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Hydrographic Conditions off West Greenland during 1972

by

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As the authors felt that a report based on the combined data from the research vessels of the three countries could give a better description of the hydrographic conditions off West Greenland than three separate reports would, we decided to present our observations in a combined research report which this year was written by F.Hermann.

R/V "Adolf Jensen" worked the section I in June, section II in April, June and July. FRV "Anton Dorn" worked the sections III,IV and V in December. Section II was worked in December by FRV "Anton Dorn" and FRV "Cirolana" together and the sections over Dana Bank, Noname Bank and off Cape Desolation and Cape Farewell were worked by FRV "Cirolana" in December.

Temperature conditions in the sections are shown on figures 2 to 9 and figures 11-to 15. Very cold conditions were found on the Fylla Bank section in the upper 100 metres in April, June and July as a result of strong winter cooling and inflow of cold polar water from the East Greenland Polar Current. The 1972 cod year-class will probably be small as the temperature over the shallow part of Fylla Bank in June was less than 1° and earlier experience indicates that great year-classes can be expected only when the temperature exceeds 1°8.

Over Little Hellefiske Bank and Great Hellefiske Bank the temperatures were very low in the upper 100 metres in July.

In December the winter cooling has caused negative temperatures in the upper layers; at section III reaching to 50 metres and at the northernmost section V reaching to 100 metres. From section II and southwards the volume of water with negative temperature was relatively small in December.

At depths greater than 100 metres relatively high temperatures were found in December. In the core of the Irminger component of the West Greenland Current the temperature exceeded 5° as far north as section IV.

Deviations of temperature and salinity from the mean values for the years 1950-66 (Hermann 1967) for the station at 63°53'N-53°22'W west of the slope of Fylla Bank in July are shown below:

Depth interval (m)	Mean temp. 1950 - 66.	Mean Salinity 1950 - 1966.	Δ T July 1972	Δ S July 1972
0- 50	2.07	33.29	-0.96	-0.14
50-100	1.33	33.65	-0.59	-0.29
100-200	1.85	34.00	-0.84	-0.30
200-300	2.88	34.39	-0.65	-0.23
300-400	3.79	34.67	-0.76	-0.20
400-500	4.22	34.81	-0.82	-0.17
0-500	2.89	34.27	-0.77	-0.22

Negative temperature and salinity anomalies are found in all water layers down to 500 m indicating great inflow of polar water.

Fig. 10 shows the 5-year running mean of the surface temperature anomalies in the West Greenland area (A_1) and the South Greenland area (B) based on the surface anomalies for the years up to 1970 (Smed, up to 1970). The temperatures are now back at the level of the mean value for the years 1876-1915 and the climatic jump back to cold conditions has been just as sudden as the rise in temperatures in the twenties.

References:

Hermann, F. 1967: Temperature variations in the West Greenland area since 1950.
Int. Comm. Northwest Atlant. Fish., Redbook 1967, Part IV, p. 76-85.

Smed, Jens up to 1970. Monthly anomalies of the surface temperature of areas of the northern North Atlantic.
Ann. Biol. Copenhague.

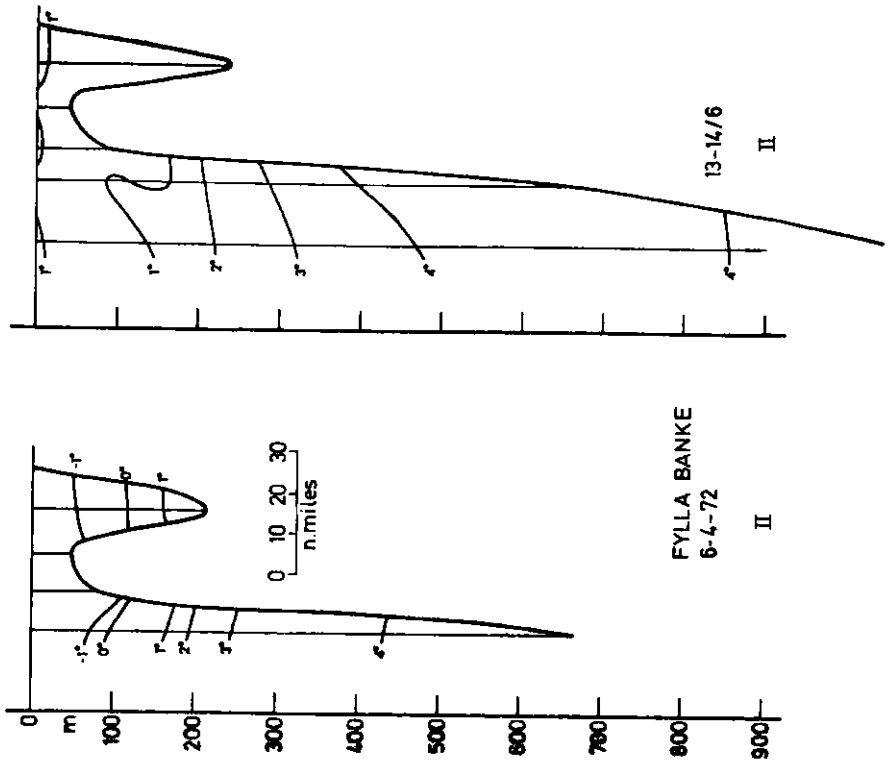


Fig. 2. Temperature distribution at Fylla Bank Section in April and June.

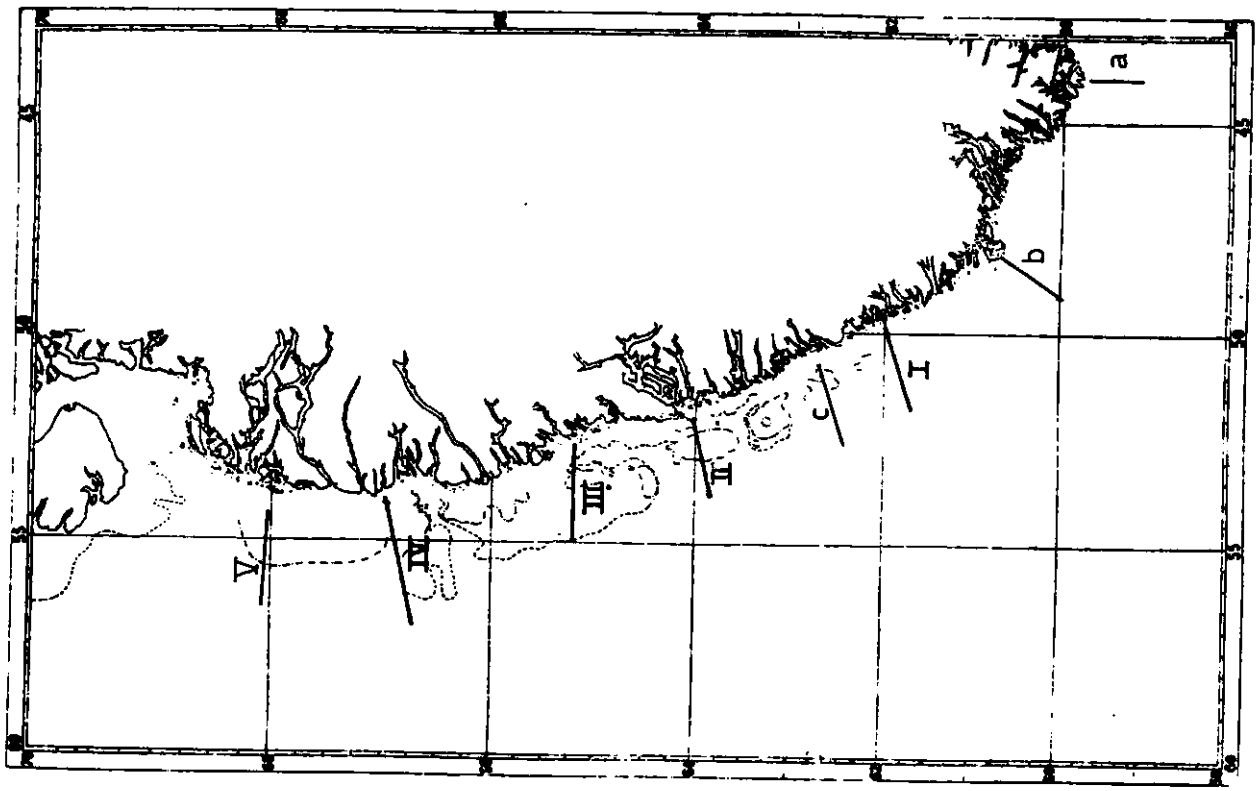


Fig. 1. Location of sections.

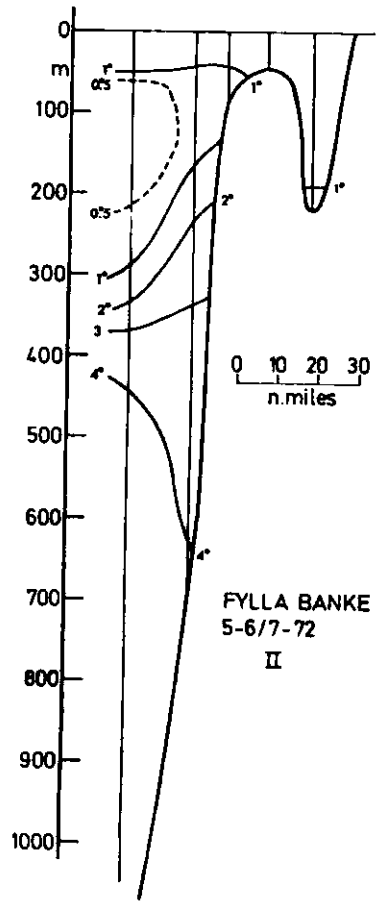


Fig. 3. Temperature distribution at Fylla Bank section in July.

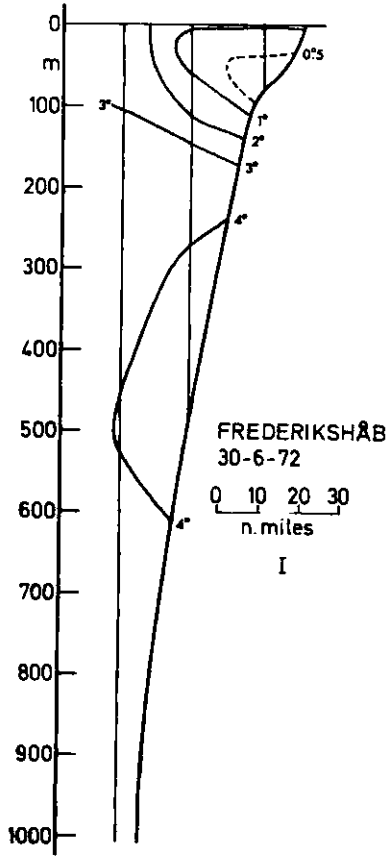


Fig. 4. Temperature distribution at Frederikshåb section in June.

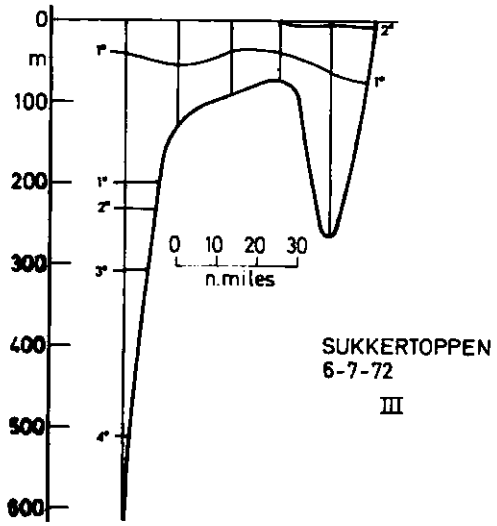


Fig. 5. Temperature distribution at section across Little Hellefiske Bank in July.

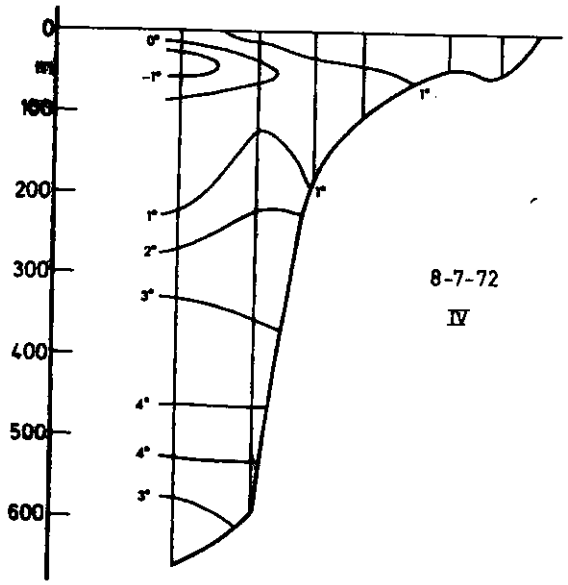
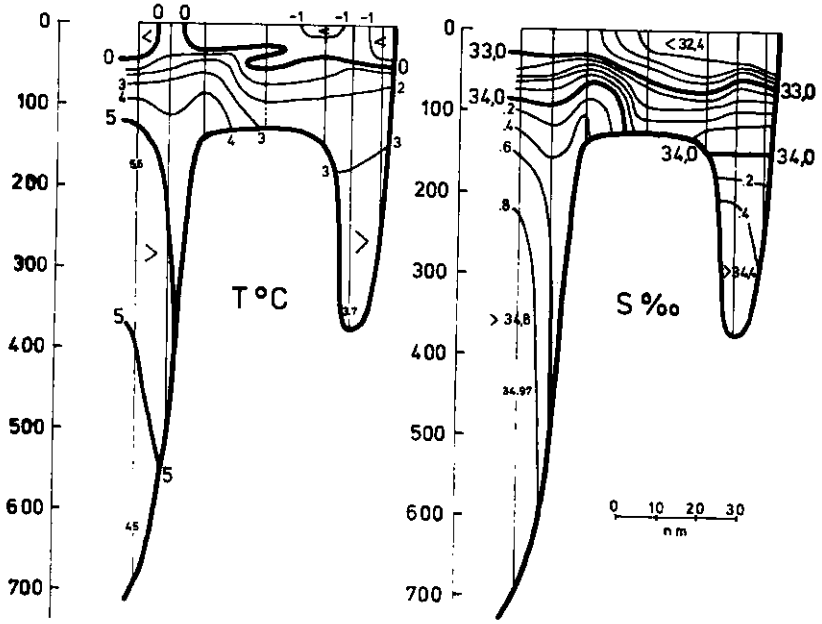


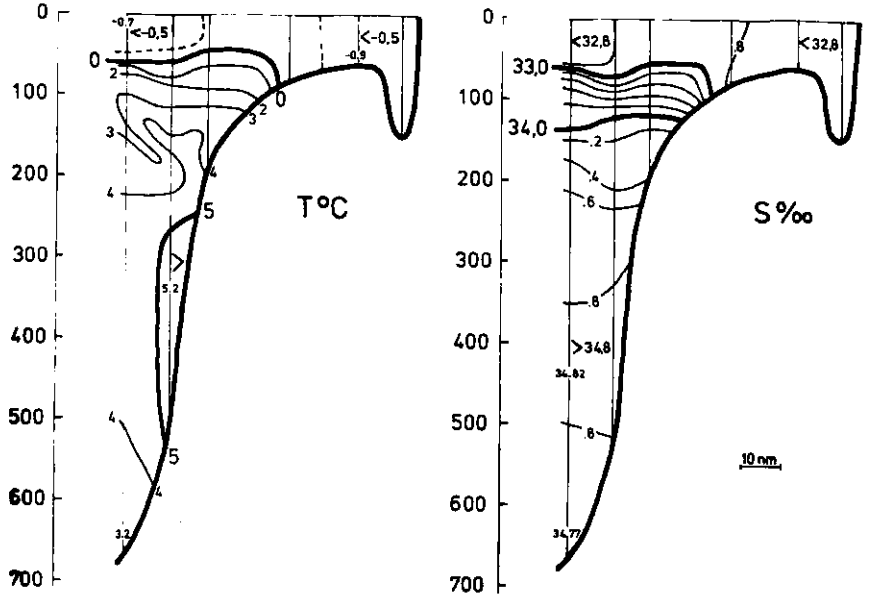
Fig. 6. Temperature distribution at section across Great Hellefiske Bank in July.



SUKKERTOPPEN, Section III

3./4. 12. 72

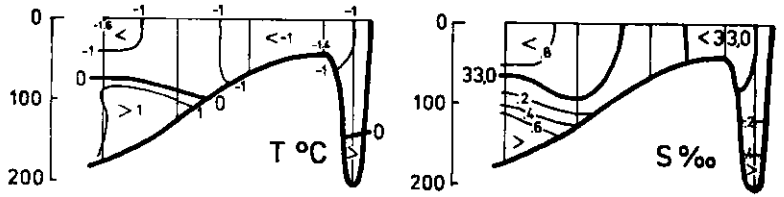
Fig. 7. Temperature and salinity distribution across Little Hellefiske Bank in December.



HOLSTEINSBORG, Section IV

2. 12. 72

Fig. 8. Temperature and salinity distribution across Great Hellefiske Bank in December.



EGEDESMINDE, Section V

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Fig. 9. Temperature and salinity distribution off Egedesminde.

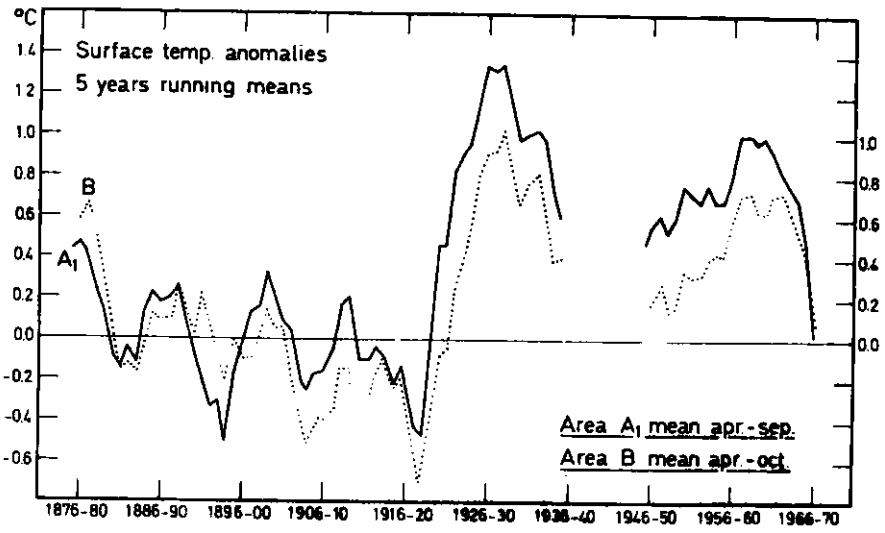

Fig. 10. Sea surface temperature anomalies, 5-year running mean.
A_1 (solid line): West Greenland area,
B (dotted line): South Greenland area.

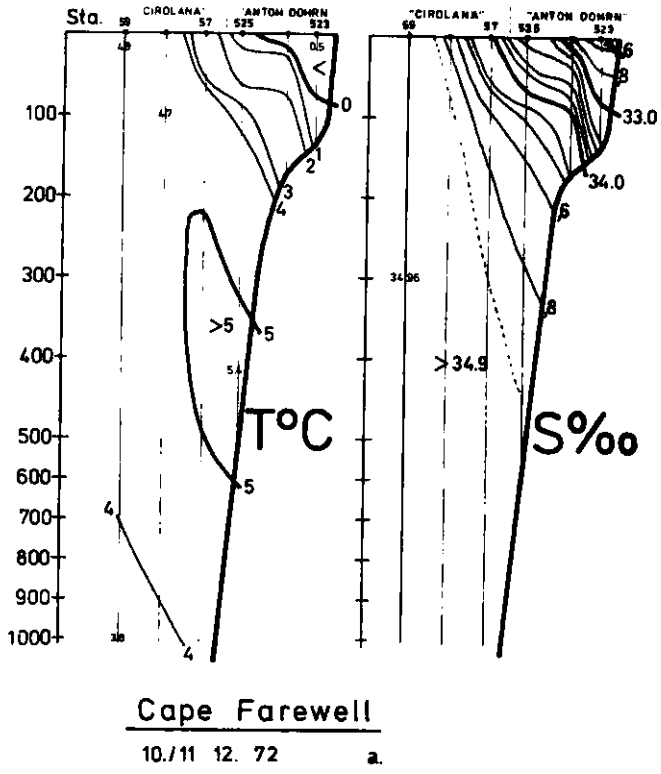

Fig. 11. Temperature and salinity off Cape Farewell in December.

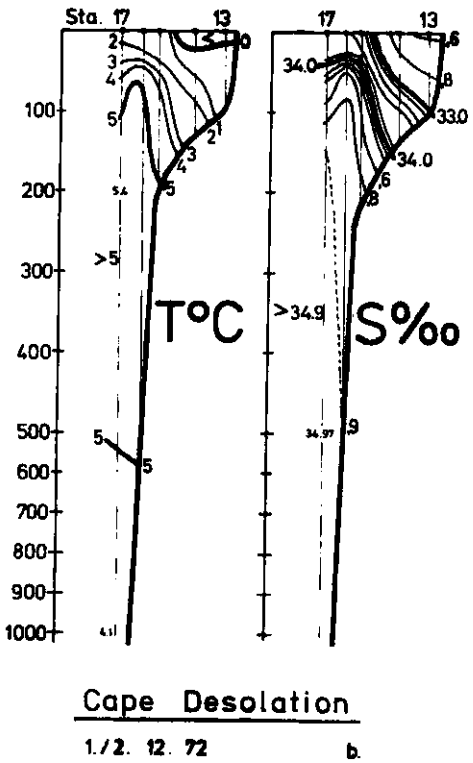

Fig. 12. Temperature and salinity off Cape Desolation in December.

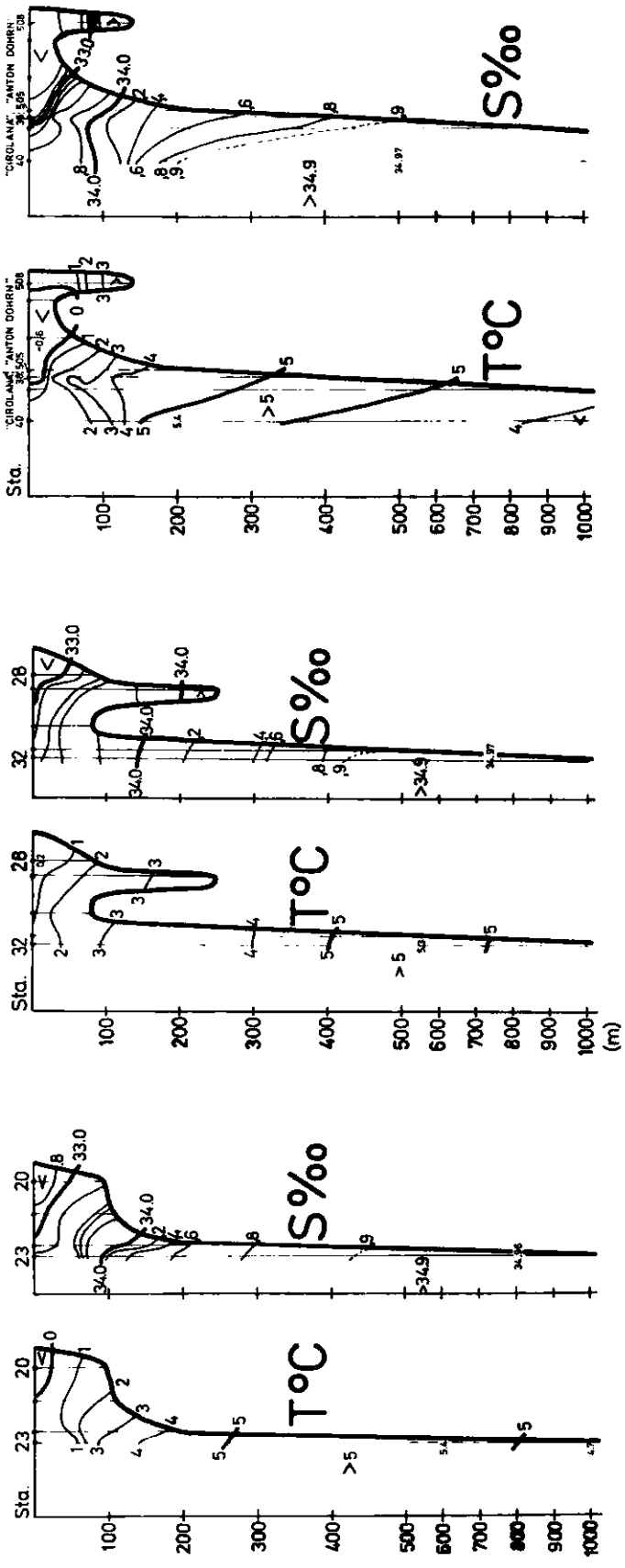

Fig. 13. Temperature and salinity over Noname Bank in December.

Fig. 14. Temperature and salinity over Danas Bank in December.

Fig. 15. Temperature and salinity over Fyllas Bank in December.