usual during the winter months, when the action of convection currents is most powerful, a very uniform surface to bottom temperature distribution was shown over the entire region. Towards the end of May, the well-marked density separation, which normally occurs over this area during the summer months, showed signs of setting in, but in no part of the section was there any indication of the presence of fresh water from the Continental coast.

No further observations were taken over this region till the first week in September, and by that date the maximum effect of the normally-occurring seasonal changes would be already past. There still existed, however, a well-marked separation of the waters into two layers, masses of cold bottom water of 6.7°C. underlying an upper warmer layer some 40 metres in thickness. The fall in temperature was very great at 40 metres depth, amounting to 3.5°C. in 10 metres.

This peculiar temperature distribution in the north-western area during the summer months is explained by the fact that the waters in these regions are in a continual state of rotation. Owing to the configuration of the North Sea bottom, the greater part of the Atlantic water entering the North Sea round the north and south of Shetland is carried back northwards before reaching the 57th parallel. East of Aberdeen, it bends round towards the Continental coast, where it becomes mixed up with a certain quantity of Baltic water and North Sea water, finally passing away northwards along the coast of Norway into the Norwegian Sea. That such a state of rotation does exist over this area has recently been proved by making use of experimental deep-water drift bottles. Several hundreds of these, weighted so as to float just clear of the bottom, were thrown overboard in the north-western area of the North Sea. Rather more than one-third have been recovered, and their positions when found prove conclusively that the waters over this region are in a state of cyclonic movement at all depths. This explanation accounts for the presence there during the summer months, of a cold deep-water area, which forms, in fact, the centre of the movement, and so remains more or less in a state of rest. It accounts, moreover, for the unequal temperature distribution at the various stations, the cold water in the central part of the rotation rising higher towards the surface than at the sides. A study of the temperature results at Stations 23 and 24 during September, 1907, illustrates this point:—

## SEPTEMBER, 1907.

Station 23 (59° 31' N.—0° 37' E.)		Station 23 (59° 37' N.—0° 37' E.)	
Depth.	Temp. °C.	Depth.	Temp. °C.
0 m.	10.95	0 m.	10.65
40 m.	10.99	40 m.	10.86
50 m.	7.69	50 m.	9.82
60 m.	6.52	60 m.	7.26
100 m.	6.19	100 m.	6.37

When the next observations were taken, towards the close of November, the density separation had almost entirely disappeared, owing to a partial surface to bottom temperature equalisation having resulted from the action of convection currents. As previously explained, it is only during the colder months, when the powerful action of convection currents comes into play, that the displacement and renewal of the bottom layers in the north-western area is at all possible.

By the middle of March, 1908, a considerable reduction had taken place in the salinity over the entire area, in consequence of the flooding of the regions south of Shetland with fresh water from the Norwegian Sea. By the following July, the usual temperature separation had again taken place, the change from one water layer into the other being very distinct at a depth of about 40 metres. Two months later, in the third week of September, the temperature distribution had undergone but little change. The

salinity, however, showed a considerable reduction at Station 23, due to the presence of Continental coast water in the northern part of the section.

The hydrographic conditions over the north-western area thus showed but slight variation from the normal during these two years, except for a somewhat more scanty salt-water distribution throughout the greater part of 1908. The changes which take place over this region, more particularly the summer and autumn temperature separation, are fully explained by the cyclonic movement of the waters, which, in turn, is accounted for by the configuration of the North Sea bottom. The velocity in the central part of this rotation is naturally small, and during the warmer months, when the action of convection currents is least powerful, the bottom waters over this region remain in a more or less stagnant condition, resulting in the well-marked density separation which normally occurs and which is quite independent of the salinity. Only during winter and spring, when the cooling down of the surface layers has brought into play the action of convection currents, can the bottom waters be displaced and renewed, and for this reason the warming of the deeper layers is subject to a great phase delay, the maximum annual temperature not being reached till near the close of the year.

#### WESTERN AREA OF THE NORTH SEA.

##### *Moray Firth line of Stations.* (Plate V.)

During each of the years 1907 and 1908, the monthly cruise was carried out on five occasions, and the resulting sections show the conditions prevailing off the east coast of Scotland during that time.

The section extending eastwards from the Moray Firth includes Stations 28, 30, 32, 34, 36, 38 and 38*a*, and the changes taking place in the Atlantic inflow over the more northerly regions from Aberdeen to Shetland, are clearly reflected in the conditions shown at these stations. In the beginning of February, 1907, the westward limit of 35 per mille water reached within a few miles of Station 32, which investigations extending over the last four-and-a-half years show to be very near its normal position. Eastwards of this point, the salinities gradually increased on passing within the region of the southward-moving Atlantic inflow, the maximum value of 35.25 per mille being found at Station 38, the most easterly point investigated. During the next two months, apparently but little change took place over this area, except for a cooling-down of the waters as a whole, due to seasonal changes.

By the following July, however, the distribution of salt-water was unusually extensive, nearly the whole area being then flooded by water of high salinity, while the 35 per mille isohaline had moved into a position some 30 miles westward of the normal. As we have already seen in studying the Aberdeen-Shetland area, the summer Atlantic inflow of 1907 was much more extensive than usual, so that the salt-water distribution south of Shetland was greater during August than in the previous April. East of the Moray Firth, the centre of this inflow was then situated at Station 34, on either side of which there extended a wedge of water extending 35.25 per mille salinity. The top and bottom density separation, which we have already seen to be due to the cyclonic movement possessed by the waters in this region, had become established at the more easterly stations when the July observations were taken, this part of the section lying near the centre of the rotation where motion of the waters is naturally small.

When the September observations were taken, the westward boundary of 35 per mille water had once again taken up its normal position in the region of Station 32. The influence of Continental coast water was then strongly marked in the eastern part of the section, where the surface salinity fell considerably below 35 per mille. The Baltic Stream, spread out over the North Sea as a thin surface layer, must, accordingly, have at that time extended some 120 miles westward from the mouth of the Skagerrack. By the first week in November, this fresh surface water had retreated backwards towards the Continental coast, so that its influence was no longer evident even at the most easterly point on the section. By that time also, the density separation, which was still strongly marked when the September observations were taken, was in process of disappearing, although a bottom layer of cold water still existed from 60 metres downwards. Consequent on the particularly scanty salt water distribution over the Aberdeen-Shetland area during that month, the 35 per mille line had been displaced some 30 miles eastward of the normal position, these changes being apparently the first indication of the southward movement of fresh Norwegian Sea water which took place early in the following year.



The observations for January and February, 1908, show that the scanty salt-water distribution of the previous November still continued, and that the 35 per mille boundary still occupied a position some 30 miles east of the normal. These conditions are quite in accordance with the distribution existing between Aberdeen and Shetland during the same period, when the whole of that area was flooded by 34·8 per mille water from the Norwegian Sea. Consequent on the partial re-establishment of the Atlantic inflow south of Shetland, a somewhat greater salt-water distribution was shown over the Moray Firth line of stations when the April observations were taken, but the salinity still remained low over a great part of the section. Towards the end of July, the effect of Continental coast water was strongly marked over the eastern part of the section, where it penetrated in the surface layers westwards beyond Station 36. The Atlantic distribution was, in consequence, particularly scanty and was almost entirely confined to the deeper layers. Compared with the conditions existing over the same area the previous year, when the Atlantic inflow was unusually powerful, the section for July, 1908, shows the greatest possible difference, almost the only point in common being the density separation of the waters which normally takes place during the warmer months and which is quite independent of the salinity.

By the first week of October, the 35 per mille boundary had once more taken up its normal position in the region of Station 32 but the salinity remained very low over almost the entire area. This scanty distribution of Atlantic water still existed when the final observations for the year were taken in the first week of December, the 35 per mille line having in the meantime moved some 15 miles eastward beyond the usual position. The action of convection currents had by that time brought about a partial equalisation of temperature from surface to bottom, but cold water was still present in the deeper layers at Station 38. As already mentioned, the warming of the bottom waters over this area is subject to a great phase delay, so that the maximum annual temperature in the deeper layers is not reached till near the close of the year.

Observations from the Moray Firth line of stations illustrate an interesting point in connection with the cyclonic movement of the waters in the northern area of the North Sea, viz., that the cold bottom waters in the centre of the rotation rise nearest the surface and are the last to be renewed when the annual displacement takes place. A comparison of the temperature distribution shown during November, 1907, at Stations 36, 38 and 38a will make this clear, Station 38 occupying a position intermediate between the other two :—

Depth.	Station 36.	Station 38.	Station 38a.
	Temp. °C.	Temp. °C.	Temp. °C.
0 m.	9·35	9·35	9·55
60 m.	8·64	7·48	8·80
80 m.	8·02	6·45	7·22
100 m.	7·61	6·41	7·21

Since the start of the Moray Firth line of stations in September, 1904, observations have been taken on thirty occasions and some interesting points are shown by studying the results obtained. From September, 1904, to April, 1907, the westward limit of 35 per mille water varied but slightly from the region of Station 32, except on three occasions when comparatively great differences were shown. In January, 1905, the Atlantic circulation was unusually weak, so that water of 35 per mille salinity receded some 40 miles eastward beyond the usual limit; in October, 1905, the Atlantic inflow was abnormally great, resulting in the movement of the 35 per mille boundary 20 miles nearer the Scottish coast; and in May, 1906, the Atlantic distribution was again very extensive, so that it flooded a great part of the Moray Firth. Leaving out these three exceptional cases, the 35 per mille isohaline lay within ten miles of Station 32 on fifteen of the seventeen other occasions on which investigations were carried out between September, 1904, and April, 1907. Thus in the absence of more extensive observations, a rough indication of the hydrographic conditions existing over the north-western area might be arrived at by simply determining the westward limit of 35 per mille water in the regions east of the Moray Firth. Any marked variation from the normal position would tend to show that unusual conditions were then in evidence over the surrounding regions.

Such a variation was shown during July, 1907, when 35 per mille water was found some 30 miles nearer the Scottish coast, in accordance with the abnormally extensive Atlantic distribution which existed at that time over the Aberdeen-Shetland area. From November, 1907, onwards till the close of 1908, moreover, corresponding to the scanty Atlantic supplies which existed south of Shetland during that time, the 35 per mille boundary almost invariably took up a position considerably to the east of the normal, the average displacement away from the Scottish coast amounting to as much as 30 miles. The section extending between the most easterly points on the Moray Firth and Firth of Forth sections respectively, appears, during normal years, to be completely flooded by Atlantic water, except in the summer months when the distribution of coastal water is at a maximum. These conditions held good during 1907, an extensive Atlantic distribution in February being followed by a gradual decrease in salinity throughout the next few months. By the time the July observations were taken, the influence of coastal water was strongly marked at the more southerly stations, where the salinity fell somewhat below 35 per mille. The density separation was very marked throughout the summer and autumn at the stations along this section, the whole of which lies within the cold deep-water area. Even when the last observations for the year were taken in the first week of November, cold bottom layers were still present at most of the stations, the temperature distribution having undergone but little change up till that time.

Owing to the unusual hydrographic conditions of the year 1908, the Atlantic distribution was then much more limited over this section. During the earlier months (February to April) most of the stations were flooded by diluted Atlantic water, the salinity seldom rising above 35.15 per mille. Towards the end of July, very little Atlantic water was present in any part of the section, the 35 per mille boundary having retreated northwards far beyond its usual position, the difference, compared with July of the previous year, amounting to some 100 miles. The conditions shown in the beginning of October were somewhat more normal, but when the last observations for the year were taken in December an unusually scanty Atlantic distribution was again in evidence, water of 35 per mille having moved northwards some distance beyond the 57th parallel.

*Firth of Forth line of Stations.* (Plates VI. and VII.)

The line of stations extending eastwards from the Firth of Forth lies some 100 miles southwards of the parallel Moray Firth section already considered. As stated above, the southward Atlantic inflow into the North Sea bends round away from the Scottish coast before reaching the 57th parallel, in consequence of which the 35 per mille boundary normally occupies a more easterly position along the Firth of Forth line of stations than at the Latitude of the Moray Firth. As far as our investigations show, the average difference amounts to about 60 miles, the normal westerly limit east of the Firth of Forth for water of that salinity appearing to lie in the region of Station 41c.

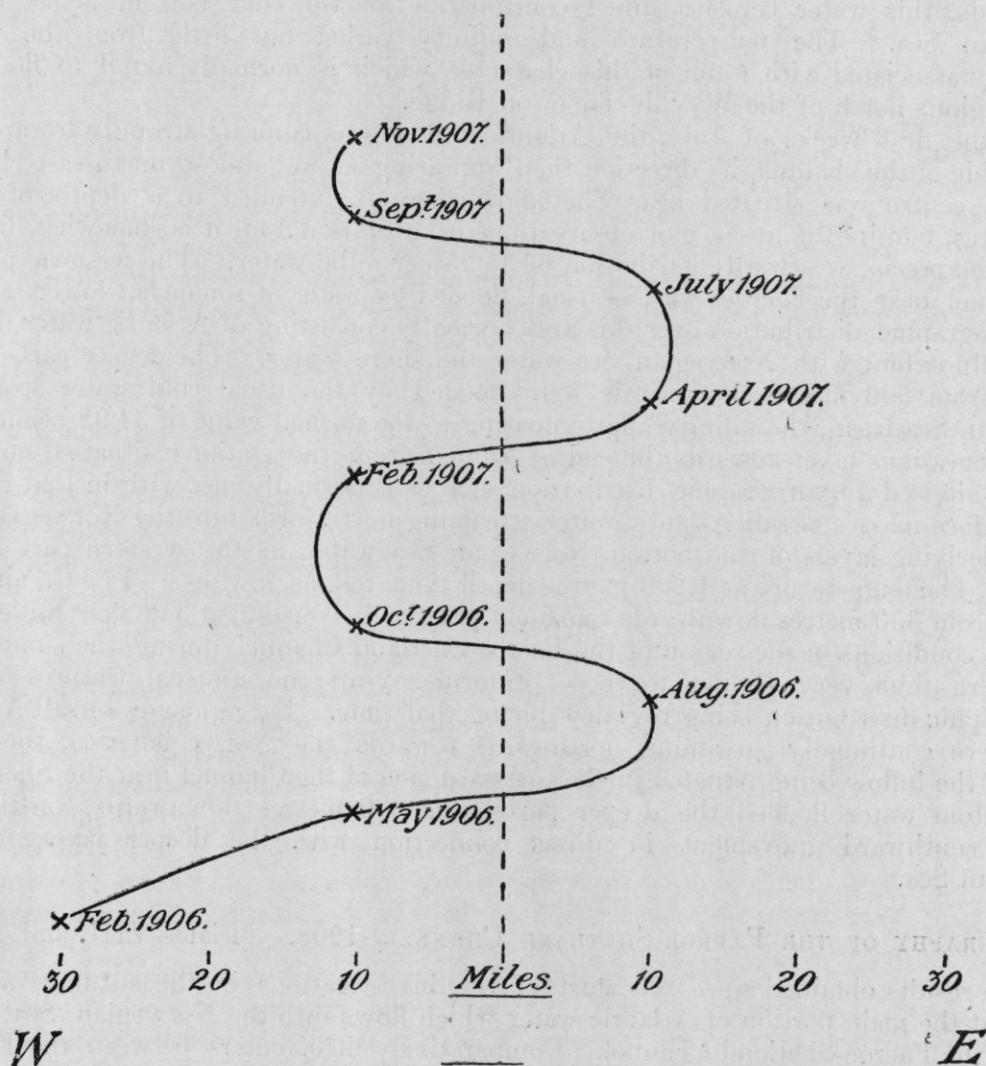
The first section shows the conditions which existed east of the Firth of Forth during February, 1907, when the 35 per mille isohaline lay some 90 miles away from the Scottish coast, apparently not far from its normal position. East of Station 41c, the section was flooded by Atlantic water of moderate salinity, the maximum value of which was 35.2 per mille. Two months later, the 35 per mille line had moved some 20 miles seaward and the salinity all over showed a considerable decrease. Much the same distribution existed when the July observations were taken, except for the appearance of Continental coast water in the eastern part of the section. By the following September, 35 per mille water had again moved westwards towards the Scottish coast, then occupying a position intermediate between Stations 41c and 42. The temperature separation of the waters, which has already been discussed in dealing with the north-western area, was very marked over the eastern part of the section from July to September, a difference of 4° C. being on several occasions shown within a depth of 10 metres. When the last observations for 1907 were taken in the first week of November, the conditions had undergone but little change, except for a slight warming of the bottom waters in the eastern part of the section.

As already indicated, the distribution of salt Atlantic water over the North Sea area was particularly scanty during the year 1908, and this effect was, perhaps, most strongly marked east of the Firth of Forth. Throughout the greater part of the year, water of 35 per mille was entirely absent from the section, its westward boundary during that time being displaced some 50 miles seawards beyond the normal limit. The observations for February and April show that only in the extreme easterly part of the section was there then any indication whatever of Atlantic water, and throughout the remainder of



the year, as shown by investigations in July, October and December, water of such character was entirely absent from all the stations. During the summer months, the usual density separation into layers took place, this change being, as already explained, brought about by the configuration of the North Sea bottom and being quite independent of the salinity.

When the monthly cruise was started in September, 1904, the Moray Firth line of stations was only carried some 60 miles east of the Scottish coast, and up till the end of 1905, when the section was extended some 70 miles out to sea, 35 per mille water had only been present on one occasion. This was in October, 1905, when an abnormal Atlantic inflow took place into the North Sea, so that the 35 per mille limit was displaced a considerable distance nearer the Scottish coast. Since the line was extended, it has become possible to study the behaviour of Atlantic water east of the Firth of Forth, and the average position of the 35 per mille boundary during the years 1906 and 1907 appears to have been somewhere in the region of Station 41*c*. Unlike the distribution eastwards of the Moray Firth, however, the 35 per mille limit at this latitude is subject to considerable changes from time to time, and these changes appear, moreover, to be directly influenced by seasonal causes. A study of the following diagram, in which the dotted line represents the average position of the 35 per mille boundary, will show these changes:—



The undue westerly position of 35 per mille water in February, 1906, is accounted for by the abnormally great Atlantic inflow which took place during that winter. Generally speaking, the 35 per mille isohaline occupied a position west of the normal during the colder months and east of the normal in the warmer months, showing that the seasonal changes of the Scottish coastal waters have a marked effect in determining the hydrographic distribution east of the Firth of Forth. During the winter months, this fresh-water effect is more or less confined to the inshore regions, while in summer and autumn its influence extends a considerable distance out to sea. The Atlantic inflow, which, outside the Moray Firth, is the main factor determining the hydrographic distribution, is less powerful east of the Firth of Forth, the effect of coastal water being,

in consequence, more marked. These fresh-water movements, a study of which may be conveniently carried on in this region, are accompanied by the transference of large quantities of pelagic eggs, larvae, &c., and are probably of considerable importance in regard to fishery problems, more especially in connection with the migration of the herring.

#### HYDROGRAPHY OF THE FAEROE-SHETLAND CHANNEL DURING THE SUMMER OF 1907. (Plate VIII.)

With the exception of a few observations taken from the stations north of Shetland in May and August, the material available for the region of the Faeroe-Shetland Channel is limited, during the year 1907, to a single series of observations in the beginning of July.

When the May observations were taken, the regions north and north-east of Shetland were flooded by water of high salinity, marking the northward continuation of the Atlantic inflow on its way to the Norwegian Sea. The centre of the inflow appeared to lie in the area between Stations 9 and 11a, where the salinity of the waters mainly exceeded 35.2 per mille. Station 11a, which lies within the deep-water area north of Shetland, was flooded by the usual cold water of moderate salinity from 400 metres downwards, this water being a direct continuation of the cold bottom layers in the Norwegian Sea. The temperature and salinity varied but little from the values commonly associated with water of this character, which is normally found to flood the deeper regions north of the Wyville-Thomson Ridge.

In the first weeks of July, the Atlantic inflow was running strongly towards the eastern side of the channel, its direction then appearing as an almost north-easterly one. Its main centre was situated near Shetland, where it extended to a depth of some 400 metres, but in the absence of observations from Station 14a, it is somewhat difficult to state the precise westward distribution of 35.25 per mille water. The western part of the channel near the Faeroes was, as usual, flooded by water of somewhat lower salinity, the hydrographic distribution over this area normally consisting of Atlantic water diluted to a certain extent with Norwegian Sea water and shore water. The deeper parts of the channel from 500 metres downwards were flooded by the usual cold water from the Norwegian Sea basin, the salinity approximating to the normal value of 34.92 per mille.

Observations taken towards the end of August from the stations situated north of Shetland showed a hydrographic distribution such as is normally met with in that region, viz. : surface masses of salt Atlantic water streaming northwards into the Norwegian Sea, with underlying layers of cold bottom Norwegian Sea water in the western part of the section. The temperature at 1,200 metres depth then fell as low as  $-1.0^{\circ}$  C., and the salinity from 350 metres downwards remained practically constant at 34.88 per mille.

The conditions in the region of the Faeroe-Shetland Channel during the summer of 1907 were thus very similar to those of former years, no unusual features in the hydrographic distribution being revealed during that time. Large masses of salt Atlantic water were continually streaming northwards towards the Norwegian Sea, the main centre of the inflow being situated in the eastward side of the Channel near the Shetlands. Cold bottom water flooded the deeper parts from 500 metres downwards, constituting a slow southward movement in direct connection with the deeper layers of the Norwegian Sea.

#### HYDROGRAPHY OF THE FAEROE-SHETLAND CHANNEL, 1908. (Plates VIII. and IX.)

The results obtained since the start of the investigations in the autumn of 1902 show that the main portion of Atlantic water which flows into the Norwegian Sea enters through the Faeroe-Shetland Channel. Comparatively little enters between the Faeroes and Iceland, its flow being there checked by the East Icelandic Polar current which normally moves southwards along the east coast of Iceland into the regions north of the Faeroe-Shetland Channel. This cold Polar water, mainly derived from the melting of ice in the Arctic regions, very rarely penetrates as far south as the channel itself, being normally prevented from so doing by the opposing motion of the Atlantic Stream. During the earlier part of 1908, however, a powerful movement of water penetrated southwards far beyond the Shetlands, the temperature and salinity of this water (more especially in the deeper layers north of Shetland) showing it to consist of Norwegian Sea water mixed with Polar water. The movement had evidently originated in the western area of the Norwegian Sea near the East Icelandic Polar current and, as already indicated, extended far enough south to completely cut off the Atlantic inflow south of Shetland. Whether the movement was due to a strengthening of the circulation in the Norwegian



Sea, or to an unusual diminution in the waters of the Atlantic Stream, can only be decided after all available material from the surrounding regions has been carefully worked up.

The Atlantic distribution north-east of Shetland during the earlier part of 1908 was, accordingly, somewhat limited, water of 35.2 per mille and over being, when the March observations were taken, entirely confined to a narrow wedge some 30 miles wide, bounded on either side by water of lower salinity. In the absence of observations from the Faeroe-Shetland Channel during that month, we are unable to determine the westward limit of the southward-moving Norwegian Sea water, but the probability is that it flooded the greater part of the region north of the channel. Any Atlantic water entering the North Sea or the Norwegian Sea during the early part of 1908 must, in consequence of the unusual conditions then existing, have first of all sunk down and passed underneath the opposing barrier of Norwegian Sea water, but the probability is that the Atlantic Stream was then largely deflected away from these regions and its flow to the east and north-east of Shetland to a great extent suspended. On the resumption of the full Atlantic inflow into the North Sea at a somewhat later date, its waters would become diluted in the regions south of Shetland by admixture with the fresher Norwegian Sea water, much of which would at the same time be swept eastwards into the North Sea area, resulting in a considerable reduction in the salinity throughout the following months. We have already seen that an unusually limited supply of salt water existed in the northern area of the North Sea during the summer and autumn of 1908, and the reason here stated must be taken as at least a partial explanation of this fact.

During March, 1908, the deeper regions north of Shetland were, as stated above, flooded from 400 metres downwards with a mixture of Norwegian Sea water and Polar water, the salinity of which remained constant at 34.5 per mille throughout a depth of 800 metres. The bottom temperature was then rather less than  $-0.5^{\circ}$  C., the deeper waters being thus somewhat warmer than is usually the case north of the Wyville-Thomson Ridge. The complete change in the temperature and salinity of the bottom layers at Station 11a compared with the previous August is of interest as showing the great variations which may take place within a comparatively short time even in the deepest regions of the sea.

A month later, towards the middle of April, the Atlantic Stream was running strongly in the eastern part of the channel, its main centre being then situated close to Shetland, and extending to a depth of about 400 metres. Its direction of flow appeared to be slightly more easterly than in the previous July, especially on the Shetland side where it probably encountered the opposing force of Norwegian Sea water. The temperature and salinity were considerably lower in the western area of the channel, indicating the usual mixture of Atlantic water, Norwegian Sea water and shore water, which is commonly associated with the region near the Faeroes. The cold water in the deeper layers was strongly banked up towards the western side of the channel, where it reached within 250 metres of the surface at the southerly stations. The temperature of this bottom water was, moreover, considerably above the average, the value at 1,000 metres depth being then about half-a-degree higher than usual.

A few observations taken in the southern section of the channel towards the middle of June show a somewhat more extensive salt-water distribution than in the previous April, the greater area being then flooded by water of 35.2 per mille and upwards. The highest salinities were once again found near the Shetland side, where water of 35.3 per mille and over extended to a depth of 400 metres. The only observations from the northern section during June, 1908, were those taken at Stations 13a and 15c (situated between 15a and 15b), so that it is somewhat difficult to determine exactly the hydrographic distribution for that month. Station 13a was then flooded by 35.3 per mille water to a considerable depth, while Station 15c, although clearly situated outside the main flow, was nevertheless flooded by water of moderate salinity. As indicated by the density distribution in the region of the channel, the Atlantic stream then appears to have followed a more or less north-easterly course in its passage towards Shetland, with a direction very similar to that of the previous July. The bottom temperature at Station 19a had decreased by over half-a-degree since the April observations were taken, showing that considerable changes may take place in the conditions at 1,000 metres depth even within the space of two months.

The material available for August, 1908, includes observations from Station 19a in the southern section of the channel and from most of the stations in the northern section. During that month, the Atlantic stream apparently assumed a winding course, so that its full effect was experienced at the most westerly and most easterly stations in the northern section, but not at intermediate points. The salt-water distribution was, accordingly,

most scanty in the central regions of the channel where the salinity fell below 35 per mille. These conditions suggest the presence of Norwegian Sea water, which at that time apparently extended far enough southwards to flood part of the northern station, and to influence the direction of the Atlantic stream in its flow across channel. During that month, also, the bottom temperatures were unusually low, the value at 1,200 metres depth being only  $-1.2^{\circ}$  C. The distribution of Atlantic water in the northern section then seems, in fact, to have been particularly scanty, especially in the central regions, where the influence of Norwegian Sea water was very marked at all depths.

Similar conditions prevailed in the northern region of the channel during the first week of November, except for a slight increase of salinity over the central area. The distribution of 35.2 per mille water was, however, somewhat more scanty, and evidence of Norwegian Sea water was again noticeable in the central regions, where the salinity was affected to a depth of 100 metres. In the southern section, the salt-water distribution appeared to be much more extensive, most of the stations being flooded by 35.25 per mille water to 300 metres depth. As explained in a former report, this apparent difference in the conditions over the northern and southern sections is due to the direction of flow assumed by the Atlantic stream in its passage across channel. During that month, it appeared to pass south of the Faeroes flowing in an easterly direction, which only changed to a more northerly one near the Shetland side. In the western part of the channel, the Atlantic flow would thus be along the southern section, not across it, so that the salt-water distribution at these stations appeared much more extensive than was really the case.

With the probable exception of the early part of 1908, Atlantic water has thus, during the last two years, been continually streaming northwards into the Norwegian Sea, and its direction of flow within the regions of the Faeroe-Shetland Channel appears to have varied, during that time, between north-east and east. Throughout 1908, the influence of Norwegian Sea water appears to have been unusually powerful in the regions north of the channel, especially during the earlier months when water of such character penetrated southwards far beyond the Shetlands. As will subsequently be seen, further evidence in support of most of the above conclusions may be derived by studying the conditions of the Faeroe-Shetland Channel from a hydrodynamical point of view.

#### HYDRODYNAMICAL TREATMENT OF THE CONDITIONS OF THE FAEROE-SHETLAND CHANNEL DURING 1906 AND 1907.

As already indicated in former reports, considerable assistance in regard to the movements of the waters may sometimes be derived by treating the conditions from a hydrodynamical point of view, and calculations based upon the differences in density may, in certain cases, give a rough indication of the actual velocity of the currents. The principle assumed in making these calculations is embodied in the statement that the lighter water is, in general, found on the right-hand side in the direction in which the current is flowing, provided always that the velocity is greatest in the surface and that it decreases with increasing depth. Where the maximum velocity exists at some distance beneath the surface, the reverse conditions hold good, the lighter water being in such cases present on the left-hand side. As previously explained, in the northern hemisphere the earth's rotation causes a current to be deflected to the right in the direction in which it is flowing, and this deflection is directly proportional to the velocity of the current. Consequently, in order to prevent a screw circulation being set up, the densities must be distributed in the manner indicated above, and results calculated from these differences of density only hold good in cases where no such screw circulation exists. An example of the above conditions is supplied by the region of the sea extending from Aberdeen to Shetland, where the density of the water almost invariably shows a gradual increase from Aberdeen northwards, such as would naturally be associated with the eastward flow of Atlantic water into the North Sea.

For the region of the Faeroe-Shetland Channel, calculations based on these lines have been made from all observations available for the years 1906 and 1907, the results obtained indicating, of course, not the actual velocities, but the differences taking place in the rate of flow from the surface downwards. As formerly explained, the highest values are found when the calculations are made along lines which are crossed vertically by the current in question, so that by calculating the differences in various ways and studying the results obtained, some indication as to the direction of flow of the currents may be arrived at. In the case of the central regions of the Faeroe-Shetland Channel, moreover, if the bottom waters are supposed to move but slowly, the maximum values obtained may be taken as supplying a rough indication of the actual surface velocity.



In reference to calculations carried out across channel from east to west, positive values indicate, as on previous occasions, that the lighter water was present at the more easterly station; negative values, for calculations made under similar conditions, indicate that the lighter water was found at the more westerly position. Where the differences of velocity were estimated across channel from north to south, positive values show that the density of the water was greater at the more northerly station, negative values, that it was greater at the more southerly one.

## FAEROE-SHETLAND CHANNEL, JULY 1907.

Velocity difference from	Calculated between Stations along Northern Section.			
	16a-16.	15b-16a.	15a-15b.	13a-15a.
0-30 metres ...	+0.70 $\frac{\text{cm}}{\text{sec}}$	-0.15 $\frac{\text{cm}}{\text{sec}}$	-0.10 $\frac{\text{cm}}{\text{sec}}$	+0.38 $\frac{\text{cm}}{\text{sec}}$
0-50 " ...	+1.00 "	-0.40 "	-0.15 "	+0.47 "
0-100 " ...	+0.60 "	-0.85 "	-0.15 "	+0.85 "
0-200 " ...	—	-0.60 "	-0.25 "	+1.50 "
0-250 " ...	—	-0.65 "	-0.30 "	—
0-300 " ...	—	—	—	+2.35 "
0-400 " ...	—	—	—	+4.20 "
0-500 " ...	—	—	—	+6.70 "

## FAEROE-SHETLAND CHANNEL, JULY 1907.

Velocity difference from	Calculated between Stations along Southern Section.					
	17-18a.	18a-19a.	19a-19b.	19b-20a.	20a-21a.	21a-21.
0-30 metres ...	+0.75 $\frac{\text{cm}}{\text{sec}}$	-0.20 $\frac{\text{cm}}{\text{sec}}$	+0.08 $\frac{\text{cm}}{\text{sec}}$	+1.25 $\frac{\text{cm}}{\text{sec}}$	+0.85 $\frac{\text{cm}}{\text{sec}}$	-1.14 $\frac{\text{cm}}{\text{sec}}$
0-50 " ...	+1.30 "	-0.30 "	+0.15 "	+2.10 "	+1.10 "	-1.90 "
0-100 " ...	+2.15 "	-0.60 "	+0.50 "	+3.65 "	+1.05 "	-2.60 "
0-150 " ...	—	—	—	+5.20 "	—	—
0-200 " ...	—	-0.65 "	+1.20 "	—	—	—
0-300 " ...	—	-0.60 "	+2.25 "	—	—	—
0-400 " ...	—	—	—	—	—	—
0-500 " ...	—	—	+8.60 "	—	—	—

## FAEROE-SHETLAND CHANNEL, JULY 1907.

Velocity difference from	Calculated between Stations in Northern and Southern Sections.							
	13a-19a.	13a-19b.	15a-18a.	15a-19a.	15a-19b.	15b-18a.	15b-19a.	15b-19b.
0-30 m.	-0.07 $\frac{\text{cm}}{\text{sec}}$	-0.05 $\frac{\text{cm}}{\text{sec}}$	+0.27 $\frac{\text{cm}}{\text{sec}}$	+0.20 $\frac{\text{cm}}{\text{sec}}$	+0.20 $\frac{\text{cm}}{\text{sec}}$	+0.25 $\frac{\text{cm}}{\text{sec}}$	+0.15 $\frac{\text{cm}}{\text{sec}}$	+0.15 $\frac{\text{cm}}{\text{sec}}$
0-50 "	-0.35 "	+0.03 "	+0.40 "	+0.30 "	+0.35 "	+0.40 "	+0.20 "	+0.20 "
0-100 "	-0.15 "	+0.03 "	+0.70 "	+0.50 "	+0.65 "	+0.80 "	+0.35 "	+0.45 "
0-200 "	-0.40 "	-0.05 "	—	—	—	+0.90 "	+0.40 "	+0.70 "
0-300 "	-0.80 "	-0.22 "	+0.85 "	+0.65 "	+1.45 "	—	—	—
0-400 "	-1.90 "	-0.80 "	—	—	—	—	—	—
0-500 "	-2.90 "	-0.50 "	—	+1.10 "	+4.30 "	—	—	—
0-800 "	—	—	—	+0.15 "	—	—	—	—

## FAEROE-SHETLAND CHANNEL, APRIL 1908.

Velocity difference from	Calculated between Stations in Northern Section.				
	16a-16.	15b-16a.	15a-15b.	14a-15a.	13a-14a.
0-30 metres ...	-0.10 $\frac{\text{cm}}{\text{sec}}$	+0.05 $\frac{\text{cm}}{\text{sec}}$	-0.07 $\frac{\text{cm}}{\text{sec}}$	+0.60 $\frac{\text{cm}}{\text{sec}}$	-0.07 $\frac{\text{cm}}{\text{sec}}$
0-50 " ...	-0.16 "	+0.12 "	-0.05 "	+0.85 "	-1.04 "
0-100 " ...	-0.31 "	+0.40 "	+0.10 "	+1.25 "	-1.95 "
0-200 " ...	—	+1.62 "	-0.13 "	+1.45 "	-2.84 "
0-300 " ...	—	—	-1.00 "	—	-5.83 "
0-400 " ...	—	—	-2.35 "	+3.68 "	-3.25 "
0-500 " ...	—	—	—	+5.91 "	-0.89 "
0-700 " ...	—	—	—	+6.96 "	—
0-1000 " ...	—	—	—	+3.63 "	—
0-1200 " ...	—	—	—	+0.60 "	—

## FAEROE-SHETLAND CHANNEL, APRIL 1908.

Velocity difference from	Calculated between Stations in Southern Section.					
	17-18a.	18a-19a.	19a-19b.	19b-20a.	20a-21a.	21a-21.
0-30 metres ...	-0.12 $\frac{\text{cm}}{\text{sec}}$	+0.13 $\frac{\text{cm}}{\text{sec}}$	+0.40 $\frac{\text{cm}}{\text{sec}}$	-0.07 $\frac{\text{cm}}{\text{sec}}$	-0.31 $\frac{\text{cm}}{\text{sec}}$	-0.10 $\frac{\text{cm}}{\text{sec}}$
0-50 " ...	-0.17 "	+0.26 "	+0.70 "	-0.18 "	-0.55 "	-0.15 "
0-100 " ...	-0.34 "	+0.68 "	+1.20 "	-0.33 "	-1.10 "	-0.55 "
0-170 " ...	—	—	—	-0.65 "	-2.00 "	—
0-200 " ...	—	—	+2.20 "	—	—	—
0-250 " ...	—	+2.12 "	—	—	—	—
0-400 " ...	—	—	+6.00 "	—	—	—
0-600 " ...	—	—	+19.75 "	—	—	—

## FAEROE-SHETLAND CHANNEL, APRIL 1908.

Velocity difference from	Calculated between Stations in the Northern and Southern Sections.											
	13a-19a.	13a-19b.	14a-18a.	14a-19a.	14a-19b.	14a-20a.	15a-18a.	15a-19a.	15a-19b.	15b-18a.	15b-19a.	15b-19b.
0-30 metres	+0.02 $\frac{\text{cm}}{\text{sec}}$	+0.15 $\frac{\text{cm}}{\text{sec}}$	-0.05 $\frac{\text{cm}}{\text{sec}}$	Nil	+0.15 $\frac{\text{cm}}{\text{sec}}$	+0.12 $\frac{\text{cm}}{\text{sec}}$	+0.12 $\frac{\text{cm}}{\text{sec}}$	+0.20 $\frac{\text{cm}}{\text{sec}}$	+0.35 $\frac{\text{cm}}{\text{sec}}$	+0.10 $\frac{\text{cm}}{\text{sec}}$	+0.15 $\frac{\text{cm}}{\text{sec}}$	+0.25 $\frac{\text{cm}}{\text{sec}}$
0-50 "	+0.30 "	+0.60 "	-0.10 "	+0.01 $\frac{\text{cm}}{\text{sec}}$	+0.95 "	+0.20 "	+0.15 "	+0.30 "	+0.55 "	+0.15 "	+0.25 "	+0.40 "
0-100 "	+0.65 "	+1.20 "	-0.20 "	+0.10 "	+0.60 "	+0.50 "	+0.15 "	+0.60 "	+1.00 "	+0.25 "	+0.60 "	+0.85 "
0-170 "	—	—	—	—	—	+1.05 "	—	—	—	—	—	—
0-200 "	+1.30 "	+2.35 "	—	—	+1.55 "	—	—	—	+2.00 "	—	+1.35 "	+1.75 "
0-250 "	—	—	+0.45 "	—	—	—	+0.45 "	—	—	+0.20 "	—	—
0-300 "	+2.90 "	—	—	+1.20 "	—	—	—	+2.35 "	—	—	+1.55 "	—
0-400 "	+2.75 "	+5.30 "	—	—	+4.80 "	—	—	—	+5.85 "	—	-2.15 "	+3.50 "
0-500 "	+1.85 "	+6.05 "	—	+2.65 "	—	—	—	+5.15 "	—	—	—	—
0-600 "	—	—	—	—	+10.65 "	—	—	—	+13.00 "	—	—	—
0-700 "	—	—	—	+3.10 "	—	—	—	+6.05 "	—	—	—	—
0-800 "	—	—	—	—	—	—	—	—	—	—	—	—
0-1000 "	—	—	—	+3.90 "	—	—	—	+5.70 "	—	—	—	—



FAEROE-SHETLAND CHANNEL, JUNE 1908.

Velocity difference from	Calculated between Stations in Southern Section.		
	17-18a.	18a-19a.	19a-19b.
0-30 metres ... ..	+0.40 $\frac{\text{cm}}{\text{sec}}$	+0.55 $\frac{\text{cm}}{\text{sec}}$	+ 0.10 $\frac{\text{cm}}{\text{sec}}$
0-50 " " " "	+0.65 "	+0.70 "	+ 0.40 "
0-100 " " " "	+1.05 "	+0.70 "	+ 2.05 "
0-200 " " " "	—	+0.75 "	+ 6.10 "
0-300 " " " "	—	-0.35 "	—
0-350 " " " "	—	—	+16.90 "

FAEROE-SHETLAND CHANNEL, JUNE 1908.

Velocity difference from	Calculated between Stations in Northern and Southern Sections.				
	13a-19a.	13a-19b.	15c-18a.	15c-19a.	15c-19b.
0-30 metres ... ..	+0.40 $\frac{\text{cm}}{\text{sec}}$	+0.55 $\frac{\text{cm}}{\text{sec}}$	-0.02 $\frac{\text{cm}}{\text{sec}}$	+0.30 $\frac{\text{cm}}{\text{sec}}$	+0.30 $\frac{\text{cm}}{\text{sec}}$
0-50 " " " "	+0.65 "	+0.90 "	+0.05 "	+0.50 "	+0.55 "
0-100 " " " "	+1.05 "	+1.95 "	+0.60 "	+1.05 "	+1.60 "
0-200 " " " "	+1.70 "	+4.10 "	+0.40 "	+0.85 "	+2.85 "
0-300 " " " "	+1.00 "	—	+0.35 "	+0.10 "	—
0-350 " " " "	+0.08 "	+5.90 "	—	—	+5.55 "
0-400 " " " "	-0.80 "	—	—	-1.50 "	—
0-500 " " " "	—	—	—	-2.55 "	—
0-550 " " " "	-3.65 "	—	—	—	—
0-600 " " " "	—	—	—	-3.20 "	—
0-700 " " " "	—	—	—	-3.40 "	—
0-750 " " " "	—	—	—	-3.45 "	—

FAEROE-SHETLAND CHANNEL, AUGUST, 1908.

Velocity difference from	Calculated between Stations in Northern Section.				
	16a-16.	15b-16a.	15a-15b.	14a-15a.	13a-14a.
0-30 metres... ..	+0.80 $\frac{\text{cm}}{\text{sec}}$	+0.35 $\frac{\text{cm}}{\text{sec}}$	+0.15 $\frac{\text{cm}}{\text{sec}}$	Nil.	+ 0.25 $\frac{\text{cm}}{\text{sec}}$
0-50 " " " "	+1.15 "	+0.20 "	+0.10 "	- 0.20 $\frac{\text{cm}}{\text{sec}}$	+ 0.55 "
0-100 " " " "	+0.40 "	-0.80 "	-0.50 "	+ 0.08 "	+ 1.88 "
0-200 " " " "	—	-1.95 "	-1.30 "	+ 0.15 "	—
0-300 " " " "	—	—	—	+ 2.30 "	+ 8.55 "
0-400 " " " "	—	—	-6.95 "	+ 6.15 "	+13.55 "
0-500 " " " "	—	—	—	—	+20.40 "
0-600 " " " "	—	—	-7.75 "	+10.35 "	—
0-1000 " " " "	—	—	—	+13.45 "	—

## FAEROE-SHETLAND CHANNEL, AUGUST, 1908.

Velocity difference from	Calculated between Stations in Northern and Southern Sections.			
	13a-19a.	14a-19a.	15a-19a.	15b-19a.
0-30 metres ... ..	-0.15 $\frac{\text{cm}}{\text{sec}}$	-0.10 $\frac{\text{cm}}{\text{sec}}$	-0.10 $\frac{\text{cm}}{\text{sec}}$	Nil.
0-50 " ... ..	-0.12 "	+0.07 "	Nil.	+0.05 $\frac{\text{cm}}{\text{sec}}$
0-100 " ... ..	-0.35 "	+0.28 "	+0.35 "	+0.03 "
0-200 " ... ..	-1.10 "	+0.50 "	+0.60 "	-0.20 "
0-300 " ... ..	-1.85 "	+1.00 "	+2.00 "	-0.30 "
0-500 " ... ..	-4.70 "	+2.00 "	+5.70 "	+0.13 "
0-600 " ... ..	—	+1.85 "	+6.05 "	+0.85 "
0-1000 " ... ..	—	+0.15 "	+5.25 "	—

## VELOCITY DIFFERENCE BETWEEN STATIONS 11a AND 12, 1907-8.

Velocity difference from	May 1907.	Aug. 1907.	March 1908.	Sept. 1908.
0-30 metres ... ..	+0.06 $\frac{\text{cm}}{\text{sec}}$	+0.10 $\frac{\text{cm}}{\text{sec}}$	+0.035 $\frac{\text{cm}}{\text{sec}}$	+0.05 $\frac{\text{cm}}{\text{sec}}$
0-100 " ... ..	+0.09 "	+0.10 "	+0.030 "	+0.70 "

## FAEROE-SHETLAND CHANNEL, NOVEMBER 1908.

Velocity difference from	Calculated between Stations in Northern Sections.				
	16a-16.	15b-16a.	15a-15b.	14a-15a.	13a-14a.
0-30 metres... ..	-0.25 $\frac{\text{cm}}{\text{sec}}$	+0.08 $\frac{\text{cm}}{\text{sec}}$	+0.30 $\frac{\text{cm}}{\text{sec}}$	-0.10 $\frac{\text{cm}}{\text{sec}}$	Nil.
0-50 " ... ..	-0.40 "	-0.02 "	+0.45 "	-0.30 "	Nil.
0-100 " ... ..	-0.90 "	-0.20 "	+0.70 "	-0.90 "	+0.40 $\frac{\text{cm}}{\text{sec}}$
0-200 " ... ..	—	-1.60 "	+0.75 "	-0.55 "	+3.70 "
0-300 " ... ..	—	—	+0.15 "	-9.60 "	+8.95 "
0-370 " ... ..	—	—	-1.20 "	—	—
0-400 " ... ..	—	—	—	-14.30 "	—
0-500 " ... ..	—	—	—	—	+24.30 "
0-600 " ... ..	—	—	—	-18.0 "	+31.90 "
0-1000 " ... ..	—	—	—	-22.6 "	—
0-1300 " ... ..	—	—	—	—	—

## FAEROE-SHETLAND CHANNEL, NOVEMBER 1908.

Velocity difference from	Calculated between Stations in Southern Section.					
	17-18a.	18a-19a.	19a-19b.	19b-20a.	20a-21a.	21a-21.
0-30 metres ... ..	+0.15 $\frac{\text{cm}}{\text{sec}}$	+0.02 $\frac{\text{cm}}{\text{sec}}$	+0.50 $\frac{\text{cm}}{\text{sec}}$	2.10 $\frac{\text{cm}}{\text{sec}}$	+0.45 $\frac{\text{cm}}{\text{sec}}$	-0.45 $\frac{\text{cm}}{\text{sec}}$
0-50 " ... ..	+0.50 "	-0.01 "	+1.00 "	3.50 "	+0.60 "	-0.90 "
0-100 " ... ..	+0.80 "	-0.35 "	+2.55 "	6.75 "	+1.15 "	-3.70 "
0-200 " ... ..	—	-0.65 "	+6.50 "	13.25 "	—	—
0-300 " ... ..	—	-1.50 "	+10.05 "	—	—	—
0-500 " ... ..	—	—	+20.65 "	—	—	—



## FAEROE-SHETLAND CHANNEL, NOVEMBER, 1908.

Velocity difference from	Calculated between Stations in Northern and Southern Sections.											
	13a-19a.	13a-19b.	14a-18a.	14a-19a.	14a-19b.	14a-20a.	15a-18a.	15a-19a.	15a-19b.	15b-18a.	15b-19a.	15b-19b.
0-30 metres	-0'05 $\frac{\text{cm}}{\text{sec}}$	+0'10 $\frac{\text{cm}}{\text{sec}}$	-0'05 $\frac{\text{cm}}{\text{sec}}$	-0'05 $\frac{\text{cm}}{\text{sec}}$	+0'15 $\frac{\text{cm}}{\text{sec}}$	+0'60 $\frac{\text{cm}}{\text{sec}}$	-0'10 $\frac{\text{cm}}{\text{sec}}$	-0'10 $\frac{\text{cm}}{\text{sec}}$	+0'10 $\frac{\text{cm}}{\text{sec}}$	Nil	+0'02 $\frac{\text{cm}}{\text{sec}}$	-0'15 $\frac{\text{cm}}{\text{sec}}$
0-50 "	-0'10 "	+0'20 "	-0'07 "	-0'10 "	+0'25 "	+1'00 "	-0'20 "	-0'20 "	+0'15 "	+0'05 $\frac{\text{cm}}{\text{sec}}$	+0'05 "	+0'30 "
0-100 "	-0'25 "	+0'55 "	Nil.	-0'20 "	+6'80 "	+2'20 "	-0'30 "	-0'55 "	+0'45 "	+0'10 "	-0'10 "	+6'65 "
0-200 "	—	—	+0'50 "	+0'35 "	+2'90 "	+5'60 "	-0'85 "	—	—	-0'55 "	-0'75 "	+1'30 "
0-300 "	-1'30	+1'95 "	+1'80 "	+1'60 "	+5'75 "	—	-0'75 "	-1'80 "	+2'20 "	-0'80 "	-1'50 "	+1'80 "
0-400 "	—	—	—	—	+9'25 "	—	—	—	—	—	—	—
0-500 "	-3'70	+2'70 "	—	+4'25 "	+12'65 "	—	—	-1'60 "	+6'30 "	—	—	—
0-600 "	—	—	—	+4'35 "	—	—	—	-2'75 "	—	—	—	—
0-1000 "	—	—	—	+4'15 "	—	—	—	-3'80 "	—	—	—	—

During July 1907, the density of the water showed a gradual increase on passing westwards from Shetland towards the central regions of the channel, this distribution corresponding to the northward flow of the Atlantic stream which, as we have already seen, was at that time mainly confined to the eastern side. The greatest velocity differences were found between Stations 13a and 15a in the northern section and 19b and 20a in the southern, but the values were, in all cases, somewhat smaller than usual. The direction of flow of the Atlantic stream across channel then seems to have been an almost due north-easterly one, as shown by the very small differences of velocity found along the line joining Stations 13a and 19a. Its rate of flow appears to have been somewhat less than in the previous summer, when the value found was about 12 miles in 24 hours. It is interesting to note, in this connection, that Danish investigators have lately calculated the annual average velocity of the current in the sea between the north coast of Scotland and the nucleus of the Atlantic stream to be about five miles in 24 hours, so that within the regions of the main Atlantic flow, the average is probably considerably greater.

In the central parts of the channel, there was apparently a slow southward movement at the time when the July observations were taken, but the differences of density were in all cases small and uncertain. Near the Faeroes, the direction of flow was northwards, the velocity being about a mile per day less at a depth of 100 metres than in the surface layers.

During April 1908, there was the usual northward movement in the eastern part of the channel, the density distribution between Stations 13a and 14a indicating, however, a northward-flowing current with a maximum velocity at 300 metres depth, where the rate of flow was some three miles per 24 hours greater than at the surface. These unusual conditions were probably caused by the opposing influence of Norwegian Sea water, which, as we have already seen, extended southwards beyond Shetland during the early part of 1908. The Atlantic stream, in order to enter the Norwegian Sea, would thus be forced to sink down and pass underneath this fresher water, and this would naturally result in a diminution of the rate of flow in the upper layers. The density distribution along the lines connecting Stations 13a-19b and 19a-19b shows that the Atlantic flow then cut these lines at approximately equal angles, so that its flow across channel was somewhat more easterly than in July of the previous year. Towards the Shetland side it appears, moreover, to have turned nearly due east, as shown by the comparatively small differences of velocity found between stations in this region. Assuming that the waters between Stations 19a and 19b were then in a state of rest at 600 metres depth, and allowing for the fact that the Atlantic stream followed a north-easterly course in its passage across channel, the rate of flow of the surface waters appears at that time to have amounted to some 15 miles per day.

In June 1908, the only Stations worked were 13a and 15c in the northern section of the channel, and 17, 18a, 19a and 19b in the southern section, but some useful information may be derived by studying the velocity differences calculated in various directions between these stations. The greatest values were found between Stations 19a and 19b, where the velocity at 350 metres was about 9 miles per day less than at the surface. That the Atlantic stream did not cross this line vertically is shown by the considerable values found between Stations 13a and 19b, where a falling-off in velocity of three miles in 24 hours was shown at 350 metres depth. All things considered, the direction of flow then seems to have been nearly the same as in July of the previous year and the velocity a few miles per day greater.

In the southern section of the channel, only one station (19a) was worked during the following August, but results have been calculated from this point across channel in all possible directions, and in addition the usual calculations have been made between stations along the northern section. The hydrodynamical conditions indicate the usual strong Atlantic flow on the eastward side, where the velocity difference then amounted to 20 cm. per sec., at a depth of 500 metres. In its passage across channel, however, the current apparently followed a winding course, the density distribution in the region of stations 15a and 15b indicating that the direction of flow was there a south-easterly one. This is quite in accordance with the conditions shown in the hydrographical section for that month, when the surface salinity in the centre of the channel, on account of a southward movement of Norwegian sea water, fell below 35 per mille. The opposing force of such a movement would naturally tend to displace southwards the Atlantic water in the centre of the channel, so that its flow would at that point be a south-easterly one. The surface velocity in the eastern part of the section seems, at that time, to have been some 12-14 miles per 24 hours.

Both sections of the channel were worked during November 1908, and the velocity differences have been calculated between the stations in all possible ways. As stated when considering the conditions from a hydrographical point of view, the Atlantic Stream then entered the channel south of the Faeroes and preserved an almost easterly course towards the central regions. This accounts for the small differences of velocity found between stations in the westerly area, where the density conditions then indicated a direction of flow nearly parallel to the sections. Beyond the centre of the channel, as shown by the high values obtained between stations 19a and 20a, the current assumed a north-easterly direction and crossed the region between stations 19b and 20a nearly at right angles. The winding course assumed in the northern part of the section during the previous August was again adhered to, the direction of flow being south-easterly in the centre of the channel and north-easterly near Shetland. As the hydrographical section shows, Norwegian Sea water was once again in evidence in the central regions, where the surface salinity fell below 35 per mille. Within the main Atlantic flow in the eastern side of the channel the velocity showed only a small decrease to a depth of 100 metres, but beyond that point the falling-off was much more rapid. Assuming, again, that the water at 600 metres was more or less motionless, and that the Atlantic Stream crossed the region from 13a-14a in a vertical direction, the rate of flow of the surface waters must at that time have amounted to at least 17 miles per day, some four miles per day greater than in the previous August.

#### SUMMARY.

The Scheme of International Hydrographic Research has now been in progress for upwards of six years, and much valuable information has been acquired from the observations made simultaneously over the different areas and repeated at the same fixed stations during that time. Several general rules may now be deduced regarding the distribution and variation of temperature and salinity, and these will in future be of assistance in determining whether results obtained at a certain place and time ought to be considered as of normal value or not.

Over a considerable part of the North Sea, the tidal action is powerful enough to effect a thorough mixing of the waters from surface to bottom, this being more particularly the case in the southern regions where the depths are but slight. Thus in future from observations taken over this area from the surface alone, it will be possible to determine the temperature and salinity of the whole water-column with an exactness sufficient for most purposes. Over the northern part of the North Sea, however, the conditions are entirely different, and only in the colder months, when the action of convection currents is most powerful, does any uniformity whatever exist in the surface to bottom distribution.

Over the North Sea area, the temperature in summer decreases from the shore outwards to the open sea, while in winter the reverse conditions hold good. During the summer months, the warmest water ( $15^{\circ}$ - $18^{\circ}$ ) occurs along the Belgian and Dutch coasts and the coldest in the deep channel off Norway, while in winter the coldest water ( $2^{\circ}$ - $3^{\circ}$ ) is found along the Danish coast, and the warmest ( $7^{\circ}$ ) usually between Scotland and Shetland. The greatest annual surface variation of temperature occurs along the Belgian, Dutch and German coasts, where it amounts to about  $13^{\circ}$ , while between Scotland and Shetland it is some  $9^{\circ}$  less. In the deeper layers over the northern area of the North Sea the corresponding value is only  $1^{\circ}$ , while the smallest variation of all takes



place in the deepest regions of the Skagerrack, where the temperature only changes by two-tenths of a degree throughout the entire year.

As regards the distribution of salinity, the strong tidal currents cause so intense a mixing along the Scottish, English, Belgian and Dutch coasts that water of less than 33 per mille is rarely found more than a few miles from shore. Over the North Sea area the variations of salinity are less in the deeper layers than in the surface, and the greatest mean deviation from the average takes place in the regions of lowest salinity. Thus near the Continental coast, where there is a considerable proportion of fresh water, large changes of salinity take place from time to time, while in the northern area of the North Sea, which is always largely flooded by salt Atlantic water, the variation rarely exceeds two-tenths per mille, within the North Sea, the lines of equal salinity usually follow the shape of the coast, and except in the inshore waters, the salinity is usually confined within the limits of 34 and 35.3 per mille. Such small changes of salinity can hardly of themselves be of importance in regard to the occurrence and wanderings of the various food-fishes, but are mainly of interest as a guide to the directions of the currents and the movements of the waters.

With respect to the hydrographic changes which take place from time to time over the North Sea and surrounding waters, much information has been acquired during the time the investigations have been in progress. Large volumes of Atlantic water are normally streaming northwards as a surface current through the Faeroe-Shetland Channel into the Norwegian Sea. Comparatively little Atlantic water enters the Norwegian Sea between the Faeroes and Iceland on account of the opposing force of the East Icelandic Polar Current, which normally flows southwards along the east coast of Iceland into the regions north of the Faeroes. Only under exceptional conditions, however, such as must have existed in the early part of 1908, can Polar water extend so far southwards as to enter the regions of the channel, the Atlantic flow being usually powerful enough to prevent this taking place. The deeper layers north of the Wyville-Thomson Ridge are normally flooded by cold water of 34.9 per mille, water which is in direct connection with the bottom area of the Norwegian Sea. Occasionally, at least in the southern parts of the channel, these bottom layers are displaced by saltier and warmer water, showing that marked changes may take place even at the greatest depths.

Between the Faeroes and Fair Isle, the centre of the Atlantic Stream is situated between 3° and 5° W. longitude, where the mean annual temperature is 9.5° and the mean annual salinity 35.29 per mille. Within the regions of the channel, its direction of flow varies from north-east to east and the velocity of the surface waters appears to average about 14 miles in 24 hours. During its passage across channel, the Atlantic Stream throws off branches of salt water which enter the North Sea round the north and south of Shetland, and this latter inflow, at least, appears to be subject to seasonal variation. A scanty winter salt-water distribution is normally flooded by a more vigorous inflow during early spring, increasing to a maximum in the beginning of summer. A gradual decrease on the approach of the following winter subsequently completes the cycle of changes for the year. Exceptions to these apparently normal conditions have been shown on three occasions since the start of the investigations in August, 1902. During the winter of 1905-6, an unusually powerful Atlantic inflow took place; during the summer of 1907, the period of maximum inflow was unduly delayed; and throughout the whole of 1908, the Atlantic inflow was very scanty, more particularly during the early part of the year.

The greater proportion of the Atlantic water entering the northern area of the North Sea bends eastward before reaching the 57th parallel, and, after throwing out an offshoot which enters the Skagerrack as an undercurrent, is carried back northwards again along with a certain quantity of Baltic water and North Sea water. This rotational movement, due to the configuration of the bottom, gives rise to a cold deep-water area, an area with a great temperature phase-delay over which the maximum value in the bottom layers is not reached till near the close of the year. A fresh-water current continually streams northwards along the Norwegian coast, being exclusively confined to the in-shore regions during the winter months but extending in spring and summer far out to sea as a thin surface layer. Similar off-shore movements take place from the Scottish coast during the summer months, and as these currents carry out to sea large quantities of pelagic eggs and larvæ, the study of their seasonal changes is of great importance in connection with fishery problems.

While the investigations have been in progress, changes have several times taken place which must be regarded as unperiodical ones, not likely to occur again at any specified time. Such conditions existed throughout the winter of 1905-6, when an

extensive salt-water inflow took place into the North Sea, this unusual occurrence being apparently due to the abnormal conditions then existing in the waters of the North Atlantic. The southward movement of Norwegian Sea water, which took place during the early part of 1908, must be similarly regarded, this being the only occasion since the investigations were started on which the Atlantic inflow south of Shetland has been entirely suspended. Throughout the whole of that year, in fact, the distribution of Atlantic water was particularly scanty over the North Sea area, and the conditions then existing must accordingly be looked on as abnormal in character and as unlikely to occur again until circumstances favourable to their development once more arise.

STATION SC. 2.

Latitude, 58° 36' N.; Longitude, 1° 46' W.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
12th February, 1907.						10th May, 1907.					6th August, 1907.				
0	6.05	35.08	27.65	47	0	7.45	35.22	27.56	55	0	11.55	35.25	26.85	117	0
10	6.40	35.02	27.52	55	510	7.45	35.15	27.50	60	575	11.00	35.21	26.96	110	1135
20	6.40	35.00	27.52	57	1070	7.45	35.13	27.48	62	1185	10.72	35.21	27.01	106	2215
30	6.40	35.00	27.52	57	1640	7.38	35.17	27.51	58	1785	9.72	35.21	27.18	90	3195
40	—	—	—	—	—	7.08	35.21	27.60	52	2335	9.46	35.21	27.22	86	4075
50	6.42	35.00	27.52	57	2780	—	—	—	—	—	—	—	—	—	—
60	—	—	—	—	—	7.04	35.20	27.59	52	3375	9.18	35.25	27.29	78	5715
70	6.44	35.04	27.55	55	3900	—	—	—	—	—	—	—	—	—	—
80	—	—	—	—	—	6.99	35.20	27.60	52	4415	9.00	35.26	27.34	76	7255
92	6.49	35.02	27.52	59	5154	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	—	—	—	—	—	—	8.72	35.28	27.40	71	8725
105	—	—	—	—	—	6.92	35.24	27.64	62	5840	—	—	—	—	—
21st August, 1907.						15th November, 1907.					11th March, 1908.				
0	10.45	35.05	26.92	114	0	9.55	35.12	27.15	93	0	6.35	34.79	27.35	72	0
10	10.51	35.03	26.91	116	1150	9.68	35.07	27.07	99	960	6.41	34.70	27.29	80	760
20	10.41	35.03	broken	—	—	9.68	35.07	27.07	99	1950	—	—	—	—	—
30	10.01	35.14	27.08	100	3310	—	—	—	—	—	6.41	34.70	27.20	80	2360
40	9.92	35.14	27.10	99	4305	9.68	35.07	27.07	100	3940	—	—	—	—	—
60	9.90	35.16	27.11	97	6265	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	—	—	—	—	—	6.41	34.74	27.32	78	5520
80	9.80	35.21	27.17	93	8165	9.69	35.07	27.07	101	7960	—	—	—	—	—
90	—	—	—	—	—	—	—	—	—	—	6.41	34.74	27.32	79	7090
100	9.80	35.25	27.19	90	9995	9.69	35.07	27.07	101	9980	—	—	—	—	—
4th June, 1908.						20th June, 1908.					6th September, 1908.				
0	9.65	34.87	26.93	114	0	9.25	34.96	27.06	101	0	11.85	35.23	26.89	124	0
10	9.40	34.83	26.94	113	1135	9.34	34.96	27.04	103	1020	11.62	35.19	26.82	123	1235
20	7.99	34.92	27.23	84	2120	9.30	34.96	27.05	102	2045	10.64	35.19	27.00	105	2375
30	7.09	35.01	27.44	66	2870	7.74	35.07	27.39	70	2905	10.40	35.19	27.05	102	3410
50	7.08	35.10	27.51	60	4130	7.12	35.10	27.50	61	4215	9.99	35.19	27.12	96	5390
70	6.90	35.10	27.64	57	5300	7.01	35.10	27.52	59	5415	8.51	35.19	27.36	73	7080
90	6.83	35.10	27.65	57	6440	7.01	35.10	27.52	60	6605	—	—	—	—	—
105	—	—	—	—	—	—	—	—	—	—	8.51	35.19	27.36	74	9653
110	6.73	35.10	27.66	55	7560	7.00	35.10	27.52	60	7685	—	—	—	—	—
15th September, 1908.						5th November, 1908.					—				
0	10.90	35.10	26.89	117	—	10.45	34.97	26.87	—	—	—	—	—	—	—
10	10.92	35.08	26.87	119	—	10.64	34.97	26.83	—	—	—	—	—	—	—
20	10.92	35.08	26.87	119	—	10.68	34.97	26.84	—	—	—	—	—	—	—
30	10.82	35.08	26.89	117	—	10.68	34.97	26.84	—	—	—	—	—	—	—
50	10.48	35.16	27.00	107	—	10.70	35.03	26.88	—	—	—	—	—	—	—
70	10.22	35.19	27.08	101	—	10.70	35.03	26.88	—	—	—	—	—	—	—
90	10.22	35.19	27.08	101	—	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	—	10.61	35.10	26.95	—	—	—	—	—	—	—



STATION SC. 3.

Latitude, 59° 10' N. ; Longitude, 1° 27' W.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
13th February, 1907.						10th May, 1907.					6th August, 1907.				
0	6.65	35.27	27.71	40	0	7.45	35.28	27.60	51	0	12.35	35.19	26.69	136	0
10	6.79	35.24	27.65	44	420	7.44	35.19	27.52	57	540	10.21	35.19	27.08	99	1185
20	6.81	35.20	27.62	47	875	7.44	35.20	27.53	55	1105	9.82	35.23	27.18	89	2125
30	6.81	35.22	27.64	46	1340	7.42	35.21	27.55	56	1665	9.72	35.23	27.19	88	3010
40	6.82	35.17	27.59	51	1825	7.40	35.21	27.55	57	2225	9.72	35.23	27.19	88	3895
60	6.84	35.17	27.59	51	2845	7.36	35.26	27.60	52	3415	9.72	35.23	27.19	88	5685
83	6.86	35.15	27.57	54	4315	7.35	35.26	27.60	53	4885	9.75	35.23	27.19	88	8191

15th November, 1907.						12th March, 1908.					19th June, 1908.				
0	9.55	35.12	27.15	93	0	6.55	34.83	27.37	72	0	8.65	35.08	27.25	82	0
10	9.82	35.03	27.02	104	985	6.61	34.76	27.30	77	745	8.49	35.10	27.29	78	800
20	9.82	35.03	27.02	104	2025	6.62	34.76	27.30	77	1522	8.28	35.17	27.38	70	1540
30	—	—	—	—	—	—	—	—	—	—	7.99	35.17	27.43	66	2220
40	9.82	35.05	27.03	103	4095	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	6.62	34.76	27.30	78	3847	7.79	35.14	27.44	66	3540
70	—	—	—	—	—	—	—	—	—	—	7.65	35.14	27.46	65	4850
80	9.79	35.07	27.05	102	8195	6.62	34.76	27.30	79	6202	—	—	—	—	—
100	9.79	35.07	27.05	102	10235	6.63	34.76	27.30	79	7782	7.70	35.14	27.45	66	6815

7th August, 1907.						15th September, 1908.					5th November, 1908.				
0	11.45	35.19	25.85	120	0	10.85	35.10	26.91	116	0	10.45	34.88	26.79	—	—
10	11.19	35.14	26.87	118	1190	10.71	35.10	26.93	114	1150	10.80	34.88	26.74	—	—
20	10.91	35.14	26.91	114	2350	10.71	35.10	26.93	114	2290	10.80	34.92	26.76	—	—
30	10.38	35.14	27.01	105	3445	10.71	35.10	26.93	114	3130	10.85	34.92	26.76	—	—
50	9.62	35.14	27.15	94	5435	10.71	15.14	26.96	112	5690	10.90	34.97	26.80	—	—
70	9.49	35.14	27.16	93	7305	10.72	35.10	26.93	116	7970	10.85	34.97	26.81	—	—
80	—	—	—	—	—	10.72	35.10	26.93	116	9130	—	—	—	—	—
100	—	—	—	—	—	—	—	—	—	—	10.84	34.97	26.81	—	—
103	9.11	35.19	27.27	83	10209	—	—	—	—	—	—	—	—	—	—

STATION SC. 4.

Latitude, 59° 26' N. ; Longitude, 1° 20' W.

13th February, 1907.						10th May, 1907.					6th August, 1907.				
0	6.85	35.31	27.76	40	0	7.35	35.28	27.61	49	0	10.75	35.19	26.99	107	0
10	7.08	35.29	27.66	45	425	7.13	35.28	27.64	47	480	9.71	35.23	27.20	87	970
20	7.08	35.29	27.66	45	875	7.13	35.29	27.65	46	945	9.62	35.23	27.22	84	1825
30	7.08	35.29	27.66	45	1325	7.13	35.30	27.66	46	1405	9.62	35.21	27.21	86	2675
40	—	—	—	—	—	7.13	35.26	27.63	49	1880	—	—	—	—	—
50	7.08	35.27	27.65	48	2255	—	—	—	—	—	9.62	35.25	27.23	85	4375
60	—	—	—	—	—	7.13	35.26	27.63	49	2860	—	—	—	—	—
70	7.09	35.31	27.68	46	3195	—	—	—	—	—	9.62	35.19	27.19	90	6125
86	—	—	—	—	—	7.13	35.28	27.64	49	4134	—	—	—	—	—
90	7.10	35.27	27.65	48	4135	—	—	—	—	—	—	—	—	—	—
94	—	—	—	—	—	—	—	—	—	—	9.57	35.26	27.25	86	8237

16th November, 1907.						12th March, 1908.					4th June, 1908.				
0	9.75	35.12	27.10	96	0	6.55	34.76	27.31	76	0	8.35	34.96	27.21	87	0
10	9.72	35.08	27.08	98	970	6.59	34.74	27.29	79	775	7.62	35.01	27.36	73	800
20	9.72	35.08	27.08	98	1950	6.59	34.74	27.29	79	1565	7.58	35.01	27.37	72	1525
30	—	—	—	—	—	—	—	—	—	—	7.54	35.07	27.41	67	2220
40	9.72	35.08	27.08	99	3920	6.59	34.74	27.29	80	3155	7.50	35.12	27.46	64	2875
60	9.72	35.08	27.08	99	5900	—	—	—	—	—	7.49	35.14	27.48	63	4145
70	—	—	—	—	—	6.58	34.74	27.29	80	5555	—	—	—	—	—
80	9.73	35.08	27.08	100	7890	—	—	—	—	—	7.43	35.17	27.52	61	5385
90	—	—	—	—	—	6.58	37.74	27.29	81	7165	—	—	—	—	—
100	—	—	—	—	—	—	—	—	—	—	7.28	35.17	27.54	59	6585





STATION SC. 5—*continued*.  
Latitude, 59° 40' N. ; Longitude, 1° 14' W.—*continued*.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
15th September, 1908.						5th November, 1908.					—				
0	10.85	35.16	26.94	112	0	10.25	34.99	26.92	—	—	—	—	—	—	—
10	10.88	35.16	26.95	112	1120	10.44	35.01	26.91	—	—	—	—	—	—	—
20	10.88	35.14	26.95	113	2245	10.46	35.01	26.90	—	—	—	—	—	—	—
30	10.88	35.14	26.95	113	3375	10.51	35.10	26.96	—	—	—	—	—	—	—
50	10.88	35.14	26.95	114	5645	10.22	35.19	27.08	—	—	—	—	—	—	—
70	10.89	35.14	26.95	115	7935	9.71	35.19	27.17	—	—	—	—	—	—	—
90	10.89	35.17	26.95	113	10215	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	—	9.41	35.19	27.22	—	—	—	—	—	—	—

STATION SC. 5a.  
Latitude, 60° 5' N. ; Longitude, 0° 48' W.

24th February, 1907.						10th May, 1907.					7th August, 1907.				
0	6.15	35.27	27.78	34	0	7.45	35.26	27.59	52	0	11.85	35.28	26.24	119	0
10	6.29	35.22	27.71	39	365	7.56	35.24	27.55	55	535	11.20	35.28	26.97	109	1140
20	6.29	35.25	27.72	37	745	7.55	35.22	27.54	57	1095	10.29	35.28	27.14	94	2155
30	6.29	35.25	27.72	37	1115	7.55	35.26	27.56	54	1650	9.92	35.28	27.21	87	3965
40	6.28	35.28	27.76	37	1485	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	7.22	35.26	27.62	50	2690	9.41	35.28	27.29	81	5645
60	6.23	35.26	27.75	38	2235	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	7.09	35.26	27.63	48	3670	8.89	35.28	27.37	71	7165
80	6.26	35.26	27.75	39	3005	—	—	—	—	—	—	—	—	—	—
90	—	—	—	—	—	7.05	35.24	27.62	50	4650	8.70	35.28	27.41	69	8565
100	6.20	35.25	27.73	38	3775	—	—	—	—	—	—	—	—	—	—
110	—	—	—	—	—	7.05	35.22	27.62	52	5670	8.39	35.28	27.45	66	9915
120	6.05	35.23	27.74	38	4535	—	—	—	—	—	—	—	—	—	—

25th November, 1907.						12th March, 1908.					15th September, 1908.				
0	8.85	35.21	27.33	75	0	7.05	34.87	27.33	76	0	11.05	35.12	26.88	118	0
10	9.09	35.14	27.23	85	800	7.21	34.87	27.31	77	765	11.15	35.14	26.88	118	1180
20	9.09	35.14	27.23	85	1650	7.25	34.88	27.31	78	1540	11.10	35.14	26.89	117	2355
30	—	—	—	—	—	—	—	—	—	—	10.90	35.14	26.93	114	3510
40	9.09	35.14	27.23	86	3360	7.25	34.88	27.31	79	3110	—	—	—	—	—
50	—	—	—	—	—	—	—	—	—	—	10.68	35.19	27.00	107	5720
60	9.09	35.14	27.23	86	5030	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	—	—	—	—	—	10.68	35.14	26.96	111	7903
80	9.10	35.14	27.23	87	6810	7.25	34.88	27.31	80	6290	—	—	—	—	—
100	9.10	35.14	27.23	87	8550	7.26	34.88	27.31	80	7890	10.06	35.14	27.07	102	11095
110	—	—	—	—	—	—	—	—	—	—	9.81	35.17	27.14	96	12085

5th November, 1908.						—					—				
0	10.00	35.23	27.15	—	—	—	—	—	—	—	—	—	—	—	—
10	10.00	35.23	27.15	—	—	—	—	—	—	—	—	—	—	—	—
20	10.00	35.23	27.15	—	—	—	—	—	—	—	—	—	—	—	—
30	10.00	35.23	27.15	—	—	—	—	—	—	—	—	—	—	—	—
50	10.00	35.23	27.15	—	—	—	—	—	—	—	—	—	—	—	—
70	10.00	35.23	27.15	—	—	—	—	—	—	—	—	—	—	—	—
100	9.96	35.23	27.16	—	—	—	—	—	—	—	—	—	—	—	—
110	9.96	35.23	27.16	—	—	—	—	—	—	—	—	—	—	—	—

STATION SC. 5b.  
Latitude, 60° 31' N. ; Longitude, 0° 35' W.

13th May, 1907.						25th November, 1907.					13th March, 1908.				
0	7.85	35.30	27.56	54	0	8.85	35.12	27.25	82	0	6.35	34.79	27.36	72	0
10	7.92	35.28	27.52	57	555	9.16	35.12	27.20	88	850	6.52	34.76	27.31	77	745
20	7.88	35.26	27.52	57	1125	9.18	35.12	27.20	88	1730	6.56	34.76	27.30	77	1515
30	7.78	35.26	27.53	56	1690	—	—	—	—	—	—	—	—	—	—
40	7.69	35.28	27.55	55	2240	9.18	35.21	27.28	82	3430	6.56	34.76	27.30	78	3065
60	7.62	35.22	27.53	58	3370	9.18	35.12	27.20	89	5140	—	—	—	—	—
80	7.59	35.26	27.55	56	4510	9.20	35.12	27.20	90	6930	6.56	34.78	27.33	78	6185
100	7.53	35.24	27.55	57	5640	9.20	35.16	27.23	86	8690	6.57	34.38	27.33	78	7745
135	—	—	—	—	—	—	—	—	—	—	6.57	34.78	27.33	78	10475
140	7.51	35.23	27.55	58	7940	9.20	35.16	27.23	87	12150	—	—	—	—	—

STATION SC. 5b—*continued.*  
Latitude, 60° 31' N.; Longitude, 0° 35' W.—*continued.*

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
16th September, 1908.						6th November, 1908.					—				
0	10.60	35.14	26.98	109	0	10.00	35.28	27.19	—	—	—	—	—	—	—
10	10.50	35.14	27.00	108	1085	10.18	35.23	27.12	—	—	—	—	—	—	—
20	10.45	35.14	27.00	107	2160	10.18	35.23	27.12	—	—	—	—	—	—	—
30	10.28	35.14	27.03	104	3215	10.18	35.23	27.12	—	—	—	—	—	—	—
50	10.12	35.14	27.06	103	5285	10.18	35.23	27.12	—	—	—	—	—	—	—
70	10.05	35.16	27.08	100	7315	10.18	35.23	27.12	—	—	—	—	—	—	—
100	10.06	35.16	27.08	100	10315	10.19	35.23	27.12	—	—	—	—	—	—	—
130	10.07	35.19	27.10	99	13300	10.19	35.23	27.12	—	—	—	—	—	—	—

STATION SC. 5c.  
Latitude, 61° 13' N.; Longitude, 0° 5' E.

9th July, 1908.						—					—				
0	11.25	35.32	26.99	107	0	—	—	—	—	—	—	—	—	—	—
10	11.20	35.28	26.97	108	1075	—	—	—	—	—	—	—	—	—	—
20	11.10	35.28	26.99	107	2150	—	—	—	—	—	—	—	—	—	—
30	10.84	35.30	27.07	101	3190	—	—	—	—	—	—	—	—	—	—
50	9.10	35.32	27.36	72	4920	—	—	—	—	—	—	—	—	—	—
70	8.91	35.32	27.39	70	6340	—	—	—	—	—	—	—	—	—	—
100	8.41	35.30	27.47	65	8365	—	—	—	—	—	—	—	—	—	—
150	8.14	35.28	27.49	63	11565	—	—	—	—	—	—	—	—	—	—

STATION SC. 6.  
Latitude, 60° 35' N.; Longitude, 0° 29' E.

25th May, 1907.						28th November, 1907.					15th March, 1908.				
0	8.35	35.32	27.49	60	0	8.95	35.30	27.39	70	0	6.85	35.25	27.65	45	0
10	8.15	35.30	27.51	59	595	9.11	35.30	27.36	73	715	7.12	35.21	27.59	51	480
20	7.92	35.29	27.53	56	1170	9.10	35.30	27.36	73	1445	—	—	—	—	—
30	7.70	35.30	27.57	53	1715	—	—	—	—	—	7.15	35.17	27.56	54	1130
40	7.66	35.30	27.58	53	2245	9.10	35.30	27.36	74	2915	—	—	—	—	—
60	7.65	35.30	27.58	52	3295	9.08	35.32	27.37	73	4385	7.15	35.17	27.56	55	2765
80	7.51	35.30	27.61	52	4335	9.02	35.32	27.38	73	5845	7.21	35.17	27.55	57	3885
100	7.21	35.28	27.63	49	5345	9.00	35.32	27.38	72	7295	7.31	35.23	27.57	55	5005
140	—	—	—	—	—	9.00	35.34	27.40	71	10275	7.33	35.25	27.58	54	7185
148	6.95	35.35	27.73	51	7745	—	—	—	—	—	—	—	—	—	—

5th July, 1908.						25th September, 1908.					—				
0	11.35	35.30	26.96	109	0	11.05	35.12	26.88	118	0	—	—	—	—	—
10	11.29	35.26	26.94	110	1095	11.08	35.14	26.89	117	1175	—	—	—	—	—
20	11.28	35.26	26.94	110	2195	11.00	35.17	26.93	113	2325	—	—	—	—	—
30	10.05	35.28	27.18	89	3190	11.00	35.19	26.94	111	3445	—	—	—	—	—
50	8.56	35.28	27.41	67	4750	10.70	35.19	26.99	108	5635	—	—	—	—	—
70	7.90	35.25	27.49	61	6030	8.75	35.21	27.34	76	7475	—	—	—	—	—
100	7.40	35.25	27.57	55	7770	7.69	35.21	27.50	61	9530	—	—	—	—	—
130	7.01	35.25	27.63	50	9345	7.23	35.21	27.58	57	11300	—	—	—	—	—

STATION SC. 6a.  
Latitude, 60° 4' N.; Longitude, 0° 33' E.

25th May, 1907.						1st September, 1907.					28th November, 1907.				
0	8.05	35.26	27.50	61	0	10.85	35.03	26.85	120	0	8.05	35.21	27.45	64	0
10	7.65	35.26	27.54	54	575	10.98	34.96	26.76	128	1240	8.39	35.21	27.40	69	665
20	7.28	35.30	27.63	47	1080	10.98	34.97	26.78	127	2515	8.39	35.23	27.41	67	1345
30	7.24	35.25	27.59	52	1575	10.98	35.01	26.81	125	3775	—	—	—	—	—
40	7.24	35.29	27.63	49	2080	8.32	35.30	27.48	64	4720	8.41	35.23	27.41	68	2695
60	7.15	35.28	27.64	48	3050	7.58	35.30	27.59	52	5880	8.41	35.23	27.41	68	4055
80	6.70	35.23	27.66	46	3990	7.37	35.30	27.62	50	6900	8.43	35.23	27.41	69	5425
100	—	—	—	—	—	7.07	35.35	27.71	42	7820	8.29	35.30	27.48	64	6755
114	6.61	35.26	27.70	43	5503	—	—	—	—	—	—	—	—	—	—
115	—	—	—	—	—	7.03	35.35	27.72	42	9290	—	—	—	—	—



STATION SC. 6a—continued.  
Latitude, 60° 4' N. ; Longitude, 0° 33' E.—continued.

Depth (Metres).	15th March, 1908.					5th July, 1908.					25th September, 1908.				
	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
0	6.45	35.25	27.70	38	0	11.05	35.25	26.97	108	0	11.60	34.63	26.32	164	0
10	6.64	35.10	27.58	52	450	11.11	35.26	26.98	108	1080	11.56	34.65	26.39	162	1630
20	—	—	—	—	—	11.11	35.19	26.92	113	2185	11.40	34.96	26.68	136	3120
30	6.68	35.16	27.58	47	1440	10.70	35.19	26.99	107	3285	11.34	35.01	26.75	131	4455
50	—	—	—	—	—	7.78	35.23	27.50	58	4935	9.89	35.28	27.37	88	6645
60	6.76	35.16	27.59	49	2880	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	7.03	35.28	27.66	47	5985	8.31	35.28	27.46	64	8165
80	6.80	35.16	27.59	50	3870	—	—	—	—	—	—	—	—	—	—
100	6.81	35.16	27.59	50	4870	6.95	35.28	27.72	46	7380	7.39	35.28	27.60	51	9890
145	6.73	35.16	27.60	50	7120	—	—	—	—	—	—	—	—	—	—
150	—	—	—	—	—	6.88	35.28	27.73	46	9680	7.36	35.28	27.61	51	10910

STATION SC. 6c.  
Latitude, 60° 3' N. ; Longitude, 1° 4' E.

3rd July, 1908.						—					—				
0	11.75	35.17	26.79	126	0	—	—	—	—	—	—	—	—	—	—
10	11.80	35.17	26.78	127	1265	—	—	—	—	—	—	—	—	—	—
20	11.58	35.21	26.85	120	2500	—	—	—	—	—	—	—	—	—	—
30	10.01	35.14	27.08	100	3600	—	—	—	—	—	—	—	—	—	—
50	6.58	35.21	27.66	44	5040	—	—	—	—	—	—	—	—	—	—
70	6.59	35.21	27.66	45	5930	—	—	—	—	—	—	—	—	—	—
100	6.46	35.21	27.68	44	7265	—	—	—	—	—	—	—	—	—	—
135	6.40	35.21	27.69	43	8788	—	—	—	—	—	—	—	—	—	—

STATION SC. 7.  
Latitude, 61° 6' N. ; Longitude, 2° 1' E.

21st May, 1907.						28th August, 1907.					14th March, 1908.				
0	7.45	35.28	27.60	51	0	11.65	34.38	26.17	184	0	5.75	35.01	27.62	48	0
10	7.56	35.28	27.58	52	515	11.50	34.49	26.30	173	1785	7.10	35.08	27.49	61	545
20	7.56	35.23	27.61	50	1025	11.34	34.58	26.41	164	3470	—	—	—	—	—
30	7.56	35.23	27.54	56	1555	10.91	34.88	26.72	133	4955	7.08	35.08	27.49	61	1765
40	7.52	35.25	27.54	57	2120	9.22	35.26	27.31	79	6015	—	—	—	—	—
60	7.51	35.28	27.55	55	4240	8.40	35.28	27.45	65	7455	6.94	35.16	27.58	54	3490
80	7.51	35.28	27.58	54	5330	8.00	35.28	27.51	60	8705	—	—	—	—	—
100	7.33	35.28	27.61	51	6380	7.73	35.28	27.55	56	9865	6.95	35.16	27.58	55	5670
125	—	—	—	—	—	7.19	35.30	27.65	48	11165	—	—	—	—	—
140	—	—	—	—	—	—	—	—	—	—	6.95	35.53	27.88	29	7350
148	7.09	35.27	27.65	50	8804	—	—	—	—	—	—	—	—	—	—
24th September, 1908.						—					—				
0	11.25	34.61	26.45	159	0	—	—	—	—	—	—	—	—	—	—
10	11.33	34.58	26.41	163	1610	—	—	—	—	—	—	—	—	—	—
20	11.28	34.63	26.45	158	3215	—	—	—	—	—	—	—	—	—	—
30	11.25	34.65	26.47	156	4785	—	—	—	—	—	—	—	—	—	—
50	9.06	35.19	27.28	81	7155	—	—	—	—	—	—	—	—	—	—
70	8.65	35.28	27.41	68	8645	—	—	—	—	—	—	—	—	—	—
100	8.31	35.28	27.44	64	10625	—	—	—	—	—	—	—	—	—	—
130	8.13	35.28	27.49	63	12530	—	—	—	—	—	—	—	—	—	—

STATION SC. 7a.  
Latitude, 60° 45' N. ; Longitude, 2° 30' E.

26th May, 1907.						28th August, 1907.					14th March, 1908.				
0	8.05	35.09	27.37	73	0	11.35	33.80	25.80	221	0	6.35	35.16	27.64	44	0
10	8.08	35.13	27.39	71	720	11.50	33.71	25.70	231	2260	6.50	35.16	27.62	46	455
20	7.42	35.17	27.52	58	1365	11.40	34.47	26.21	174	4285	—	—	—	—	—
30	7.36	35.18	27.54	57	1940	—	—	—	—	—	6.50	35.16	27.62	46	1375
40	7.24	35.18	27.55	57	2510	8.35	35.25	27.43	66	6685	—	—	—	—	—
60	7.20	35.20	27.57	54	3620	8.12	35.30	27.51	60	7945	6.50	35.16	27.62	47	2770
80	6.49	35.24	27.70	42	4580	7.73	35.30	27.57	55	9095	6.50	35.17	27.65	47	3710
100	6.29	35.27	27.75	36	5360	7.51	35.34	27.63	49	10135	—	—	—	—	—
120	6.03	35.26	27.78	35	6070	—	—	—	—	—	6.51	35.19	27.65	46	5570







STATION SC. 9.

Latitude, 61° 34' N. ; Longitude, 2° 4' E.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
20th May, 1907.						28th August, 1907.					14th March, 1908.				
0	7.75	34.88	27.24	85	0	10.95	35.21	26.97	109	0	7.05	35.17	27.57	53	0
10	7.30	34.84	27.25	81	830	11.00	35.26	27.00	106	1075	7.28	35.14	27.50	59	560
20	7.30	34.82	27.24	83	1650	10.99	35.26	27.00	106	2135	—	—	—	—	—
30	7.39	34.97	27.35	73	2430	10.98	35.26	27.00	106	4195	7.41	35.17	27.52	58	1730
40	7.70	35.14	27.43	65	3120	10.98	35.26	27.00	107	5260	—	—	—	—	—
60	7.81	35.13	27.42	67	4440	10.31	35.26	27.12	98	7310	7.45	35.17	27.51	59	3485
80	7.89	35.17	27.44	66	5770	9.50	35.26	27.27	85	9140	—	—	—	—	—
100	7.85	35.23	27.50	62	7050	9.31	35.26	27.30	82	10810	7.43	35.19	27.53	59	5845
150	7.77	35.23	27.51	61	10125	8.98	35.30	27.38	74	14710	7.44	35.19	27.53	60	8820
200	7.46	35.20	27.53	61	13175	8.52	35.30	27.45	69	18285	—	—	—	—	—
250	7.13	35.18	27.57	59	16175	8.34	35.25	27.43	70	21760	7.47	35.21	27.54	61	14870
300	7.02	35.21	27.61	56	19050	7.99	35.19	27.44	70	25260	6.73	35.12	27.57	57	17820
325	—	—	—	—	—	7.88	35.19	27.45	70	27010	—	—	—	—	—
350	—	—	—	—	—	—	—	—	—	—	6.30	35.12	27.62	53	20570
362	5.99	35.10	27.67	50	22336	—	—	—	—	—	—	—	—	—	—

9th July, 1907.						23rd September, 1908.					—				
0	11.25	32.83	25.07	293	0	10.55	35.12	26.96	109	0	—	—	—	—	—
10	11.31	32.94	25.13	286	2895	10.51	35.12	26.97	109	1090	—	—	—	—	—
20	10.22	35.16	27.06	102	4835	10.22	35.12	27.03	104	2155	—	—	—	—	—
30	9.79	35.21	27.27	90	5795	10.19	35.14	27.04	103	3190	—	—	—	—	—
50	8.98	35.26	27.35	75	7445	10.02	35.19	27.12	97	5190	—	—	—	—	—
70	8.89	35.26	27.36	74	8935	9.04	35.28	27.35	75	6910	—	—	—	—	—
100	8.70	35.26	27.39	72	11125	8.53	35.28	27.43	67	9040	—	—	—	—	—
150	8.44	35.26	27.44	69	14650	—	—	—	—	—	—	—	—	—	—
200	8.37	35.26	27.45	69	18100	7.71	35.23	27.51	62	15490	—	—	—	—	—
290	8.03	35.26	27.50	66	24175	—	—	—	—	—	—	—	—	—	—
300	—	—	—	—	—	7.17	35.17	27.55	61	21640	—	—	—	—	—
350	—	—	—	—	—	6.60	35.16	27.61	53	24490	—	—	—	—	—

STATION SC. 10.

Latitude, 61° 35' N. ; Longitude, 0° 47' E.

20th May, 1907.						27th August, 1907.					14th March, 1908.				
0	8.05	35.26	27.50	61	0	11.50	35.19	26.84	121	0	7.15	35.25	27.61	49	0
10	8.00	35.23	27.47	62	615	11.26	35.14	26.85	119	1200	7.42	35.25	27.57	53	510
20	7.91	35.23	27.48	61	1230	11.14	35.19	26.91	114	2365	—	—	—	—	—
30	7.90	35.23	27.48	61	1840	11.02	35.19	26.94	111	3490	7.42	35.25	27.57	53	1570
40	7.90	35.24	27.48	61	2445	10.90	35.19	26.96	111	4600	—	—	—	—	—
60	7.90	35.23	27.48	62	3675	9.40	35.28	27.29	81	6520	7.42	35.25	27.57	54	3175
80	7.90	35.25	27.49	61	4905	8.95	35.32	27.39	71	8040	—	—	—	—	—
100	7.73	35.23	27.51	60	6115	8.55	35.32	27.45	65	9400	7.43	35.26	27.59	54	5335
150	7.54	35.23	27.56	59	9090	8.31	35.28	27.46	65	12650	—	—	—	—	—
200	—	—	—	—	—	7.91	35.25	27.49	63	15850	7.44	35.26	27.59	56	10835
208	7.50	35.25	27.56	58	12483	—	—	—	—	—	—	—	—	—	—

9th July, 1908.						23rd September, 1908.					—				
0	11.05	35.30	27.02	104	0	10.85	35.21	26.97	—	—	—	—	—	—	—
10	11.08	35.30	27.01	105	1045	10.80	35.21	27.00	—	—	—	—	—	—	—
20	10.89	35.32	27.06	100	2070	10.72	35.21	27.01	—	—	—	—	—	—	—
30	10.05	35.32	27.21	86	3000	10.68	35.21	27.02	—	—	—	—	—	—	—
50	9.10	35.30	27.36	74	4000	10.68	35.23	27.03	—	—	—	—	—	—	—
70	8.82	35.30	27.41	70	6040	10.35	35.28	27.13	—	—	—	—	—	—	—
100	8.59	35.28	27.44	68	8110	9.13	35.30	27.42	—	—	—	—	—	—	—
150	8.26	35.28	27.47	64	11410	—	—	—	—	—	—	—	—	—	—
198	7.94	35.32	27.55	58	14338	—	—	—	—	—	—	—	—	—	—
206	—	—	—	—	—	8.72	35.30	27.42	—	—	—	—	—	—	—





STATION. SC. 12.

Latitude, 61° 2' N. ; Longitude, 1° 10' W.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub> .	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub> .	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub> .	v-v'.	e-e'.
15th May, 1907.						26th August, 1907.					13th March, 1908.				
0	9.15	35.28	27.35	75	0	10.85	35.28	27.04	101	0	7.35	34.87	27.29	80	0
10	8.76	35.28	27.40	69	720	11.00	35.26	27.00	106	1035	7.45	34.90	27.30	79	795
20	8.61	35.25	27.39	68	1405	10.98	35.26	27.00	106	2095	—	—	—	—	—
30	8.59	35.26	27.41	68	2085	10.91	35.26	27.02	104	3145	7.48	34.90	27.29	79	2375
40	8.52	35.26	27.42	68	2765	10.91	35.26	27.02	105	4190	—	—	—	—	—
60	8.21	35.25	27.45	65	4095	9.12	35.23	27.30	80	6040	7.48	34.90	27.29	81	4775
80	8.08	35.28	27.49	62	5365	8.99	35.26	27.35	76	7600	—	—	—	—	—
100	7.72	35.28	27.56	56	6545	8.82	35.26	27.38	73	9090	7.49	34.90	27.29	81	8015
125	—	—	—	—	—	8.79	35.26	27.38	74	10928	7.49	34.90	27.29	81	10040
131	7.52	35.30	27.61	52	8219	—	—	—	—	—	—	—	—	—	—
22nd September, 1908.						—					—				
0	10.75	35.23	27.01	104	0	—	—	—	—	—	—	—	—	—	—
10	10.70	35.23	27.02	104	1040	—	—	—	—	—	—	—	—	—	—
20	10.68	35.23	27.03	104	2080	—	—	—	—	—	—	—	—	—	—
30	10.63	35.23	27.04	104	3120	—	—	—	—	—	—	—	—	—	—
50	10.55	35.23	27.06	103	5190	—	—	—	—	—	—	—	—	—	—
70	9.60	35.28	27.26	83	7050	—	—	—	—	—	—	—	—	—	—
100	9.19	35.28	27.32	78	9465	—	—	—	—	—	—	—	—	—	—
130	9.15	35.28	27.32	78	11805	—	—	—	—	—	—	—	—	—	—

STATION SC. 13a.

Latitude, 61° 9' N. ; Longitude, 2° 14' W.

6th July, 1907.						9th April, 1908.					7th June, 1908.				
0	10.35	35.39	27.22	86	0	7.95	35.32	27.55	55	0	9.35	35.35	27.36	73	0
10	10.12	35.34	27.22	85	855	7.82	35.32	27.57	53	540	7.62	35.34	27.64	48	605
20	9.82	35.32	27.25	83	1695	7.68	35.30	27.58	52	1065	7.60	35.34	27.64	48	1085
30	9.41	35.32	27.32	77	2495	7.68	35.30	27.53	52	1585	7.58	35.32	27.60	50	1575
50	9.12	35.32	27.36	73	3925	7.66	35.30	27.58	53	2110	7.48	35.32	27.61	49	2565
70	8.99	35.35	27.41	69	5345	7.62	35.26	27.56	55	3190	7.10	35.32	27.67	43	3485
100	8.77	35.32	27.42	68	7400	7.48	35.26	27.57	56	4300	6.92	35.32	27.70	41	4745
150	8.55	35.32	27.45	67	10775	7.40	35.23	27.56	57	5995	—	—	—	—	—
200	8.23	35.32	27.50	63	14025	7.02	35.16	27.54	57	8845	6.70	35.35	27.76	39	8745
250	8.07	35.26	27.49	66	17250	—	—	—	—	—	—	—	—	—	—
300	7.71	35.26	27.54	62	20450	6.85	35.16	27.62	56	11670	8.02	35.25	27.48	66	14045
350	7.41	35.25	27.57	69	23725	—	—	—	—	—	—	—	—	—	—
400	6.95	35.21	27.62	56	26850	6.43	35.16	27.64	53	17120	7.18	35.25	27.61	56	20145
450	6.13	35.16	27.67	49	29475	—	—	—	—	—	—	—	—	—	—
500	4.40	35.03	27.83	35	31575	6.05	35.16	27.68	50	22270	6.00	35.16	27.67	48	25345
530	—	—	—	—	—	5.80	35.12	27.69	50	23770	—	—	—	—	—
550	—	—	—	—	—	—	—	—	—	—	5.34	35.07	27.70	48	27745
19th August, 1908.						7th November, 1908.					—				
0	11.65	35.19	26.82	125	0	9.65	35.34	27.29	79	0	—	—	—	—	—
10	11.65	35.19	26.82	125	1250	9.74	35.21	27.19	89	840	—	—	—	—	—
20	11.11	35.19	26.92	124	2495	9.72	35.21	27.19	89	1730	—	—	—	—	—
30	10.51	35.19	27.03	104	3635	9.60	35.21	27.21	87	2610	—	—	—	—	—
50	9.75	35.21	27.18	91	5585	9.29	35.19	27.23	85	4330	—	—	—	—	—
70	9.36	35.21	27.24	85	7345	9.00	35.19	27.29	82	6000	—	—	—	—	—
100	9.19	35.23	27.29	82	9850	8.99	35.19	27.29	82	8460	—	—	—	—	—
200	8.73	35.25	27.37	75	17700	7.91	35.19	27.46	68	15960	—	—	—	—	—
300	8.51	35.25	27.40	74	25500	7.53	35.19	27.56	64	22560	—	—	—	—	—
400	7.82	35.17	27.46	71	32500	7.02	35.19	27.59	58	28660	—	—	—	—	—
500	—	—	—	—	—	5.64	35.10	27.71	48	33960	—	—	—	—	—
530	7.47	35.19	27.53	68	41535	—	—	—	—	—	—	—	—	—	—
570	—	—	—	—	—	4.45	35.05	27.82	40	37040	—	—	—	—	—



STATION Sc. 14a.  
Latitude, 61° 18' N. ; Longitude, 2° 59' W.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
9th April, 1908.						20th August, 1908.					7th November, 1908.				
0	7.85	35.32	27.56	54	0	11.05	35.10	26.87	119	0	8.15	34.96	27.74	85	0
10	7.74	35.26	27.54	55	545	11.11	35.12	26.87	118	1185	8.38	34.96	27.20	88	865
20	7.65	35.26	27.55	54	1090	11.00	35.08	26.86	120	2375	8.42	34.96	27.20	88	1745
30	7.59	35.26	27.56	53	1625	9.81	35.08	27.08	100	3475	8.44	35.01	27.23	85	2610
50	7.55	35.26	27.57	54	2695	8.16	35.08	27.33	76	5235	8.48	35.01	27.23	86	4320
70	7.54	35.26	27.57	54	3775	7.81	35.08	27.39	72	6715	8.48	35.07	27.27	82	6000
100	7.40	35.26	27.59	54	5395	7.03	35.08	27.50	61	8710	7.77	35.16	27.46	66	8220
200	6.47	35.21	27.68	47	10145	6.72	35.08	27.54	59	14710	6.22	35.16	27.66	47	13870
250	—	—	—	—	—	—	—	—	—	—	4.12	34.96	27.75	36	15945
300	5.83	35.16	27.71	43	14945	5.33	35.01	27.67	47	20010	2.97	34.94	27.86	28	17545
400	4.21	34.99	27.78	37	18945	2.36	34.76	27.77	36	24160	1.02	34.94	28.02	11	19495
450	2.08	34.83	27.85	29	20595	—	—	—	—	—	—	—	—	—	—
500	1.09	34.87	27.95	18	21770	-0.32	34.78	27.97	19	26910	0.04	34.94	28.08	5	20295
600	1.05	34.92	28.00	13	23320	-0.37	34.85	28.02	13	28510	-0.32	34.94	28.10	3	20395
700	-0.20	34.94	28.09	5	24220	-0.40	34.85	28.02	13	29810	-0.54	34.94	28.11	1	20895
800	-0.35	34.94	28.10	4	24670	-0.79	34.85	28.04	7	30810	-0.68	34.94	28.12	-1	20895
900	-0.46	34.96	28.12	0	24870	-0.72	34.85	28.04	5	31410	—	—	—	—	—
1000	-0.38	34.96	28.11	1	24920	—	—	—	—	—	-0.86	34.94	28.13	-2	20595
1050	—	—	—	—	—	-1.05	34.85	28.05	4	32085	—	—	—	—	—
1100	-0.46	34.96	28.12	0	24970	—	—	—	—	—	—	—	—	—	—
1200	-0.53	34.96	28.12	-2	24970	—	—	—	—	—	—	—	—	—	—
1300	—	—	—	—	—	—	—	—	—	—	-1.12	34.94	28.14	-2	19995

STATION Sc. 15a.  
Latitude, 61° 27' N. ; Longitude, 3° 42' W.

7th July, 1907.						9th April, 1908.					20th August, 1908.				
0	8.25	35.19	27.39	70	0	6.35	35.21	27.69	41	0	10.45	34.90	26.82	125	0
10	8.39	35.19	27.38	70	700	6.55	35.21	27.67	44	425	10.28	34.90	26.85	122	1235
20	8.39	35.19	27.38	70	1400	6.55	35.21	27.67	44	865	9.79	34.94	26.97	111	2400
30	—	—	—	—	—	6.55	35.17	27.64	46	1315	9.55	34.97	27.04	105	3480
40	8.02	35.17	27.43	67	2770	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	6.53	35.14	27.63	49	2265	8.34	35.05	27.28	81	5340
60	7.49	35.17	27.51	61	4050	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	6.50	35.14	27.62	49	3245	7.40	35.12	27.46	63	6780
80	7.44	35.16	27.49	61	5270	—	—	—	—	—	—	—	—	—	—
100	7.34	35.14	27.50	61	6490	6.43	35.10	27.60	52	4760	7.37	35.12	27.47	63	8670
150	7.21	35.14	27.51	61	9540	—	—	—	—	—	—	—	—	—	—
200	7.02	35.19	27.59	55	12440	5.85	35.10	27.68	47	9710	6.42	35.07	27.57	56	14620
300	6.43	35.10	27.60	55	17940	4.03	34.92	27.74	39	14010	2.19	34.85	27.85	28	18820
350	—	—	—	—	—	2.32	34.83	27.83	30	15735	—	—	—	—	—
400	3.15	34.90	27.82	33	22340	1.52	34.83	27.90	23	17060	0.63	34.85	27.96	16	21020
450	1.42	34.85	27.91	20	23665	—	—	—	—	—	—	—	—	—	—
500	—	—	—	—	—	0.23	34.87	28.00	11	18760	0.11	34.87	28.01	10	22320
600	-0.09	34.88	28.03	8	25765	—	—	—	—	—	-0.30	34.87	28.04	8	23220
700	—	—	—	—	—	-0.39	34.87	28.00	8	20660	-0.47	34.88	28.06	6	23920
750	-0.39	34.87	28.04	5	26740	—	—	—	—	—	—	—	—	—	—
800	—	—	—	—	—	—	—	—	—	—	-0.59	34.88	28.06	6	24520
850	-0.59	34.87	28.05	4	27190	—	—	—	—	—	—	—	—	—	—
900	—	—	—	—	—	—	—	—	—	—	-0.69	34.88	28.07	4	25020
950	-0.66	34.85	28.03	4	27590	—	—	—	—	—	—	—	—	—	—
1000	—	—	—	—	—	-0.58	34.85	27.97	8	23060	-0.96	34.94	28.13	-3	25070
1050	-0.75	34.88	28.07	2	27890	—	—	—	—	—	—	—	—	—	—
1150	-0.89	34.92	28.11	-1	27940	—	—	—	—	—	—	—	—	—	—
1250	—	—	—	—	—	—	—	—	—	—	-1.19	34.94	28.14	-3	24320
1350	—	—	—	—	—	-0.57	34.85	27.97	7	25685	—	—	—	—	—
7th November, 1908.						—					—				
0	8.45	35.05	27.28	83	0	—	—	—	—	—	—	—	—	—	—
10	8.49	34.97	27.22	90	865	—	—	—	—	—	—	—	—	—	—
20	8.44	34.97	27.22	89	1760	—	—	—	—	—	—	—	—	—	—
30	8.49	34.97	27.22	90	2655	—	—	—	—	—	—	—	—	—	—
50	8.50	34.97	27.22	91	4465	—	—	—	—	—	—	—	—	—	—
70	8.50	35.07	27.27	83	6205	—	—	—	—	—	—	—	—	—	—
100	8.74	35.12	27.27	83	8695	—	—	—	—	—	—	—	—	—	—
200	7.81	35.16	27.46	68	16245	—	—	—	—	—	—	—	—	—	—
300	6.83	35.16	27.58	56	22445	—	—	—	—	—	—	—	—	—	—
350	4.71	34.99	27.73	42	24895	—	—	—	—	—	—	—	—	—	—
400	3.06	34.85	27.78	35	26820	—	—	—	—	—	—	—	—	—	—
450	1.52	bottle	broken	21	28260	—	—	—	—	—	—	—	—	—	—
500	-0.12	34.88	28.04	9	29010	—	—	—	—	—	—	—	—	—	—
600	-0.03	34.88	28.03	9	29910	—	—	—	—	—	—	—	—	—	—
700	-0.24	34.90	28.06	7	30710	—	—	—	—	—	—	—	—	—	—
800	-0.40	34.90	28.07	5	31310	—	—	—	—	—	—	—	—	—	—
900	-0.53	34.90	28.08	4	31760	—	—	—	—	—	—	—	—	—	—
1000	-0.62	34.90	28.08	4	32160	—	—	—	—	—	—	—	—	—	—
1200	-0.84	34.90	28.10	0	32560	—	—	—	—	—	—	—	—	—	—
1350	-0.96	34.94	28.13	-1	32485	—	—	—	—	—	—	—	—	—	—





STATION Sc. 16—*continued.*

Latitude, 62° 00' N. ; Longitude, 6° 12' W.—*continued.*

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub> .	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub> .	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub> .	v-v'.	e-e'.
21st August, 1908.						8th November, 1908.					—				
0	10.15	35.10	27.03	105	0	8.55	35.10	27.24	85	0	—	—	—	—	—
10	9.90	35.16	27.11	96	1005	9.00	35.10	27.22	86	855	—	—	—	—	—
20	9.44	35.14	27.17	91	1940	9.00	35.10	27.22	86	1715	—	—	—	—	—
30	9.32	35.10	27.16	91	2850	9.00	35.10	27.22	86	2575	—	—	—	—	—
50	9.21	35.14	27.22	87	4630	9.01	35.10	27.22	87	4305	—	—	—	—	—
70	9.12	35.14	27.23	87	6370	9.01	35.10	27.22	87	6045	—	—	—	—	—
100	8.93	35.14	27.27	84	8935	9.02	35.10	27.22	88	8670	—	—	—	—	—
120	—	—	—	—	—	9.02	35.10	27.22	88	10430	—	—	—	—	—
140	8.72	35.14	27.31	82	12255	—	—	—	—	—	—	—	—	—	—

STATION Sc. 16a.

Latitude, 61° 49' N. ; Longitude, 5° 36' W.

8th July, 1907.						10th April, 1908.					9th June, 1908.				
0	8.35	35.17	27.38	72	0	6.05	35.12	27.66	43	0	7.85	35.19	27.46	64	0
10	8.52	35.14	27.31	76	740	5.99	35.08	27.64	46	445	7.86	35.19	27.46	64	640
20	8.52	35.12	27.30	78	1510	5.92	35.08	27.65	45	900	7.79	35.19	27.47	63	1275
30	8.50	35.14	27.32	76	2280	5.89	35.08	27.65	45	1350	7.63	35.19	27.49	64	1910
40	8.49	35.14	27.33	77	3045	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	5.82	35.08	27.66	44	2240	7.42	35.19	27.53	58	3130
60	8.14	35.14	27.38	72	4535	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	5.82	35.08	27.66	44	3120	6.96	35.14	27.56	56	4270
80	7.49	35.17	27.50	62	5875	—	—	—	—	—	—	—	—	—	—
100	7.26	35.16	27.52	60	7895	5.83	35.10	27.68	44	4440	6.80	35.17	27.59	51	5875
150	7.13	35.16	27.54	58	10045	5.83	35.10	27.68	45	6665	—	—	—	—	—
170	—	—	—	—	—	5.85	35.10	27.68	45	7565	—	—	—	—	—
190	—	—	—	—	—	—	—	—	—	—	6.42	35.17	27.65	49	10375
240	6.94	35.16	27.57	58	15265	—	—	—	—	—	—	—	—	—	—
21st August, 1908.						7th November, 1908.					—				
0	10.85	35.16	26.94	113	0	8.76	35.16	27.30	79	0	—	—	—	—	—
10	10.71	35.14	26.96	111	1120	8.98	35.16	27.26	82	805	—	—	—	—	—
20	10.61	35.14	26.98	109	2220	8.98	35.16	27.26	82	1625	—	—	—	—	—
30	10.19	35.14	27.05	102	3275	8.98	35.16	27.26	82	2445	—	—	—	—	—
50	9.50	35.14	27.17	92	5215	8.98	35.16	27.26	83	4095	—	—	—	—	—
70	8.81	35.19	27.32	78	6915	8.98	35.16	27.26	83	5755	—	—	—	—	—
100	8.21	35.19	27.41	70	9135	8.89	35.19	27.30	80	8200	—	—	—	—	—
150	7.81	35.19	27.47	65	12510	8.76	35.19	27.32	78	12150	—	—	—	—	—
200	7.72	35.19	27.48	65	15760	—	—	—	—	—	—	—	—	—	—
213	—	—	—	—	—	8.73	35.19	27.33	78	17064	—	—	—	—	—

STATION Sc. 17.

Latitude, 61° 11' N. ; Longitude, 6° 33' W.

10th July, 1907.						13th April, 1908.					13th June, 1908.				
0	8.45	35.23	27.40	68	0	7.25	35.25	27.59	51	0	7.25	35.16	27.52	56	0
10	8.51	35.19	27.36	72	700	7.28	35.17	27.54	55	530	7.09	35.12	27.52	58	570
20	8.40	35.19	27.38	71	1415	6.78	35.12	27.56	53	1070	7.02	35.12	27.52	58	1150
30	8.16	35.23	27.44	64	2090	6.62	35.12	27.58	50	1585	7.06	35.10	27.51	58	1730
40	7.92	35.23	27.49	62	2720	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	6.42	35.08	27.58	52	2605	7.03	35.14	27.54	56	2870
60	7.80	35.21	27.49	61	3950	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	6.41	35.10	27.60	52	3645	7.05	35.16	27.55	54	3970
80	7.79	35.21	27.49	62	5180	—	—	—	—	—	—	—	—	—	—
100	7.79	35.21	27.49	62	6420	6.40	35.10	27.60	52	5205	7.05	35.16	27.55	55	5605
120	—	—	—	—	—	6.41	35.12	27.61	50	6225	—	—	—	—	—
130	—	—	—	—	—	—	—	—	—	—	7.09	35.16	27.55	56	7270
145	7.75	35.21	27.50	62	9210	—	—	—	—	—	—	—	—	—	—

STATION SC. 17—*continued.*

Latitude, 61° 11' N. ; Longitude, 6° 33' W.—*continued.*

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v <sup>2</sup>	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
9th November, 1908.															
0	8.85	35.19	27.32	78	0	—	—	—	—	—	—	—	—	—	—
10	8.92	35.19	27.31	78	780	—	—	—	—	—	—	—	—	—	—
20	8.90	35.19	27.31	78	1560	—	—	—	—	—	—	—	—	—	—
30	8.84	35.19	27.32	78	2340	—	—	—	—	—	—	—	—	—	—
50	8.80	35.19	27.32	77	3890	—	—	—	—	—	—	—	—	—	—
70	8.80	35.19	27.32	77	5430	—	—	—	—	—	—	—	—	—	—
100	8.76	35.19	27.33	77	7740	—	—	—	—	—	—	—	—	—	—
115	8.76	35.19	27.33	77	8895	—	—	—	—	—	—	—	—	—	—

STATION SC. 18a.

Latitude, 60° 57' N. ; Longitude, 5° 47' W.

10th July, 1907.						13th April, 1908.					13th June, 1908.				
0	9.55	35.35	27.32	76	0	6.55	35.16	27.63	48	0	8.25	35.23	27.43	65	0
10	9.40	35.19	27.22	86	810	6.49	35.08	27.57	52	500	8.29	35.25	27.43	65	650
20	9.36	35.17	27.22	87	1675	6.39	35.08	27.58	51	1015	8.12	35.19	27.42	66	1305
30	9.23	35.17	27.24	85	2535	6.29	35.08	27.60	49	1515	8.06	35.19	27.43	65	1960
40	8.89	35.21	27.32	77	3345	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	6.28	35.08	27.60	50	2505	7.99	35.23	27.47	63	3240
60	8.81	35.19	27.32	77	4885	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	6.26	35.08	27.60	50	3505	8.00	35.23	27.47	63	4500
80	8.13	35.19	27.42	69	6345	—	—	—	—	—	—	—	—	—	—
100	7.74	35.17	27.47	64	7675	6.19	35.08	27.61	50	5005	7.01	35.21	27.61	51	6210
150	7.40	35.17	27.51	62	10825	6.13	35.08	27.62	51	7530	—	—	—	—	—
200	7.04	35.17	27.58	58	13825	6.01	35.12	27.67	47	9955	6.74	35.16	27.60	53	11410
250	6.84	35.17	27.60	54	16625	5.72	34.92	27.55	59	12605	—	—	—	—	—
300	6.67	35.17	27.62	53	19300	—	—	—	—	—	6.24	35.21	27.72	44	16260

9th November, 1908.															
0	8.95	35.12	27.24	84	0	—	—	—	—	—	—	—	—	—	—
10	9.09	35.16	27.24	83	835	—	—	—	—	—	—	—	—	—	—
20	9.09	35.16	27.24	83	1665	—	—	—	—	—	—	—	—	—	—
30	9.09	35.16	27.24	83	2495	—	—	—	—	—	—	—	—	—	—
50	9.09	35.16	27.24	84	4165	—	—	—	—	—	—	—	—	—	—
70	9.09	35.16	27.24	84	5845	—	—	—	—	—	—	—	—	—	—
100	8.93	35.25	27.44	75	8230	—	—	—	—	—	—	—	—	—	—
200	8.34	35.28	27.46	66	14830	—	—	—	—	—	—	—	—	—	—
295	7.87	35.28	27.54	62	20910	—	—	—	—	—	—	—	—	—	—

STATION SC. 19a.

Latitude, 60° 36' N. ; Longitude, 4° 46' W.

10th July, 1907.						13th April, 1908.					13th June, 1908.				
0	9.75	35.37	27.31	78	0	7.55	35.23	27.55	55	0	9.15	35.21	27.29	79	0
10	9.80	35.37	27.30	79	785	7.62	35.26	27.56	54	545	9.34	35.23	27.26	81	800
20	9.84	35.28	27.27	80	1580	7.55	35.26	27.58	54	1085	8.88	35.14	27.27	82	1615
30	—	—	—	—	—	7.48	35.25	27.57	54	1625	8.42	35.14	27.35	75	2400
40	9.11	35.28	27.33	76	3140	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	7.48	35.25	27.57	55	2715	7.80	35.14	27.44	67	3820
60	8.43	35.26	27.44	67	4570	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	7.48	35.21	27.54	57	3835	7.51	35.21	27.53	57	5060
80	8.24	35.26	27.46	65	5890	—	—	—	—	—	—	—	—	—	—
100	8.13	35.26	27.48	64	7180	7.49	35.21	27.54	58	5560	7.19	35.19	27.57	56	6755
150	7.52	35.21	27.53	60	10280	—	—	—	—	—	—	—	—	—	—
200	7.51	35.23	27.53	60	13280	7.42	35.21	27.55	59	11410	6.70	35.19	27.63	49	12005
300	6.48	35.17	27.65	51	18830	7.15	35.21	27.59	58	17260	3.84	35.01	27.74	30	15955
400	4.44	35.03	27.79	36	23180	5.35	35.08	27.72	45	22410	1.50	34.85	27.90	22	18555
500	1.03	34.85	27.94	19	25930	1.91	34.87	27.90	24	25860	0.24	34.88	28.02	11	20205
600	-0.07	34.94	27.12	2	26980	—	—	—	—	—	-0.16	34.88	28.04	9	21205
700	—	—	—	—	—	-0.13	34.87	28.03	7	28960	-0.47	34.90	28.07	4	21855
800	-0.57	34.94	27.11	0	27180	—	—	—	—	—	-0.69	34.92	28.10	2	22155
900	—	—	—	—	—	—	—	—	—	—	-0.87	34.94	28.13	-1	22205
950	-0.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1000	—	—	—	—	—	-0.36	34.87	28.00	6	30910	-0.97	34.94	28.13	-2	22055



STATION Sc. 19a—*continued*.  
Latitude, 60° 36' N.; Longitude, 4° 46' W.—*continued*.

Depth (Metres).	Temp. °C.	S <sub>o</sub> /‰	σ <sub>t</sub>	v—v'. e—e'.	10 November, 1908.					
					Temp. °C.	S <sub>o</sub> /‰	σ <sub>t</sub>	v—v'. e—e'.		
0	11.05	35.19	26.93	114	0	9.45	35.21	27.23	84	0
10	11.00	35.16	26.91	114	1140	9.44	35.21	27.23	84	840
20	10.12	35.01	26.96	110	2260	9.44	35.21	27.23	84	1680
30	10.01	35.07	27.02	104	3330	9.40	35.23	27.25	83	2515
50	9.67	35.12	27.12	97	5340	9.22	35.23	27.28	81	4155
70	8.49	35.17	27.36	75	7060	9.22	35.28	27.32	77	5735
100	8.03	35.25	27.48	63	9130	8.93	35.32	27.40	70	7940
200	7.57	35.19	27.50	63	15430	8.01	35.32	27.54	59	14390
300	7.11	35.17	27.57	58	21480	6.85	35.23	27.65	53	19990
400	5.33	35.07	27.71	44	26580	3.93	34.97	27.80	35	24390
500	1.83	34.90	27.95	22	29880	1.15	34.82	27.99	13	26790
600	-0.26	34.90	28.06	6	31280	0.02	34.97	28.11	2	27540
700	-0.76	34.90	28.09	3	31730	—	—	—	—	—
800	-0.94	35.01	28.19	2	31980	-0.49	34.99	28.15	-2	27540
900	-1.06	34.90	28.11	0	32080	-0.86	—	—	—	—
1000	-1.07	Content lost.	—	0	32080	-0.86	34.99	28.17	-4	26940

STATION Sc. 19b.  
Latitude, 60° 23' N.; Longitude, 4° 6' W.

Depth (Metres).	11th July, 1907.				14th April, 1908.				14th June, 1908.						
	0	9.55	35.37	27.35	75	0	8.05	35.26	27.49	60	0	9.55	35.26	27.24	84
10	9.61	35.26	27.25	84	795	8.18	35.26	27.47	62	610	9.69	35.28	27.24	84	840
20	9.42	35.28	27.29	80	1615	8.18	35.26	27.47	62	1230	9.69	35.30	27.26	82	1670
30	—	—	—	—	—	8.18	35.26	27.47	62	1850	9.68	35.37	27.32	77	2465
40	9.22	35.28	27.32	78	3195	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	8.18	35.26	27.47	62	3100	9.59	35.30	27.27	82	4055
60	8.89	35.30	27.39	70	4675	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	8.18	35.26	27.47	62	4360	9.22	35.30	27.34	76	5635
80	8.80	35.30	27.40	70	6070	—	—	—	—	—	—	—	—	—	—
100	8.53	35.30	27.45	67	7445	8.19	35.28	27.48	61	6250	9.13	35.30	27.35	75	7900
200	7.82	35.23	27.50	63	13945	8.16	35.28	27.49	61	12650	8.98	35.30	27.37	75	15400
300	7.15	35.19	27.57	60	20095	—	—	—	—	—	8.81	35.30	27.41	75	22900
350	—	—	—	—	—	—	—	—	—	—	9.14	35.34	27.38	76	26700
400	6.25	35.17	27.68	49	25545	8.02	35.28	27.51	58	25750	—	—	—	—	—
500	6.14	35.10	27.64	55	30745	—	—	—	—	—	—	—	—	—	—
600	—	—	—	—	—	6.58	35.12	27.59	50	38450	—	—	—	—	—

10th November, 1908.

0	9.65	35.19	27.17	91	0	—	—	—	—	—	—	—	—	—	—
16	9.78	35.16	27.13	94	925	—	—	—	—	—	—	—	—	—	—
20	9.76	35.16	27.13	94	1865	—	—	—	—	—	—	—	—	—	—
30	9.76	35.16	27.13	94	2805	—	—	—	—	—	—	—	—	—	—
50	9.76	35.16	27.13	95	4695	—	—	—	—	—	—	—	—	—	—
70	9.71	35.16	27.14	94	6585	—	—	—	—	—	—	—	—	—	—
100	9.52	35.16	27.17	92	9375	—	—	—	—	—	—	—	—	—	—
200	9.20	35.26	27.32	81	18025	—	—	—	—	—	—	—	—	—	—
300	8.35	35.21	27.41	73	25725	—	—	—	—	—	—	—	—	—	—
400	7.72	35.21	27.51	66	32675	—	—	—	—	—	—	—	—	—	—
500	5.16	35.03	27.70	47	38325	—	—	—	—	—	—	—	—	—	—

STATION Sc. 20a.  
Latitude, 60° 17' N.; Longitude, 3° 52' W.

Depth (Metres).	11th July, 1907.				14th April, 1908.				10th November, 1908.						
	0	10.45	35.34	27.15	92	0	8.05	35.30	27.52	57	0	10.95	35.12	26.91	115
10	10.45	35.28	27.10	97	945	8.10	35.26	27.48	61	590	11.10	35.14	26.89	117	1160
20	10.45	35.32	27.13	91	1900	8.10	35.26	27.48	61	1200	11.10	35.14	26.89	117	2330
30	—	—	—	—	—	8.10	35.26	27.48	61	1810	11.10	35.14	26.89	117	3500
40	10.26	35.32	27.18	91	3750	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	8.05	35.26	27.49	62	3040	11.10	35.14	26.89	118	5850
60	9.82	35.34	27.27	83	5490	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	8.00	35.26	27.50	62	4280	11.10	35.17	26.91	116	8190
80	9.42	35.32	27.32	79	7110	—	—	—	—	—	—	—	—	—	—
100	9.21	35.32	27.35	75	8650	8.01	35.26	27.50	62	6140	10.99	35.25	26.98	111	11595
170	9.12	35.34	27.38	75	13900	7.97	35.26	27.50	63	10515	—	—	—	—	—
200	—	—	—	—	—	—	—	—	—	—	10.57	35.25	27.06	105	22395

## STATION SC. 21.

Latitude, 59° 46' N. ; Longitude, 2° 21' W.

Depth (Metres).	13th July, 1907.					14th April, 1908.					10th November, 1908.				
	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
0	9.85	35.25	27.18	89	0	7.05	35.05	27.46	62	0	10.35	34.99	26.91	117	0
10	9.75	35.21	27.19	90	895	6.82	35.05	27.50	58	600	10.52	35.03	26.90	116	1165
20	9.18	35.23	27.29	79	1740	6.70	35.08	27.54	55	1165	10.51	35.05	26.91	114	2315
30	8.72	35.26	27.39	71	2490	6.70	35.08	27.54	55	1715	10.50	35.12	26.97	108	3425
50	8.64	35.26	27.40	70	3900	6.71	35.08	27.54	56	2825	10.30	35.12	27.01	106	5565
70	8.64	35.26	27.40	70	5300	6.71	35.08	27.54	56	3945	10.00	35.21	27.14	96	7585
85	—	—	—	—	—	6.71	35.10	27.56	56	4785	—	—	—	—	—
95	8.65	35.26	27.40	71	7063	—	—	—	—	—	—	—	—	—	—
105	—	—	—	—	—	—	—	—	—	—	9.90	35.25	27.18	92	9935

## STATION SC. 21a.

Latitude, 60° 2' N. ; Longitude, 3° 10' W.

Depth	11th July, 1907.					14th April, 1908.					10th November, 1908.				
	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
0	9.85	34.96	26.96	110	0	7.75	35.28	27.55	55	0	10.75	35.01	26.85	122	0
10	9.85	34.94	26.95	111	1105	7.66	35.26	27.55	55	550	10.80	34.97	26.82	125	1235
20	9.82	34.94	26.97	111	2215	7.61	35.26	27.56	54	1095	10.80	34.97	26.82	125	2485
30	9.49	34.94	27.01	106	3300	7.61	35.26	27.56	54	1635	10.80	34.97	26.82	125	3735
50	8.88	35.07	27.21	88	5240	7.61	35.26	27.56	55	2725	10.80	35.03	26.86	122	6205
70	8.73	35.16	27.30	79	6910	7.61	35.26	27.56	56	3835	—	—	—	—	—
75	—	—	—	—	—	—	—	—	—	—	10.80	35.03	26.86	122	9255
90	8.70	35.21	27.35	76	8460	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	—	7.61	35.26	27.56	56	5515	—	—	—	—	—
150	—	—	—	—	—	7.54	35.26	27.57	55	8290	—	—	—	—	—
200	—	—	—	—	—	7.48	35.26	27.58	56	11065	—	—	—	—	—

## STATION SC. 22.

Latitude, 59° 36' N. ; Longitude, 0° 41' W.

Depth	13th February, 1907.					10th May, 1907.					7th August, 1907.				
	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
0	6.15	35.23	27.74	37	0	7.05	35.22	27.62	50	0	11.55	35.19	26.83	121	0
10	6.39	35.19	27.67	42	395	6.98	35.22	27.62	49	495	11.41	35.19	26.86	118	1195
20	6.39	35.16	27.64	44	825	6.95	35.24	27.64	47	975	11.09	35.19	26.92	113	2350
30	6.39	35.17	27.64	44	1265	6.92	35.28	27.67	44	1430	10.88	35.23	26.99	106	3445
40	6.39	35.17	27.66	45	1710	6.85	35.24	27.65	47	1885	8.18	35.25	27.46	64	4295
60	6.40	35.17	27.66	45	2610	6.99	35.26	27.64	47	2825	7.22	35.28	27.63	50	5435
80	6.42	35.21	27.69	43	3490	6.60	35.26	27.69	42	3715	6.89	35.28	27.67	45	6385
100	—	—	—	—	—	6.60	35.27	27.71	41	4545	6.59	35.28	27.72	40	7235
115	6.42	35.21	27.69	43	4995	—	—	—	—	—	—	—	—	—	—
125	—	—	—	—	—	—	—	—	—	—	6.49	35.32	27.76	36	8185
132	—	—	—	—	—	6.60	35.20	27.65	46	5937	—	—	—	—	—

Depth	12th March, 1908.					15th September, 1908.					12th November, 1908.				
	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
0	7.05	34.87	27.33	73	0	11.75	34.88	26.56	150	0	9.70	35.16	27.15	93	0
10	7.09	34.83	27.30	81	770	11.70	34.85	26.54	150	1500	9.60	35.16	27.16	91	920
20	—	—	—	—	—	11.60	34.85	26.56	148	2990	9.60	35.19	27.19	89	1820
30	7.12	34.83	27.29	82	2400	11.38	34.97	26.70	135	4405	9.60	35.19	27.19	89	2710
50	—	—	—	—	—	8.85	35.19	27.31	77	6525	9.60	35.19	27.19	90	4500
60	7.15	34.85	27.30	79	4815	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	8.71	35.19	27.33	75	8045	9.60	35.19	27.19	90	6300
80	7.12	34.85	27.30	79	6395	—	—	—	—	—	—	—	—	—	—
100	6.87	34.81	27.31	81	7995	7.31	35.19	27.54	55	10000	8.15	35.23	27.45	68	8670
120	6.81	34.81	27.33	80	10410	—	—	—	—	—	—	—	—	—	—
130	—	—	—	—	—	7.32	35.19	27.54	57	11700	7.81	35.23	27.50	61	10600





STATION SC. 24—continued.

Latitude, 58° 55' N. ; Longitude, 0° 4' E.—continued.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
25th September, 1908.															
0	11.75	35.12	26.75	130	0	—	—	—	—	—	—	—	—	—	—
10	11.70	35.10	26.75	131	1305	—	—	—	—	—	—	—	—	—	—
20	11.53	35.19	26.84	120	2560	—	—	—	—	—	—	—	—	—	—
30	10.25	35.19	27.07	99	3655	—	—	—	—	—	—	—	—	—	—
40	9.47	35.23	27.24	86	4580	—	—	—	—	—	—	—	—	—	—
50	7.63	35.23	27.52	57	5295	—	—	—	—	—	—	—	—	—	—
70	7.01	35.19	27.59	53	6395	—	—	—	—	—	—	—	—	—	—
100	6.83	35.19	27.62	51	7955	—	—	—	—	—	—	—	—	—	—
120	6.79	35.19	27.62	51	8975	—	—	—	—	—	—	—	—	—	—

STATION SC. 25.

Latitude, 58° 11' N. ; Longitude, 0° 32' W.

25th February, 1907.						27th May, 1907.					2nd September, 1907.				
0	6.05	35.20	27.73	38	0	8.45	35.26	27.43	66	0	10.65	35.25	27.04	102	0
10	6.15	35.18	27.70	40	390	8.51	35.27	27.43	67	665	10.55	35.25	27.06	100	1010
20	6.15	35.20	27.71	39	785	7.80	35.26	27.54	57	1285	10.55	35.21	27.04	103	2025
30	6.15	35.20	27.71	39	1175	7.80	35.24	27.52	59	1865	10.55	35.23	27.05	101	3040
40	6.15	35.20	27.71	40	1570	7.59	35.24	27.54	57	2445	10.55	35.26	27.08	100	4045
50	—	—	—	—	—	6.82	35.22	27.65	48	2970	—	—	—	—	—
60	6.15	35.20	27.71	40	2370	—	—	—	—	—	8.60	35.26	27.41	69	5735
70	—	—	—	—	—	6.80	35.22	27.65	47	3920	—	—	—	—	—
80	6.15	35.20	27.71	41	3180	—	—	—	—	—	8.27	35.30	27.48	63	7055
90	—	—	—	—	—	6.80	35.24	27.66	47	4860	—	—	—	—	—
100	—	—	—	—	—	—	—	—	—	—	8.23	35.35	27.53	59	8275
104	6.15	35.20	27.71	41	4164	—	—	—	—	—	—	—	—	—	—

29th November, 1907.						16th March, 1908.					3rd July, 1908.				
0	8.25	35.28	27.47	62	0	6.15	35.19	27.71	40	0	12.55	35.03	26.52	152	0
10	8.38	35.21	27.40	69	655	6.42	35.08	27.58	51	455	12.49	34.97	26.49	156	1540
20	8.38	35.21	27.40	69	1345	—	—	—	—	—	9.25	34.99	27.09	99	7815
30	—	—	—	—	—	6.42	35.10	27.60	50	960	6.82	35.08	27.53	57	8595
40	8.38	35.23	27.41	69	2725	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	—	—	—	—	—	6.62	35.12	27.59	52	9685
60	8.38	35.23	27.41	69	4105	6.46	35.17	27.65	47	2415	—	—	—	—	—
70	—	—	—	—	—	—	—	—	—	—	6.63	35.08	27.56	56	10765
80	8.33	35.25	27.43	67	5465	6.46	35.10	27.59	52	3405	—	—	—	—	—
98	—	—	—	—	—	—	—	—	—	—	6.63	35.08	27.56	56	11906
110	—	—	—	—	—	6.47	35.10	27.59	53	4455	—	—	—	—	—
120	7.41	35.30	27.62	51	7825	—	—	—	—	—	—	—	—	—	—

26th September, 1908.						—					—				
0	11.35	35.19	26.87	118	0	—	—	—	—	—	—	—	—	—	—
10	11.33	35.17	26.87	120	1190	—	—	—	—	—	—	—	—	—	—
20	11.25	35.17	26.88	119	2385	—	—	—	—	—	—	—	—	—	—
30	11.25	35.21	26.91	115	3555	—	—	—	—	—	—	—	—	—	—
50	11.10	35.21	26.94	113	5835	—	—	—	—	—	—	—	—	—	—
70	9.23	35.21	27.27	84	7805	—	—	—	—	—	—	—	—	—	—
100	8.61	35.21	27.37	74	10175	—	—	—	—	—	—	—	—	—	—

STATION SC. 26.

Latitude, 58° 9' N. ; Longitude 1° 50' W.

27th January, 1907.						12th February, 1907.					9th May, 1907.				
0	6.65	35.25	27.68	40	0	5.85	34.91	27.53	57	0	7.35	34.93	27.35	76	0
10	6.85	35.16	27.58	51	455	6.02	34.88	27.48	62	595	7.40	34.91	27.32	78	770
20	6.85	35.17	27.60	50	960	6.02	34.89	27.49	61	1210	7.00	34.97	27.41	68	1500
30	6.85	35.25	27.65	44	1430	6.02	34.88	27.48	62	1825	6.90	35.06	27.49	59	2135
40	6.85	35.19	27.61	50	1900	—	—	—	—	—	6.88	35.09	27.52	58	2720
50	—	—	—	—	—	6.02	34.86	27.46	64	3085	—	—	—	—	—
64	—	—	—	—	—	—	—	—	—	—	6.88	35.09	27.52	58	4112
66	6.85	35.21	27.63	49	3187	—	—	—	—	—	—	—	—	—	—
78	—	—	—	—	—	6.02	34.89	27.49	62	4849	—	—	—	—	—



STATION SC. 26—continued.

Latitude, 58° 9' N. ; Longitude, 1° 50' W.—continued.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
4th July, 1905.						6th August, 1907.					21st August, 1907.				
0	9.85	34.99	26.98	108	0	10.95	35.10	26.89	117	0	10.55	35.05	26.90	115	0
10	9.78	34.97	26.98	108	1080	10.78	34.92	26.77	128	1225	10.49	35.03	26.91	115	1150
20	9.34	34.97	27.06	102	2130	10.42	35.05	26.93	113	2430	10.48	35.03	26.91	115	2300
30	9.29	34.99	27.08	100	3140	10.58	35.19	27.01	104	3515	10.32	35.03	26.94	113	3440
40	9.28	34.99	27.08	101	4145	—	—	—	—	—	10.32	35.01	26.93	115	4580
50	9.52	35.07	27.11	98	5140	9.61	35.19	27.19	90	5455	—	—	—	—	—
60	—	—	—	—	—	—	—	—	—	—	10.12	35.03	26.97	108	6810
70	—	—	—	—	—	8.90	35.25	27.35	74	7095	—	—	—	—	—
72	9.19	35.03	27.13	96	7274	—	—	—	—	—	—	—	—	—	—
80	—	—	—	—	—	—	—	—	—	—	10.08	35.10	27.04	105	8940
85	—	—	—	—	—	8.89	35.25	27.35	75	8213	—	—	—	—	—
15th November, 1907.						11th March, 1908.					3rd June, 1908.				
0	9.95	34.88	26.89	117	0	6.15	34.31	27.01	107	0	9.35	34.63	26.80	126	0
10	9.98	34.83	26.84	122	1195	6.28	34.42	27.07	99	1030	9.12	34.70	26.89	117	1215
20	9.99	34.83	26.84	122	2415	6.32	34.43	27.08	98	2015	7.81	34.83	27.19	88	2240
30	10.00	34.88	26.88	119	3620	6.32	34.45	27.09	98	2995	7.00	34.97	27.42	67	3115
40	10.00	34.90	26.90	118	4805	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	6.51	34.61	27.20	99	4985	6.82	35.01	27.48	62	4405
60	10.00	34.90	26.90	118	7165	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	—	—	—	—	—	6.82	35.03	27.49	61	5635
80	10.00	34.90	26.90	119	9535	—	—	—	—	—	—	—	—	—	—
88	—	—	—	—	—	—	—	—	—	—	6.82	35.03	27.49	61	6735
20th June, 1908.						6th August, 1908.					14th September, 1908.				
0	9.05	34.87	27.03	105	0	12.05	34.96	26.56	148	0	10.85	34.96	26.79	126	0
10	9.18	34.83	26.98	109	1070	11.84	34.96	26.61	144	1460	10.80	35.01	26.85	122	1240
20	8.31	34.83	27.11	96	2095	11.40	34.90	26.64	140	2880	10.80	35.01	26.85	122	2460
30	7.80	34.87	27.22	87	3010	10.56	34.90	26.79	126	4210	10.80	35.01	26.85	122	3680
50	7.39	34.87	27.28	81	4690	10.11	34.96	26.92	109	6560	—	—	—	—	—
55	—	—	—	—	—	—	—	—	—	—	10.80	35.01	26.85	123	6740
65	—	—	—	—	—	9.79	34.99	27.00	103	8185	—	—	—	—	—
70	7.31	34.88	27.30	79	6290	—	—	—	—	—	—	—	—	—	—
88	7.21	35.01	27.42	68	7613	—	—	—	—	—	—	—	—	—	—
4th November, 1908.						—					—				
0	10.65	34.85	26.73	131	0	—	—	—	—	—	—	—	—	—	—
10	10.71	34.83	26.71	133	1320	—	—	—	—	—	—	—	—	—	—
20	10.71	34.85	26.72	132	2640	—	—	—	—	—	—	—	—	—	—
30	10.70	34.94	26.80	125	3925	—	—	—	—	—	—	—	—	—	—
50	10.61	35.07	26.92	115	6325	—	—	—	—	—	—	—	—	—	—
70	10.62	35.07	26.92	115	8625	—	—	—	—	—	—	—	—	—	—
85	10.62	35.07	26.62	116	10355	—	—	—	—	—	—	—	—	—	—

STATION SC. 27.

Latitude, 57° 31' N. ; Longitude, 1° 12' W.

25th February, 1907.						27th May, 1907.					16th March, 1908.				
0	5.85	35.00	27.60	50	0	8.05	34.95	27.26	83	0	5.55	34.65	27.36	73	0
10	5.72	35.00	27.62	49	495	7.75	34.95	27.30	79	810	5.62	34.65	27.34	73	730
20	5.72	35.02	27.62	48	980	7.20	34.93	27.36	73	1570	—	—	—	—	—
30	5.72	35.00	27.64	49	1465	7.19	34.93	27.36	73	2300	5.80	34.69	27.34	73	2190
40	—	—	—	—	—	7.19	34.93	27.36	74	3035	—	—	—	—	—
50	5.71	35.00	27.63	50	2455	7.18	34.91	27.36	75	3780	6.00	34.79	27.41	69	3610
70	5.70	35.00	27.63	50	3455	7.16	34.93	27.37	73	5260	6.02	34.79	27.41	69	4990
90	5.59	35.00	27.63	48	4435	—	—	—	—	—	—	—	—	—	—
95	—	—	—	—	—	—	—	—	—	—	6.13	34.79	27.39	70	6727
96	—	—	—	—	—	7.16	34.88	27.33	78	7223	—	—	—	—	—
120	5.59	35.00	27.63	49	5890	—	—	—	—	—	—	—	—	—	—

STATION SC. 27—*continued.*  
 Latitude, 57° 31' N. ; Longitude, 1° 12' W.—*continued.*

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
23rd July, 1908.						26th September, 1908.					—				
0	12.15	34.29	26.03	199	0	11.85	34.42	26.18	183	0	—	—	—	—	—
10	11.84	34.70	26.42	162	1805	11.75	34.52	26.29	174	1785	—	—	—	—	—
20	11.08	34.70	26.55	150	3365	11.49	34.81	26.56	151	3410	—	—	—	—	—
30	9.15	34.70	26.88	118	4705	11.10	34.96	26.74	131	4820	—	—	—	—	—
50	8.95	34.70	26.92	116	7045	11.00	35.01	26.81	128	7410	—	—	—	—	—
70	8.55	34.72	26.99	109	9295	10.86	35.05	26.86	121	9900	—	—	—	—	—
90	—	—	—	—	—	10.69	35.08	26.91	116	12270	—	—	—	—	—
100	8.42	34.76	27.04	105	12505	—	—	—	—	—	—	—	—	—	—
115	8.34	34.76	27.05	104	14070	—	—	—	—	—	—	—	—	—	—

STATION SC. 28.  
 Latitude, 57° 53' N. ; Longitude, 3° 48' W.

8th February, 1907.						8th April, 1907.					22nd July, 1907.				
0	4.25	34.11	27.09	107	0	5.75	34.35	27.11	97	0	12.05	34.29	26.05	197	0
10	4.62	34.43	27.28	79	930	5.79	34.41	27.14	93	950	12.99	34.22	25.80	220	2085
24	5.32	34.70	27.41	67	1952	—	—	—	—	—	—	—	—	—	—
25	—	—	—	—	—	5.48	34.50	27.24	83	2270	—	—	—	—	—
27	—	—	—	—	—	—	—	—	—	—	10.02	34.90	26.90	117	4100
12th September, 1907.						8th November, 1907.					14th January, 1908.				
0	12.35	34.65	26.28	175	0	9.05	34.43	26.68	137	0	5.25	33.96	26.83	121	0
5	12.00	34.69	26.36	166	853	—	—	—	—	—	5.45	34.13	26.94	111	580
10	11.18	34.78	26.59	144	1628	9.14	34.47	26.70	135	1360	5.90	34.47	27.18	90	1082
15	11.00	34.83	26.66	139	2336	—	—	—	—	—	—	—	—	—	—
20	11.00	34.87	26.69	135	3021	9.38	34.52	26.70	135	2710	—	—	—	—	—
25	—	—	—	—	—	—	—	—	—	—	6.81	34.81	27.33	76	2327
17th February, 1908.						23rd April, 1908.					24th July, 1908.				
0	5.15	33.66	26.61	142	0	5.85	33.95	26.76	130	0	12.65	34.58	26.15	186	0
5	5.19	33.69	26.64	141	705	—	—	—	—	—	—	—	—	—	—
10	5.38	34.09	26.92	112	1325	5.99	33.86	26.67	136	1330	12.76	34.60	26.14	187	1865
20	5.72	34.56	27.26	82	1810	6.12	34.20	26.92	113	2530	11.21	34.60	26.44	159	3595
10th October, 1908.						1st December, 1908.					—				
0	11.95	33.98	25.83	218	0	7.45	30.81	25.09	—	—	—	—	—	—	—
10	11.90	33.98	25.84	217	2175	8.89	34.65	26.87	118	—	—	—	—	—	—
20	—	—	—	—	—	9.21	34.70	26.88	119	1185	—	—	—	—	—
25	11.40	34.78	26.55	149	4920	—	—	—	—	—	—	—	—	—	—

STATION SC. 30.  
 Latitude, 58° N. ; Longitude, 2° 54' W.

7th February, 1907.						8th April, 1907.					22nd July, 1907.				
0	5.85	34.94	27.55	55	0	6.50	34.98	27.58	60	0	12.05	35.07	26.65	139	0
10	5.92	34.92	27.52	57	560	6.10	34.91	27.50	60	600	12.00	34.96	26.57	146	1425
20	5.92	34.92	27.52	57	1130	6.09	34.95	27.53	57	1185	10.08	34.96	26.92	114	2725
30	5.92	34.94	27.54	55	1690	6.08	34.95	27.53	57	1755	9.79	34.96	26.97	109	3840
48	—	—	—	—	—	6.08	34.98	27.56	56	2772	—	—	—	—	—
55	5.92	34.96	27.55	54	3053	—	—	—	—	—	9.78	34.99	27.01	108	6553
12th September, 1907.						8th November, 1907.					14th January, 1908.				
0	11.45	34.83	26.58	147	0	9.95	34.70	26.75	131	0	6.85	34.76	27.28	81	0
10	10.78	34.83	26.69	135	1410	10.11	34.70	26.72	134	1325	6.80	34.78	27.30	79	800
20	10.78	34.88	26.73	131	2740	10.15	34.70	26.70	134	2665	6.79	34.78	27.30	79	1590
30	10.75	34.83	26.70	135	4070	10.15	34.70	26.70	134	4005	6.78	34.78	27.30	79	2380
45	10.75	34.83	26.70	136	6103	10.18	34.76	26.75	131	5993	—	—	—	—	—
50	—	—	—	—	—	—	—	—	—	—	6.75	34.85	27.35	74	3910



STATION SC. 30—continued.  
Latitude, 58° N. ; Longitude, 2° 54' W.—continued.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
17th February, 1908.						23rd April, 1908.					24th July, 1908.				
0	5.85	34.61	27.30	79	0	6.25	34.74	27.34	74	0	11.85	34.72	26.41	160	0
10	6.09	34.67	27.30	78	785	6.28	34.69	27.28	79	765	10.89	34.67	26.55	148	1540
20	6.09	34.67	27.30	78	1565	6.29	34.69	27.28	79	1555	10.60	34.74	26.66	138	2970
30	6.09	34.65	27.28	79	2350	6.29	34.70	27.30	79	2345	10.50	34.74	26.68	134	4330
40	6.09	34.65	27.28	79	3410	—	—	—	—	—	—	—	—	—	—
45	—	—	—	—	—	6.31	34.74	27.33	75	3500	—	—	—	—	—
50	6.09	34.65	27.28	80	3935	—	—	—	—	—	10.50	34.85	26.76	130	6970
68	—	—	—	—	—	—	—	—	—	—	10.23	34.83	26.80	126	9274
9th October, 1908.						2nd December, 1908.					—				
0	11.35	34.90	26.66	139	0	9.25	34.76	26.91	116	0	—	—	—	—	—
10	11.38	34.92	26.67	139	1390	9.32	34.76	26.90	116	1160	—	—	—	—	—
20	11.38	34.92	26.67	139	2780	9.32	34.76	26.90	116	2320	—	—	—	—	—
30	11.38	34.94	26.69	137	4160	9.32	34.76	26.90	116	3480	—	—	—	—	—
50	—	—	—	—	—	9.32	34.76	26.90	117	5810	—	—	—	—	—
55	11.38	34.94	26.69	138	7598	—	—	—	—	—	—	—	—	—	—

STATION SC. 32.  
Latitude, 58° 8' N. ; Longitude, 2° 0' W.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
7th February, 1907.						8th April, 1907.					22nd July, 1907.				
0	5.95	34.88	27.49	60	0	6.25	34.89	27.46	63	0	11.05	35.17	26.92	114	0
10	6.19	34.88	27.45	63	615	6.26	34.91	27.48	62	625	11.24	35.16	26.86	118	1160
20	6.19	34.88	27.45	63	1215	6.21	34.88	27.45	63	1250	9.31	35.16	27.21	87	2185
30	6.19	34.85	27.43	65	1835	6.19	34.86	27.43	64	1885	9.31	35.16	27.21	87	3055
40	6.19	34.85	27.43	66	2540	6.19	34.88	27.45	64	2525	—	—	—	—	—
50	—	—	—	—	—	—	—	—	—	—	9.06	35.17	27.27	83	4755
60	—	—	—	—	—	6.19	35.06	27.59	50	3665	—	—	—	—	—
65	6.19	34.83	27.42	68	4215	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	—	—	—	—	—	9.06	35.19	27.28	82	6405
84	—	—	—	—	—	6.19	35.08	27.61	50	4865	—	—	—	—	—
12th September, 1907.						8th November, 1907.					14th January, 1908.				
0	10.85	35.01	26.83	123	0	10.05	34.83	26.82	122	0	7.05	34.79	27.22	81	0
10	10.73	34.99	26.84	122	1225	10.20	34.83	26.80	125	1235	7.21	34.76	27.22	86	835
20	10.60	34.99	26.85	120	2435	10.20	34.83	26.80	125	2485	7.21	34.76	27.22	86	1695
30	10.55	35.07	26.92	113	3600	10.20	34.83	26.80	125	3735	7.22	34.76	27.22	86	2555
40	—	—	—	—	—	10.20	34.83	26.80	126	4990	—	—	—	—	—
50	10.20	35.08	27.00	108	5810	10.20	34.83	26.80	126	6250	7.24	34.76	27.21	87	4285
60	10.00	35.08	27.03	104	6870	—	—	—	—	—	—	—	—	—	—
65	—	—	—	—	—	—	—	—	—	—	7.25	34.78	27.23	85	5575
70	7.21	35.12	27.50	61	7695	10.16	34.83	26.81	125	8760	—	—	—	—	—
90	7.16	35.12	27.51	61	8915	—	—	—	—	—	—	—	—	—	—
17th February, 1908.						23rd April, 1908.					24th July, 1908.				
0	6.45	34.83	27.39	70	0	6.05	34.83	27.44	65	0	11.55	34.72	26.48	156	0
10	6.79	34.72	27.24	83	765	6.31	34.83	27.40	69	670	11.00	34.69	26.55	149	1525
20	6.79	34.72	27.24	83	1595	6.39	34.83	27.39	70	1365	10.50	34.69	26.63	141	2975
30	6.79	34.72	27.24	83	2425	6.41	34.88	27.45	66	2045	10.42	34.74	26.70	135	4355
40	6.79	34.72	27.24	83	3255	—	—	—	—	—	—	—	—	—	—
50	6.79	34.74	27.26	83	4085	6.41	34.90	27.45	66	3365	10.19	34.83	26.81	126	6965
60	—	—	—	—	—	6.48	34.99	27.50	61	4000	10.06	34.83	26.83	124	8215
70	6.80	34.74	27.26	83	4915	—	—	—	—	—	—	—	—	—	—
9th October, 1908.						2nd December 1908.					—				
0	11.35	34.94	26.68	136	0	9.55	34.78	26.88	119	0	—	—	—	—	—
10	11.32	34.94	26.69	136	1360	9.59	34.74	26.84	122	1205	—	—	—	—	—
20	11.30	34.99	26.73	132	2700	9.59	34.74	26.84	122	2425	—	—	—	—	—
30	11.20	35.07	26.81	124	3980	9.59	34.74	26.84	122	3645	—	—	—	—	—
50	10.80	35.17	26.97	111	6330	9.59	34.74	26.84	123	6095	—	—	—	—	—
70	10.81	35.21	27.00	109	8530	9.59	34.74	26.84	123	8555	—	—	—	—	—
78	—	—	—	—	—	9.59	34.79	26.88	120	10742	—	—	—	—	—
90	10.81	35.21	27.00	109	10710	—	—	—	—	—	—	—	—	—	—

STATION SC. 34.

Latitude, 58° 17' N. ; Longitude, 1° 3' W.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub> .	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub> .	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub> .	v-v'.	e-e'.
7th February, 1907.						8th April, 1907.					26th June, 1907.				
0	6.25	35.12	27.64	46	0	6.15	35.16	27.71	42	0.	10.75	35.25	27.03	104	0
10	6.80	35.12	27.55	54	500	6.16	35.14	27.79	44	480	—	—	—	—	—
20	6.81	35.10	27.54	56	1050	6.16	35.16	27.80	42	860	—	—	—	—	—
30	6.85	35.12	27.55	55	1605	6.16	35.17	27.82	41	1275	—	—	—	—	—
40	6.85	35.19	27.61	50	2130	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	6.16	35.17	27.82	42	2105	—	—	—	—	—
51	—	—	—	—	—	—	—	—	—	—	7.49	35.23	27.54	57	4106
60	6.85	35.14	27.57	54	3170	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	6.16	35.17	27.82	42	2945	—	—	—	—	—
80	6.86	35.16	27.58	53	4240	—	—	—	—	—	—	—	—	—	—
94	—	—	—	—	—	6.16	35.21	27.85	40	3929	—	—	—	—	—
102	—	—	—	—	—	—	—	—	—	—	7.41	35.23	27.56	57	7013
112	6.87	35.16	27.58	53	5936	—	—	—	—	—	—	—	—	—	—

23rd July, 1907						12th September, 1907.					7th and 8th November, 1907.				
0	11.45	35.28	26.92	113	0	10.65	35.17	26.99	107	0	9.95	34.96	26.95	112	0
10	11.61	35.23	26.86	119	1160	10.35	35.14	26.96	110	1085	10.08	34.96	26.91	114	1130
20	11.31	35.28	26.95	110	2305	10.65	35.12	26.94	111	2190	10.08	34.92	26.88	117	2285
30	9.08	35.28	27.35	74	3225	10.62	35.12	26.95	111	3300	10.09	34.97	26.93	114	3440
40	—	—	—	—	—	10.10	35.12	27.05	101	4360	—	—	—	—	—
50	7.82	35.28	27.54	57	4535	10.05	35.21	27.12	96	5345	10.09	34.97	26.93	115	5730
60	—	—	—	—	—	7.00	35.21	27.61	51	6080	—	—	—	—	—
70	7.65	35.28	27.55	54	5645	—	—	—	—	—	10.10	35.03	26.97	110	7980
80	—	—	—	—	—	6.79	35.25	27.65	46	7050	—	—	—	—	—
94	7.63	35.28	27.56	55	6953	—	—	—	—	—	—	—	—	—	—
95	—	—	—	—	—	—	—	—	—	—	10.10	35.03	26.97	111	10743
105	—	—	—	—	—	6.76	35.25	27.66	46	8200	—	—	—	—	—

20th January, 1908.						20th February, 1908.					24th April, 1908.				
0	7.65	35.07	27.41	67	0	6.85	34.94	27.42	67	0	6.05	35.16	27.63	40	0
10	7.71	34.97	27.32	77	720	6.81	34.88	27.37	71	690	6.35	35.16	27.64	44	420
20	7.72	34.97	27.32	77	1490	6.81	34.88	27.37	71	1400	6.40	35.16	27.64	45	920
30	—	—	—	—	—	6.81	34.88	27.37	71	2110	6.40	35.16	27.64	45	1370
40	7.72	34.99	27.33	76	3020	6.82	34.88	27.37	71	2820	—	—	—	—	—
50	—	—	—	—	—	6.82	34.92	27.40	69	3520	6.40	35.16	27.64	46	2280
60	7.74	35.01	27.34	75	4530	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	6.89	34.99	27.44	66	4870	6.40	35.16	27.64	46	3200
80	7.75	35.01	27.34	75	6030	—	—	—	—	—	—	—	—	—	—
90	—	—	—	—	—	6.89	35.03	27.47	63	6160	6.40	35.16	27.64	46	4120
100	7.79	35.01	27.34	77	7550	—	—	—	—	—	—	—	—	—	—

26th July, 1908.						9th October, 1908.					2nd December, 1908.				
0	12.55	34.99	26.50	153	0	11.45	35.12	26.80	124	0	9.55	35.08	27.10	96	0
10	12.52	35.01	26.52	152	1525	11.31	35.12	26.83	123	1235	9.52	35.08	27.11	95	955
20	11.11	35.05	26.81	124	2905	11.28	35.16	26.87	120	2450	9.52	35.08	27.11	95	1905
30	8.48	35.10	27.31	79	4420	11.22	35.16	26.88	118	3640	9.51	35.08	27.11	95	2855
50	8.12	35.21	27.44	65	5860	11.12	35.16	26.90	117	5990	9.46	35.10	27.14	95	3805
70	7.46	35.17	27.51	60	7110	10.01	35.23	27.15	94	8100	9.42	35.12	27.16	92	5675
95	—	—	—	—	—	—	—	—	—	—	9.39	35.12	27.16	92	7975
100	—	—	—	—	—	9.43	35.23	27.25	85	10785	—	—	—	—	—
105	7.11	35.14	27.53	57	9158	—	—	—	—	—	—	—	—	—	—

STATION SC. 36.

Latitude, 58° 26' N. ; Longitude, 0° 8' W.

7th February, 1907.						9th April, 1907.					23rd July, 1907.				
0	6.45	35.19	27.70	43	0	6.25	35.17	27.69	43	0	11.45	35.17	26.87	121	0
10	6.72	35.19	27.62	47	450	5.80	35.10	27.68	42	425	11.48	35.08	26.77	128	1245
20	6.72	35.19	27.62	47	920	5.80	35.12	27.69	40	835	11.42	35.10	26.80	126	2515
30	6.72	35.17	27.61	48	1395	5.80	35.18	27.75	36	1215	8.61	35.16	27.32	75	3520
40	—	—	—	—	—	5.80	35.12	27.69	41	1600	7.56	35.16	27.48	62	4205
50	6.72	35.21	27.64	47	2345	—	—	—	—	—	—	—	—	—	—
60	—	—	—	—	—	5.80	35.16	27.72	39	2400	6.61	35.17	27.63	48	5305
70	6.73	35.23	27.65	45	3265	—	—	—	—	—	—	—	—	—	—
80	—	—	—	—	—	5.80	35.19	27.75	37	3160	6.27	35.17	27.68	45	6235
90	6.73	35.19	27.62	49	4205	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	—	5.80	35.19	27.75	37	3900	6.23	35.19	27.69	43	7115
120	—	—	—	—	—	5.80	35.21	27.77	36	4630	—	—	—	—	—
123	6.74	35.19	27.62	49	5842	—	—	—	—	—	—	—	—	—	—
130	—	—	—	—	—	—	—	—	—	—	6.23	35.19	27.69	43	8405



STATION SC. 36—continued.

Latitude, 58° 26' N. ; Longitude, 0° 8' W.—continued.

Depth (Metres).	11th September, 1907.					7th November, 1907.					20th February, 1908.				
	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.
0	10.65	35.23	27.03	102	0	9.35	35.19	27.23	85	0	6.75	35.21	27.64	46	0
10	10.80	35.16	26.96	111	1065	9.52	35.19	27.21	88	865	6.70	35.19	27.63	47	465
20	10.70	35.16	26.97	109	2165	9.51	35.23	27.24	85	1730	6.70	35.19	27.63	47	935
30	10.62	35.16	26.98	107	3245	9.49	35.23	27.24	84	2575	6.70	35.19	27.63	47	1405
40	10.50	35.17	27.02	106	4310	9.48	35.23	27.24	85	3420	6.70	35.19	27.63	47	1875
50	9.50	35.17	27.19	90	5290	—	—	—	—	—	—	—	—	—	—
60	8.38	35.21	27.40	69	6085	8.64	35.26	27.39	69	4960	6.70	35.19	27.63	48	2825
80	6.99	35.28	27.66	46	7235	8.02	35.26	27.50	62	6270	6.71	35.21	27.65	47	3775
100	6.83	35.28	27.69	45	8145	7.61	35.28	27.67	55	7440	6.71	35.21	27.65	48	4725
120	6.83	35.28	27.69	45	9045	—	—	—	—	—	—	—	—	—	—
125	—	—	—	—	—	7.61	35.23	27.67	55	8815	—	—	—	—	—
130	—	—	—	—	—	—	—	—	—	—	6.71	35.21	27.65	48	6165

Depth (Metres).	24th April, 1908.					26th July, 1908.					9th October, 1908.				
	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.
0	5.75	35.17	27.74	36	0	13.05	34.92	26.34	169	0	12.05	35.05	26.64	141	0
10	6.20	35.16	27.66	43	395	13.06	34.92	26.34	169	1690	11.98	35.07	26.66	139	1400
20	6.28	35.16	27.65	44	830	13.00	34.94	26.37	167	3370	11.92	35.07	26.67	137	2780
30	6.28	35.25	27.72	37	1235	10.15	35.08	27.00	105	4730	11.89	35.07	26.68	137	4150
40	—	—	—	—	—	—	—	—	—	—	11.39	35.07	26.77	129	5480
50	6.28	35.16	27.65	45	2055	6.58	35.14	27.62	50	6280	7.50	35.16	27.48	61	6430
70	6.28	35.16	27.65	45	2955	6.61	35.14	27.61	50	7280	7.01	35.17	27.56	53	7570
100	6.29	35.16	27.65	46	4320	6.57	35.14	27.62	51	8795	6.69	35.17	27.61	50	9115
130	6.29	35.16	27.65	46	5700	—	—	—	—	—	—	—	—	—	—
135	—	—	—	—	—	6.48	35.17	27.65	48	10527	6.66	35.21	27.65	47	10812

Depth (Metres).	2nd December, 1908.					—					—				
	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.
0	8.75	35.19	27.32	75	0	—	—	—	—	—	—	—	—	—	—
10	8.69	35.19	27.33	75	750	—	—	—	—	—	—	—	—	—	—
20	8.69	35.19	27.33	75	1500	—	—	—	—	—	—	—	—	—	—
30	8.69	35.19	27.33	75	2250	—	—	—	—	—	—	—	—	—	—
50	8.68	35.19	27.34	76	3760	—	—	—	—	—	—	—	—	—	—
70	8.66	35.21	27.36	74	5260	—	—	—	—	—	—	—	—	—	—
100	8.56	35.23	27.38	71	7435	—	—	—	—	—	—	—	—	—	—
120	8.30	35.25	27.43	66	8805	—	—	—	—	—	—	—	—	—	—

STATION SC. 38.

Latitude, 58° 34' N. ; Longitude, 0° 47' E.

Depth (Metres).	7th February, 1907.					9th April, 1907.					23rd July, 1907.				
	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.
0	6.05	35.19	27.72	38	0	5.65	35.16	27.74	36	0	11.35	35.25	26.92	113	0
10	6.28	35.24	27.73	37	375	5.69	35.21	27.78	32	340	11.44	35.12	26.80	125	1190
20	6.30	35.25	27.73	37	745	5.69	35.19	27.76	34	670	11.44	35.16	26.83	122	2425
30	6.30	35.19	27.68	42	1140	5.69	35.17	27.75	35	1015	11.44	35.19	26.86	119	3630
40	6.30	35.21	27.70	41	1555	5.69	35.17	27.75	35	1365	8.38	35.16	27.55	73	4590
60	6.30	35.23	27.71	39	2355	5.69	35.17	27.75	36	2075	6.90	35.21	27.62	49	5810
80	6.31	35.17	27.67	45	3195	5.69	35.16	27.73	37	2805	6.42	35.21	27.69	44	6740
100	—	—	—	—	—	5.69	35.14	27.73	39	3565	6.33	35.21	27.70	42	7600
110	6.32	35.24	27.72	40	4470	—	—	—	—	—	—	—	—	—	—
132	—	—	—	—	—	5.69	35.19	27.77	36	4765	—	—	—	—	—
150	—	—	—	—	—	—	—	—	—	—	6.31	35.23	27.71	40	9650

Depth (Metres).	11th September, 1907.					7th November, 1907.					20th February, 1908.				
	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.	Temp. °C.	S.°/∞.	σ <sub>t</sub> .	v—v'.	e—e'.
0	11.45	35.22	26.77	117	0	9.35	35.16	27.21	87	0	6.55	35.12	27.57	50	0
10	11.33	35.22	26.82	115	1160	9.45	35.12	27.15	92	895	6.56	35.08	27.54	54	520
20	—	—	—	—	—	9.45	35.12	27.15	92	1815	6.56	35.08	27.54	54	1040
30	11.22	35.08	26.82	124	3550	9.45	35.12	27.15	92	2735	6.54	35.08	27.54	53	1575
40	11.15	35.05	26.80	126	4800	9.45	35.16	27.18	90	3645	6.54	35.08	27.54	53	2105
50	—	—	—	—	—	9.45	35.17	27.20	90	4545	—	—	—	—	—
60	7.15	35.25	27.61	50	6560	7.48	35.25	27.55	54	5265	6.54	35.10	27.56	52	3155
80	7.01	35.25	27.63	49	7550	6.45	35.19	27.66	46	6265	6.59	35.10	27.67	53	4205
100	6.81	35.25	27.66	47	8510	6.41	35.21	27.69	45	7175	6.63	35.14	27.60	51	5245
135	—	—	—	—	—	6.40	35.23	27.70	43	8715	—	—	—	—	—
140	6.67	35.25	27.67	45	10350	—	—	—	—	—	6.64	35.16	27.61	50	7265

STATION SC. 38.—*continued.*Latitude, 58° 34' N. ; Longitude, 0° 47' E.—*continued.*

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'	e-e'	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'	e-e'	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'	e-e'
24th April, 1908.						26th July, 1908.					9th October, 1908.				
0	6.15	35.03	27.58	52	0	13.85	34.87	26.14	188	0	12.15	35.03	26.60	145	0
10	6.19	35.03	27.57	53	525	13.62	34.87	26.18	184	1860	12.10	35.03	26.61	144	1445
20	6.19	35.03	27.57	53	1055	11.98	34.94	26.56	148	3520	12.10	35.03	26.61	144	2885
30	6.19	35.03	27.57	53	1585	10.02	34.97	26.96	112	4820	12.10	35.03	26.61	144	4325
40	—	—	—	—	—	—	—	—	—	—	12.10	35.03	26.61	144	5765
50	6.21	35.07	27.60	50	2615	6.61	34.97	27.48	63	6570	8.40	35.03	27.26	84	6905
70	6.22	35.07	27.60	50	3615	6.51	35.03	27.53	58	7780	7.13	35.12	27.51	58	8325
100	6.20	35.12	27.64	48	5085	6.50	35.03	27.53	59	9535	6.81	35.12	27.56	55	10020
140	6.21	35.14	27.66	46	6965	6.50	35.08	27.57	55	11815	6.82	35.12	27.56	55	12220
2nd December, 1908.						—					—				
0	9.05	35.08	27.20	88	0	—	—	—	—	—	—	—	—	—	—
10	9.04	35.08	27.19	88	880	—	—	—	—	—	—	—	—	—	—
20	9.04	35.08	27.19	88	1760	—	—	—	—	—	—	—	—	—	—
30	9.02	35.08	27.20	88	2640	—	—	—	—	—	—	—	—	—	—
50	8.99	35.08	27.20	88	4400	—	—	—	—	—	—	—	—	—	—
70	8.88	35.08	27.22	88	6160	—	—	—	—	—	—	—	—	—	—
100	8.73	35.08	27.25	89	8815	—	—	—	—	—	—	—	—	—	—
120	8.09	35.08	27.34	76	10465	—	—	—	—	—	—	—	—	—	—
140	7.85	35.08	27.38	73	11955	—	—	—	—	—	—	—	—	—	—

## STATION SC. 38a.

Latitude, 58° 42' N. ; Longitude, 1° 44' E.

9th April, 1907.						11th September, 1907.					7th November, 1907.				
0	5.85	35.17	27.74	38	0	11.40	34.79	26.56	148	0	9.55	35.19	27.21	88	0
10	5.92	35.17	27.72	39	385	11.25	34.79	26.59	146	1470	9.58	35.19	27.19	89	885
20	5.92	35.17	27.72	39	775	11.21	34.81	26.62	144	2920	9.58	35.19	27.19	89	1775
30	5.92	35.19	27.73	37	1155	10.88	34.96	26.78	127	4275	9.58	35.19	27.19	89	2665
40	5.92	35.19	27.73	37	1525	—	—	—	—	—	9.58	35.19	27.19	90	3560
50	—	—	—	—	—	10.15	34.99	26.95	113	6675	—	—	—	—	—
60	5.89	35.19	27.73	38	2275	7.52	35.23	27.55	56	7520	8.80	35.19	27.32	78	5240
80	5.89	35.19	27.73	38	3035	6.86	35.23	27.64	49	8570	7.22	35.21	27.58	55	6570
100	5.89	35.21	27.75	37	3785	6.81	35.23	27.65	48	9540	7.21	35.21	27.58	55	7670
122	5.89	35.25	27.77	34	11595	—	—	—	—	—	—	—	—	—	—
140	—	—	—	—	—	6.81	35.23	27.65	48	11460	—	—	—	—	—
26th July, 1908.						8th October, 1908.					3rd December, 1908.				
0	13.70	34.81	26.12	190	0	12.05	35.12	26.69	135	0	8.85	35.08	27.22	86	0
10	13.69	34.81	26.12	190	1900	12.00	35.12	26.70	135	1350	9.07	35.08	27.19	89	875
20	12.32	34.81	26.40	163	3665	12.00	35.12	26.70	135	2700	9.07	35.08	27.19	89	1765
30	9.70	34.85	26.90	115	5055	12.00	35.12	26.70	135	4050	9.07	35.08	27.19	89	2655
40	—	—	—	—	—	11.99	35.12	26.70	135	5400	—	—	—	—	—
50	6.90	34.90	27.38	78	6985	7.72	34.97	27.32	81	6500	9.07	bottle	broken	89	3545
70	6.62	34.94	27.45	65	8415	6.82	35.05	27.50	59	7900	8.88	35.08	27.22	87	5305
100	—	—	—	—	—	6.81	35.07	27.52	59	9670	8.21	35.08	27.33	78	7780
110	6.51	34.97	27.49	63	10975	—	—	—	—	—	—	—	—	—	—

## STATION SC. 39b.

Latitude, 57° 59' N. ; Longitude, 0° 57' E.

6th February, 1907.						10th April, 1907.					23rd July, 1907.				
0	6.05	35.21	27.74	37	0	5.85	35.21	27.77	34	0	11.45	35.19	26.88	120	0
10	6.35	35.19	27.77	42	395	5.91	35.17	27.72	38	360	11.75	35.12	26.75	130	1250
20	6.35	35.19	27.77	42	815	5.91	35.19	27.73	36	730	11.62	35.12	26.79	127	2535
30	6.35	35.19	27.77	42	1235	5.91	35.19	27.73	36	1090	8.61	35.17	27.34	75	3545
40	6.35	35.19	27.77	43	1660	5.91	35.17	27.72	38	1460	7.81	35.21	27.49	61	4225
60	6.35	35.17	27.76	45	2540	5.91	35.23	27.76	34	2180	6.35	35.21	27.68	42	5255
80	6.36	35.21	27.79	43	3420	5.90	35.25	27.77	33	2850	6.23	35.21	27.69	42	6095
100	6.37	35.23	27.80	42	4270	5.88	35.25	27.77	33	3510	6.20	35.21	27.71	41	6925
150	—	—	—	—	—	—	—	—	—	—	6.20	35.21	27.71	41	8975
152	6.38	35.21	27.79	43	6480	—	—	—	—	—	—	—	—	—	—
155	—	—	—	—	—	5.80	35.16	27.72	40	5518	—	—	—	—	—



STATION Sc. 39b—continued.  
Latitude, 57° 59' N. ; Longitude, 0° 57' E.—continued.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'	e-e'	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'	e-e'	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'	e-e'
11th September, 1907.						7th November, 1907.					14th February, 1908.				
0	11.25	35.17	26.88	117	0	9.25	35.12	27.19	89	0	6.75	35.08	27.54	56	0
10	11.50	35.14	26.82	124	1205	9.45	35.14	27.17	90	895	6.88	35.03	27.47	62	590
20	11.43	35.16	26.83	122	2435	9.45	35.14	27.17	90	1795	6.88	35.05	27.48	60	1200
30	—	—	—	—	—	9.45	35.14	27.17	90	2695	6.88	35.08	27.51	58	1790
40	11.18	35.17	26.90	117	4825	9.45	35.17	27.20	89	3590	6.88	35.08	27.51	58	2370
50	11.18	35.28	26.98	109	5955	—	—	—	—	—	—	—	—	—	—
60	7.45	35.30	27.61	50	6750	9.45	35.19	27.21	88	5360	6.90	35.08	27.51	59	3540
70	—	—	—	—	—	7.21	35.19	27.56	55	6075	—	—	—	—	—
80	7.16	35.30	27.66	47	7720	6.81	35.19	27.62	51	6605	6.91	35.08	27.51	59	4720
100	7.01	35.30	27.67	45	8640	6.56	35.23	27.67	44	7555	6.91	35.08	27.51	60	5910
140	—	—	—	—	—	—	—	—	—	—	6.90	35.08	27.51	60	8310
145	—	—	—	—	—	6.51	35.23	27.68	43	9513	—	—	—	—	—
150	6.88	35.26	27.67	47	10940	—	—	—	—	—	—	—	—	—	—
24th April, 1908.						27th July, 1908.					8th October, 1908.				
0	5.75	35.07	27.66	43	0	13.55	34.90	26.23	181	0	11.85	35.14	26.75	131	0
10	6.04	34.97	27.56	54	485	13.51	34.90	26.24	180	1805	11.85	35.08	26.70	135	1330
20	6.20	34.97	27.53	57	1140	11.11	34.90	26.75	135	3380	11.80	35.16	26.76	129	2650
30	6.20	34.97	27.53	57	1710	8.42	34.90	27.16	92	4515	11.76	35.16	26.77	129	3940
40	—	—	—	—	—	—	—	—	—	—	11.18	35.19	26.90	117	5170
50	6.21	34.97	27.53	58	2860	7.01	34.96	27.40	69	6125	7.82	35.21	27.49	61	6060
70	6.21	35.01	27.56	55	3990	6.91	34.96	27.42	68	7495	7.52	35.21	27.54	57	7240
100	6.23	35.08	27.61	51	5680	—	—	—	—	—	7.11	35.23	27.60	51	8860
110	—	—	—	—	—	6.84	35.12	27.56	55	9955	—	—	—	—	—
140	6.22	35.14	27.66	46	7620	—	—	—	—	—	7.00	35.23	27.62	50	10880
3rd December, 1908.						—					—				
0	9.25	35.03	27.12	95	0	—	—	—	—	—	—	—	—	—	—
10	9.30	35.08	27.15	92	935	—	—	—	—	—	—	—	—	—	—
20	9.30	35.08	27.15	92	1855	—	—	—	—	—	—	—	—	—	—
30	9.30	35.08	27.15	92	2775	—	—	—	—	—	—	—	—	—	—
50	9.30	35.08	27.15	93	4625	—	—	—	—	—	—	—	—	—	—
70	9.28	35.08	27.15	93	6485	—	—	—	—	—	—	—	—	—	—
100	8.73	35.08	27.26	85	9155	—	—	—	—	—	—	—	—	—	—
130	7.37	35.14	27.50	62	11360	—	—	—	—	—	—	—	—	—	—

STATION Sc. 40b.  
Latitude, 57° 24' N. ; Longitude, 1° 7' E.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'	e-e'	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'	e-e'	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'	e-e'
6th February, 1907.						10th April, 1907.					24th July, 1907.				
0	6.25	35.35	27.73	36	0	5.85	35.11	27.69	42	0	11.75	34.99	26.64	140	0
10	6.45	35.21	27.68	42	390	5.90	35.08	27.65	45	435	11.87	34.86	26.59	144	1420
20	6.45	35.21	27.68	42	810	5.90	35.11	27.68	43	875	11.87	34.96	26.59	144	2860
30	6.45	35.18	27.66	45	1245	5.91	35.08	27.65	45	1315	11.69	34.96	26.63	140	4280
40	—	—	—	—	—	5.92	35.07	27.65	47	1775	7.84	35.01	27.33	77	5365
50	6.45	35.20	27.67	44	2135	—	—	—	—	—	—	—	—	—	—
60	—	—	—	—	—	5.93	35.09	27.66	45	2695	7.16	35.01	27.43	68	6815
70	6.46	35.18	27.65	46	3035	—	—	—	—	—	—	—	—	—	—
80	—	—	—	—	—	5.93	35.14	27.70	42	3565	—	—	—	—	—
88	—	—	—	—	—	—	—	—	—	—	7.01	35.01	27.45	67	8705
92	6.47	35.17	27.64	48	4069	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	—	5.93	35.13	27.69	43	4415	—	—	—	—	—
120	—	—	—	—	—	5.93	35.11	27.68	45	5295	—	—	—	—	—
10th September, 1907.						6th November, 1907.					14th February, 1908.				
0	11.05	35.23	26.96	109	0	9.45	35.12	27.10	97	0	6.35	35.10	27.61	49	0
10	11.32	35.23	26.91	115	1120	9.92	35.12	27.08	100	985	6.40	34.99	27.51	58	535
20	—	—	—	—	—	9.92	35.12	27.08	100	1985	6.40	35.03	27.54	55	1100
30	11.25	35.17	26.89	117	2280	9.92	35.12	27.08	100	2985	6.41	36.05	27.54	54	1645
40	—	—	—	—	—	9.92	35.16	27.11	97	3970	6.42	35.08	27.57	51	2170
50	11.10	35.14	26.89	119	4640	—	—	—	—	—	6.45	35.08	27.57	52	2685
60	7.70	35.14	27.45	66	5565	9.30	35.19	27.24	86	5800	—	—	—	—	—
70	7.66	35.14	27.46	65	6220	—	—	—	—	—	6.39	35.08	27.58	52	3725
85	7.51	35.14	27.48	64	7188	8.86	35.21	27.32	78	7850	—	—	—	—	—
90	—	—	—	—	—	—	—	—	—	—	6.39	35.08	27.58	52	4765

STATION Sc. 40b—*continued.*Latitude, 57° 24' N. ; Longitude, 1° 7' E.—*continued.*

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
28th April, 1908.						27th July, 1908.					8th October, 1908.				
0	6.15	35.05	27.59	50	0	13.75	34.70	26.03	199	0	12.25	34.88	26.47	157	0
10	6.12	34.97	27.54	56	530	13.52	34.65	26.03	198	1985	12.02	34.88	26.52	153	1550
20	6.09	35.01	27.58	53	1075	10.42	34.65	26.63	142	3685	12.00	34.97	26.59	146	3045
30	6.02	35.05	27.61	49	1585	8.78	34.69	26.86	113	4960	11.64	35.01	26.70	138	4465
50	5.99	35.05	27.61	50	2575	7.31	34.78	27.23	87	6960	10.24	35.16	27.07	101	6855
60	—	—	—	—	—	—	—	—	—	—	9.18	35.16	27.23	86	7790
70	5.99	35.05	27.61	53	2575	7.05	34.81	27.29	81	8640	7.22	35.07	27.46	62	8530
85	—	—	—	—	—	6.90	34.90	27.38	72	2787	—	—	—	—	—
88	—	—	—	—	—	—	—	—	—	—	6.82	35.07	27.52	58	9610
90	5.99	35.05	27.61	50	4575	—	—	—	—	—	—	—	—	—	—
3rd December, 1908.						—					—				
0	9.05	35.03	27.15	92	0	—	—	—	—	—	—	—	—	—	—
10	9.04	35.03	27.15	91	915	—	—	—	—	—	—	—	—	—	—
20	9.01	35.03	27.16	91	1825	—	—	—	—	—	—	—	—	—	—
30	9.00	35.03	27.16	91	2735	—	—	—	—	—	—	—	—	—	—
50	8.94	35.03	27.17	92	4565	—	—	—	—	—	—	—	—	—	—
70	8.90	35.03	27.18	92	6405	—	—	—	—	—	—	—	—	—	—
90	7.64	35.03	27.18	92	8245	—	—	—	—	—	—	—	—	—	—

## STATION Sc. 41a.

Latitude, 56° 48' N. ; Longitude, 1° 19' E.

6th February, 1907.						10th April, 1907.					24th July, 1907.				
0	6.25	35.22	27.71	39	0	5.85	35.08	27.62	44	0	11.75	35.05	26.67	135	0
10	6.42	35.18	27.65	44	415	5.88	35.11	27.61	42	430	11.80	34.97	26.62	142	1385
20	6.42	35.17	27.64	45	860	5.88	35.08	27.61	45	865	11.78	34.99	26.63	139	2790
30	6.42	35.15	27.64	46	1315	5.88	35.08	27.61	45	1315	8.24	35.01	27.27	82	3895
50	6.42	35.17	27.64	46	2235	5.82	35.08	27.62	45	2215	7.00	35.03	27.46	64	5355
70	6.42	35.18	27.66	45	3145	5.82	35.08	27.62	45	3115	6.97	35.03	27.46	63	6625
93	—	—	—	—	—	—	—	—	—	—	6.97	35.03	27.46	64	8086
97	—	—	—	—	—	5.80	35.11	27.63	43	4303	—	—	—	—	—
98	6.44	35.18	27.66	46	4419	—	—	—	—	—	—	—	—	—	—
10th September, 1907.						6th November, 1907.					14th February, 1908.				
0	11.80	35.14	26.75	129	0	10.25	35.08	26.98	108	0	6.25	35.17	27.69	42	—
10	12.00	35.12	26.70	134	1315	10.29	35.07	26.97	109	1085	6.22	35.17	27.69	42	420
20	—	—	—	—	—	10.29	35.08	26.98	108	2170	6.22	35.17	27.69	42	840
30	11.70	35.14	26.78	128	3935	10.29	35.08	26.98	108	3250	6.22	35.14	27.66	43	1265
40	11.50	35.14	26.81	125	5200	10.28	35.08	26.98	109	4335	6.22	35.14	27.66	43	1695
50	7.10	35.19	27.57	54	6095	10.18	35.08	26.99	107	5415	6.22	35.14	27.66	44	2130
60	—	—	—	—	—	7.54	35.08	27.43	68	6290	—	—	—	—	—
70	7.01	35.19	27.59	52	7155	—	—	—	—	—	6.22	35.14	27.66	44	3010
85	—	—	—	—	—	7.23	35.14	27.52	59	7878	—	—	—	—	—
90	6.99	35.19	27.59	53	8205	—	—	—	—	—	6.22	35.17	27.68	44	3890
28th April, 1908.						27th July, 1908.					8th October, 1908.				
0	5.75	35.10	27.69	42	0	14.55	34.90	26.02	201	0	12.35	34.94	26.50	155	0
10	5.91	35.10	27.67	44	430	14.39	34.92	26.06	196	1985	12.30	34.85	26.43	161	1580
20	5.92	35.10	27.67	44	870	13.18	34.94	26.33	171	3820	12.11	34.87	26.49	155	3160
30	5.82	35.10	27.68	42	1300	10.60	34.94	26.82	124	5295	11.40	34.88	26.63	142	4645
40	—	—	—	—	—	—	—	—	—	—	9.18	34.94	27.06	101	5860
50	5.82	35.10	27.68	43	2150	6.75	34.96	27.44	65	7185	6.82	34.97	27.45	65	6690
70	5.82	35.10	27.68	43	3010	6.52	34.96	27.47	63	8465	6.71	34.97	27.46	64	7980
80	5.82	35.10	27.68	43	3440	—	—	—	—	—	6.66	35.01	27.50	61	8605
88	—	—	—	—	—	6.51	34.96	27.47	63	9599	—	—	—	—	—



STATION SC. 41a—continued.

Latitude, 56° 48' N. ; Longitude, 1° 19' E.—continued.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
3 December, 1908.															
0	8.25	34.94	27.20	87	0	—	—	—	—	—	—	—	—	—	—
10	8.28	34.94	27.20	87	870	—	—	—	—	—	—	—	—	—	—
20	8.28	34.94	27.20	87	1740	—	—	—	—	—	—	—	—	—	—
30	8.28	34.94	27.20	87	2610	—	—	—	—	—	—	—	—	—	—
50	8.28	34.94	27.20	88	4860	—	—	—	—	—	—	—	—	—	—
70	8.26	34.99	27.25	84	6080	—	—	—	—	—	—	—	—	—	—
90	7.41	34.99	27.37	79	7710	—	—	—	—	—	—	—	—	—	—

STATION SC. 41b.

Latitude, 56° 42' N. ; Longitude, 0° 35' E.

6th February, 1907.						10th April, 1907.					24th July, 1907.				
0	5.15	35.20	27.85	28	0	5.85	35.02	27.62	49	0	12.25	35.05	26.59	144	0
10	6.41	35.18	27.67	44	360	5.93	35.02	27.61	50	495	12.11	34.97	26.57	148	1460
20	6.41	35.18	27.67	44	800	5.93	35.02	27.61	50	995	11.78	35.01	26.65	139	2895
30	6.41	35.17	27.66	45	1245	5.91	35.02	27.61	50	1495	7.79	35.07	27.38	71	3945
40	6.41	35.17	27.66	46	1700	5.91	35.04	27.62	49	1990	—	—	—	—	—
50	—	—	—	—	—	—	—	—	—	—	7.42	35.07	27.43	67	5325
60	6.41	35.17	27.66	46	2620	5.91	35.04	27.62	49	2970	—	—	—	—	—
75	—	—	—	—	—	—	—	—	—	—	7.42	35.07	27.43	67	7000
85	—	—	—	—	—	5.91	35.06	27.63	48	4183	—	—	—	—	—
86	6.41	35.17	27.66	47	3829	—	—	—	—	—	—	—	—	—	—

10th October, 1907.						6th November, 1907.					14th February, 1908.				
0	11.75	35.12	26.75	130	0	10.15	35.08	27.01	106	0	6.35	34.99	27.52	63	0
10	11.60	35.10	26.77	128	1290	10.11	35.05	26.98	108	1070	6.46	34.99	27.50	58	605
20	—	—	—	—	—	10.11	35.05	26.98	108	2150	6.46	34.99	27.50	58	1185
30	11.26	35.08	26.81	125	3820	10.11	35.05	26.98	108	3230	6.46	34.99	27.50	58	1765
40	10.80	35.07	26.88	118	5035	10.11	35.07	27.00	107	4305	6.46	34.99	27.50	58	2340
60	7.90	35.01	27.33	78	6995	9.42	35.14	27.18	91	6285	6.48	34.99	27.50	59	3515
80	7.88	35.01	27.33	79	8565	9.81	35.16	27.12	97	8165	6.49	34.99	27.50	59	4695

27th April, 1908.						27th July, 1908.					8th October, 1908.				
0	6.05	35.01	27.58	52	0	14.75	34.83	25.92	210	0	12.35	34.88	26.45	158	0
10	6.21	35.01	27.56	54	530	14.28	34.83	26.01	201	2055	12.24	34.94	26.51	152	1550
20	6.20	35.01	27.56	54	1070	12.88	34.81	26.30	175	3935	12.19	34.94	26.52	152	3070
30	6.11	35.01	27.58	54	1610	8.58	34.74	27.00	112	5370	12.09	34.94	26.55	150	4580
40	—	—	—	—	—	—	—	—	—	—	10.51	34.94	26.84	122	5940
50	6.10	34.97	27.55	61	2760	6.98	34.74	27.24	85	7340	7.80	34.94	27.28	81	6955
70	6.10	34.96	27.53	61	3980	7.00	34.81	27.30	81	9000	7.51	34.94	27.31	76	8525
90	6.10	35.03	27.59	55	5140	—	—	—	—	—	—	—	—	—	—
98	—	—	—	—	—	—	—	—	—	—	7.46	34.94	27.32	77	10667

3rd December, 1908.						—					—				
0	8.85	34.94	27.11	97	0	—	—	—	—	—	—	—	—	—	—
10	8.91	34.96	27.11	95	960	—	—	—	—	—	—	—	—	—	—
20	8.86	34.96	27.12	95	1910	—	—	—	—	—	—	—	—	—	—
30	8.86	34.99	27.15	93	2850	—	—	—	—	—	—	—	—	—	—
50	8.86	34.99	27.15	94	4720	—	—	—	—	—	—	—	—	—	—
70	8.86	34.99	27.15	94	6600	—	—	—	—	—	—	—	—	—	—
90	8.86	34.99	27.15	95	8490	—	—	—	—	—	—	—	—	—	—

STATION Sc. 41c.

Latitude, 56° 35' N. ; Longitude, 0° 10' W.

Depth Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
5th February, 1907.						10th April, 1907.					24th July, 1907.				
0	5.95	35.10	27.67	44	0	5.95	34.97	27.58	53	0	12.45	34.99	26.51	152	0
10	6.23	35.07	27.61	50	470	5.80	34.98	27.59	51	520	12.41	34.94	26.48	155	1535
20	6.23	35.07	27.61	50	970	5.80	34.97	27.57	52	1035	12.18	34.96	26.54	149	3055
30	6.28	35.10	27.62	49	1465	5.80	34.97	27.58	52	1555	8.41	34.97	27.22	87	4235
40	6.28	35.03	27.56	55	1985	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	5.80	34.98	27.59	52	2595	7.91	34.99	27.30	79	5895
60	6.28	35.08	27.60	51	3045	—	—	—	—	—	—	—	—	—	—
73	—	—	—	—	—	—	—	—	—	—	7.91	35.01	27.32	78	7701
75	—	—	—	—	—	5.80	35.00	27.60	51	3883	—	—	—	—	—
80	6.23	35.08	27.60	52	4075	—	—	—	—	—	—	—	—	—	—
10th September, 1907.						6th November, 1907.					14th February, 1908.				
0	11.25	35.01	26.77	129	0	10.15	35.07	27.00	107	0	6.35	34.99	27.52	57	0
10	—	—	—	—	—	10.21	35.01	26.95	112	1095	6.39	34.99	27.51	57	570
20	—	—	—	—	—	10.21	35.01	26.95	112	2215	6.39	34.99	27.51	57	1140
30	—	—	—	—	—	10.21	35.01	26.95	112	3335	6.40	34.99	27.51	57	1710
35	10.71	35.03	26.86	119	4340	—	—	—	—	—	—	—	—	—	—
40	—	—	—	—	—	10.22	35.01	26.95	113	4460	6.40	34.99	27.51	57	2230
50	9.40	35.03	27.09	99	5975	—	—	—	—	—	6.40	34.99	27.51	58	2855
60	—	—	—	—	—	10.22	35.01	26.95	113	6720	—	—	—	—	—
70	9.36	35.07	27.13	96	7925	—	—	—	—	—	6.42	34.99	27.51	59	4025
80	—	—	—	—	—	10.25	35.03	26.95	114	8990	—	—	—	—	—
27th April, 1908.						27th July, 1908.					7th October, 1908.				
0	6.15	34.81	27.41	63	0	14.45	34.67	25.86	210	0	11.95	34.78	26.45	160	0
10	6.09	34.87	27.46	63	655	14.30	34.67	25.89	202	2060	11.82	34.78	26.48	157	1585
20	5.86	34.87	27.48	61	1270	12.44	34.72	26.80	175	3945	11.80	34.78	26.48	157	3155
30	5.86	34.81	27.45	64	1900	7.90	34.72	27.09	99	5414	11.18	34.85	26.64	140	4640
50	5.89	34.81	27.44	66	3200	7.58	34.72	27.14	95	7354	10.00	34.96	26.94	113	7170
60	5.89	34.81	27.44	66	3860	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	7.58	34.72	27.14	95	9254	—	—	—	—	—
75	—	—	—	—	—	—	—	—	—	—	8.56	34.88	27.12	97	6795
80	5.89	34.85	27.47	64	5160	—	—	—	—	—	—	—	—	—	—
4th December, 1908.						—					—				
0	9.25	34.94	27.05	102	0	—	—	—	—	—	—	—	—	—	—
10	9.28	34.94	27.05	102	1020	—	—	—	—	—	—	—	—	—	—
20	9.22	34.94	27.06	102	2040	—	—	—	—	—	—	—	—	—	—
30	9.22	34.96	27.07	100	3050	—	—	—	—	—	—	—	—	—	—
50	9.22	34.96	27.07	101	5060	—	—	—	—	—	—	—	—	—	—
75	9.22	34.96	27.07	101	7585	—	—	—	—	—	—	—	—	—	—

STATION Sc. 42.

Latitude, 56° 28' N. ; Longitude, 0° 53' W.

5th February, 1907.						5th April, 1907.					24th July, 1907.				
0	5.85	34.94	27.35	55	0	5.35	34.97	27.63	47	0	12.35	34.90	26.47	157	0
10	5.91	34.92	27.52	57	560	5.45	34.97	27.60	48	475	11.62	34.88	26.58	145	1510
20	5.92	34.97	27.57	53	1110	5.45	34.93	27.57	51	970	9.24	34.81	26.96	112	2795
30	5.93	34.92	27.52	57	1660	5.45	34.93	27.57	51	1480	9.12	34.81	26.98	110	3905
40	5.93	34.90	27.51	60	2245	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	5.40	34.97	27.62	48	2470	9.09	34.81	26.98	111	6115
68	5.93	34.94	27.54	57	3883	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	5.40	35.00	27.65	46	3410	—	—	—	—	—



STATION SC. 42—continued.

Latitude, 56° 28' N. ; Longitude, 0° 53' W.—continued.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
10th September, 1907.						6th November, 1907.					14th February, 1908.				
0	11.05	34.92	26.72	132	0	10.35	34.94	26.87	120	0	5.75	34.78	27.43	65	0
10	—	—	—	—	—	10.57	34.94	26.81	123	1215	5.90	34.76	27.39	69	670
20	—	—	—	—	—	10.67	34.94	26.80	125	2455	5.90	34.76	27.39	69	1360
30	9.80	34.90	26.93	114	3690	10.68	34.94	23.80	125	3705	5.91	34.76	27.39	69	2050
40	—	—	—	—	—	—	—	—	—	—	5.91	34.76	27.39	69	2740
50	—	—	—	—	—	10.70	34.88	26.75	131	6265	—	—	—	—	—
60	—	—	—	—	—	—	—	—	—	—	5.93	34.78	27.41	73	4160
65	9.75	34.90	26.94	114	7680	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	10.71	34.88	26.75	131	8885	—	—	—	—	—
27th April, 1908.						28th July, 1908.					7th October, 1908.				
0	6.35	34.81	27.38	71	0	13.55	34.58	25.97	203	0	12.05	34.72	26.38	166	0
10	6.12	34.81	27.42	68	695	13.41	34.58	26.01	201	2020	11.91	34.72	26.41	164	1650
20	6.00	34.78	27.40	68	1375	9.41	34.58	26.74	131	3680	11.91	34.74	26.43	162	3280
30	5.99	34.85	27.45	63	2030	8.31	34.60	26.97	113	4900	11.16	34.74	26.57	148	4830
50	5.99	34.85	27.45	64	3300	8.24	34.60	26.95	113	7160	10.71	34.85	26.72	133	7640
60	—	—	—	—	—	8.30	34.63	26.97	113	8290	—	—	—	—	—
70	5.99	34.88	27.48	68	4620	—	—	—	—	—	10.71	34.85	26.72	133	10300
4th December, 1908.						—					—				
0	9.45	34.74	27.92	123	0	—	—	—	—	—	—	—	—	—	—
10	9.70	34.76	27.93	122	1225	—	—	—	—	—	—	—	—	—	—
20	9.70	34.76	27.93	122	2445	—	—	—	—	—	—	—	—	—	—
30	9.70	34.76	27.93	122	3665	—	—	—	—	—	—	—	—	—	—
50	9.70	34.76	27.93	123	6115	—	—	—	—	—	—	—	—	—	—
75	9.69	34.76	27.93	123	9190	—	—	—	—	—	—	—	—	—	—

STATION SC. 43.

Latitude, 56° 24' N. ; Longitude, 1° 21' W.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
5th February, 1907.						5th April, 1907.					24th July, 1907.				
0	6.45	34.85	27.52	57	0	5.35	34.87	27.55	54	0	11.65	34.74	26.57	157	0
10	5.44	34.81	27.50	60	585	5.32	34.88	27.56	53	535	11.01	34.65	26.52	152	1545
20	5.44	34.74	27.44	65	1210	5.30	34.87	27.55	53	1065	9.01	34.65	26.86	120	2905
30	5.48	34.78	27.46	63	1850	5.28	34.87	27.55	53	1595	9.00	34.65	26.86	120	4105
40	—	—	—	—	—	5.28	34.84	27.53	56	2140	—	—	—	—	—
46	—	—	—	—	—	—	—	—	—	—	8.95	34.65	26.87	121	6033
55	5.48	34.74	27.43	67	3475	—	—	—	—	—	—	—	—	—	—
62	—	—	—	—	—	5.28	34.85	27.53	56	3372	—	—	—	—	—
10th September, 1907.						5th November, 1907.					13th February, 1908.				
0	10.85	34.81	26.68	137	0	10.65	34.88	26.75	129	0	6.05	34.81	27.42	167	0
10	—	—	—	—	—	10.65	34.88	26.75	129	1290	6.01	34.76	27.38	169	1680
20	—	—	—	—	—	10.66	34.88	26.75	129	2580	6.01	34.76	27.38	169	3370
25	10.80	34.81	26.69	136	3413	—	—	—	—	—	—	—	—	—	—
30	—	—	—	—	—	10.68	34.88	26.75	130	3875	6.01	34.76	27.38	169	5060
40	—	—	—	—	—	—	—	—	—	—	6.01	34.81	27.43	167	6740
50	10.80	34.81	26.69	138	6838	10.68	34.88	26.75	131	6485	—	—	—	—	—
60	—	—	—	—	—	—	—	—	—	—	6.02	34.81	27.43	167	10080
27th April, 1908.						28th July, 1908.					7th October, 1908.				
0	6.35	34.70	27.29	80	0	13.05	34.58	26.08	195	0	11.85	34.63	26.35	169	0
10	5.88	34.67	27.32	75	775	12.60	34.58	26.16	187	1910	11.70	34.63	26.38	167	1680
20	5.82	34.67	27.33	75	1525	10.00	34.51	26.59	146	3575	11.69	34.63	26.38	167	3350
30	5.82	34.65	27.31	76	2280	9.33	34.51	26.69	136	4985	11.50	34.63	26.41	163	5000
45	—	—	—	—	—	9.18	34.51	26.72	133	7002	—	—	—	—	—
50	5.82	34.65	27.31	76	3800	—	—	—	—	—	11.34	34.63	26.45	162	8250
60	5.82	34.69	27.34	74	4550	—	—	—	—	—	—	—	—	—	—

STATION SC. 43—*continued.*Latitude, 56° 24' N. ; Longitude, 1° 21' W.—*continued.*

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
4th December, 1908.															
0	9.25	34.72	26.88	119	0	—	—	—	—	—	—	—	—	—	—
10	9.62	34.67	26.78	125	1270	—	—	—	—	—	—	—	—	—	—
20	9.62	34.67	26.78	125	2520	—	—	—	—	—	—	—	—	—	—
30	9.62	34.74	26.84	123	3760	—	—	—	—	—	—	—	—	—	—
50	9.62	34.74	26.84	123	6220	—	—	—	—	—	—	—	—	—	—
65	9.61	34.74	26.84	123	8065	—	—	—	—	—	—	—	—	—	—

## STATION SC. 44.

Latitude, 56° 20' N. ; Longitude, 1° 49' W.

5th February, 1907.						5th April, 1907.					25th July, 1907.				
0	5.25	34.68	27.42	67	0	5.45	34.78	27.47	63	0	11.45	34.85	26.60	145	0
10	5.18	34.59	27.35	73	700	5.42	34.81	27.50	60	615	10.64	34.74	26.65	139	1420
20	5.18	34.61	27.37	72	1425	5.31	34.81	27.51	59	1210	9.50	34.74	26.85	121	2720
30	5.18	34.57	27.34	75	2160	5.30	34.78	27.48	61	1810	9.35	34.74	26.88	118	3915
40	—	—	—	—	—	5.30	34.76	27.46	62	2425	9.30	34.74	26.89	118	5095
57	5.18	34.57	27.34	76	4199	—	—	—	—	—	—	—	—	—	—
60	—	—	—	—	—	5.30	34.76	27.46	63	3675	9.20	34.74	26.91	117	7445

9th October, 1907.						5th November, 1907.					13th February, 1908.				
0	11.35	34.72	26.51	153	0	10.65	34.88	26.76	130	0	5.55	34.40	27.17	92	0
10	—	—	—	—	—	10.60	34.88	26.77	129	1295	5.62	34.43	27.20	91	915
20	10.50	34.70	26.65	140	2930	10.60	34.88	26.77	129	2585	5.62	34.45	27.21	90	1820
30	—	—	—	—	—	10.60	34.88	26.77	129	3875	5.68	34.52	27.24	92	2730
40	10.45	34.70	26.66	140	5730	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	10.62	34.88	26.77	130	6465	—	—	—	—	—
55	—	—	—	—	—	—	—	—	—	—	5.74	34.54	27.25	94	5055

27th April, 1908.						28th July, 1908.					6th October, 1908.				
0	5.85	34.54	27.23	85	0	13.55	34.23	25.71	230	0	12.15	34.38	26.10	193	0
10	5.70	34.52	27.24	86	855	12.97	34.29	25.87	210	2200	12.11	34.42	26.13	189	1910
20	5.68	34.54	27.25	84	1705	10.65	34.47	26.44	159	4045	11.72	34.54	26.31	172	3715
30	5.68	34.54	27.25	84	2545	10.30	34.47	26.51	154	5610	11.62	34.54	26.33	171	5430
50	5.68	34.54	27.25	84	4225	—	—	—	—	—	—	—	—	—	—
55	—	—	—	—	—	9.49	34.47	26.64	141	9297	11.60	34.58	26.36	168	7667

4th December, 1908.						—					—				
0	9.35	34.51	26.70	136	0	—	—	—	—	—	—	—	—	—	—
10	9.48	34.49	26.66	140	1380	—	—	—	—	—	—	—	—	—	—
20	9.48	34.49	26.66	140	2780	—	—	—	—	—	—	—	—	—	—
30	9.48	34.51	26.63	138	4170	—	—	—	—	—	—	—	—	—	—
50	9.48	34.51	26.68	138	6930	—	—	—	—	—	—	—	—	—	—
64	9.48	34.51	26.68	138	8862	—	—	—	—	—	—	—	—	—	—

## STATION SC. 45.

Latitude, 56° 16' N. ; Longitude, 2° 17' W.

5th February 1907.						4th April, 1907.					25th July, 1907.				
0	5.35	34.74	27.45	64	0	5.45	34.29	27.08	99	0	13.05	34.56	26.05	196	0
10	5.48	34.72	27.41	67	655	5.30	34.56	27.31	77	880	12.70	34.58	26.15	188	1920
20	5.48	34.72	27.41	67	1325	5.25	34.58	27.34	75	1640	10.25	34.58	26.60	144	3580
30	5.46	34.72	27.41	67	1995	5.21	34.65	27.39	69	2360	8.71	34.63	26.90	116	4880
51	5.43	34.74	27.44	66	3392	—	—	—	—	—	—	—	—	—	—
52	—	—	—	—	—	5.21	34.69	27.42	67	3856	8.60	34.63	26.91	116	7432



STATION SC. 45—*continued.*

Latitude, 56° 16' N. ; Longitude, 2° 17' W.—*continued.*

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
9th September, 1907.						5th November, 1907.					13th February, 1908.				
0	11.80	34.18	26.20	210	0	10.45	34.79	26.72	133	0	5.45	34.09	26.91	110	0
10	—	—	—	—	—	10.62	34.79	26.70	136	1345	5.50	34.18	26.98	107	1085
20	—	—	—	—	—	10.62	34.79	26.70	136	2705	5.78	34.54	27.25	85	2945
25	10.18	34.63	26.66	139	4250	—	—	—	—	—	—	—	—	—	—
30	—	—	—	—	—	10.64	34.76	26.65	138	4075	5.91	34.70	27.44	74	3635
50	9.85	34.63	26.71	136	7688	10.68	34.76	26.66	139	9845	—	—	—	—	—
60	—	—	—	—	—	—	—	—	—	—	5.98	34.70	27.44	70	5795
25th April, 1908.						28th July, 1908.					6th October, 1908.				
0	5.45	34.31	27.07	100	0	13.25	33.87	25.49	250	0	12.75	33.54	25.25	271	0
10	5.55	34.27	27.05	102	1010	12.51	34.22	25.90	211	7135	12.42	33.64	25.47	252	2615
20	5.59	34.31	27.08	100	2020	10.61	34.42	26.40	162	9000	11.50	34.47	26.29	174	4745
30	5.62	34.36	27.12	96	3000	9.90	34.38	26.55	154	10580	11.50	34.49	26.30	172	6475
50	5.62	34.49	27.22	87	4830	9.88	34.38	26.56	153	13650	11.50	34.51	26.32	171	9905
4th December, 1908.						—					—				
0	8.75	34.22	26.56	148	0	—	—	—	—	—	—	—	—	—	—
10	8.88	34.23	26.55	148	1480	—	—	—	—	—	—	—	—	—	—
20	9.34	34.49	26.66	137	2905	—	—	—	—	—	—	—	—	—	—
30	9.36	34.49	26.67	137	4275	—	—	—	—	—	—	—	—	—	—
45	9.38	34.49	26.67	138	6337	—	—	—	—	—	—	—	—	—	—

STATION SC. 46.

Latitude, 56° 10' N. ; Longitude, 2° 45' W.

Depth (Metres).	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.	Temp. °C.	S.‰	σ <sub>t</sub>	v-v'.	e-e'.
5th February, 1907.						3rd April, 1907.					25th July, 1907.				
0	4.75	34.57	27.39	—	—	5.15	34.23	27.06	100	0	12.85	34.20	25.81	218	0
10	5.01	34.57	27.36	—	—	5.18	34.23	27.06	101	1005	12.12	34.22	25.97	204	2110
20	5.01	34.55	27.35	—	—	5.15	34.33	27.14	93	1975	11.11	34.31	26.25	179	4025
30	5.01	34.57	27.36	—	—	5.12	34.33	27.15	93	2905	10.84	34.31	26.29	175	5795
44	—	—	—	—	—	—	—	—	—	—	10.29	34.38	26.44	161	9827
45	5.01	34.57	27.36	—	—	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	5.12	34.23	27.07	101	4845	—	—	—	—	—
9th September, 1907.						5th November, 1907.					13th February, 1908.				
0	11.05	34.45	26.36	163	0	10.05	33.62	25.88	212	0	5.65	34.29	27.05	101	0
10	—	—	—	—	—	10.21	33.91	26.09	194	2030	5.70	34.34	27.09	98	995
20	10.83	34.45	26.41	164	3320	10.35	34.05	26.17	186	3930	5.70	34.45	27.17	90	1935
30	—	—	—	—	—	—	—	—	—	—	5.74	34.45	27.17	90	2835
35	10.83	34.45	26.41	164	5780	—	—	—	—	—	—	—	—	—	—
40	—	—	—	—	—	10.50	34.51	26.51	155	7340	5.78	34.49	27.20	88	3725
25th April, 1908.						28th July, 1908.					6th October, 1908.				
0	5.85	33.66	26.53	151	0	12.15	34.29	26.03	199	0	12.85	33.66	25.39	257	0
10	5.52	33.58	26.52	153	1520	11.24	34.29	26.19	182	1905	12.40	34.09	25.82	278	2375
20	5.42	33.66	26.53	146	3015	10.60	34.33	26.33	169	3660	11.92	34.25	26.04	198	4455
30	5.59	33.75	26.64	141	4450	—	—	—	—	—	11.90	34.33	26.10	191	6400
40	5.60	33.82	26.70	136	5835	—	—	—	—	—	11.60	34.38	26.21	182	8265
4th December, 1908.						—					—				
0	8.65	33.91	26.35	170	0	—	—	—	—	—	—	—	—	—	—
10	8.92	34.33	26.62	142	1560	—	—	—	—	—	—	—	—	—	—
20	9.00	34.42	26.66	136	2950	—	—	—	—	—	—	—	—	—	—
35	9.05	34.52	26.74	130	4945	—	—	—	—	—	—	—	—	—	—

STATION Sc. 52d.

Latitude, 60° 17' N.; Longitude, 6° 11' W.

Depth (Metres).	Temp. °C.	S.°∞	σ <sub>t</sub>	V-V'.	e-e'	Temp. °C.	S.°∞	σ <sub>t</sub>	V-V'.	e-e'.
24th August, 1908.										
0	11.25	35.30	26.98	108	0	—	—	—	—	—
100	9.23	35.28	27.33	78	9360	—	—	—	—	—
400	5.18	35.08	27.74	43	12835	—	—	—	—	—
700	1.54	34.90	27.95	22	13810	—	—	—	—	—
1000	1.15	34.90	27.98	18	14410	—	—	—	—	—

STATION Sc. 53.

Latitude, 59° 36' N.; Longitude, 7° 0' W.

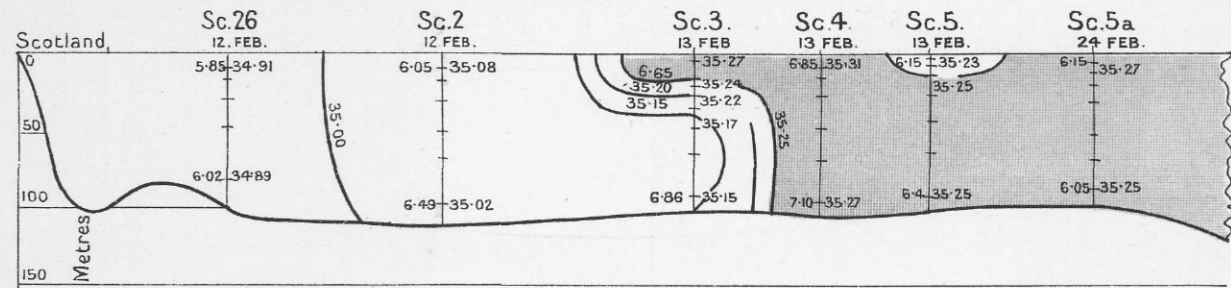
17th August, 1907.										
Depth (Metres).	Temp. °C.	S.°∞	σ <sub>t</sub>	V-V'.	e-e'	Temp. °C.	S.°∞	σ <sub>t</sub>	V-V'.	e-e'.
0	11.40	35.32	26.96	110	0	—	—	—	—	—
10	11.31	35.23	26.91	114	1120	—	—	—	—	—
20	11.00	35.31	27.04	102	2200	—	—	—	—	—
30	10.62	35.25	27.06	101	3215	—	—	—	—	—
40	10.35	35.25	27.11	97	4205	—	—	—	—	—
60	9.55	35.26	27.26	83	6005	—	—	—	—	—
80	9.24	35.30	27.34	77	7605	—	—	—	—	—
100	9.10	35.26	27.33	78	9155	—	—	—	—	—
150	8.89	35.30	27.39	72	12905	—	—	—	—	—
200	8.80	35.30	27.40	73	16530	—	—	—	—	—
400	8.42	35.26	27.44	74	31230	—	—	—	—	—
600	8.24	35.21	27.42	79	46530	—	—	—	—	—
800	7.90	35.16	27.42	81	62530	—	—	—	—	—
1000	7.22	35.16	27.53	75	78130	—	—	—	—	—



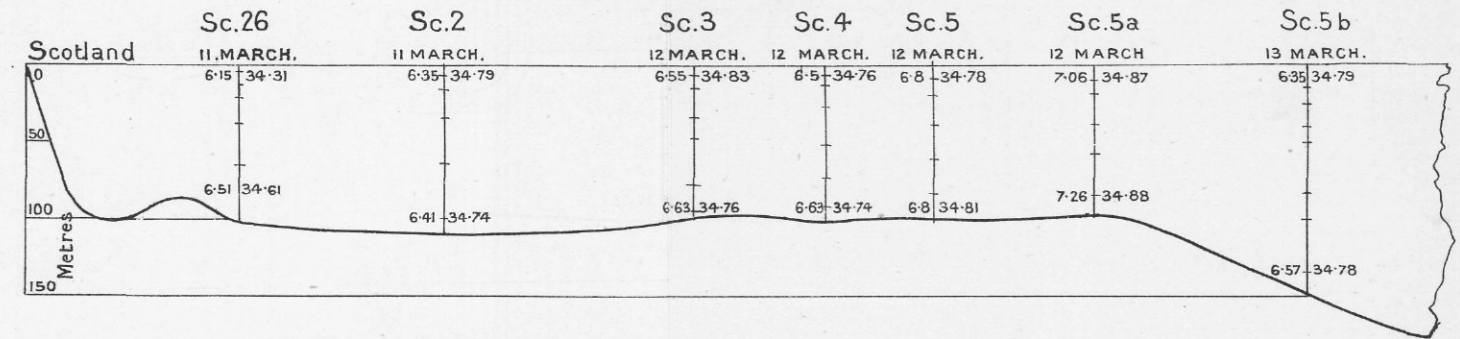
# NORTH SEA BETWEEN SCOTLAND AND SHETLAND.

1907 - 1908.

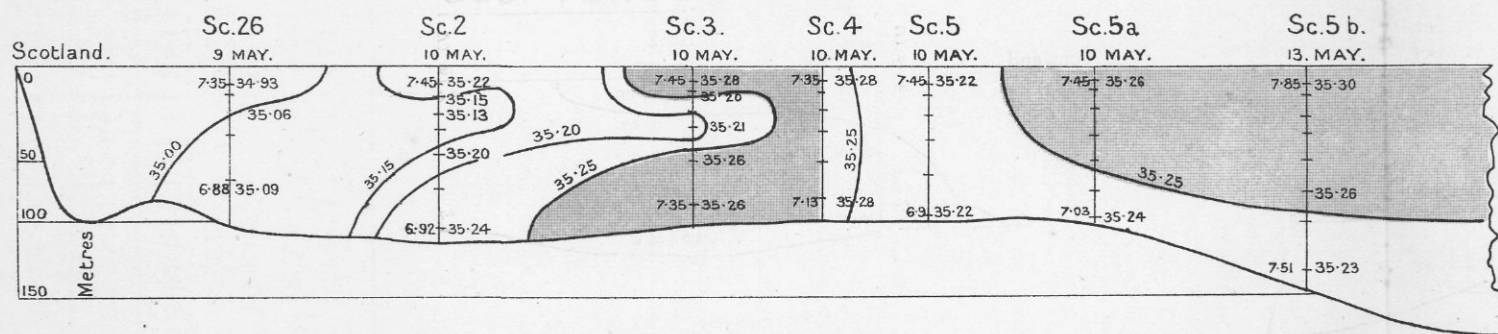
FEBRUARY, 1907.



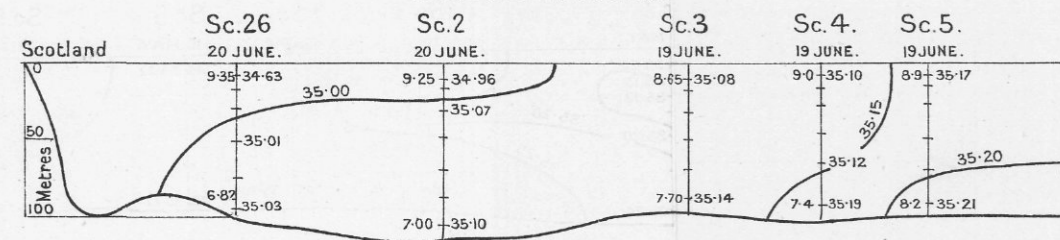
MARCH, 1908.



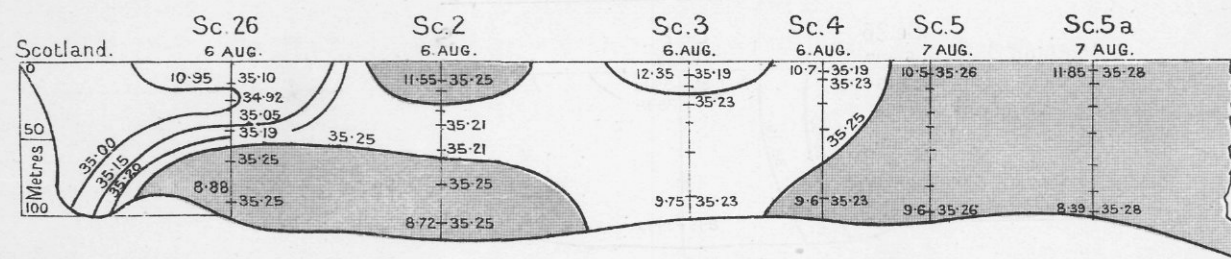
MAY, 1907.



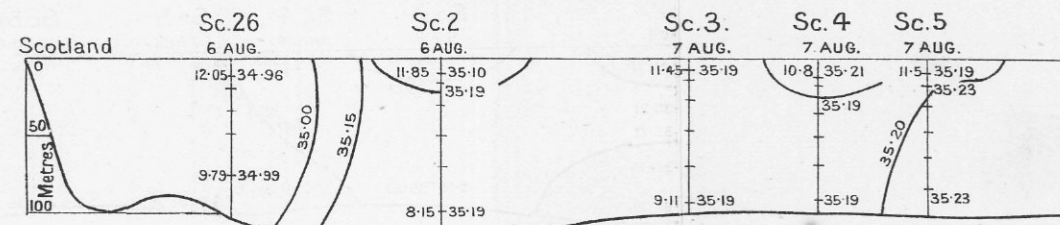
JUNE, 1908.



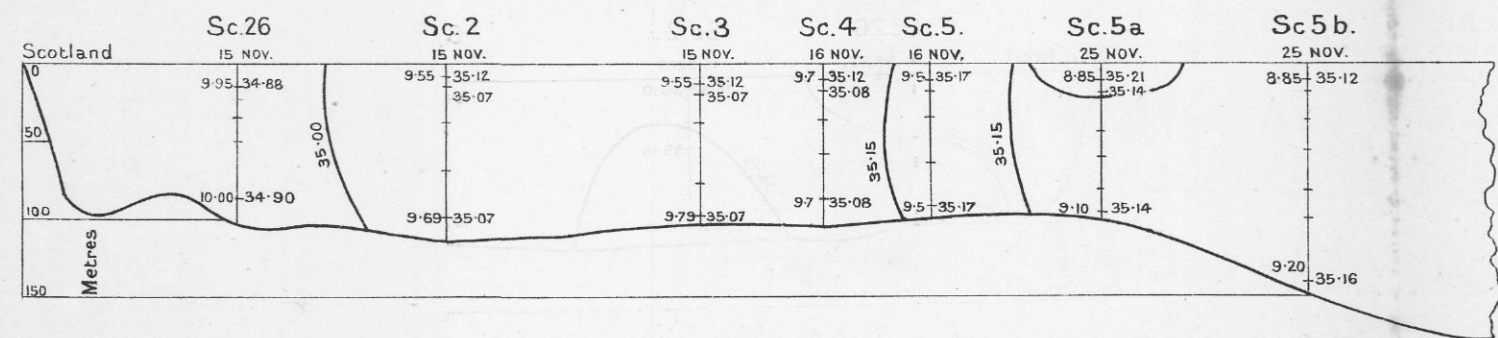
AUGUST, 1907.



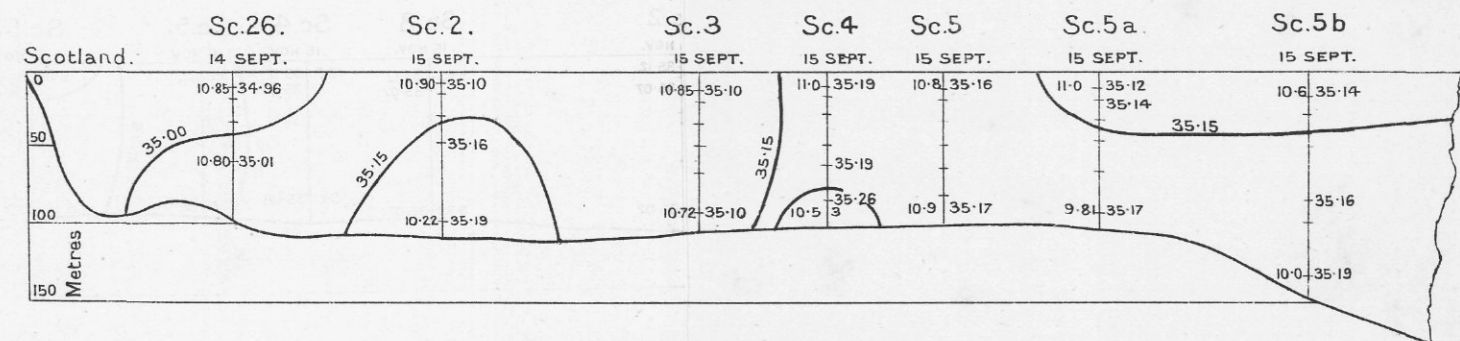
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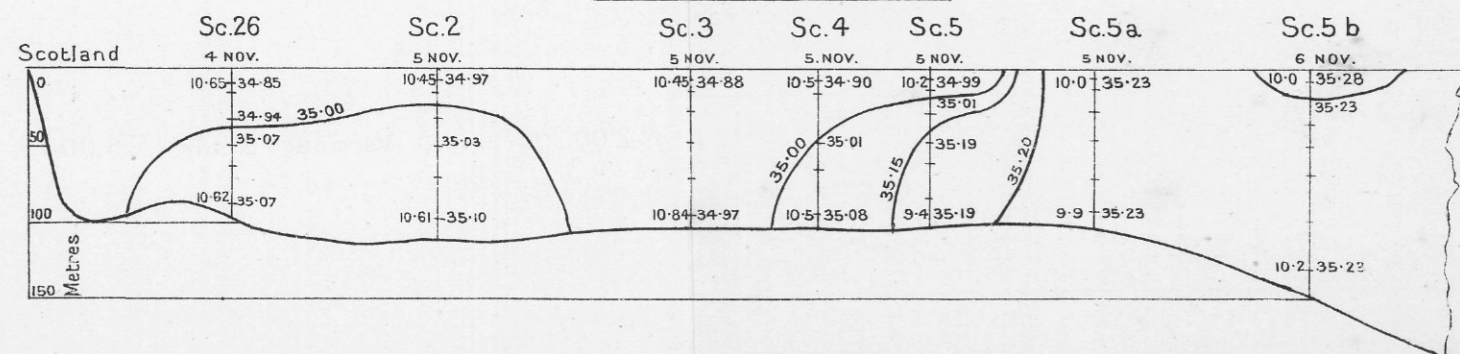
NOVEMBER, 1907.



SEPTEMBER, 1908.



NOVEMBER, 1908.



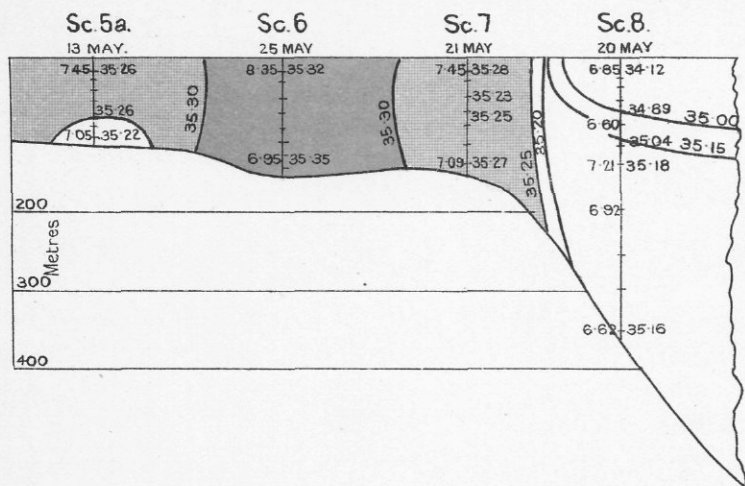
Horizontal Scale 1:2,000,000. Vertical Scale 1:5,000.



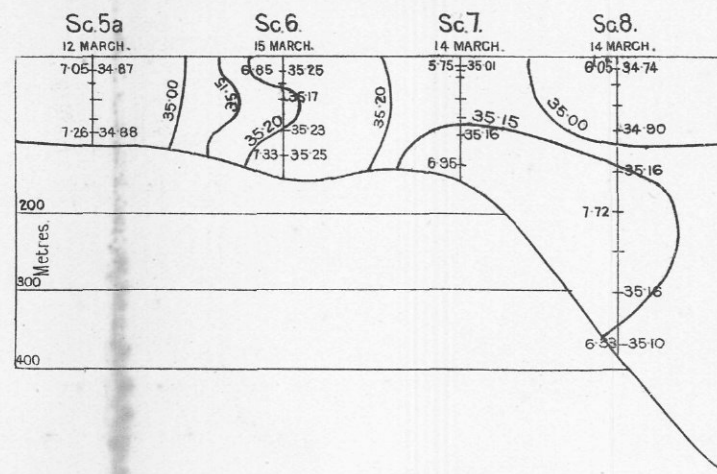
# SECTION FROM NORTH OF SHETLAND EASTWARDS

1907 1908.

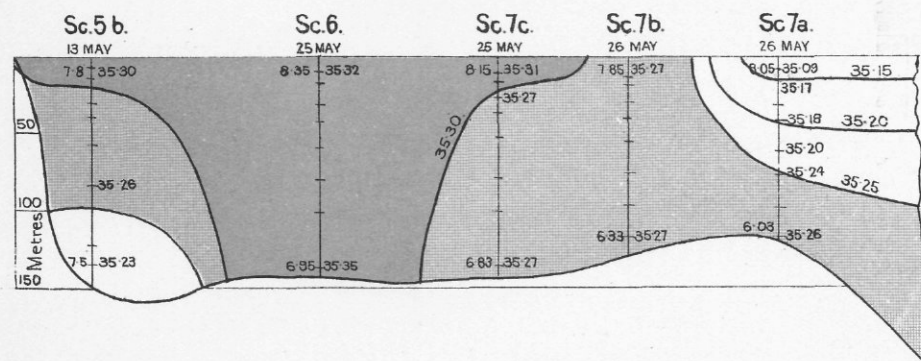
MAY 1907.



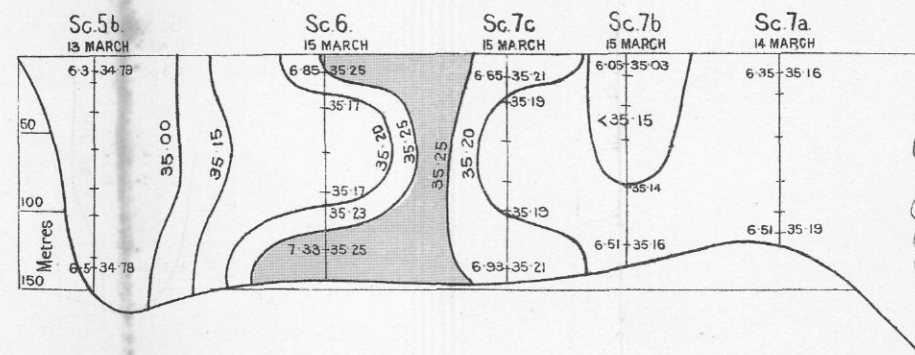
MARCH 1908.



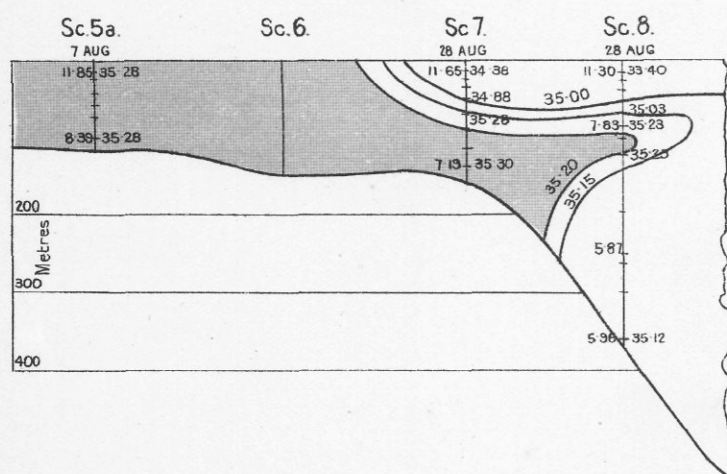
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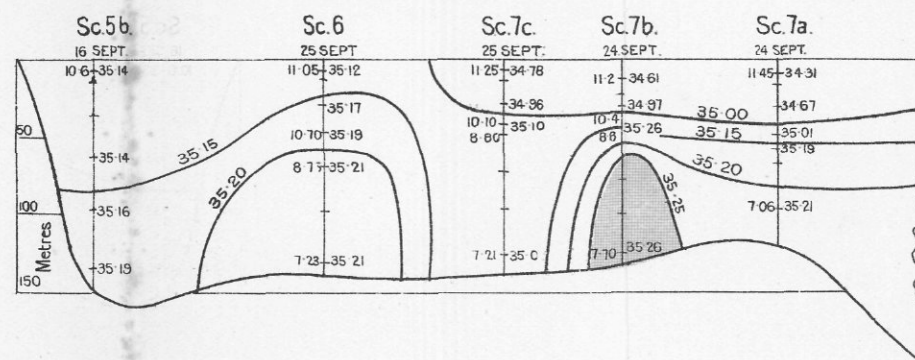
MARCH 1908.



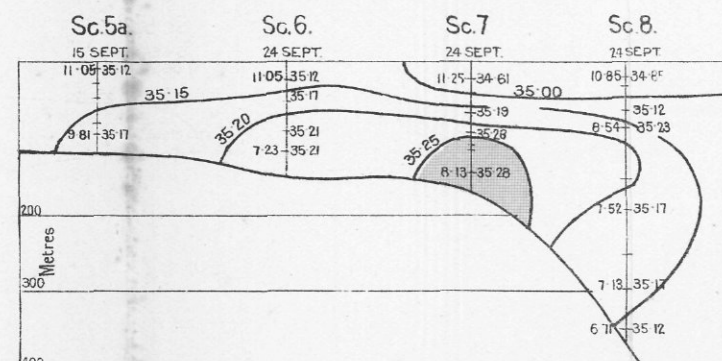
AUGUST 1907.



SEPTEMBER 1908.



SEPTEMBER 1908



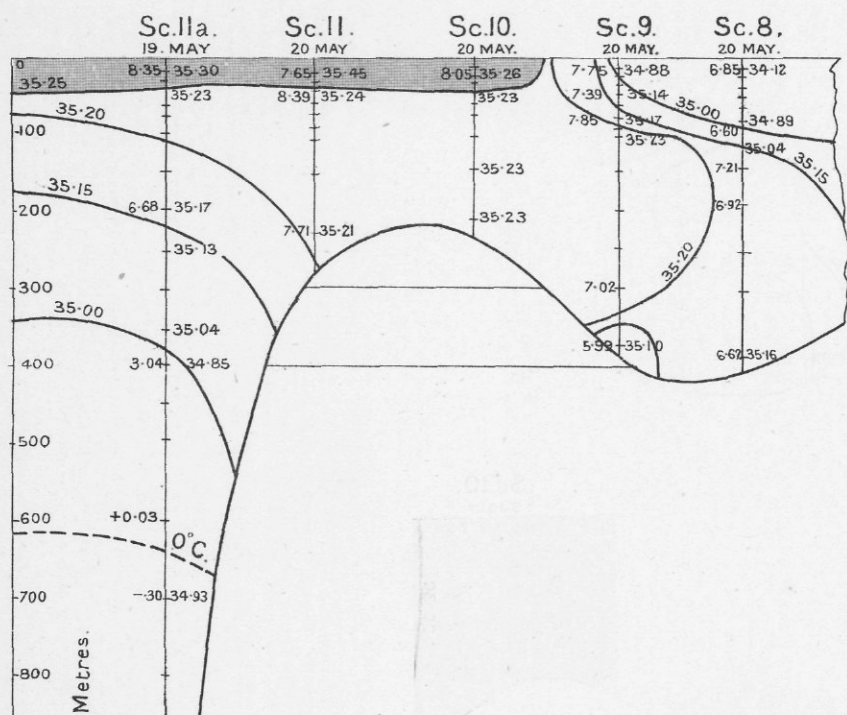
Horizontal Scale 1: 2,000,000  
Vertical Scale 1: 5,000



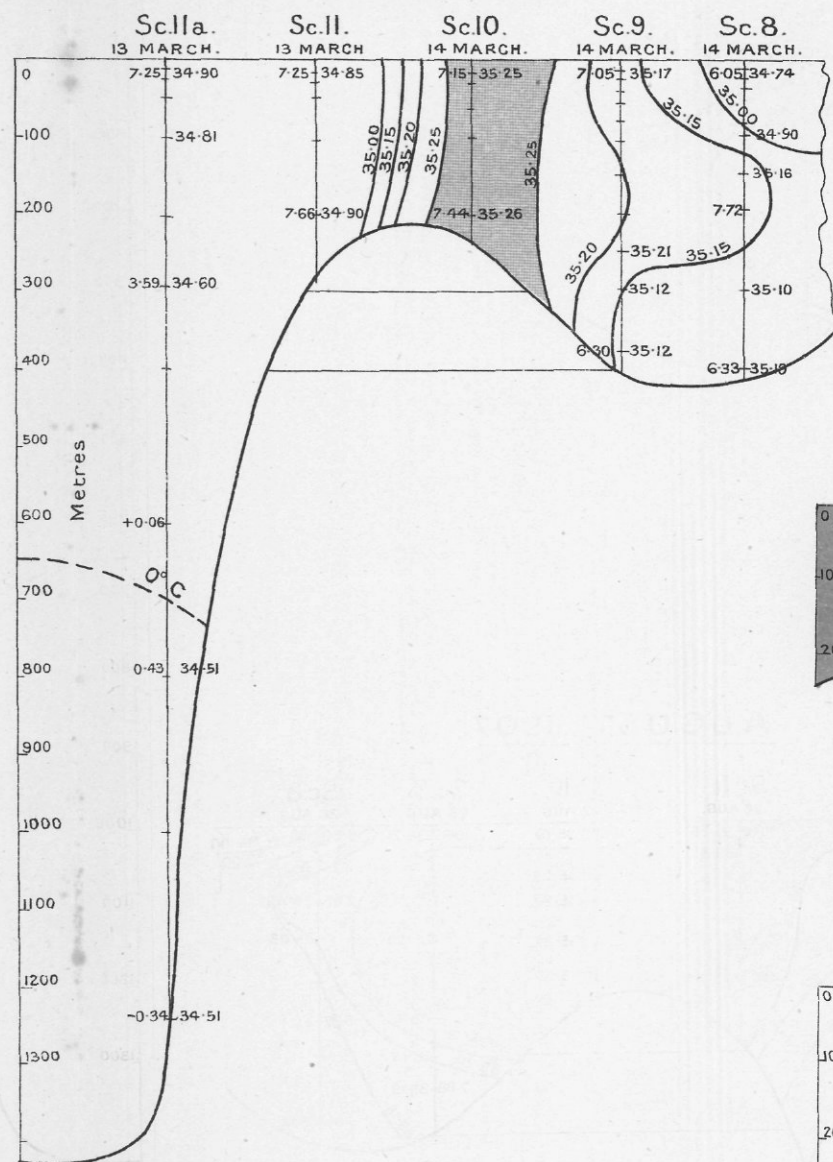
ENTRANCE FROM NORTH SEA TO NORWEGIAN SEA.

1907 - 1908.

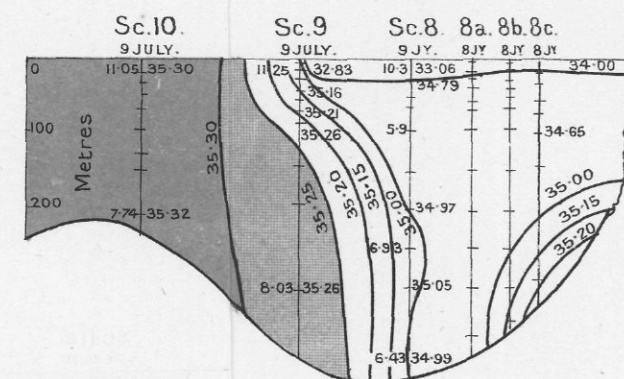
MAY, 1907.



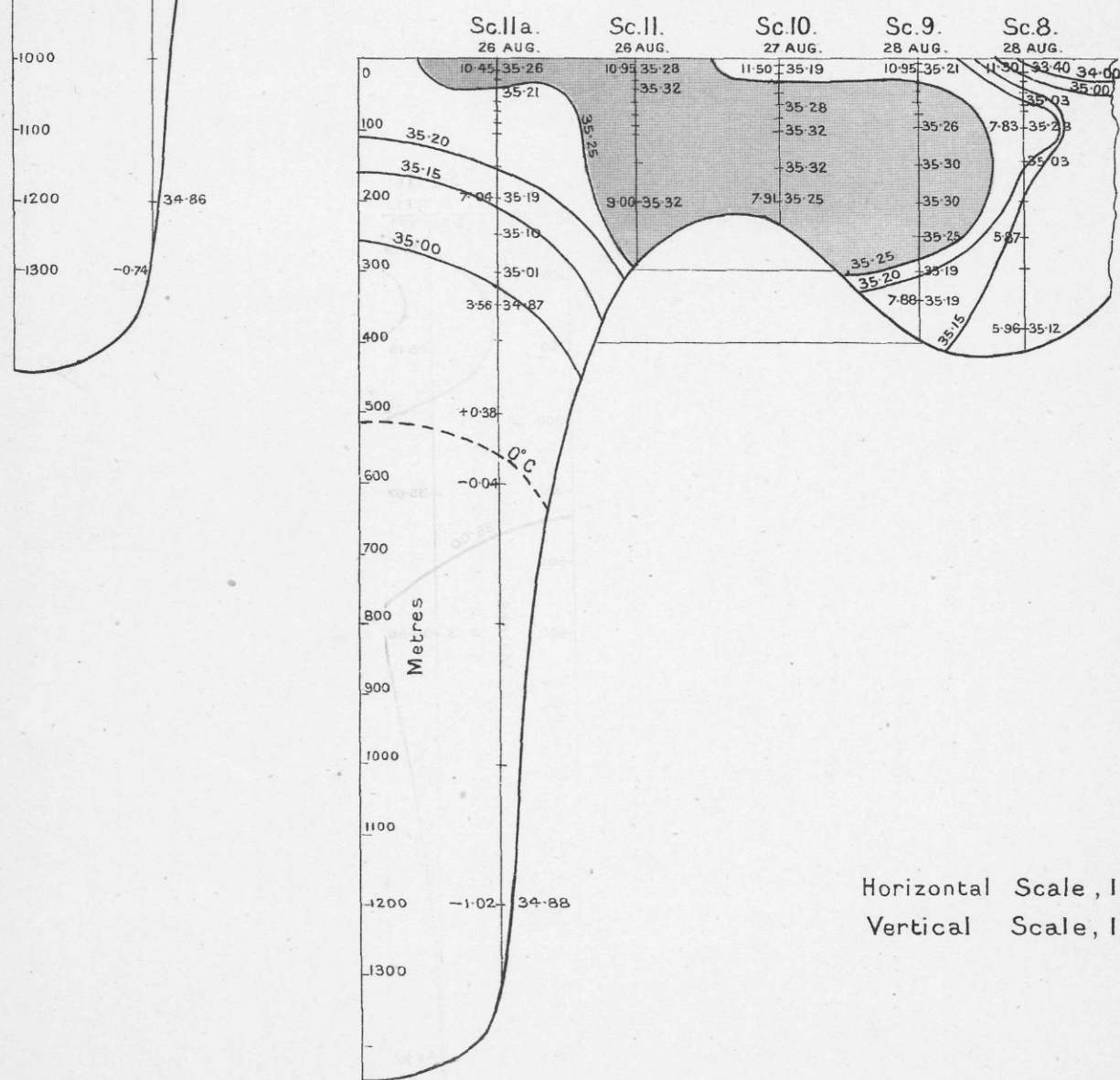
MARCH, 1908.



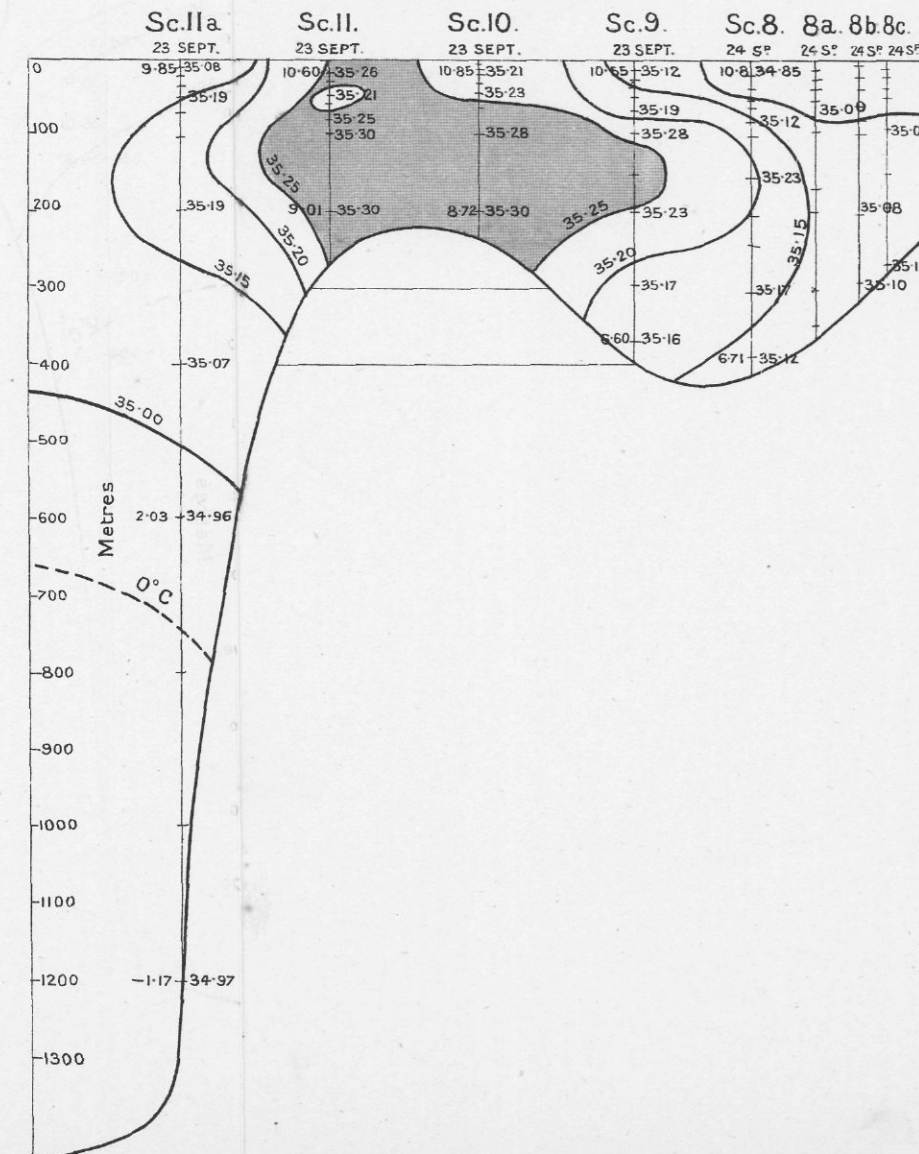
JULY, 1908.



AUGUST, 1907.



SEPTEMBER, 1908.

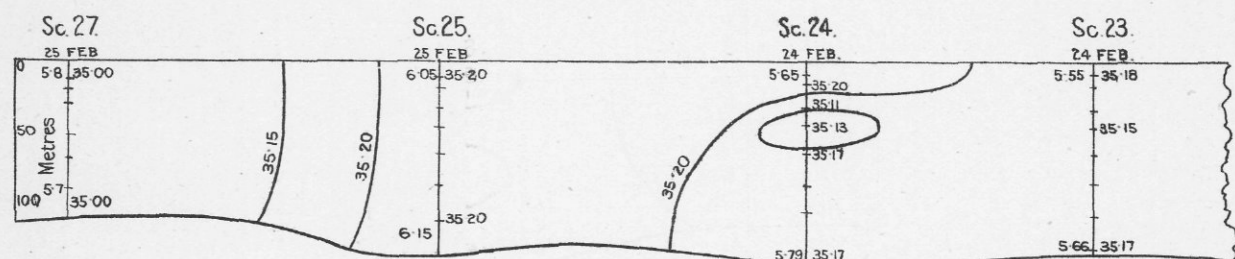


Horizontal Scale, 1: 2,000,000.  
Vertical Scale, 1: 10,000.

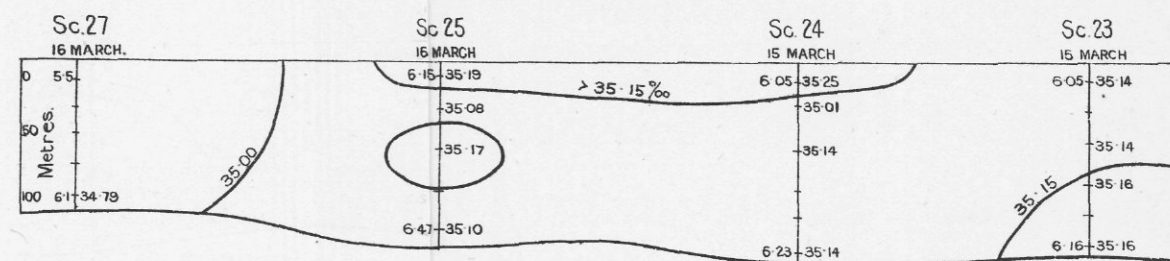


NORTH SEA NORTH WESTERN AREA.  
1907-1908.

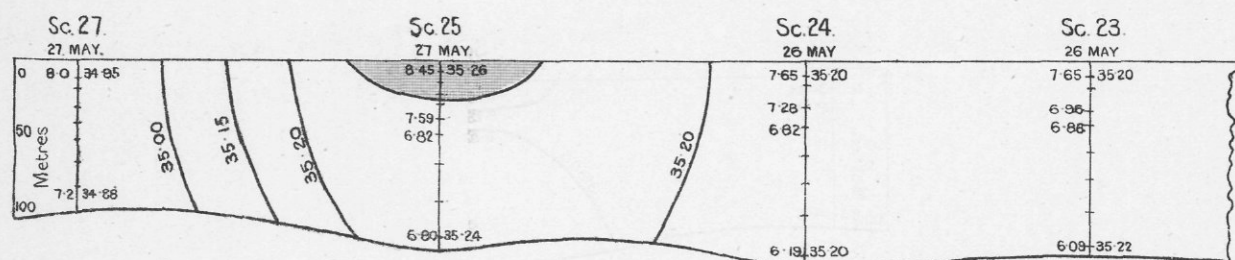
FEBRUARY 1907



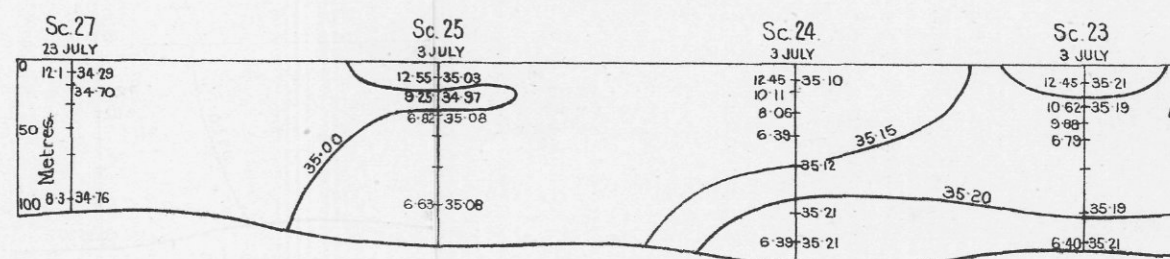
MARCH 1908.



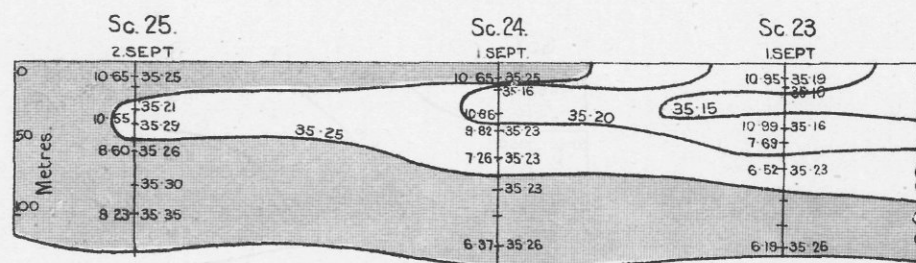
MAY 1907



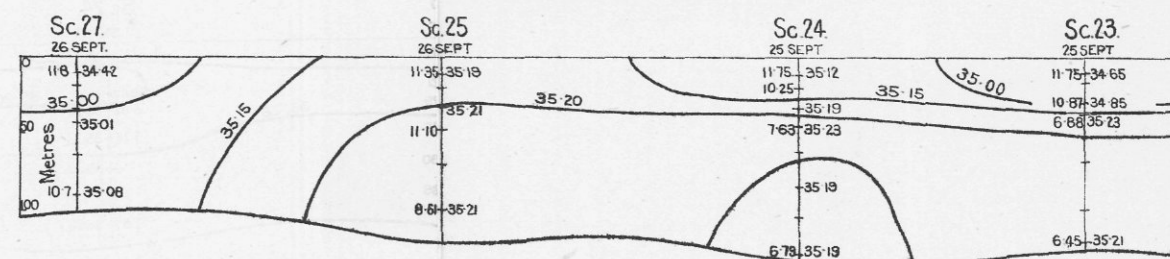
JULY 1908.



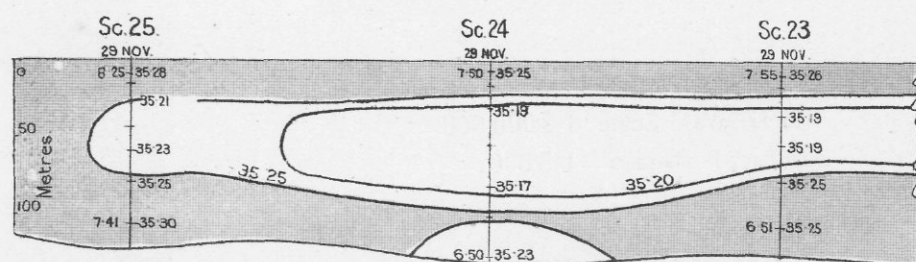
SEPTEMBER 1907



SEPTEMBER 1908



NOVEMBER 1907.

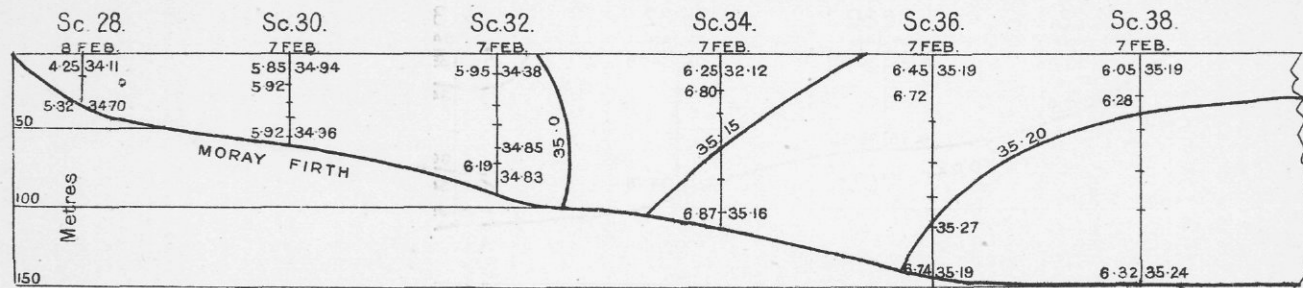


Horizontal Scale 1:2,000,000.  
Vertical Scale 1:5,000.

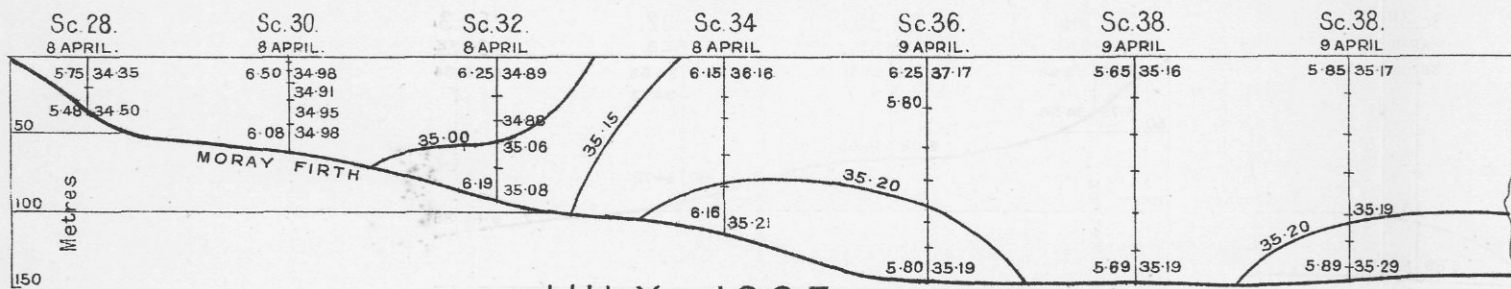


SECTIONS FROM MORAY FIRTH TOWARDS NORWAY.  
1907 — 1908.

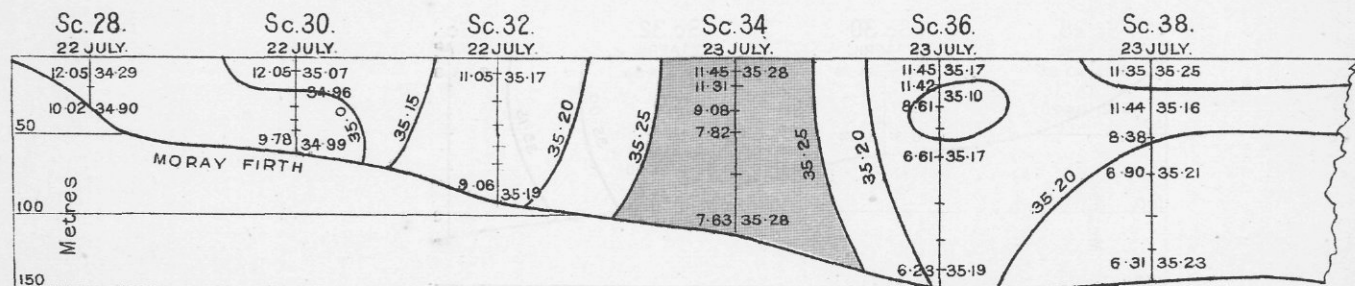
FEBRUARY 1907.



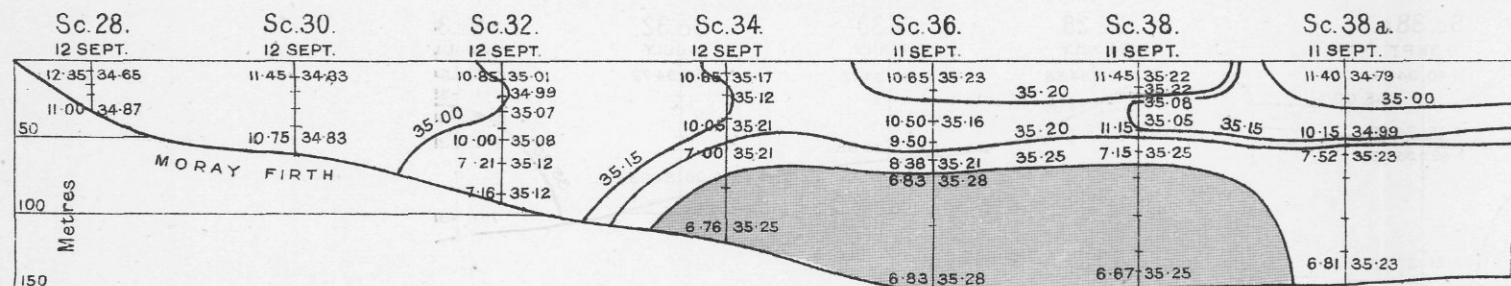
APRIL 1907.



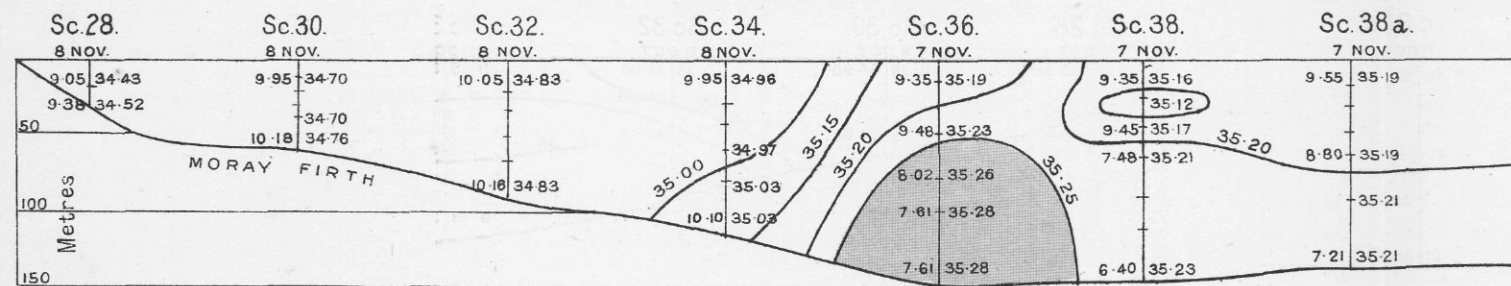
JULY 1907.



SEPTEMBER 1907.



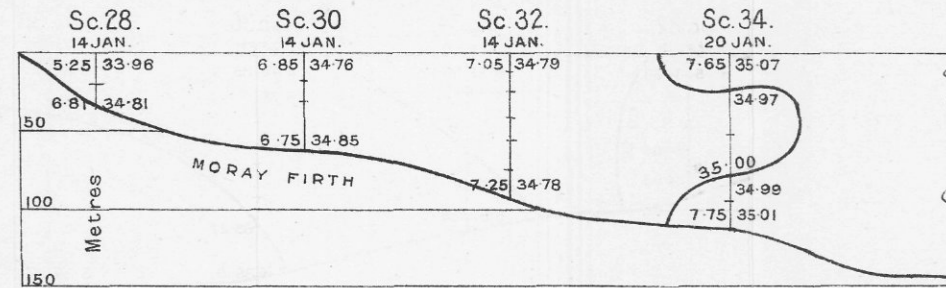
NOVEMBER 1907.



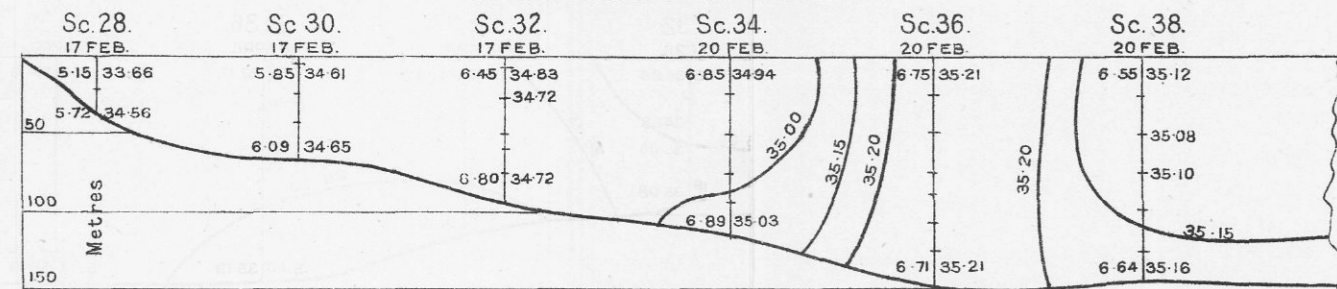
Horizontal Scale 1:2,000,000.

Vertical Scale 1:5,000.

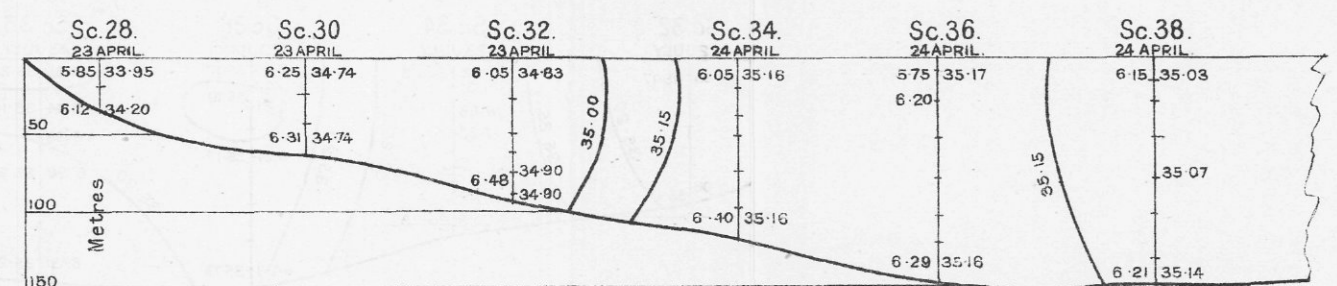
JANUARY 1908.



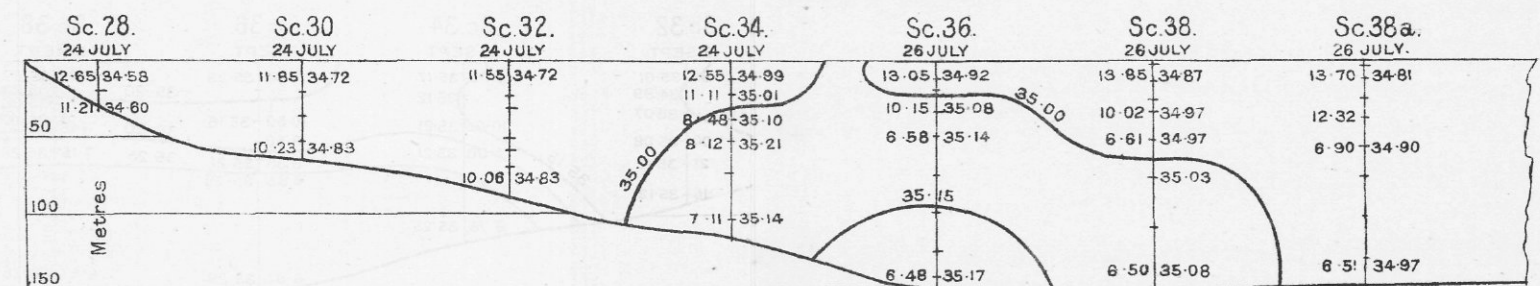
FEBRUARY 1908.



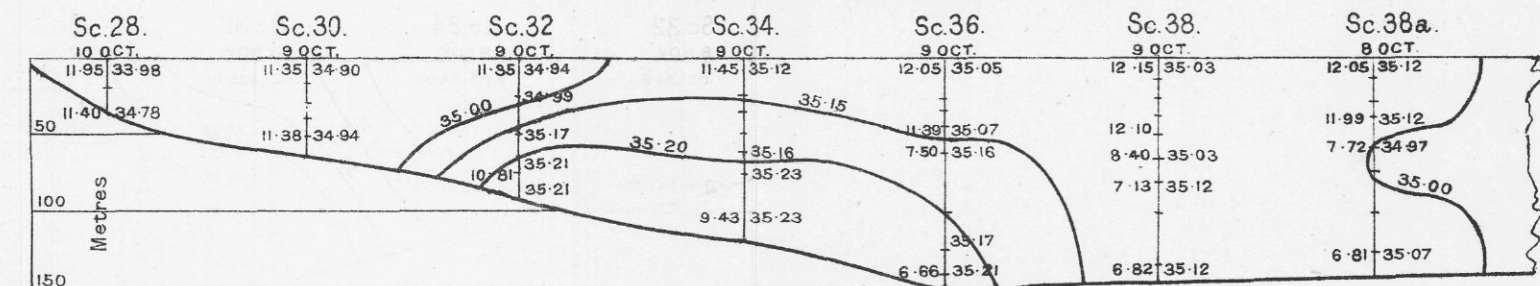
APRIL 1908.



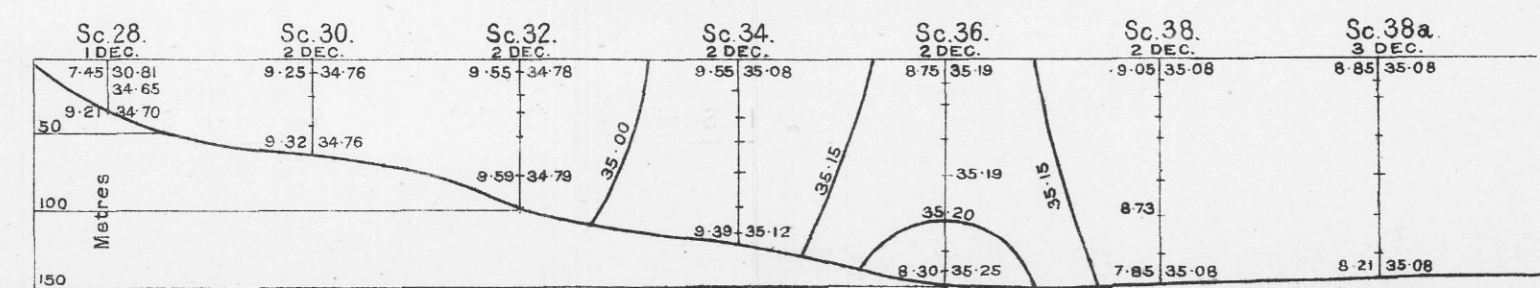
JULY 1908.



OCTOBER 1908.



DECEMBER 1908.

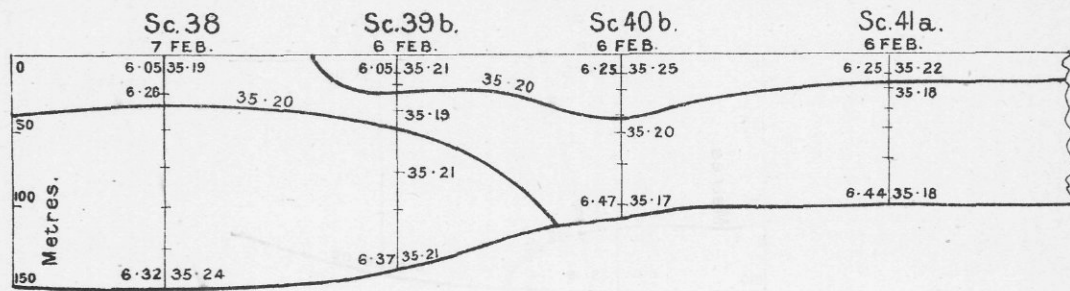




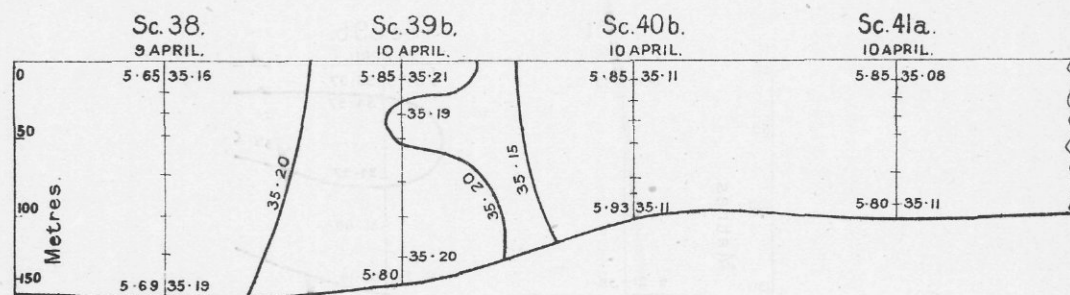
SECTION IN NORTH SEA, FROM NORTH TO SOUTH, ABOUT 1° E.

1907-1908.

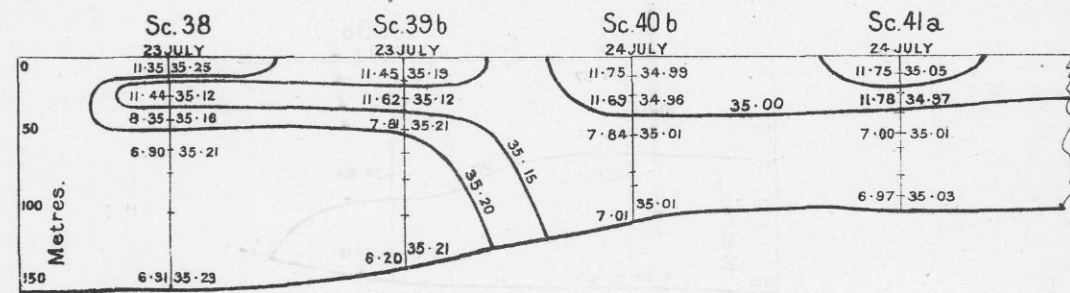
FEBRUARY 1907.



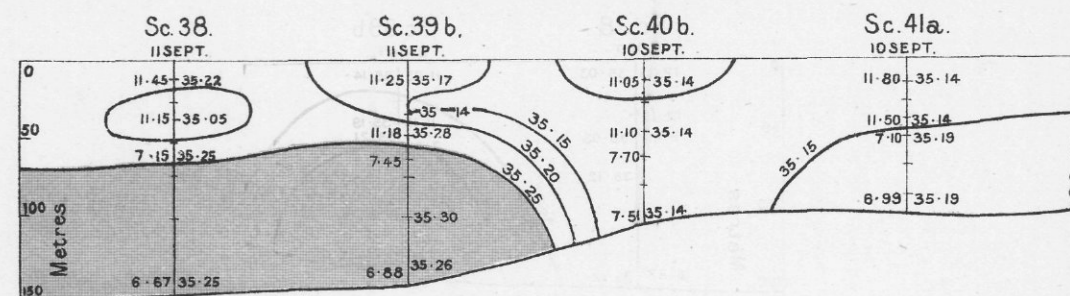
APRIL 1907.



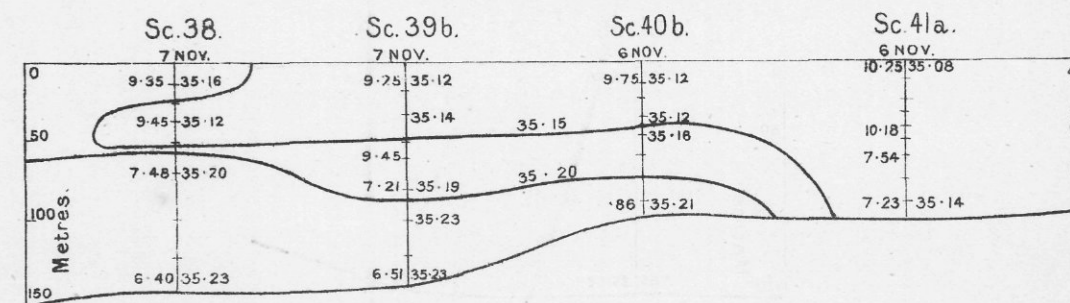
JULY 1907.



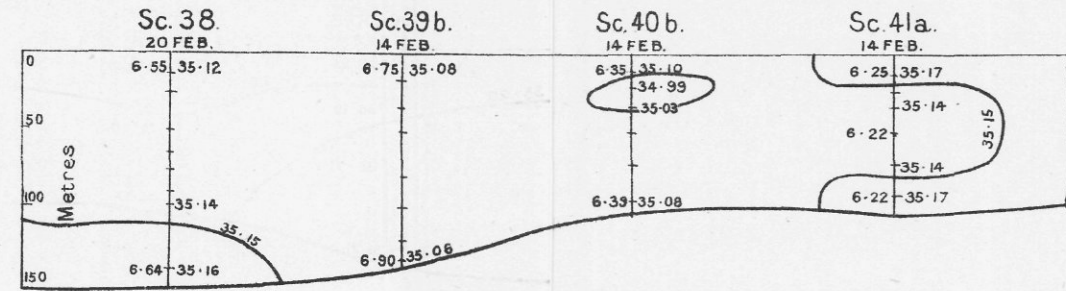
SEPTEMBER 1907.



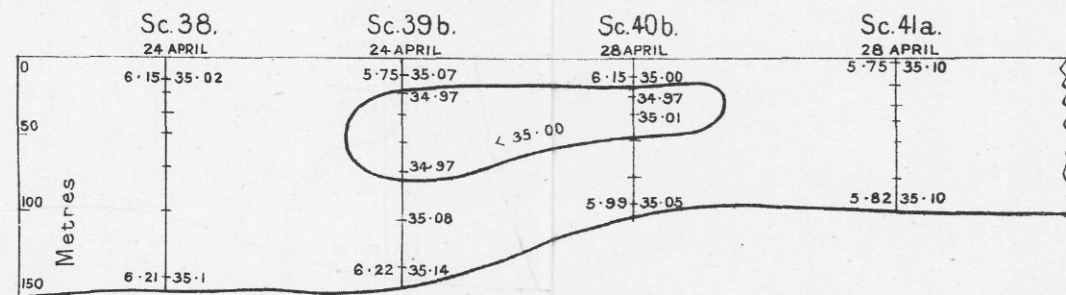
NOVEMBER 1907.



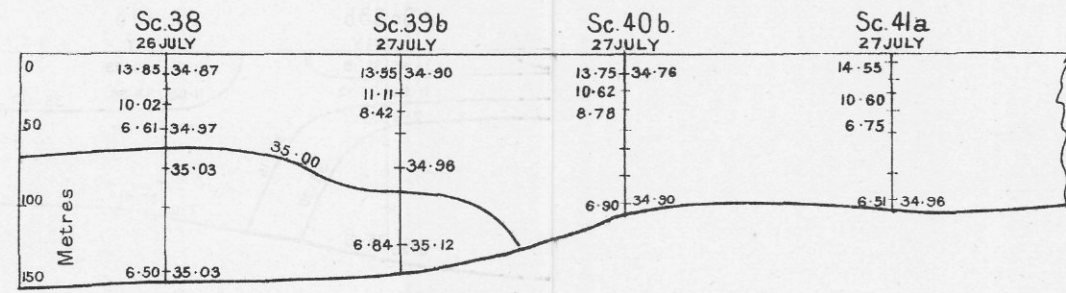
FEBRUARY 1908.



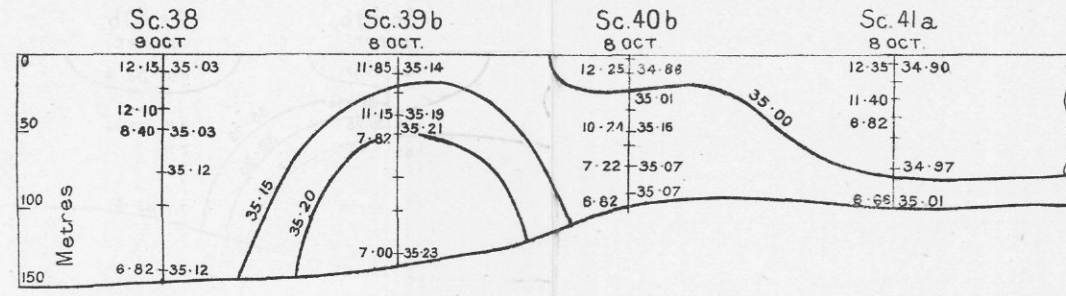
APRIL 1908.



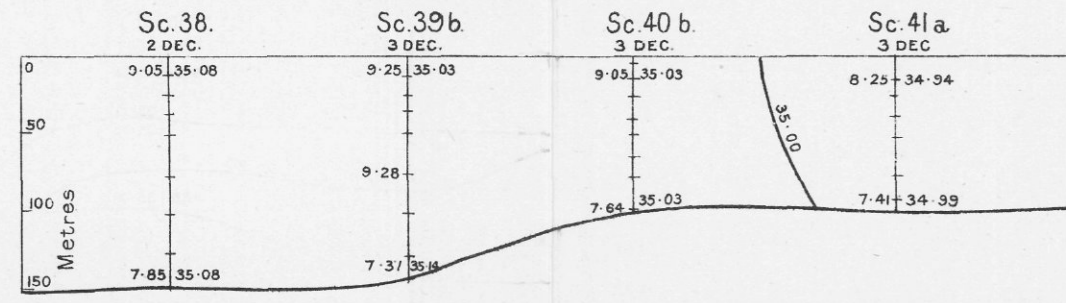
JULY 1908.



OCTOBER 1908.



DECEMBER 1908.



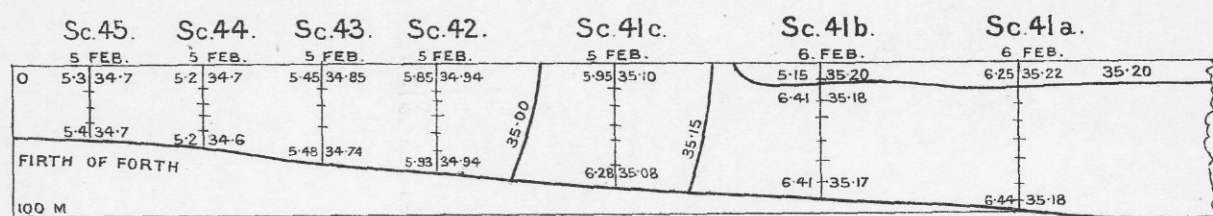
Horizontal Scale 1: 2,000,000.  
Vertical Scale 1: 5,000.



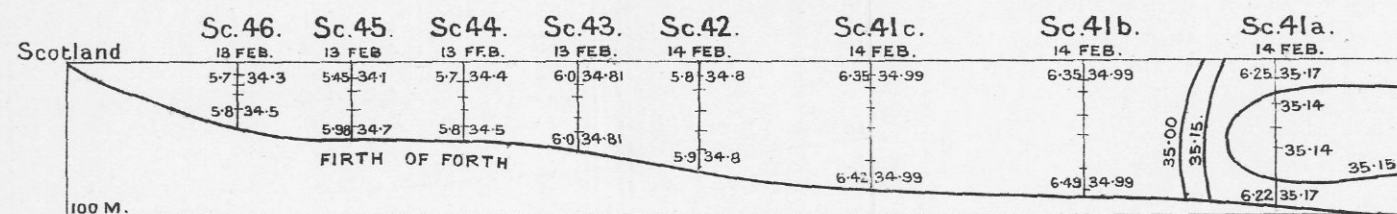
SECTIONS FROM FIRTH OF FORTH TOWARDS NORWEGIAN COAST.

1907 - 1908.

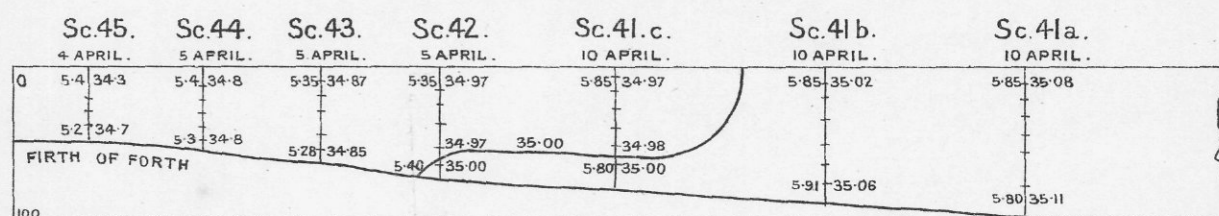
FEBRUARY, 1907.



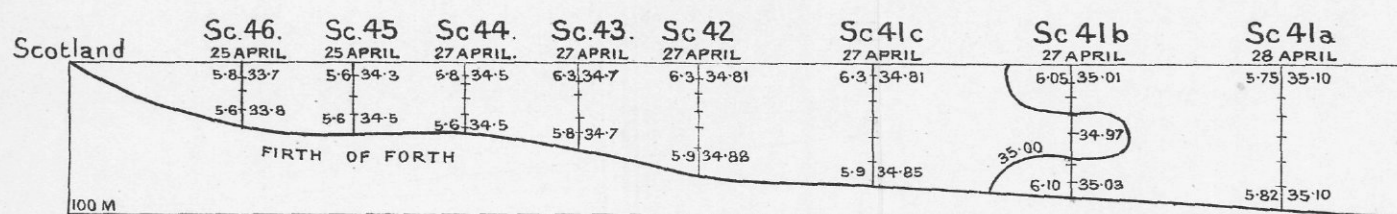
FEBRUARY, 1908.



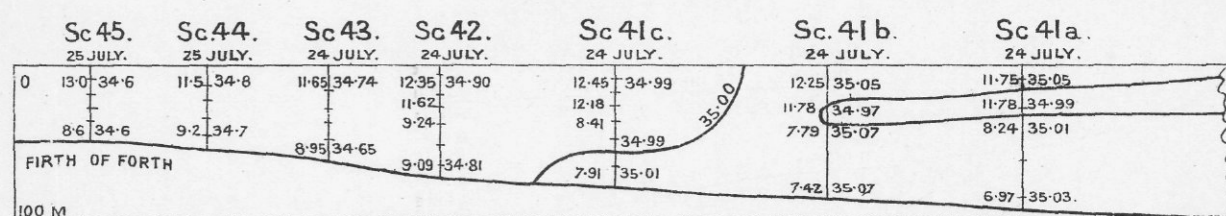
APRIL, 1907.



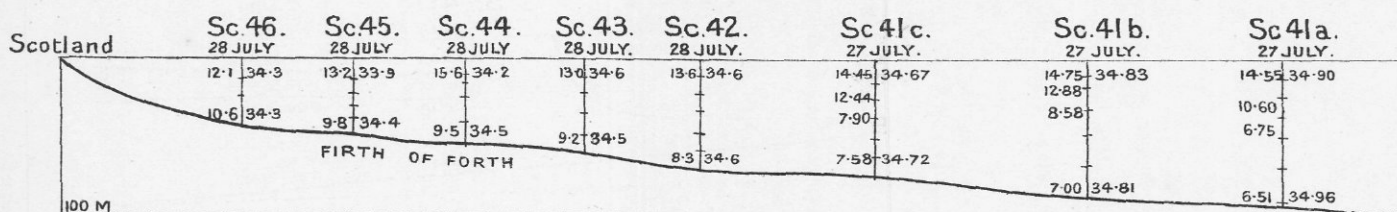
APRIL, 1908.



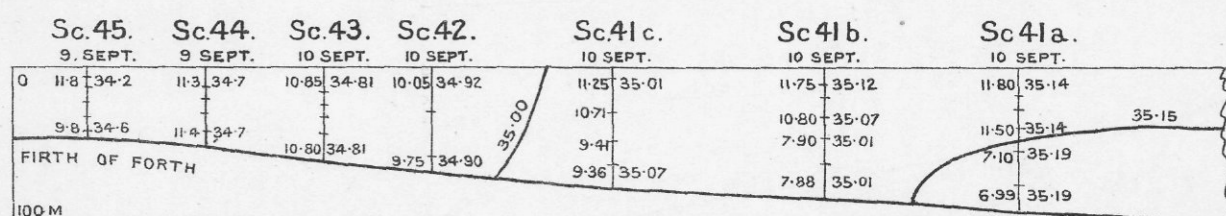
JULY, 1907.



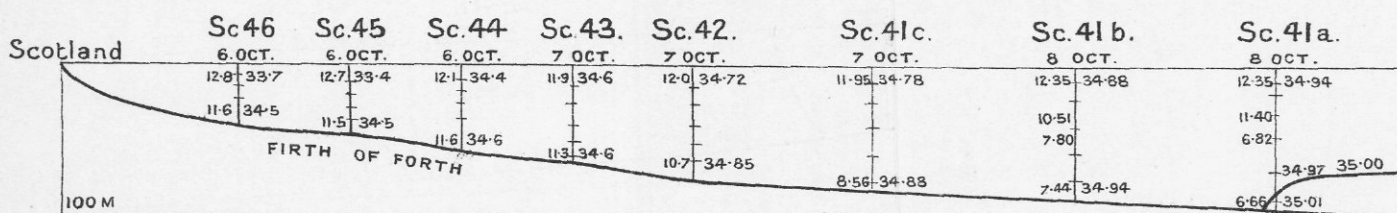
JULY, 1908.



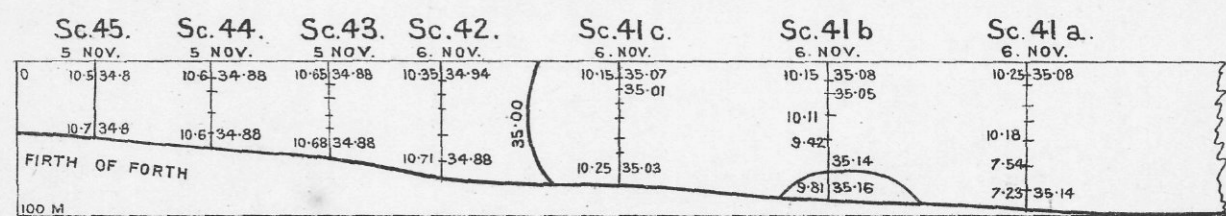
SEPTEMBER, 1907.



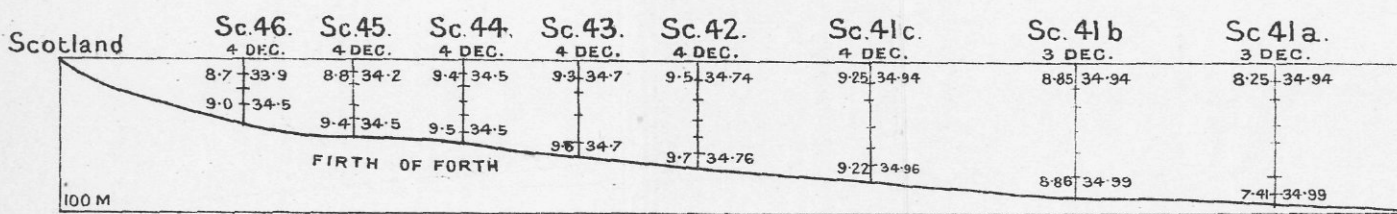
OCTOBER, 1908.



NOVEMBER, 1907.



DECEMBER, 1908.



Horizontal Scale 1: 2,000,000. Vertical Scale 1: 5,000.

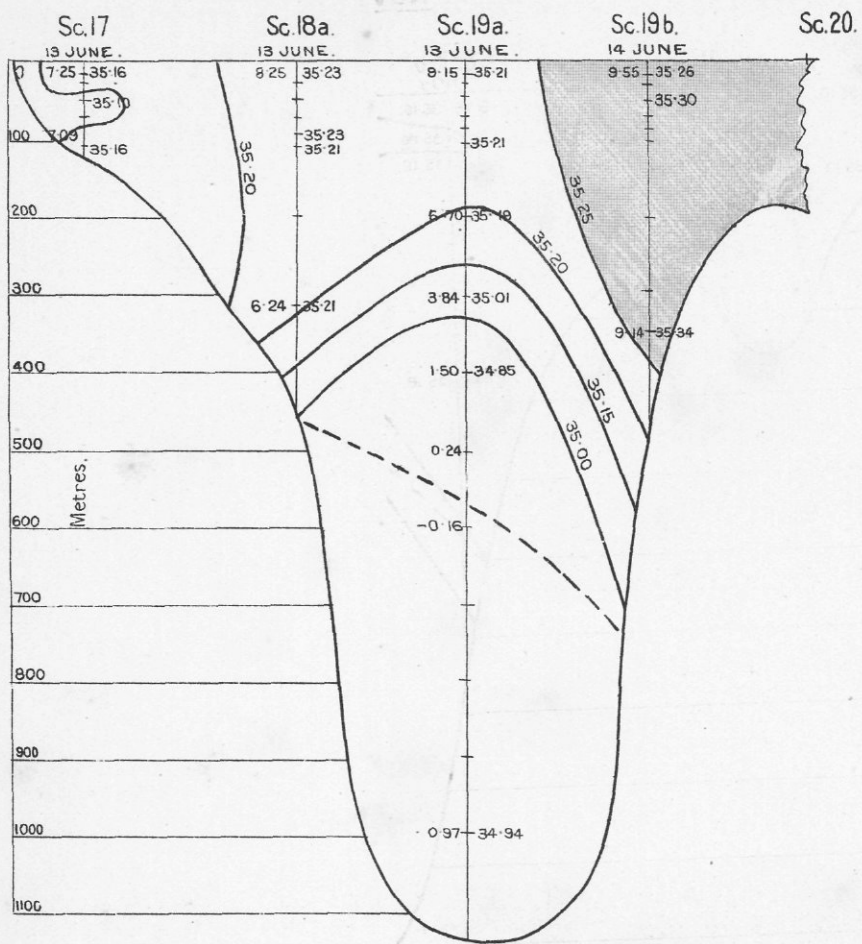






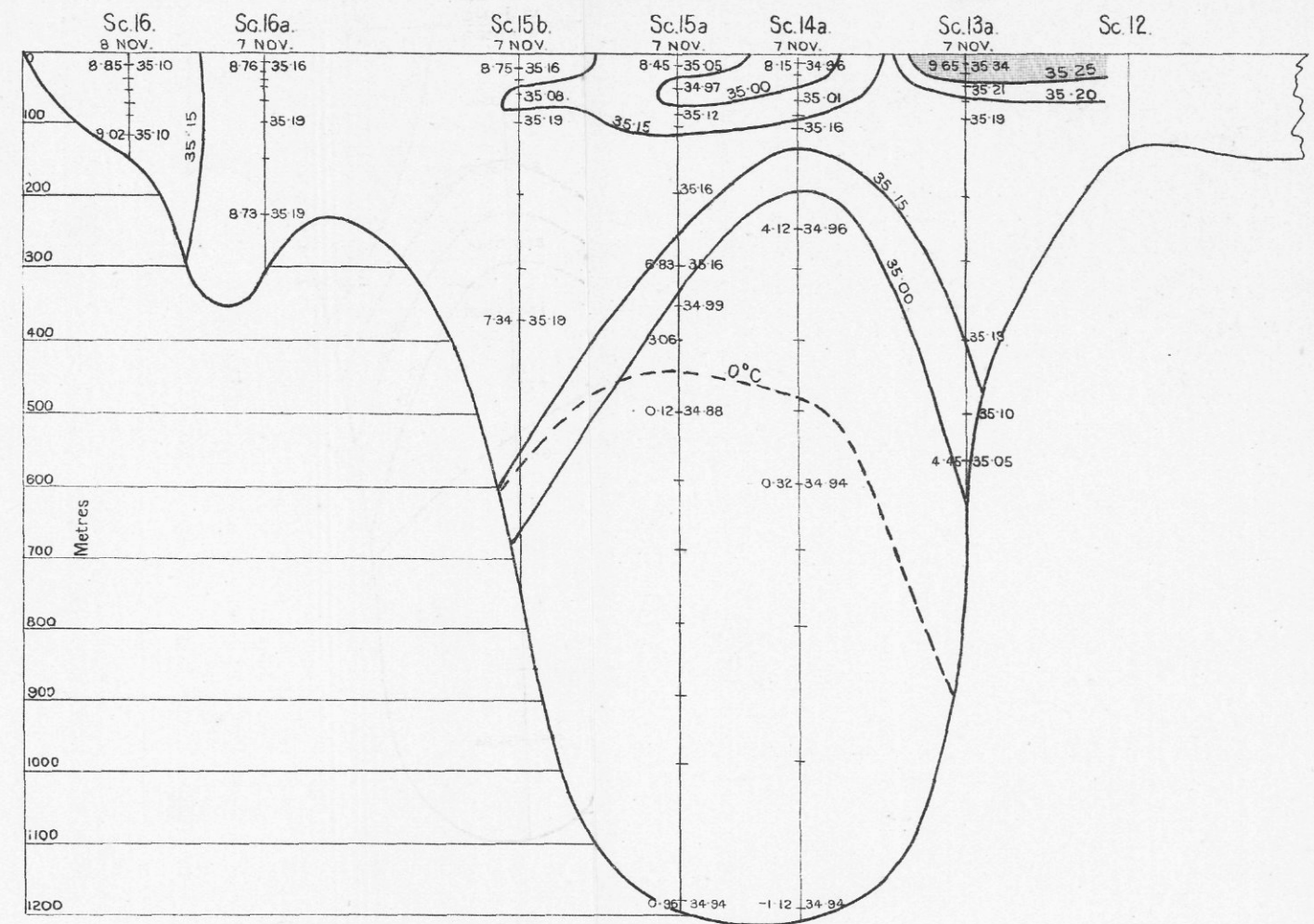
SOUTHERN SECTION

JUNE. 1908.



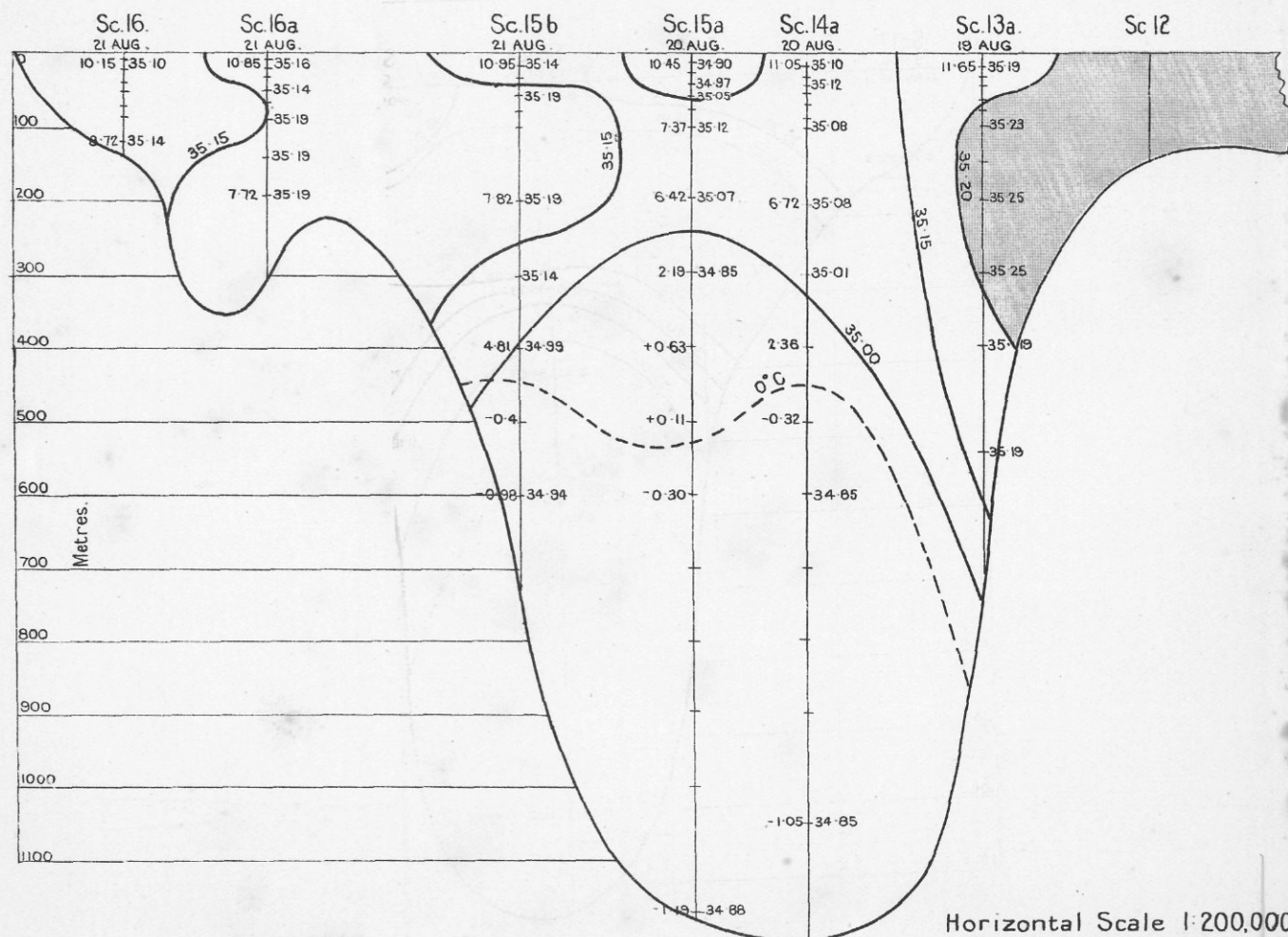
NORTHERN SECTION

NOVEMBER 1908.



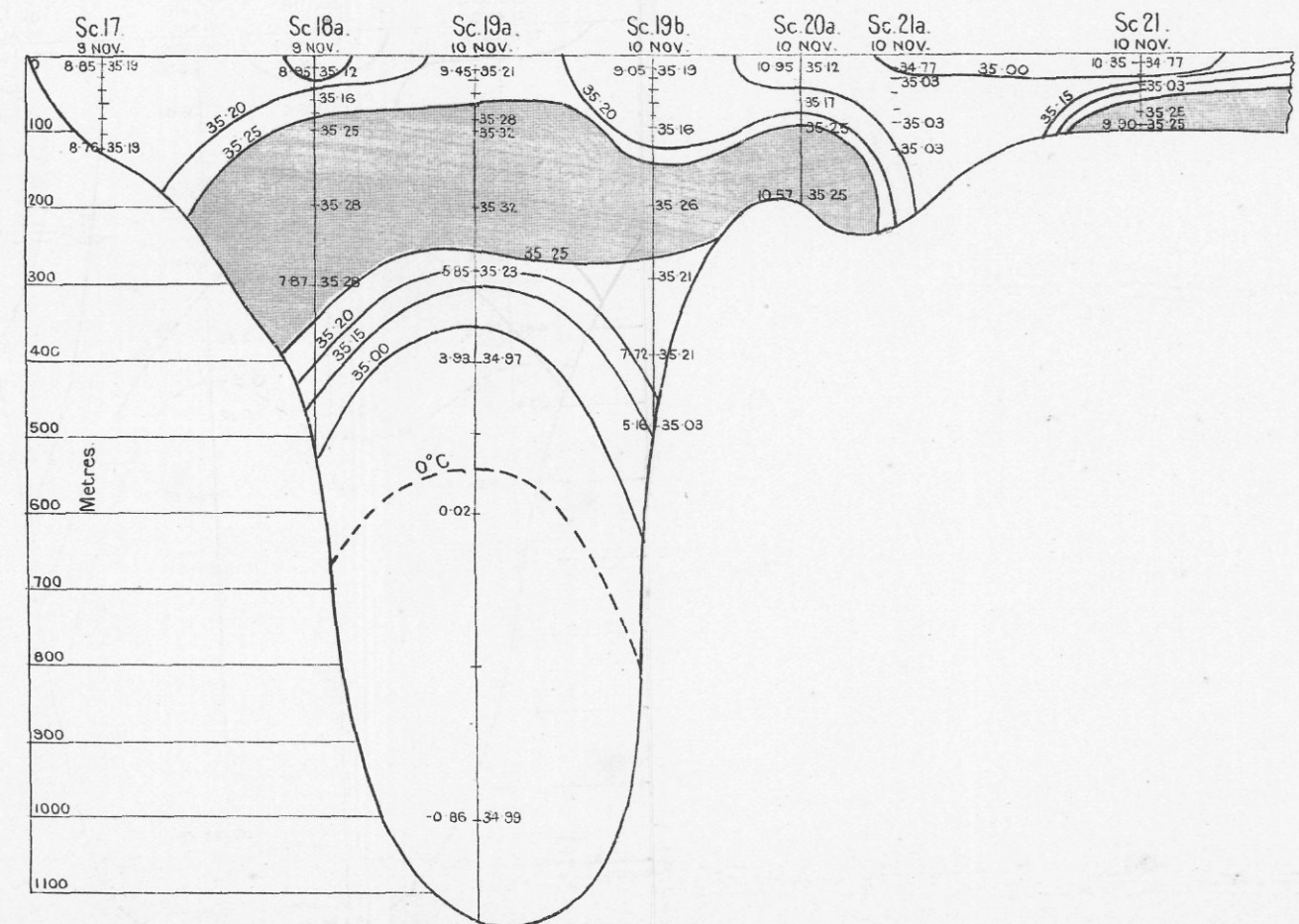
NORTHERN SECTION.

AUGUST. 1908.



SOUTHERN SECTION

NOVEMBER 1908.



Horizontal Scale 1:200,000. Vertical Scale 1:10,000.



