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Contributions to the hydrography of the waters of the Scotian shelf. Hydrography of the waters - 1934.

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Introduction:

The area of investigation of the waters of the Scotian shelf was extended during the season of 1934 (Hachey, 1933, 1934), and a series of stations for hydrographic observations covered the coastal anf offshore area between Shelbourne and Canso. The location of these stations is shown in figure 1, and it will be noted that certain of these stations are located on Roseway, LaHave, Sambro, Western, Middle and Canso Banks. The series of stations was occupied in May, and again in August. The eastern half of the area only, was investigated in July. Inshore sections off Halifax and Canso were occupied six and eight times respectively between May and October. The locations of these stations are shown in the key maps which accompany the plotted results.

The Submarine Physiography of the Scotian Shelf:

The bold and rocky coast of Nova Scotia is marked by numerous indentations, forming many bays and harbours. Extending all along the coast are numerous shoals and islands which form the more pronounced irregularities of the sea floor. The continental shelf extends outwards from this coast to a distance of one hundred to one hundred and fifty miles. The general topography of this shelf is very irregular. The submerged Laurentian valley proceeding from the Gulf of St. Lawrence, and the Fundian channel proceeding from the Bay of Fundy and the Gulf of Maine, form the east and west

boundaries respectively of an irregular-shaped submerged plateau of irregular topography, which might be rightly designated as the Scotian Shelf. The more important elevations on this Scotian shelf are Sable Island, and Middle, Western, Roseway, La Have, Emerald, and Sambro banks, as well as the banks known as Banquereau, Canso, and Misaine. The submarine physiography of the main portion of the Scotian shelf is illustrated in figure 1 chiefly by means of the contours of fifty and one hundred fathoms (91 and 182 m.). With the exception of five basins of limited extent whose depths are greater than 100 fathoms (182 m.), the Scotian shelf as a whole, is less than 100 fathoms (182 m.) below the sea surface. A large western area of this Scotian shelf is of depths greater than 50 fathoms (91 m.) and less than 100 fathoms (182 m.). Bounded as it is on the north by the mainland of Nova Scotia, on the east by Canso bank, Middle Ground, and Sable Island bank, and on the west by Brown's bank, and with its greater depths extending to the continental shelf to the southward, this submarine western area may be termed the Scotian Gulf. Roseway, La Have, Sambro, and Emerald banks form elevations over this portion of the sea floor.

The area of the sea floor enclosed by the Nova Scotia coast line and the 50 fathom (91 m.) contour is approximately 15 miles (24 Km.) in width along the south coast of Nova Scotia. The continental shelf varies from about 65 miles (104 Km.) in width off Cape Sable to 130 miles (208 Km.) in width off Cape Breton. Consequently, the Scotian Gulf in the western portion of the shelf not only has a submarine mouth opening to the southward, but this mouth has close contact with oceanic depths.

The Nature of the Waters:

Observations in the smaller area of investigation throughout the summer seasons of 1932 and 1933 (Hachey, 1933, 1934) have

indicated that the outstanding features of the waters are the three distinct layers as follows:

1. the "upper layers" consisting of water of a temperature greater than 5.0°C. and having a salinity of less than 32.00 ‰.

2. the "intermediate layers" consisting of water of a temperature of less than 5.0°C. and having a salinity between 32.00 ‰ and 33.50 ‰, and

3. the "bottom layers" consisting of water of a temperature greater than 5.0°C. and having a salinity greater than 33.50 ‰.

During the spring and summer of 1934, three cruises of the area (indicated in the introduction to this report) were made.

(a) the Spring cruise (figures 2-5 inclusive)

The spring cruise was made between May 6th and May 10th 1934, and the observations are plotted in section in figures 2 and 3 (temperatures) and figures 4 and 5 (salinities), while the pertinent data are furnished in table 1. In section 121-124, which is the most westerly section in the area, the temperatures of less than 5.0°C. reach to depths of 110 m. while a large portion of the section contains water of a temperature less than 2.0°C. In section 58-50, only a trace of water of less than 2.0°C. is to be found. The water of a temperature of less than 5.0°C. extends inshore, to a depth of 90 m. inshore, and 70 m. offshore. In section 124-50 (roughly parallel to the coast), a trace of water of a temperature less than 2.0°C. is to be found, and the sloping of the deep isotherm of 5.0°C. from a depth of 95 m. (at the western end of the section) to a depth of 70 m. is a feature of the section. In section 127-129, only a trace of water of a temperature less than 2.0°C. is to be found, while the deep isotherm of 5.0°C. exists at a depth of approximately 120 m. inshore, at a depth of 85 m. at station 128, and sloping to a depth

of 100m. farther off shore. Water of a temperature less than 3.0°C. forms an important part of the section. In section 129-131, a thin surface layer of water of a temperature greater than 5.0°C. exists offshore, and a large part of the section is of water of a temperature of less than 3.0°C. and even less than 2.0 C In section 134-131, which is the most easterly of the sections, about all of the water is of a temperature less than 3.0°C. with only traces of water of a temperature between 3.0°C. and 4.0°C.

The most outstanding feature of the waters in these sections, aside from the distinct layering, is the change in the nature of the waters from west to east. In so far as temperature is concerned, the "surface layers" (temperatures greater than 5.0 C.) cannot be differentiated as vernal warming had not progressed to any great degree at the time of the spring cruise. The colder "intermediate layers" are quite pronounced in the western sections and are easily differentiated from the "bottom layers"(with temperatures higher than 5.0°C. and generally less than 8.0°C.) . The more central sections (58-50 and 127-129), in comparison with the westerly and easterly sections, contain less of the water of extremely low temperatures. In the extreme easterly section, the "bottom layers",as differentiated by temperatures greater than 5.0°C. are not present, and the coldest waters of the area feature the section. Again, it is to be noted that the shallower portions of the area to the eastward (section 129-131), water of the "bottom layers" are absent, and the waters in contact with the bottom are quite cold (even lower than 2.0°C.).

The distribution of salinity in spring is indicated in section in figures 4 and 5. All of the three layers referred to previously may be distinguished in the more westerly sections (e. g. 121-124, 58-50, 124-50, and 127-129). As differentiated by salinity,

the "upper layers" (salinities of less than 32.00) are of considerable depth in some sections and extremely thin and absent in others. In the extreme westerly section 121-124, the "surface layers" vary between 25 and 50 m. in thickness. In sections 124-50 and 50-58, the thickness of the "surface layers" is 25 m. . In the extreme easterly section 134-131, the "upper layers" are of a thickness of 60 m. inshore at station 134, 25 m. at stations 133 and 132, while the isohaline reaches the surface between stations 132 and 131. In section 129-131, the "surface layers" cannot be differentiated, and in the section 127-129, the "surface layers are 25 m. in thickness inshore and the isohaline meets the surface a short distance offshore.

The offshore section 129-131 contains only water of the so-called "intermediate layers" with salinities ranging between 32.00‰ and 33.50‰ . It may be noted also that in the section 134-131, the o outer portion consists wholly of water of the characteristics of the "intermediate layers". In all other sections, the "intermediate layers" are sandwiched between characteristic "surface layers" and "bottom layers", and the average thickness of these "intermediate layers", when so sandwiched, would seem to be about 50 m.

In recapitulation of the facts presented with respect to the spring cruise, probably the most outstanding point is concerned with the origin of the waters of the "intermediate layers". Section 129-131, in this spring cruise, ccontains only water characteristic of t the "intermediate layers" as determined both by salinities and temperatures. This is also the case for the outer portion of section 134-131. This water of the so-called "intermediate layers", which exists as a subsurface and intermediate water to the westward, is a surface, intermediate, and bottom water offshore to the eastward. It is readily seen that we can imagine a continuity between the

"intermediate layers" which are a feature of the waters of the Scotian shelf and a large source of supply to the eastward.

(b) early summer cruise (figures 6-7 inclusive).

An early summer cruise was made in the eastern portion of the area in the period July 3rd to July 4th, and pertinent data are furnished in table 2. The temperature data are plotted in section in figure 6. Vernal and summer warming have differentiated the "upper layers" (temperatures greater than 5.0 °C.) which now has a maximum thickness of 50 m. In the section 127-129, the "bottom layers" are as much as 90 m. in thickness and are of a temperature of 5.0 C. to greater than 8.0 °C. These "bottom layers" do not form part of either the offshore section 129-131 or the more easterly section 134-131. The colder waters of the "intermediate layers" hold close to the coast, with the comparatively lower temperatures (less than 1.0 °C.) in the more easterly section 134-131. It is evident than the waters of a temperature less than 2.0 °C. form an important feature of the most easterly section 134-131, while only a trace of such water is found in the section 127-129, and none of such a temperature in the offshore section 129-131.

In comparing the temperature conditions of July with the corresponding sections in the May cruise, it will be noted that, aside from the differentiation of the "surface layers" through vernal and summer warming, the waters of the more easterly section (134-131) have become somewhat warmer, in the sense that waters of a temperature of less than 1.0 °C. are not so extensive. Similarly, in the offshore section 129-131, the minimum temperatures (less than 3.0 °C.) are somewhat higher than the minimum temperatures in May (less than 2.0 °C). On the other hand, comparatively colder waters (less than 2.0 °C) have entered the section 127-129 since the May observations were made.

It may be noted also that this colder water (less than 2.0° C.) in the section 127-129 holds close to the coast.

The salinityi data for the July cruise are plotted in section in figure 7. As determined by salinities, the "upper layers" (salinity less than 32.00 ‰) are of greatest thickness inshore ((100 m. at staion 134), do not exist at station 129, and only in trace in the offshore section 129-131. Waters of the "intermediate layers" (32.00 ‰ - 33.50 ‰) occupy the remaining portions of the sections 129-131 and 134-131, while waters of the "bottom layers" constitute an important part of the section 127-129. In comparing the salinity distributions of the May and July cruises (figures 4 and 7) it is found that the salinity of the waters as a whole has decreased somewhat, the greatest change taking place in section 134-131 where a thick shore layer of water of lower salinity is found.

(c) Summer cruise (figures 8, 9, 10, and 11).

A summer cruise over the whole area was made within the period August 8th, to August 11th, and pertinent data is furnished in table 3. The temperature distribution is indicated in section in figures 8 and 9. In the western sections 121-124, 58-50, and 124-50 (figure 8), the typical layers -- the "surface layers", "intermediate layers", and "bottom layers" are now fully developed with the exception that at station 50, the "intermediate layers" (temperatures less than 5.0° C.) do not exist. In cruises of previous years (Hachey, 1933 and 1934) the "intermediate layers" at station 50 were always quite pronounced. The thickness of the "surface layers" (which extends to depths of 50 m., as indicated by temperatures greater than 5.0° C., gives some indication of the effect of vernal and summer warming. The temperatures of these "surface layers" have been raised

since the spring cruise by as much as ten degrees.

The waters of the "intermediate layers" are of higher temperatures than in the spring cruise. This is probably best illustrated in the offshore section 124-50 (compare figures 2 and 8) where minimum temperatures are between 4.0° C. and 5.0° C. in August as compared with maximum temperatures of less than 2.0° C. in May. The large quantity of water of less than 2.0°C. found in section 121-124 in May has since been replaced by much warmer water containing only traces of water of temperatures less than 3.0° C. In so far as temperatures are concerned, the "intermediate layers" have been considerably decreased in thickness in the western sections (figure 8), having in August a thickness varying from zero at station 50 to a maximum of 75 m. at station 123. It is of particular interest to note the thickness of the "intermediate layers" in the most westerly section 121-124 (maximum thickness of 75 m.) as compared to the thickness of this same layer in sections 58-50 and 124-50 (maximum thickness of 50 m.)

In the easterly sections (figure 9), the "upper layers" are well developed, varying in thickness from 25 to 35 m. inshore to 60 m. offshore. The maximum temperatures in the "upper layers" have increased by as much as five degrees since July. The "intermediate layers" are but little changed from those of the July cruise (compare figures 6 and 9), and the colder waters (less than 2.0° C.) which were found to have entered section 127-129 in the interval, May to July, are still present at station 127. The "Bottom layers" are noted only in the section 127-129.

The distribution of salinity for the August cruise is shown in section in figures 10 and 11. The "upper layers", as distinguished by salinities, have decreased somewhat in thickness in the western

sections (compare figures 4 and 10), but in particular in the section 121-124 (from a maximum thickness of 55 m. in May to a maximum of 30 m. in August). On the other hand, in the easterly sections (compare figures 5, 7, and 11), although the "upper layers" have thickened considerably since May (due principally to lowered salinities of the immediate surface waters), the salinities of the "upper layers" in the western section 134-131 have become much lower without much change in the thickness of thelayers.

The "intermediate layers", in the westerly sections, have undergone slight changes in thickness, due principally to displacements of the isohaline of 32.00‰. The "bottom layers" in sections 58-50 and 124-50 have, in general, a higher average salinity in August than in May.

In the easterly sections, the "intermediate layers" have, since May, undergone changes in thickness due to displacement of the isohaline of 32.00‰, but in the interval July to August (figures 7 to 11), the position of the isohaline of 32.00‰ changed but little. The nature of the "bottom layers" in section 127-129 changed but little in the interval May to August.

A comparison of the results of the May, July, and August cruises indicates that the "upper layers" (aside from water movements in the area) are constituted through vernal and summer warming, which extends to depths as great as 50 m. On the other hand, the "intermediate layers" are necessarily due, in part, to winter cooling as is indicated by the conditions obtaining in early spring. The question as to what depth this winter cooling penetrates (through vertical convection and radiation) is a matter which will be dealt with later.

These seasonal cruises over the area have demonstrated the

existence of the three distinct layers ("upper layers,"intermediate layers", and "bottom layers") over the greater portion of the Scotian shelf. To the eastward, however, with the exception of the immediate coastal waters, the "upper layers" and "bottom layers", as distinguished by salinity, are not to be found. It would seem that over the shallower eastern portion of the shelf, we have an extensive source of waters of a salinity suitable for enhancement of the "intermediate layers"

(d) horizontal distribution of temperatures and salinities on the surface, at a depth of 50 metres, and on the bottom.

The horizontal distribution of salinity and temperature on the surface is indicated in figure 12. for th spring (May) and summer (August) cruises. In the spring cruise, the range of temperature is from less than 2.5° C. to greater than 5.0° C., while the range of salinity is from less than 31.10‰ to greater than 32.30‰. Waters of comparatively low salinity (less than 31.50‰) are to be noted inshore in the eastern portion of the area. This is a matter of some significance, as the question arises in particular, as to the source of surface water of lower salinity in the western portion of the area. The waters of the greater portion of the area are of a temperature greater than 4.0° C. the colder waters being found in the eastern portion of the area.

In August, the temperature range in the surface waters is from less than 12.0° C. to greater than 17.5° C., the higher temperatures being found offshore. The greater portion of the area has surface temperatures greater than 17.0° C., and within a narrow coastal band of a width of thirty to forty miles (48 to 64 Km.) the temperature variation from 17.0° C. offshore to less than 14.0° C. inshore

(as low as 12.0° C.) occurs. This narrow band of water of lower temperatures is , to some extent the result of upwelling and shore mixing. In May, the maximum surface temperature was somewhat higher than 5.0° C. Consequently vernal and summer warming has been responsible for an increase in surface temperatures of about twelve degrees.

The salinity distribution in the surface water is from a minimum of less than 30.10‰ in offshore to the eastward, to greater than 32.10‰ offshore. Waters of comperatively low salinity (less than 31.50‰) are found inshore to the eastward, and offshore to the westward. Water of such a salinity was referred to in connection with the distribution in May. Comparing the distribution of water of such a salinity in the May and August cruises, it will be noted that such waters (less than 31.50‰) noted only in trace, inshore to the eastward in May, extend well down the coast in August. It will be noted also that such waters (less than 31.50‰), offshore to the westward, are of less importance to the area in August than in May. With the shifting of the isohaline of 31.50‰ some distance to the westward in the interval May to August, other waters of lower salinity have entered the eastern portion of the area. It would seem then, that the change in the salinity distribution is due, almost entirely, to the acquisition of fresher surface waters from the eastward. This has resulted in the offshore displacement of other isohalines as well. The significance of the above statements is concerned with the effect on the salinity of the waters of the "surface layers" through coastwise movements of waters from the east. There are definite indications (through the analysis of salinity distribution) that such movements took place within the interval May to August.

The horizontal distribution of salinities and temperatures at a depth of 50 m. is indicated in figure 13 for the spring (May) and summer (August) cruises. In May, there is but a small range

of salinity at this depth (less than 32.10 ‰ to greater than 32.50 ‰. It is to be noted that the greater portion of the area has a salinity greater than 32.30 ‰ at a depth of 50 metres. It might also be noted that waters of a salinity less than 32.10 ‰ are found inshore to the eastward, and offshore to the westward. The temperature range at a depth of 50 m. in May is from less than 0.5° C. to greater than 2.5° C, with the colder waters inshore to the eastward. Water of a temperature less than 1.5° C. is found in the western portion of the area as well as in the eastern portion.

In the interval, May to August, the main feature of the changes in the salinity distribution, at a depth of 50 m., would seem to cetre around the isohalines of 32.30 ‰ and 32.50 ‰. The horizontal distribution of salinity for August indicates that, in the interval, the isohaline of 32.50 ‰ has moved inshore in the western portion of the area. This was accompanied by the withdrawal of the isohaline of 32.30 ‰ to the eastward. In the same interval, the isohaline of 32.30 ‰ has swung to the west in the offshore eastern portion of the area. The shoreward movement of the isohaline of 32.00 ‰ was accompanied by the invasion of more saline waters at this depth (greater than 33.10 ‰). It might be noted that waters of a salinity less than 32.50 ‰ are found offshore in the extreme western portion of the area.

In so far as temperatures are concerned, the isotherm of 2.5° C. has moved shoreward with the accompanying invasion of warmer waters at the fifty metre level (greater than 5.0° C.). At the same time, colder waters (less than 1.5° C.) have become a feature of the eastern inshore area, indicating a coastwise movement at this depth, from east to west. Waters of a temperature less than 3.0° C. are found offshore to the west.

There are indications that the distribution of the waters is, to some extent, effected by the configuration of the bottom. In the May cruise, the distribution at 50 m. would suggest that the isotherm of 2.0° C. and the isohaline of 32.50 ‰ roughly outline what has been defined previously as the "Scotian Gulf". In the August cruise, the position of the isohaline of 32.90 ‰ indicates that the invasion of more saline waters was controlled to some extent by the configuration of the bottom, as it is definitely delimited by the outline of the submarine mouth of the"Scotian Gulf".

The distribution of salinity and temperature on the bottom is indicated in figure 14. for both the spring (May) and the summer (August) cruises. The waters of a salinity greater than 34.00 ‰, and of a temperature between 7.0° C. and 8.0° C. are found fairly well delimited within the "Scotian Gulf", where depths are greater than 50 fathoms (91 metres). It would seem however, that bottom waters of both Sambro and Emerald banks (where depths are somewhat less than 50 fathoms (91 m.) according to the charts) are also in the above category. To the extreme east, the bottom waters inshore, are of a salinity greater than 32.00 ‰ and of a temperature less than 2.0° C. With the exception of the immediate inshore area, the bottom waters are of a salinity greater than 32.00 ‰, and a temperature between 2.0° C. and 7.0° C. It will be noted that such conditions prevail over the greater portion of the eastern banks, as well as over the western banks of Roseway and La Have.

As the nature of the bottom waters of the immediate inshore areas are subject to sharp and erratic changes in both temperatures and salinities, a general picture is not attempted. The nature of the changes are dealt with in detail in connection with observations made at frequent intervals in certain chosen localities.

Comparison with Previous Years:

A comparison of the distribution of temeperatures and salinities for the years 1932 and 1933 (Mackey , 1933, 1934) and the year 1934 leads to the following conclusions:

1. Surface salinities were approximately 0.5 ‰ higher in August in 1934 than in the two previous years (station 50: 1932 -- 31.06, 1933 -- 31.09, and 1934 -- 31.62). Later in the season, inshore observations indicated that surface salinities were as high as 32.70 ‰ for a short period.

2. The mean monthly surface temperatures for the month of September for inshore waters (Halifax, harbour) were higher than the monthly averages for 1932 and 1933 (1932 -- 15.5, 1933 -- 13.5, and 1934 -- 17.5). This was also true for other points of observation (see Mackey, 1935).

3. Bottom salinities at station 50 (Sambro bank) were much higher in 1934 than in the two previous years (1934 -- from 34.00 ‰ in May to 34.33 ‰ in August; 1933 -- from 32.97 ‰ in May to 33.40 ‰ in August; 1932 -- from 33.85 ‰ in June to 33.69 ‰ in October).

4. Bottom temperatures at station 50 (Sambro bank) were much higher in 1934 than in the two previous years (1934 -- from 7.17° C. in May to 7.26 ° C. in August; 1933 -- from 3.68 ° C. in May to 4.26 °C. in August; 1932 -- from 5.40 ° C. in June to 4.60 ° C. in October.).

5. Waters of the "intermediate layers" were less extensive in 1934 than in the two previous years. In so far as temperatures are concerned, no water of the "intermediate layers" was to be found at station 50 (Sambro bank) in the August cruise of 1934. In the two previous years, waters of the "intermediate layers" was

were a prominent feature of the conditions on Sambro bank.

6. Indications of an invasion of more saline waters during the 1934 season are evident. This feature will be dealt with in some further detail in a separate report.

Summary:

1. A feature of the submarine topography of the Scotian shelf is the so-called "Scotian Gulf" which is delimited to the east by the various eastern banks, and to the west by Roseway, La Have, and Brown's banks.

2. The three typical waters, the "upper layers", the "intermediate layers", and the "bottom layers" are fairly generally distributed over the Scotian shelf. Inshore to the eastward, the "bottom layers" are non-existent, while offshore to the eastward, only waters of the "intermediate layers" are to be found.

3. A continuity exists between the so-called "intermediate layers" which are a feature of the waters of the Scotian shelf, and a large source of supply to the eastward.

4. Vernal and summer warming is responsible for differentiation of the "upper layers" insofar as temperatures is concerned. This warming extends to depths as great as fifty metres.

5. The "intermediate layers" are in part, the result of winter cooling. It would seem, however, that continued enhancement of these waters from the source of supply to the eastward is necessary to the maintenance of these "intermediate layers". The evidence in the 1934 season is that this enhancement did not take place as efficiently as in previous years of observation.

6. Definite movements from east to west, in the immediate inshore area, are indicated in the surface and at a depth of fifty

metres.

7. Invasions of warmer and more saline waters took place being distributed over the deeper portion of the "Scotian Gulf".

8. Higher salinities over the area as a whole, at all depths (noted particularly on surface and bottom), higher monthly mean surface temperatures of inshore waters in late summer, and a lessening of the "intermediate layers" indicate that the season of 1934 was marked by invasions of warmer and more saline waters from the south.

Appended Diagrams:

Diagrams indicating the distribution of temperatures and salinities in section off Halifax and off Canso at intervals throughout the 1934 season are appended (figures 15-22 inclusive). Pertinent data are also appended in tables 4-5 inclusive.

References Cited:

Mackay, H. B. Contributions to the Hydrography of the Waters of the Scotian Shelf --- 1932.
MSS Report to the Biol. Board of Canad. 1933.
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An Analysis of Surface Water Temperatures for the Atlantic Coast of Canada for 1934.
MSS Report to the Biol. Board of Canad. 1935.

Station	Date	Depth	Salinity	Temperature
121	May 6/34	0m.	31.78	4.5
"	"	10m.	31.76	3.70
"	"	25m.	32.01	1.77
"	"	43m.	32.43	2.17
122	"	0m.	31.64	4.4
"	"	10m.	31.65	3.77
"	"	25m.	31.9[illegible]	1.22
"	"	50m.	32.12	1.31
"	"	60m.	32.18	1.37
123	"	0m.	31.31	5.0
"	"	10m.	31.40	4.15
"	"	25m.	31.58	1.36
"	"	50m.	31.89	1.44
"	"	75m.	32.38	2.08
"	"	100m.	33.24	4.28
"	"	150m.	34.51	7.57
"	"	165m.	34.56	7.74
124	May 7/34	0m.	31.24	5.3
"	"	10m.	31.56	4.66
"	"	25m.	32.09	3.25
"	"	50m.	32.50	2.17
"	"	75m.	33.21	4.23
"	"	80m.	33.22	4.18
125	"	0m.	31.42	5.0
"	"	10m.	31.46	4.73
"	"	25m.	32.01	2.83
"	"	50m.	32.39	1.60
"	"	75m.	33.31	4.71
"	"	100m.	34.29	7.38
"	"	150m.	34.67	7.96
"	"	200m.	34.78	7.91
50	"	0m.	31.38	4.7
"	"	10m.	31.40	3.48
"	"	25m.	31.89	2.01
"	"	50m.	32.45	2.85
"	"	75m.	33.73	5.97
"	"	100m.	34.20	7.09
"	"	110m.	34.20	7.17
126	"	0m.	31.55	4.8
"	"	10m.	31.64	4.43
"	"	25m.	32.01	3.48
"	"	50m.	32.47	2.38
"	"	75m.	33.37	4.81
"	"	100m.	34.16	7.45
"	"	140m.	34.43	7.80
58	"	0m.	31.56	4.3
"	"	10m.	31.56	3.99
"	"	25m.	32.00	3.19
"	"	50m.	32.29	1.82
"	"	75m.	32.57	2.28

Depth

Table I (cont.)

Station	Date	Depth	Salinity	Temperature
127	May 9/34	0m.	31.82	3.9
"	"	10m.	31.74	3.16
"	"	25m.	32.09	3.04
"	"	50m.	32.29	2.02
"	"	75m.	32.38	2.08
128	"	0m.	31.94	5.3
"	"	10m.	32.03	4.29
"	"	25m.	32.41	2.30
"	"	50m.	32.66	2.17
"	"	75m.	33.13	4.23
"	"	100m.	34.05	6.67
"	"	150m.	34.63	7.89
"	"	185m.	34.87	8.23
129	"	0m.	-----	5.1
"	"	10m.	32.29	5.36
"	"	25m.	32.39	2.91
"	"	50m.	32.52	2.21
"	"	61m.	32.68	1.76
130	May 10/34	0m.	32.36	5.3
"	"	10m.	32.32	4.69
"	"	25m.	32.34	4.19
"	"	50m.	32.45	2.59
"	"	60m.	32.56	2.26
131	"	0m.	32.18	4.5
"	"	10m.	32.09	3.84
"	"	25m.	32.07	3.06
"	"	40m.	32.10	2.98
132	"	0m.	31.73	3.0
"	"	10m.	31.67	2.85
"	"	25m.	31.98	1.66
"	"	50m.	32.29	0.57
"	"	75m.	32.50	0.57
"	"	100m.	32.65	0.93
"	"	150m.	33.10	2.77
"	"	200m.	33.35	3.83
133	"	0m.	31.38	3.3
"	"	10m.	31.44	2.34
"	"	25m.	31.98	1.64
"	"	50m.	32.18	0.67
"	"	75m.	32.38	0.47
"	"	100m.	32.63	0.93
134	"	0m.	31.04	2.5
"	"	10m.	30.99	1.93
"	"	25m.	31.42	-0.09
"	"	50m.	31.91	0.24
"	"	75m.	32.18	1.00?
"	"	100m.	32.63	0.39
"	"	125m.	32.99	0.95

Table 1 (concluded)

Station	Date	Depth	Salinity	Temperature
127	Jul. 3/34	0m.	30.81	11.0
"	"	10m.	30.90	9.50
"	"	25m.	31.40	2.98
"	"	50m.	31.91	1.22
"	"	75m.	32.23	1.09
128	"	0m.	30.99	13.5
"	"	10m.	31.62	11.20
"	"	25m.	32.23	7.72
"	"	50m.	32.68	2.76
"	"	75m.	33.03	2.80
"	"	100m.	33.68	5.26
"	"	150m.	34.25	7.12
"	"	190m.	34.83	8.34
129	"	0m.	32.32?	14.0
"	"	10m.	32.25?	12.71
"	"	25m.	32.07?	8.57
"	"	50m.	32.48	2.28
"	"	65m.	32.54	2.29
130	"	0m.	32.07	12.9
"	"	10m.	32.01	11.57
"	"	25m.	32.18	4.22
"	"	50m.	32.30	3.21
131	Jul. 4/34	0m.	31.26	11.5
"	"	10m.	31.40	10.45
"	"	25m.	31.96	6.62
"	"	35m.	32.03	6.25
132A	"	0m.	31.71	12.7
"	"	10m.	31.89	7.64
"	"	25m.	31.87	9.19
"	"	50m.	32.30	2.59
"	"	75m.	32.38	2.11
"	"	100m.	32.61	1.78
133	"	0m.	30.75	10.8
"	"	10m.	30.75	9.50
"	"	25m.	31.42	2.61
"	"	50m.	32.07	1.29
"	"	65m.	32.34	0.41
134	"	0m.	30.55	10.5
"	"	10m.	30.53	10.16
"	"	25m.	31.15	4.56
"	"	50m.	31.38	2.70
"	"	75m.	31.62	1.43
"	"	100m.	31.82	1.02
"	"	150m.	33.17	1.20

Table ------ 2.

Station	Date	Depth	Salinity	Temperature
121	Aug. 12/34	0m.	31.85	11.6
"	"	10m.	31.89	8.59
"	"	25m.	31.87	5.31
"	"	50m.	32.70	3.05
"	"	75m.	33.06	3.70
122	"	0m.	31.78	14.4
"	"	10m.	31.78	14.36
"	"	25m.	31.89	9.37
"	"	50m.	32.36	3.45
"	"	60m.	32.34	3.49
123	"	0m.	31.42	15.0
"	"	10m.	31.42	14.97
"	"	25m.	31.89	7.27
"	"	50m.	32.29	2.34
"	"	75m.	32.72	2.84
"	"	100m.	33.15	3.83
"	"	150m.	34.65	8.00
124	"	0m.	31.44	15.7
"	"	10m.	31.42	15.52
"	"	25m.	31.74	9.74
"	"	50m.	32.84	4.84
"	"	75m.	33.31	4.11
125	"	0m.	31.92	16.5
"	"	10m.	31.89	16.91
"	"	25m.	31.91	15.05
"	"	50m.	33.04	4.03
"	"	75m.	33.82	5.70
"	"	100m.	34.45	7.60
"	"	150m.	34.87	8.53
"	"	200m.	34.85	7.97
50	"	0m.	32.62	17.60
"	"	10m.	31.60	17.36
"	"	25m.	32.39	12.39
"	"	50m.	33.21	5.21
"	"	75m.	34.00	6.15
"	"	100m.	34.33	7.26
126	"	0m.	31.60	17.2
"	"	10m.	31.55	17.10
"	"	25m.	32.29	9.63
"	"	50m.	32.94	3.40
"	"	75m.	33.78	5.52
"	"	100m.	34.20	6.81
"	"	130m.	34.61	8.08
58	"	0m.	31.35	12.70
"	"	10m.	31.35	9.94
"	"	25m.	31.44	4.15
"	"	50m.	32.30	1.78

Table 3 (continued)

Station	Date	Depth	Salinity	Temperature
127	Aug. 9/34	0m.	30.99	14.6
"	"	10m.	31.26	13.39
"	"	25m.	31.65	7.68
"	"	50m.	32.27	1.15
"	"	75m.	32.72	1.78
"	"	95m.	32.94	2.56
128	"	0m.	31.27	17.0
"	"	10m.	31.40	15.70
"	"	25m.	32.00	11.68
"	"	50m.	32.54	2.35
"	"	75m.	33.01	2.61
"	"	100m.	33.71	5.17
"	"	150m.	34.61	8.00
"	"	160m.	34.78	8.27
129	"	0m.	32.14	17.4
"	"	10m.	32.07	17.79
"	"	25m.	32.05	13.33
"	"	50m.	32.30	5.37
"	"	75m.	32.74	3.20
130	"	0m.	31.96	17.5
"	"	10m.	32.00	16.94
"	"	25m.	31.96	13.89
"	"	50m.	32.23	5.67
"	"	75m.	32.47	3.79
"	"	100m.	32.84	2.40
131	"	0m.	31.67	17.2
"	"	10m.	31.65	17.11
"	"	25m.	32.14	5.21
"	"	30m.	32.14	6.09
132A	"	0m.	30.14	16.8
"	"	10m.	30.35	14.14
"	"	25m.	31.26	7.86
"	"	50m.	32.30	2.85
"	"	75m.	32.61	2.19
"	"	85m.	32.72	2.10
133	Aug. 8/34	0m.	29.99	16.6
"	"	10m.	29.94	16.10
"	"	25m.	31.35	5.84
"	"	50m.	32.07	1.17
"	"	60m.	32.10	1.00
134	"	0m.	30.50	13.6
"	"	10m.	30.53	11.95
"	"	25m.	31.17	5.44
"	"	50m.	31.76	1.98
"	"	75m.	32.38	0.42
"	"	100m.	32.86	0.74
"	"	150m.	33.04	0.97

Table ------- 3 (concluded)

Station	Depth	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.
		May 28/34		June 11/34		June 25/34		Aug. 13/34	
531	0m.	9.0	29.29	11.1	30.48	14.0	29.70	16.9	30.16
	5m.	4.53	30.62	7.05	30.86	10.05	30.61	10.45	31.17
	10m.	3.22	31.17	4.84	31.33	7.77	30.99	7.63	31.42
	25m.	1.10	31.58	1.80	31.56	2.77	31.56	5.43	31.47
	60m.	1.28	31.76	1.29	31.76	1.29	31.71	1.36	31.74
								Aug.16/34	
533	0m.	10.0	30.53	11.5	30.88	12.2	30.30	14.7	30.84
	5m.	7.54	30.43	7.58	30.91	11.64	30.64	14.83	30.88
	10m.	4.63	31.00	5.54	31.56	8.04	31.00	10.25	31.24
	20m.	3.11	31.53	4.47	31.74	6.53	31.29	6.17	31.40
62	0m.	9.6	30.99	9.2	31.29	9.0	31.18	12.6	31.22
	10m.	5.66	31.27	7.80	31.44	7.88	31.22	12.05	31.35
	25m.	3.26	31.82	3.86	31.85	2.95	31.92	5.34	31.42
	30m.	3.29	31.83	3.75	31.87	2.35	32.20	4.94	31.46
61	0m.	8.1	31.78	9.0	31.36	9.1	31.29	14.0	31.22
	10m.	5.29	31.80	8.22	31.35	8.65	31.29	13.99	31.20
	25m.	2.59	32.09	5.32	31.85	3.59	31.74	5.56	31.85
	50m.	2.35	32.14	1.44	32.16	1.29	32.01	2.43	-----
60	0m.	7.9	31.71	8.1	31.18	9.6	31.35	15.3	31.35
	10m.	5.48	31.67	7.22	31.26	8.96	31.36	14.92	31.26
	25m.	3.75	31.91	3.03	31.91	7.24	31.92	7.18	31.27
	50m.	1.96	32.27	1.16	32.38	2.03	32.36	2.28	32.14
	75m.	2.15	32.43	1.75	32.48	1.80	32.59	2.37	32.75
	100m.	1.76	-----	2.37	32.72	3.25	33.12	2.99	32.97
59	0m.	7.4	31.65	8.4	31.18	9.8	31.46	15.3	31.22
	10m.	5.90	31.64	7.80	31.18	9.56	31.42	14.31	31.22
	25m.	4.23	31.67	5.01	32.27	8.36	32.18	3.56	32.09
	50m.	1.60	32.47	2.73	32.63	2.87	32.61	1.60	32.43
	75m.	1.81	32.65	1.96	32.97	2.47	32.77	2.75	33.01
	100m.	2.22	32.79	3.81	33.24	4.63	33.69	3.89	33.33
	150m.	7.18	34.36	6.89	34.07	7.91	34.51	7.95	34.56

Table ----- 4 (cont.)

Station	Date	Depth	Salinity	Temperature
127	Aug. 9/34	0m.	30.99	14.6
"	"	10m.	31.26	13.39
"	"	25m.	31.65	7.68
"	"	50m.	32.27	1.15
"	"	75m.	32.72	1.78
"	"	95m.	32.94	2.56
128	"	0m.	31.27	17.0
"	"	10m.	31.40	15.70
"	"	25m.	32.00	11.68
"	"	50m.	32.54	2.35
"	"	75m.	33.01	2.61
"	"	100m.	33.71	5.17
"	"	150m.	34.61	8.00
"	"	160m.	34.78	8.27
129	"	0m.	32.14	17.4
"	"	10m.	32.07	17.79
"	"	25m.	32.05	13.33
"	"	50m.	32.30	5.37
"	"	75m.	32.74	3.20
130	"	0m.	31.96	17.5
"	"	10m.	32.00	16.94
"	"	25m.	31.96	13.89
"	"	50m.	32.23	5.67
"	"	75m.	32.47	3.79
"	"	100m.	32.84	2.40
131	"	0m.	31.67	17.2
"	"	10m.	31.65	17.11
"	"	25m.	32.14	5.21
"	"	30m.	32.14	6.09
132A	"	0m.	30.14	16.8
"	"	10m.	30.35	14.14
"	"	25m.	31.26	7.86
"	"	50m.	32.30	2.85
"	"	75m.	32.61	2.19
"	"	85m.	32.72	2.10
133	Aug. 8/34	0m.	29.99	16.6
"	"	10m.	29.94	16.10
"	"	25m.	31.35	5.84
"	"	50m.	32.07	1.17
"	"	60m.	32.10	1.00
134	"	0m.	30.50	13.6
"	"	10m.	30.53	11.95
"	"	25m.	31.17	5.44
"	"	50m.	31.76	1.98
"	"	75m.	32.38	0.42
"	"	100m.	32.86	0.74
"	"	150m.	33.04	0.97

Table ------- 3 (concluded)

Station	Date	Depth	Salinity	Temperature
127	Aug. 9/34	0m.	30.99	14.6
"	"	10m.	31.26	13.39
"	"	25m.	31.65	7.68
"	"	50m.	32.27	1.15
"	"	75m.	32.72	1.78
"	"	95m.	32.94	2.56
128	"	0m.	31.27	17.0
"	"	10m.	31.40	15.70
"	"	25m.	32.00	11.68
"	"	50m.	32.54	2.35
"	"	75m.	33.01	2.61
"	"	100m.	33.71	5.17
"	"	150m.	34.61	8.00
"	"	160m.	34.78	8.27
129	"	0m.	32.14	17.4
"	"	10m.	32.07	17.79
"	"	25m.	32.05	13.33
"	"	50m.	32.30	5.37
"	"	75m.	32.74	3.20
130	"	0m.	31.96	17.5
"	"	10m.	32.00	16.94
"	"	25m.	31.96	13.89
"	"	50m.	32.23	5.67
"	"	75m.	32.47	3.79
"	"	100m.	32.84	2.40
131	"	0m.	31.67	17.2
"	"	10m.	31.65	17.11
"	"	25m.	32.14	5.21
"	"	30m.	32.14	6.09
132A	"	0m.	30.14	16.8
"	"	10m.	30.35	14.14
"	"	25m.	31.26	7.86
"	"	50m.	32.30	2.85
"	"	75m.	32.61	2.19
"	"	85m.	32.72	2.10
133	Aug. 8/34	0m.	29.99	16.6
"	"	10m.	29.94	16.10
"	"	25m.	31.35	5.84
"	"	50m.	32.07	1.17
"	"	60m.	32.10	1.00
134	"	0m.	30.50	13.6
"	"	10m.	30.53	11.95
"	"	25m.	31.17	5.44
"	"	50m.	31.76	1.98
"	"	75m.	32.38	0.42
"	"	100m.	32.86	0.74
"	"	150m.	33.04	0.97

Table ------- 3 (concluded)

Station	Date	Depth	Salinity	Temperature
127	Aug. 9/34	0m.	30.99	14.6
"	"	10m.	31.26	13.39
"	"	25m.	31.65	7.68
"	"	50m.	32.27	1.15
"	"	75m.	32.72	1.78
"	"	95m.	32.94	2.56
128	"	0m.	31.27	17.0
"	"	10m.	31.40	15.70
"	"	25m.	32.00	11.68
"	"	50m.	32.54	2.35
"	"	75m.	33.01	2.61
"	"	100m.	33.71	5.17
"	"	150m.	34.61	8.00
"	"	160m.	34.78	8.27
129	"	0m.	32.14	17.4
"	"	10m.	32.07	17.79
"	"	25m.	32.05	13.33
"	"	50m.	32.30	5.37
"	"	75m.	32.74	3.20
130	"	0m.	31.96	17.5
"	"	10m.	32.00	16.94
"	"	25m.	31.96	13.89
"	"	50m.	32.23	5.67
"	"	75m.	32.47	3.79
"	"	100m.	32.84	2.40
131	"	0m.	31.67	17.2
"	"	10m.	31.65	17.11
"	"	25m.	32.14	5.21
"	"	30m.	32.14	6.09
132A	"	0m.	30.14	16.8
"	"	10m.	30.35	14.14
"	"	25m.	31.26	7.86
"	"	50m.	32.30	2.85
"	"	75m.	32.61	2.19
"	"	85m.	32.72	2.10
133	Aug. 8/34	0m.	29.99	16.6
"	"	10m.	29.94	16.10
"	"	25m.	31.35	5.84
"	"	50m.	32.07	1.17
"	"	60m.	32.10	1.00
134	"	0m.	30.50	13.6
"	"	10m.	30.53	11.95
"	"	25m.	31.17	5.44
"	"	50m.	31.76	1.98
"	"	75m.	32.38	0.42
"	"	100m.	32.86	0.74
"	"	150m.	33.04	0.97

Table ------- 3 (concluded)

Station	Depth	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.
		May 28/34		June 11/34		June 25/34		Aug. 13/34	
531	0m.	9.0	29.29	11.1	30.48	14.0	29.70	16.9	30.16
	5m.	4.53	30.62	7.05	30.86	10.05	30.61	10.45	31.17
	10m.	3.22	31.17	4.84	31.33	7.77	30.99	7.63	31.42
	25m.	1.10	31.58	1.80	31.56	2.77	31.56	5.43	31.47
	60m.	1.28	31.76	1.29	31.76	1.29	31.71	1.36	31.74
								Aug.16/34	
533	0m.	10.0	30.53	11.5	30.88	12.2	30.30	14.7	30.84
	5m.	7.54	30.43	7.58	30.91	11.64	30.64	14.83	30.88
	10m.	4.63	31.00	5.54	31.56	8.04	31.00	10.25	31.24
	20m.	3.11	31.53	4.47	31.74	6.53	31.29	6.17	31.40
62	0m.	9.6	30.99	9.2	31.29	9.0	31.18	12.6	31.22
	10m.	5.66	31.27	7.80	31.44	7.28	31.22	12.05	31.35
	25m.	3.26	31.82	3.86	31.85	2.95	31.92	5.34	31.42
	30m.	3.29	31.83	3.75	31.87	2.35	32.20	4.94	31.46
61	0m.	8.1	31.78	9.0	31.36	9.1	31.29	14.0	31.22
	10m.	5.29	31.80	8.22	31.35	8.65	31.29	13.99	31.20
	25m.	2.59	32.09	5.32	31.85	3.59	31.74	5.56	31.85
	50m.	2.35	32.14	1.44	32.16	1.29	32.01	2.43	-----
60	0m.	7.9	31.71	8.1	31.18	9.6	31.35	15.3	31.35
	10m.	5.48	31.67	7.22	31.26	8.96	31.36	14.92	31.26
	25m.	3.75	31.91	3.03	31.91	7.24	31.92	7.18	31.27
	50m.	1.96	32.27	1.16	32.38	2.03	32.36	2.28	32.14
	75m.	2.15	32.43	1.75	32.48	1.80	32.59	2.37	32.75
	100m.	1.76	-----	2.37	32.72	3.25	33.12	2.99	32.97
59	0m.	7.4	31.65	8.4	31.18	9.8	31.46	15.3	31.22
	10m.	5.90	31.64	7.80	31.18	9.56	31.42	14.31	31.22
	25m.	4.23	31.67	5.01	32.27	8.36	32.18	3.56	32.09
	50m.	1.60	32.47	2.73	32.63	2.87	32.61	1.60	32.43
	75m.	1.81	32.65	1.96	32.97	2.47	32.77	2.75	33.01
	100m.	2.22	32.79	3.81	33.24	4.63	33.69	3.89	33.33
	150m.	7.18	34.36	6.89	34.07	7.91	34.51	7.95	34.56

Table ----- 4 (cont.)

Station	Depth	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.
	~~Sept. 22/34~~			Sept. 22/34		Oct. 4/34		Dec. 6/34	
531	0m.			17.6	30.70				
	5m.			17.45	30.64				
	10m.			17.10	30.75				
	25m.			6.91	31.42				
	60m.			1.57	31.74				
533	0m.			18.3	32.12	14.5	30.88	5.7	29.96?
	5m.			18.10	32.16	15.00	30.88	6.45	30.07?
	10m.			17.8	32.20	14.30	31.04	6.65	29.33?
	20m.			15.84	32.32	8.99	31.62	7.40	31.29
						Oct. 3/34		Dec. 7/34	
62	0m.			18.3	30.82	15.6	31.33	4.80	30.95
	10m.			18.22	30.81	15.10	31.29	6.51	31.11
	25m.			15.98	31.15	7.48	31.80	5.48	32.21
	50m.			15.67	31.15	6.06	31.94	5.44	32.23
61	0m.			17.80?	30.84	17.3	31.44	5.40	31.27
	10m.			18.12?	30.88	16.45	31.51	6.72	31.24
	25m.			17.90	31.62	8.73	31.73	7.08	31.64
	50m.			5.26	32.00	3.41	32.50	3.96	32.65
60	0m.			18.0	30.86	18.2	31.62?	5.40	31.69
	10m.			18.05	31.09	18.16	31.76?	6.91	31.67
	25m.			17.08	31.46	12.83	31.51?	6.59	31.71
	50m.			3.65	32.12	3.47	32.43?	5.12	32.38
	75m.			3.61	32.12	3.40	33.01?	4.52	33.13
	100m.			3.90	33.31	4.48	31.49?	4.56	33.26
59	0m.			18.5	31.62	18.2	31.64	5.80	31.22
	10m.			18.03	31.60	18.08	31.65	7.20	31.13
	25m.			17.34	31.65	18.05	31.67	7.00	31.17
	50m.			5.23	32.66	7.72	32.61	7.51	31.67
	75m.			3.20	33.08	4.44	33.30	6.40	32.74
	100m.			6.28	33.93	6.27	33.98	4.27	33.28
	150m.			8.29	33.95	7.47	34.42	7.84	34.52

Table ----- 4 (concluded)

Station	Depth	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.
		Jul. 9/34		Jul. 16/34		Jul. 30/34		Aug. 6/34		Aug.20/34	
140	0m.	13.2	30.46	14.0	30.35	16.3	30.14	13.8	30.55	17.4	30.43
	10m.	11.60	30.77	11.81	30.43	15.75	30.08	13.71	30.46	16.89	30.35
	25m.	5.03	30.99	6.74	30.88	5.73	31.02	4.50	31.33	7.89	31.51
	50m.	0.64	31.85	2.99	31.46	1.52	31.83	1.76	31.87	1.47	31.98
	75m.	0.92	32.54	0.64	32.21	1.39	32.63	1.11	32.47	1.57	32.63
141	0m.	12.7	30.55	14.3	30.34	16.8	29.92	13.2	30.46	17.6	30.17
	10m.	11.98	30.46	13.76	30.28	15.85	29.96	12.96	30.44	16.69	30.10
	25m.	5.35	31.20	7.93	30.73	5.38	30.97	4.54	31.44	4.27	31.44
	50m.	0.95	31.92	3.20	31.40	2.83	31.64	1.27	31.94	1.29	32.23
	75m.	0.41	32.29	0.99	32.32	1.03	32.54	1.34	32.48	1.77	32.74
	100m.	0.77	32.65	1.14	32.65	1.65	32.84	1.20	32.65	1.81	32.79
	140m.	1.53	32.88	[illegible]	[illegible]	1.05	33.01	1.29	32.94	1.95	32.86
	150m.			1.02	33.01						
142	0m.	11.5	30.48	14.2	30.41	16.7	29779	14.1	30.44	17.3	30.03
	10m.	10.90	30.53	13.91	30.39	15.97	29.85	13.30	30.44	16.85	29.92
	25m.	8.43	31.13	7.76	30.79	7.09	30.91	4.84	31.18	4.66	31.35
	50m.	2.41	31.67	3.43	31.49	3.33	31.51	3.32	32.10	1.59	31.96
	65m.	1.34	31.94	1.42	32.05	1.85	31.91	1.00	32.38	1.19	32.68
143	0m.	12.0	30.73	14.1	30.43	15.4	30.23	14.2	30.30	16.6	30.07
	10m.	7.64	30.90	13.42	30.39	13.39	30.30	13.29	30.30	15.29	30.16
	25m.	6.85	30.99	7.62	30.88	6.90	30.68	8.71	30.86	6.05	31.20
	27m.					6.90	30.99				
	30m.	6.56	30.97	6.15	31.04					4.11	31.53

Table ----- 5 (cont.)

Station	Depth	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.	Temp.	Sal.
		Aug. 27/34		Sept. 4/34		Sept. 29/34		Dec. 11/34			
140	0m.	16.2	30.26	17.5	29.88	17.9	30.93	3.40	30.59		
	10m.	15.75	30.26	16.89	29.90	17.94	30.91	4.66	30.59		
	25m.	5.55	31.33	5.48	31.38	15.38	31.15	4.79	30.59		
	50m.	1.97	32.23	4.32	32.47	3.15	32.00	4.66	30.59		
	75m.	1.44	32.50	2.25	32.77	1.62	32.61	3.54	32.00		
141	0m.	16.7	30.17	17.3	29.85	18.0	30.77	2.95	30.57		
	10m.	15.85	30.19	16.89	30.01	18.09	30.73	4.61	30.55		
	25m.	5.52	31.17	6.25	31.24	13.22	31.26	4.74	30.55		
	50m.	1.92	31.98	4.58	32.45	4.61	32.36	4.61	30.59		
	75m.	2.53	32.63	2.45	32.72	2.55	32.74	3.94	31.67		
	100m.	2.01	32.77	2.15	32.90	2.36	32.84	2.47	32.45		
	140m.	1.73	32.88	2.41	33.08	2.39	33.01	1.86	32.90		
142	0m.	16.5	30.21	18.0	29.87	17.4	31.29	3.40	30.41		
	10m.	16.10	30.16	17.44	29.81	18.14	31.29	4.94	30.44		
	25m.	6.11	31.20	10.35	30.70	16.44	31.74	4.83	30.52		
	50m.	2.35	31.78	1.37	32.18	4.55	32.32	5.07	31.02?		
	65m.			1.42	32.54	2.67	32.74	4.75	30.70?		
	75m.	1.76	31.98								
143	0m.	17.0	30.05	17.8	29.69	17.5	30.10	3.80	30.39		
	10m.	16.83	30.03	17.22	29.69	17.44	30.77	4.99	30.37		
	25m.	7.42	30.97	10.33	30.68	4.81	31.92	5.10	30.43		
	50m.	5.91	31.20	8.09	31.00	4.51	31.94	5.08	30.41		

Table ------ 5 (concluded).