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Danish Research Report, 1970

Part I

by

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SUBAREA 1

A. Status of the Fisheries

The nominal catches taken by Denmark (Greenland) in 1970 are given in the following table:

Table 1. Greenlanders' nominal catches, 1970 (provisional figures).

Species	Nominal catch (tons)	Increase or Decrease from 1969 (%)
Cod	20,174 ⁺)	-15
Redfish	154	+12
Wolffish	2,700	-20
Greenland halibut	1,325	-14
Halibut	4	+33
Atlantic salmon	1,267 ⁺⁺)	-10
Capelin	3,124	+1688
Lumpsucker roe (not converted to round fresh fish)	417	+63
Arctic char	120	-38
Industrial fish	278	+24
Deep sea prawn	8,429	+27
Total	37,992	+11

⁺) Excl. 926 tons landed by small Faroese boats in Faeringehavn (Div. 1D).

⁺⁺) Excl. Danish drifters (app. 335 tons).

I. Cod.

1. The fisheries. The later years' downward trend continued in 1970 with a decrease of 15% from 1969. Taken into consideration that in 1970 about 21% of the catch was landed by the Greenland trawlers, which is a little more than twice the 1969 landings, the Greenland inshore fishery from small vessels has probably decreased about 20% from 1969.

The decrease of the Greenland inshore fishery was mostly due to the failing pound-net fishery, which began about one month later (in June) than in 1969. The ice conditions and the cold surface water are regarded as the main causes for the decrease.

2. Forecast for 1971-72. It is expected that the cod fishery in 1971-72 will be based mostly on the year-classes 1965 and 1966. Presumably the 1966 year-class will be dominating in the northern catches (Divs. 1B-1C) while there may be a more equal representation of these two year-classes in the southern catches (Divs. 1D - 1F), where also the 1963 year-class is expected to be of some importance. However, as the 1963 year-class is mainly origin from the East Greenland - Iceland spawning area a considerable spawning migration to that area may be expected. Most likely the later years' decline in the Greenland coastal fishery will continue, while the new Greenland trawlers (in 1971 4 vessels will raise the landings from offshore fishing.

II. Atlantic salmon.

The total catch was of the same order of size in 1970 as in 1969 (about 2150 tons, of which the Greenland-Danish-Faroese amounted to about 1600 tons). Especially there was a good inshore fishery in Divs. 1E-1F contrary to 1969 when Polar ice ("storis") impeded the fishery, but also the drift-net fishery made good catches in the southern part of Div. 1E in September. In the year before almost all drift-net caught salmon were fished in Div. 1A, 1B, and 1C. Also in 1970 a considerable number of Greenland vessels were taking part in the offshore fishery.

III. Other fish.

Fisheries for wolffish, Greenland halibut and Arctic char decreased. There was a considerable increase in the lumpsucker fishery for caviar production and the fishery for capelin increased immensely. A small increase is noted for the redfish fishery.

IV. Deep sea prawn.

There was a considerable increase in the prawn fishery in continuation of the previous years' growth in that fishery. The offshore fishing has now become of some importance, five vessels having taken part in that fishery in 1970.

B. Special Research Studies

I. Environmental Studies.

1. Hydrography. (See F.Hermann, Danish Research Report, 1970, Part I.)

II. Biological Studies.

1. Cod.

a. Eggs and larvae. Hauls with 2 m stramin net were taken at the standard hydrographic ~~station~~ sections in Davis Strait in May-July. Oblique hauls were taken from approximately 50 m to surface (wire length 225-0 m). Eggs taken in May-July are shown in Fig.1. The greatest quantities were taken in May over the western slopes of the banks off Godthåb and Frederikshåb, but the numbers were considerably smaller than in 1969.

Cod larvae taken in the same months are shown in Fig.2. Numbers per half-hour were even smaller than in 1969, when the larvae also were scarce. Thus the amount of larvae as well as the hydrographic conditions indicate a very poor West Greenland 1970 year-class.

b. Occurrence of pre-recruit cod (age-groups I, II and III). These age-groups were generally very poor in 1970. In commercial pound-net landings (Fig.3) age-group III was represented in Div. 1B in smaller quantities than in 1969, and in Div. 1F no pre-recruits at all were observed in landings from pound-net, whereas small cod, mostly the II-group, were represented in beach-seine catches in the same division. In an offshore research catch (Div. 1D, depth 300 m) by small meshed otter-trawl (36 mm) the age-groups II and III only amounted to 11 and 10% respectively, while age-group IV amounted to 62% and older age-groups to 17%.

c. Age and size distribution of cod in landings. In Fig.3 are shown age and size distribution in cod from offshore landings from otter-trawl and inshore landings from various gears. All the samples are from commercial landings except sample No. 10 which is from a research vessel.

In 1969 the year-class 1966 was regarded as relatively good as pre-recruit, and in 1970 it occurred in the landings for the first time, especially in landings from gears, in which smaller fish are captured. In pound-net landings from Div. 1B (sample No.7) it amounted to 41% by numbers, while it was scarce in landings from the same gear in Div. 1F (sample No.8). Further, the 1966 year-class was dominant in inshore landings in Div 1C (sample No. 13, gear not known) and in the above mentioned offshore research trawl catch (Div. 1D). Only at the end of the year 1970 the 1966 year-class had reached such a size as to be represented in the offshore trawl catches (sample No. 4, Div. 1D). - To judge from its occurrence the year-class 1966 is of West Greenland origin.

Besides year-class 1966 the most important year-classes were 1963, 1964, and 1965, which were dominating the trawl landings from Divs. 1C - 1D (samples Nos. 1 - 4), while year-class 1963 was the only dominant in trawl landings from Div. 1E (samples Nos. 5 - 6). Also in the inshore landings in Div. 1F (samples Nos. 8, 10, 14) the 1963 year-class was absolutely dominant. The occurrence of year-class 1963 is in good accordance with its East Greenland origin, while year-class 1965 is regarded as West Greenlandic to judge from its occurrence.

The previous rich year-classes 1960 and 1961 have decreased very much, but they were still dominant in some inshore catches ^{in Div. 1B} (sample No. 11, long-line, and No. 12, gear not known, but likely also long-line).

d. Tagging experiments. A total number of 1,642 cod was tagged, of which 796 were small cod (less than 50 cm total length) caught in inshore waters in Div. 1D (pound-net) and in Div. 1F (beach-seine). Details are given in the following tabel:

Div.	Inshore		Offshore big cod
	small cod	big cod	
1C	0	11	0
1D	567	0	54
1E	0	105	0
1F	229	676	0
Total	796	792	54

2. Atlantic Salmon.

As in previous years a collaboration with scientists from Denmark, UK and Canada was carried out. From March 29 to April 1, 1971, the ICES/ICNAF Joint Working Party on North Atlantic Salmon had a meeting in Pitlochry, where a report was made including the 1970 results. Therefore a brief summary only should be given here.

The main efforts were concentrated on tagging salmon. In the river Kapisigdlit (Godthåb Fjord, Div. 1D) 155 parr were tagged, in the coastal area 67 gill-net captured salmon were tagged, and 21 long-line captured were tagged in the offshore area. Further efforts were concentrated on sampling material for age and size distribution, blood and tissue samples. Also from the commercial catches a big material was collected.

3. Other Fish.

A material of American plaice from trawl catches has been collected, as this species is now regarded as a possible resource for the industry. In Godthåb Fjord (Div. 1D) 639 Greenland halibut have been tagged. In the same area, and in Julianehåb district (Div. 1F) a material of herring was collected and a total of 305 specimens was tagged.

4. Deep Sea Prawn.

Continuous research catches were taken on offshore grounds in Divs. 1B and 1D, and new offshore fishing experiments were made in Div. 1E.

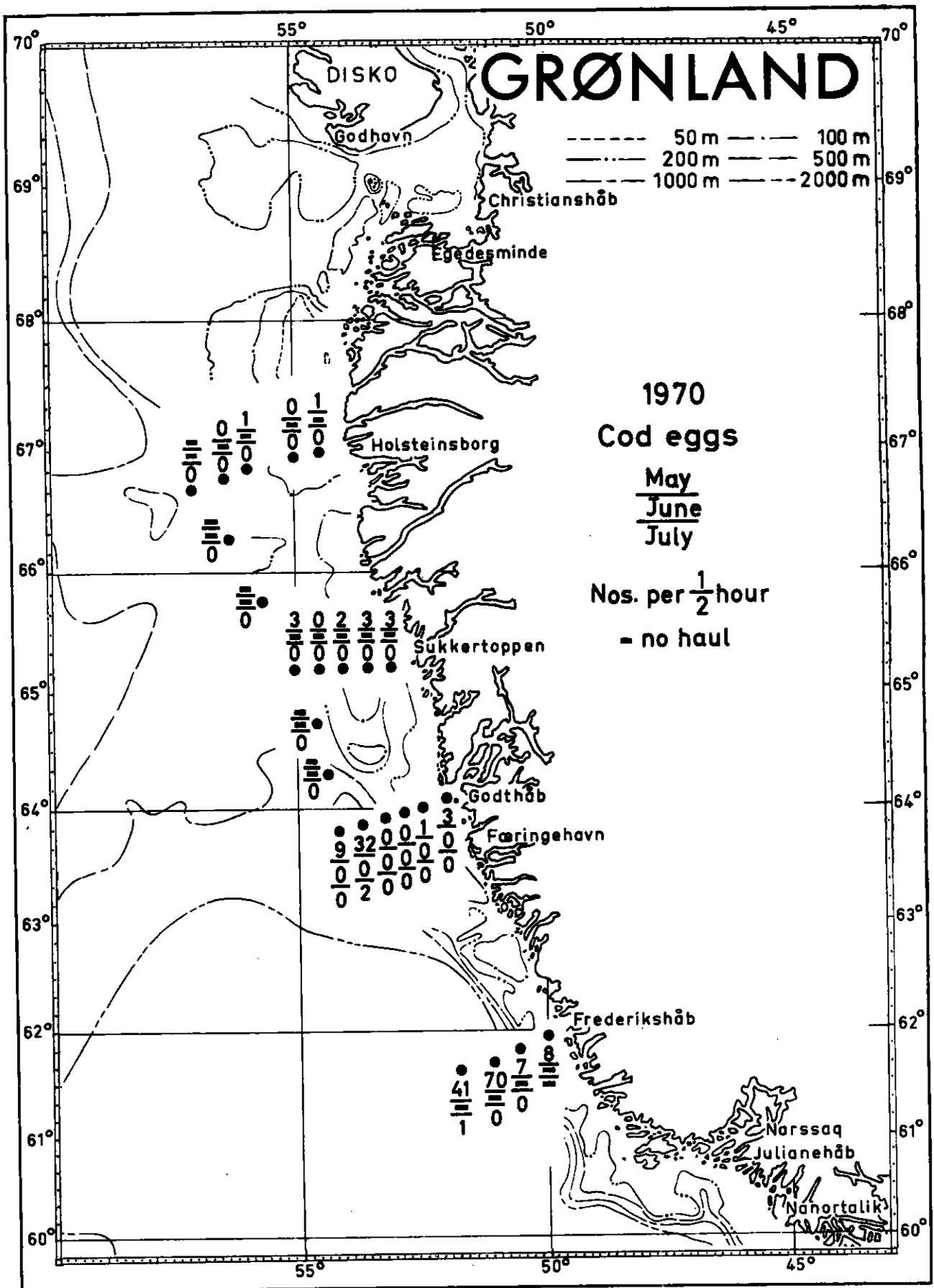
5. Seals.

A material of jaws and sexual organs from hooded seal was collected in Southwest Greenland (Div. 1F) and in East Greenland (Angmagssalik district) for age and maturity determination. In Northwest Greenland (Div. 1A) a material of about 100 harp seal jaws was collected in different settlements, and about 50 jaws of ringed seal have been collected in Angmagssalik district.

C. Practical Fishing Experiments.

As in previous years the Royal Greenland Trade Department (KGH) has conducted practical fishing experiments in Greenland waters. The most important were some comparative experiments with different types of prawn-trawls in Disko Bay (Div. 1A) in order to find the most effective gear. A Norwegian trawl and a Danish North Sea trawl were compared with the traditional Greenland trawl, and as the results were in favour of the Norwegian, several Greenland fishermen have now got the Norwegian type.

Off Sukkertoppen (Div. 1C) an experimental fishing for American plaice has been started for a production of frozen fillets.



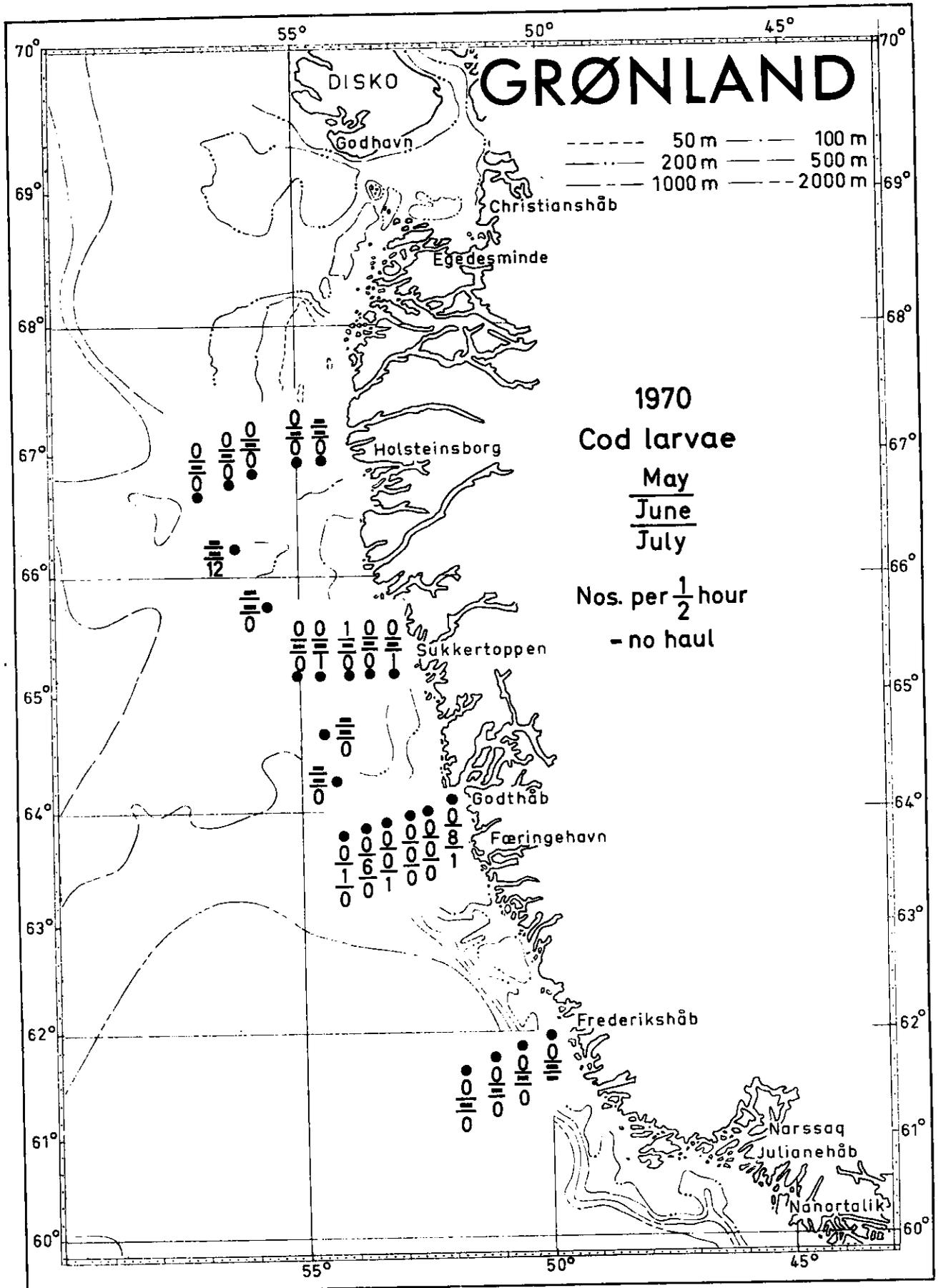


Figure 2. Cod larvae (number per 1/2 hour) taken by 2 m stramin net in the upper water layers (maximum depth about 50 m).

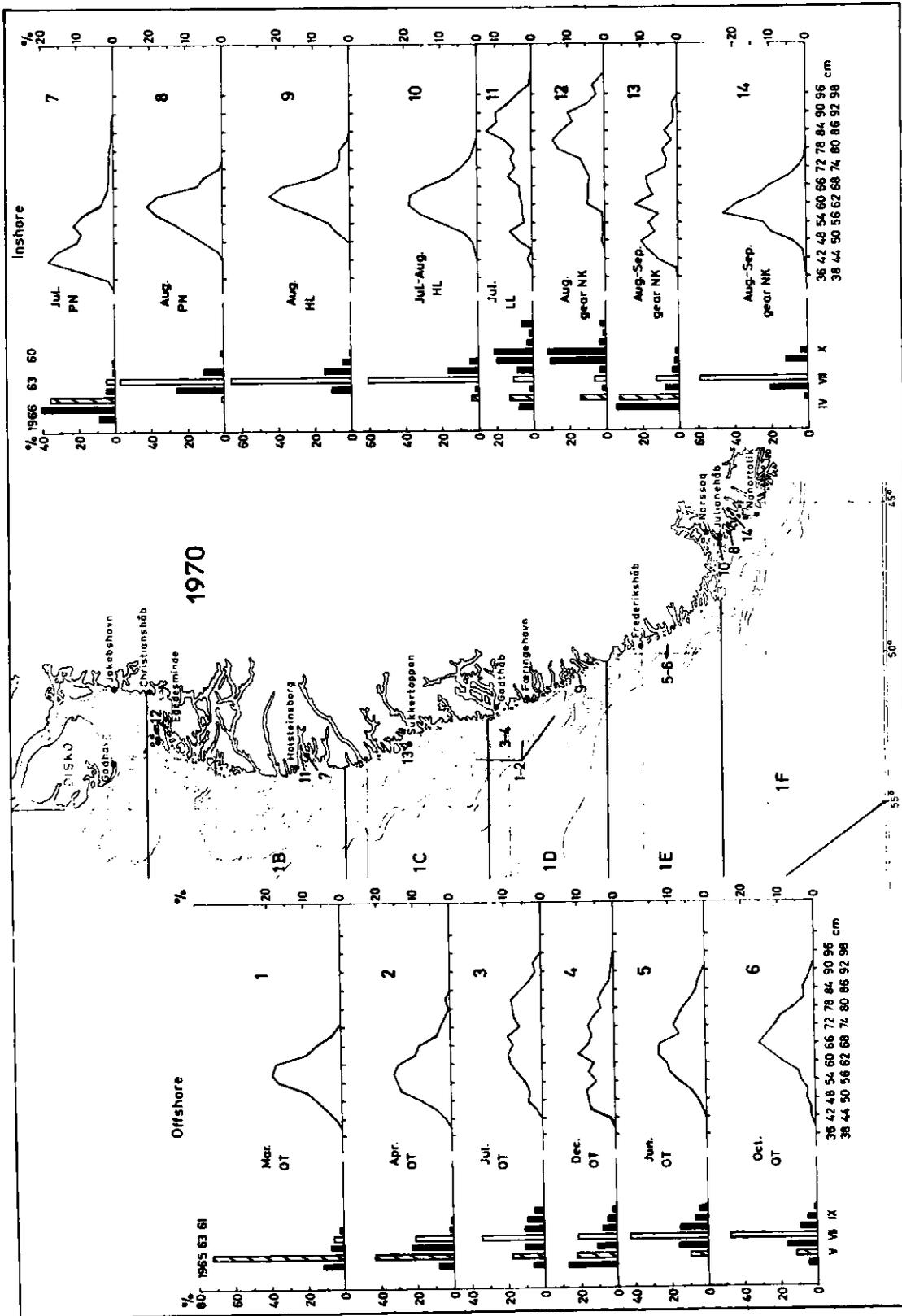


Figure 3. Age and length compositions of cod sampled from commercial landings (one research catch sample No. 10). To the left offshore samples (Nos. 1-6) and to the right inshore samples (Nos. 7-14). The locations at which samples were taken are shown on the map. OT = otter-trawl, PN = pound-net, HL = hand-line (snelle), LL = long-line, NK = gear not known.

Part II

by

Frede Hermann

Hydrographic Conditions off West Greenland during 1970

From R/C Adolf Jensen a number of the standard sections shown in fig 1 were worked during the time May to December, 1970.

Section I off Frederikshåb was worked in May and October, section II across Fylla Bank was worked in May, June, twice in July and in September, October, november and December. Sections III and IV over Lille Hellefiske Bank and Store Hellefiske Bank were worked in May and July.

The ice conditions were rather severe in 1970. Both in April and in July/August the "storis" reached from Cape Farewell to a position north of Godthåb during its maximum extension. In April the "storis" was relatively scattered and in a period with northerly wind in May it disappeared from the bank area off the middle part of West Greenland.

The temperature sections are shown in Figures 2 - 8. As in the two preceding years the temperatures were unusual low in the upper 100 m. In the Fylla Bank section negative temperatures were measured as late as September off the western slope of the bank.

The temperature deviation from the mean value for the period 1950 to 1966 (Hermann 1967) for the station r . 3 (63°53'N-53°22'W) west of the slope of Fylla Bank in July is given in table 1 and the corresponding salinity anomaly is given in table 2.

Table 1. Temperature anomalies west of Fylla Bank in July.

Depth interval	0-50	50-100	100-200	200-300	300-400	400-500	0-500
Mean Temp. 1950-1966.	2.07	1.33	1.85	2.88	3.79	4.22	2.89
Δ t, July 1970.	-1.31	-1.12	-1.73	-2.06	-1.19	-0.08	-1.2

Table 2. Salinity anomalies west of Fylla Bank in July.

Depth interval	0-50	50-100	100-200	200-300	300-400	400-500	0-500
Mean S‰ 1950-66	33.29	33.65	34.00	34.39	34.67	34.81	34.27
Δ S‰, July-70	-0.46	-0.50	-0.56	-0.60	-0.30	+0.03	-0.38

In the upper 400 metres the temperature was between 1° and 2° lower than the mean value and the salinity was between 0.30 ‰ and 0.6 ‰ lower than the mean value. The low temperature and salinity indicate a strong inflow of polar water to the West Greenland area.

Fig. 9 shows the 5 years running mean values of the sea surface temperatures the the West Greenland area (A₁) and South Greenland area (B) based on the sea surface anomalies published by Jens Smed (Jens Smed) for the years up to 1969.

The strong decrease in temperature in the last half of the sixties is rather alarming.

The low temperature in the surface layers will probably affect the survival of the cod larvae. The cod yearclass 1970 will probably be very small in the Northwest Greenland area.

The author is grateful to Jens Smed for placing the unpublished temperature anomalies for 1969 at his disposal.

References:

Hermann, F.: "Temperature variations in the West Greenland area since 1950".

I.C.N.A.F., Redbook 1967, IV.

Smed, Jens: "Monthly anomalies of the surface temperature of areas of the Northern North Atlantic".

I.C.E.S. Ann.Biol. up to 1968.

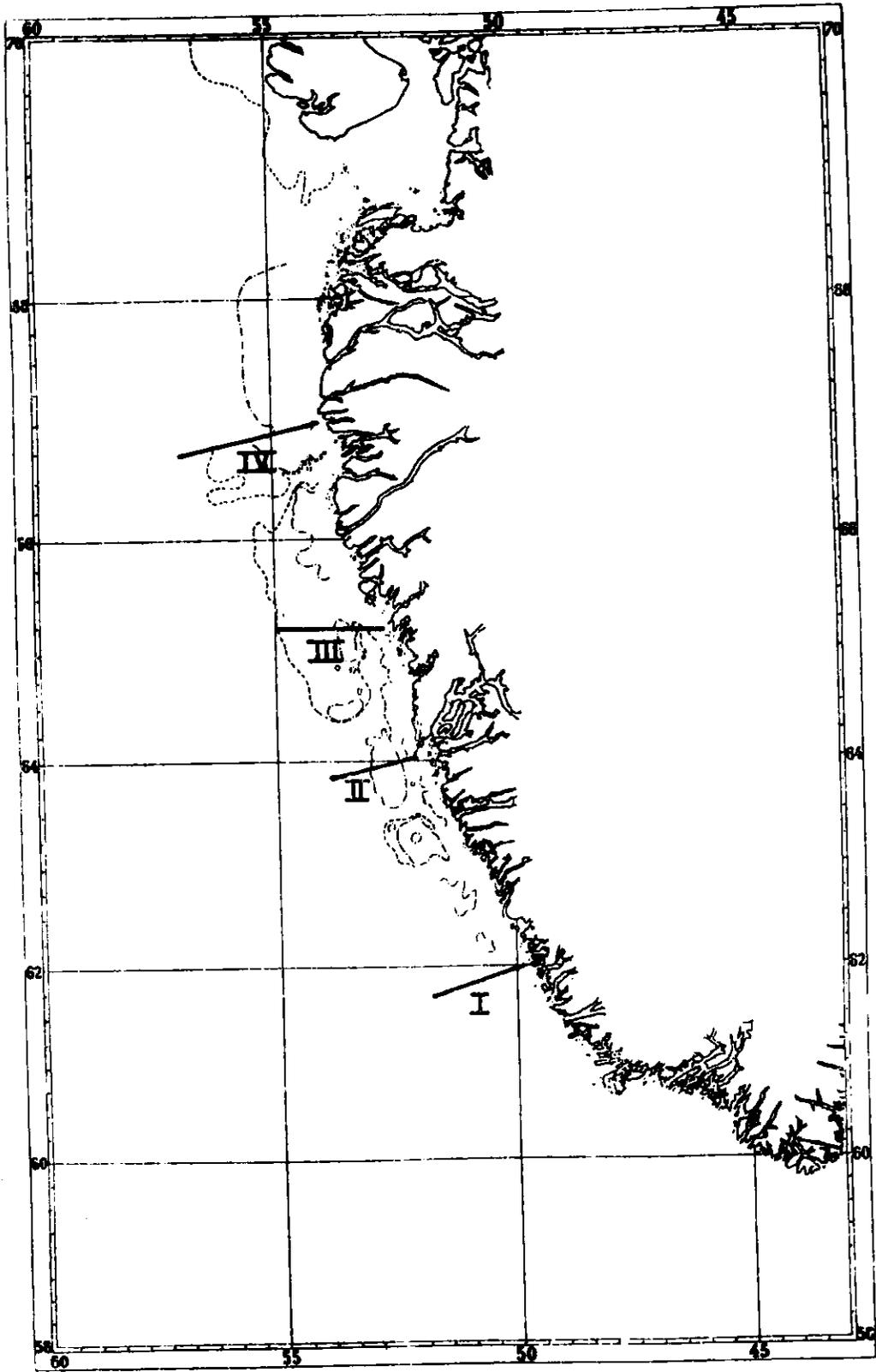


Figure 1. Location of sections.

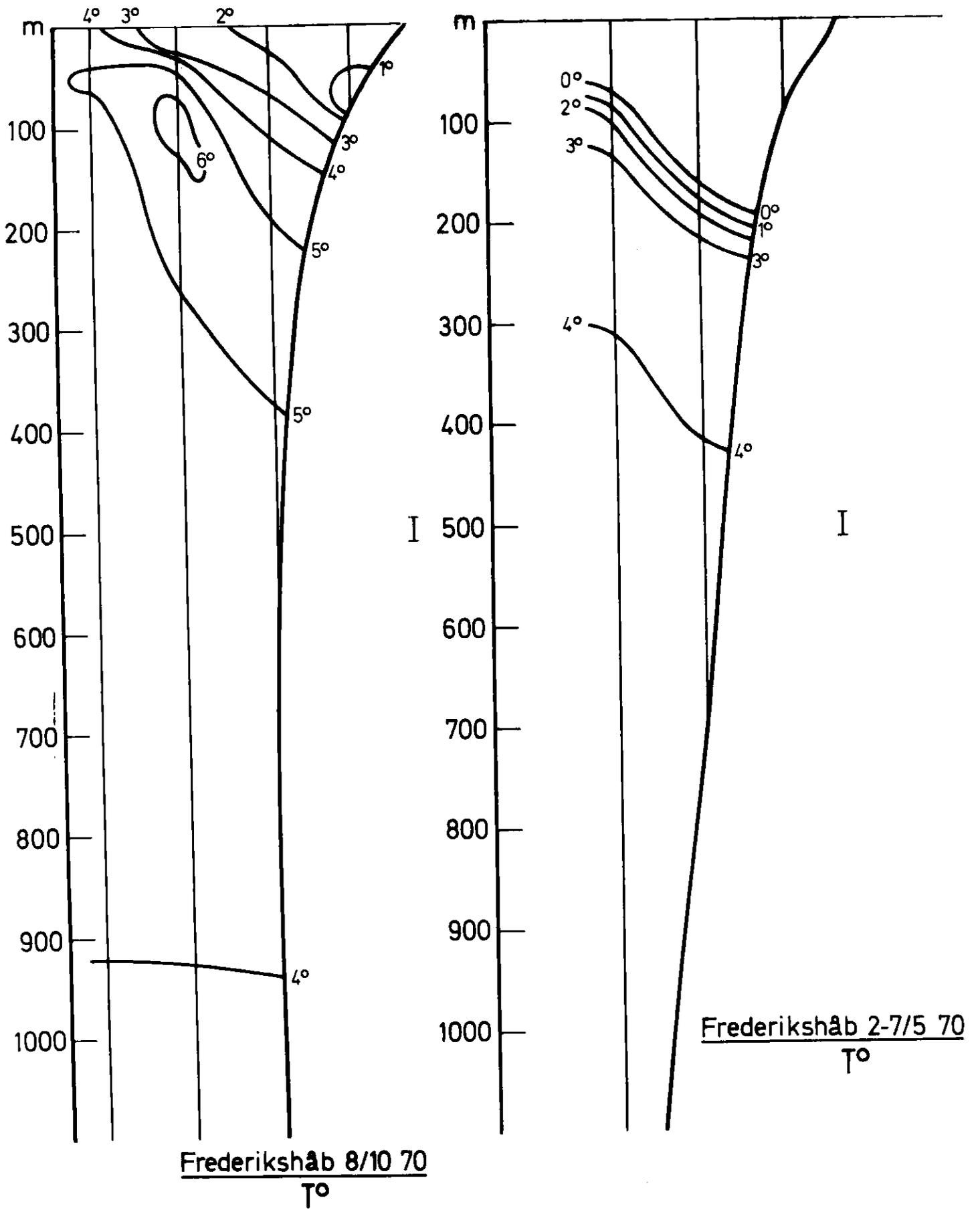


Figure 2. Temperature sections off Frederikshab (I) for May and October, 1970.

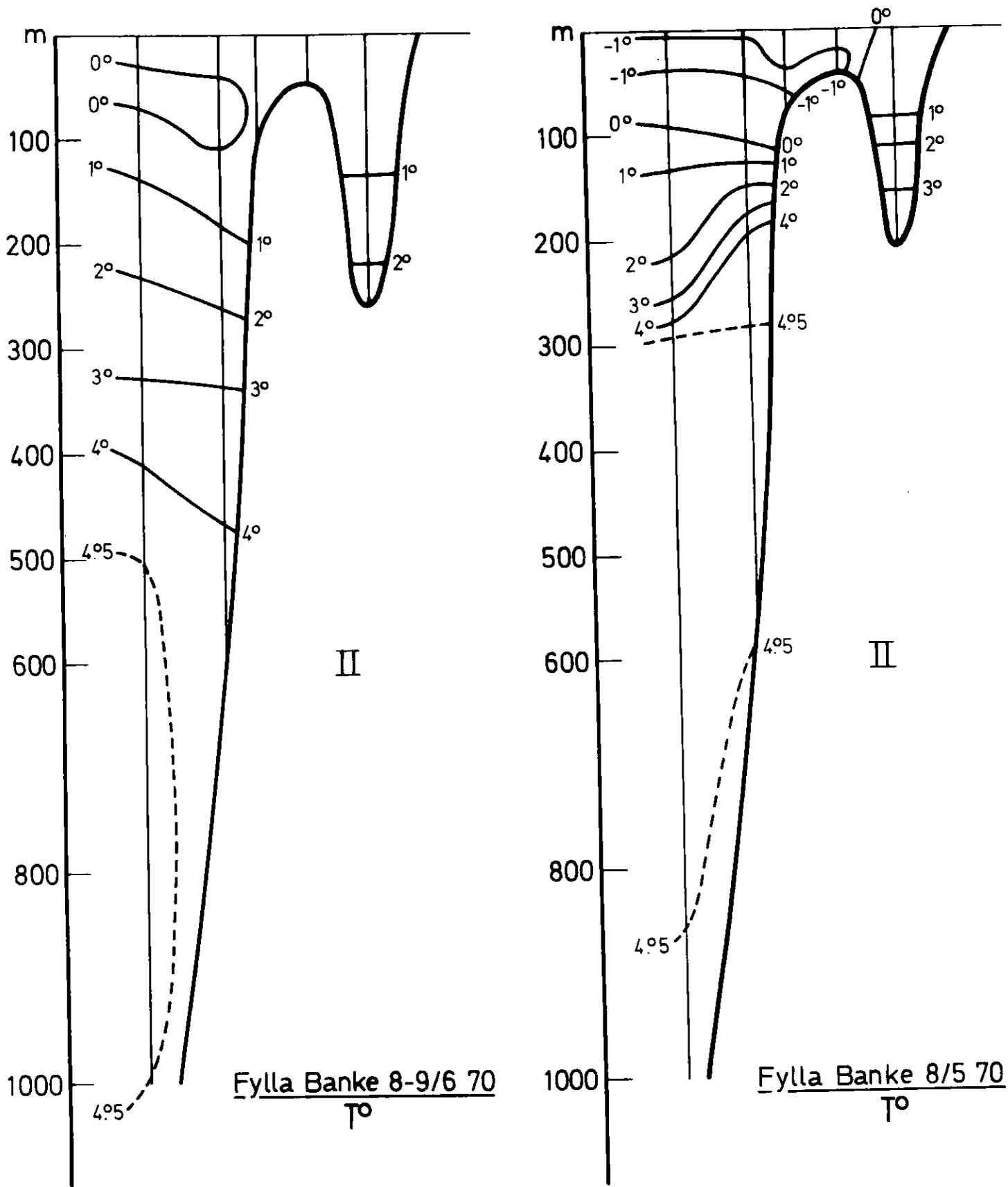


Figure 3. Temperature sections across Fylla Bank (II) in May and June, 1970.

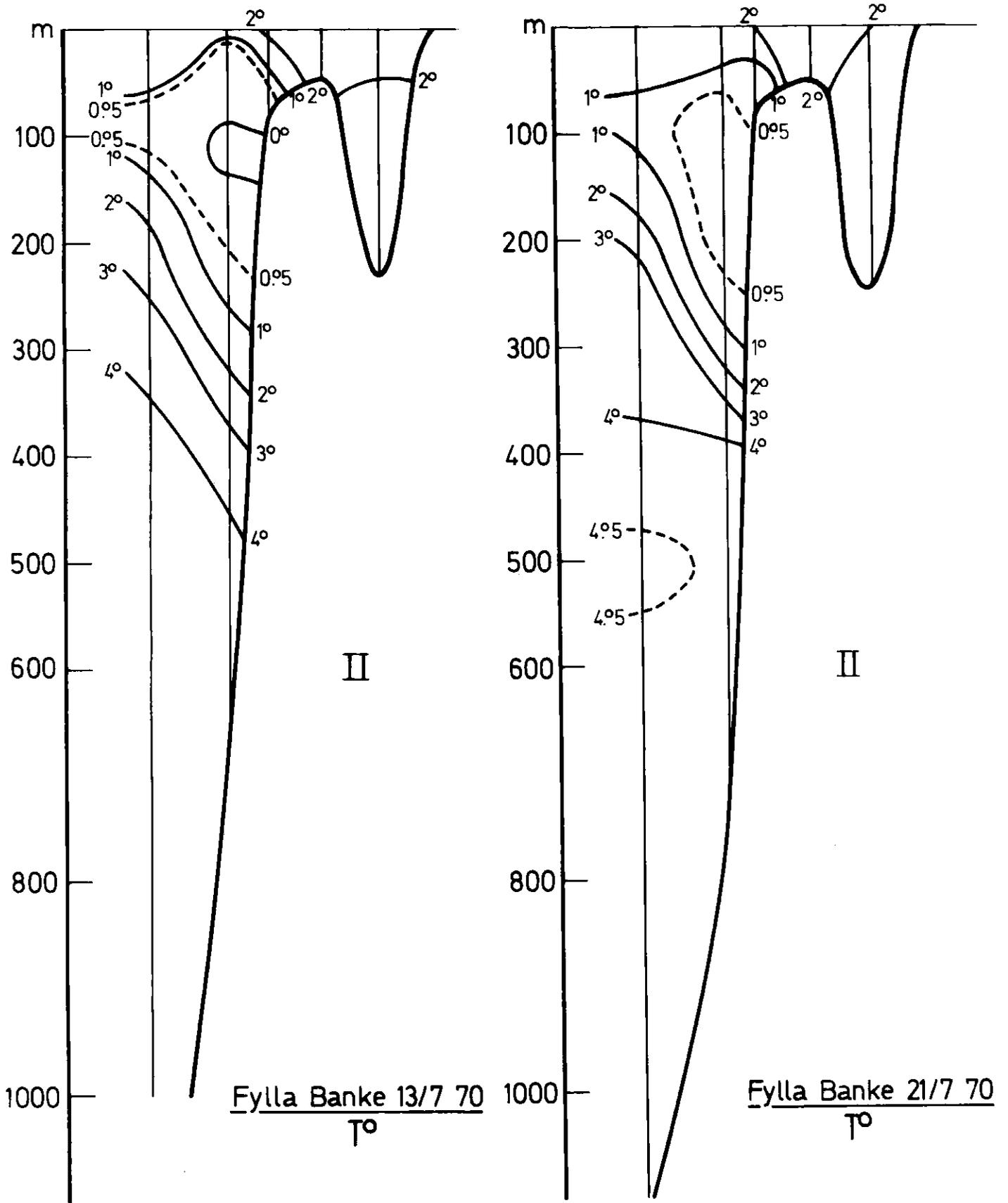


Figure 4. Temperature sections across Fylla Bank (II) in July, 1970.

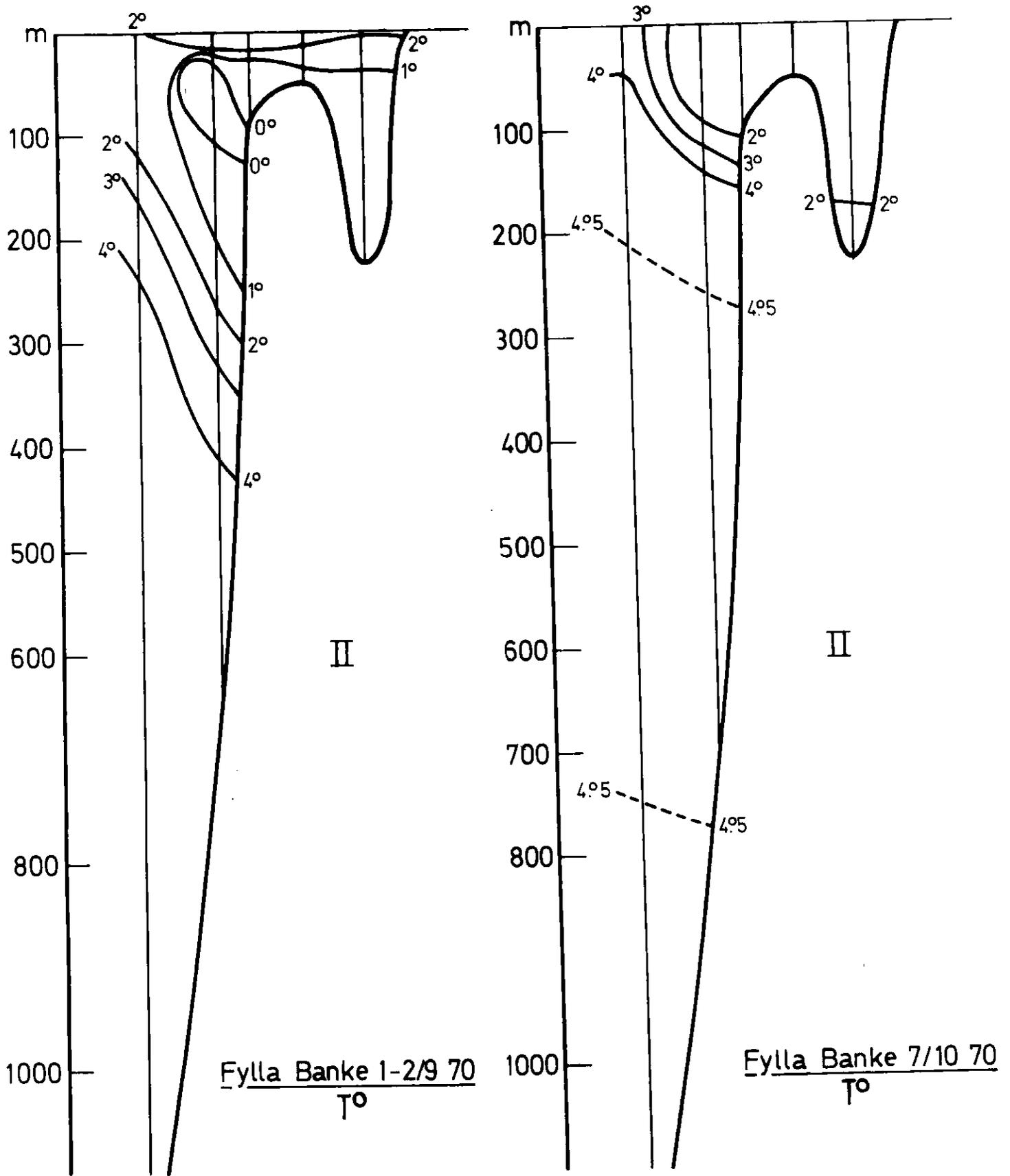


Figure 5. Temperature sections across Fylla Bank (II) in September and October, 1970.

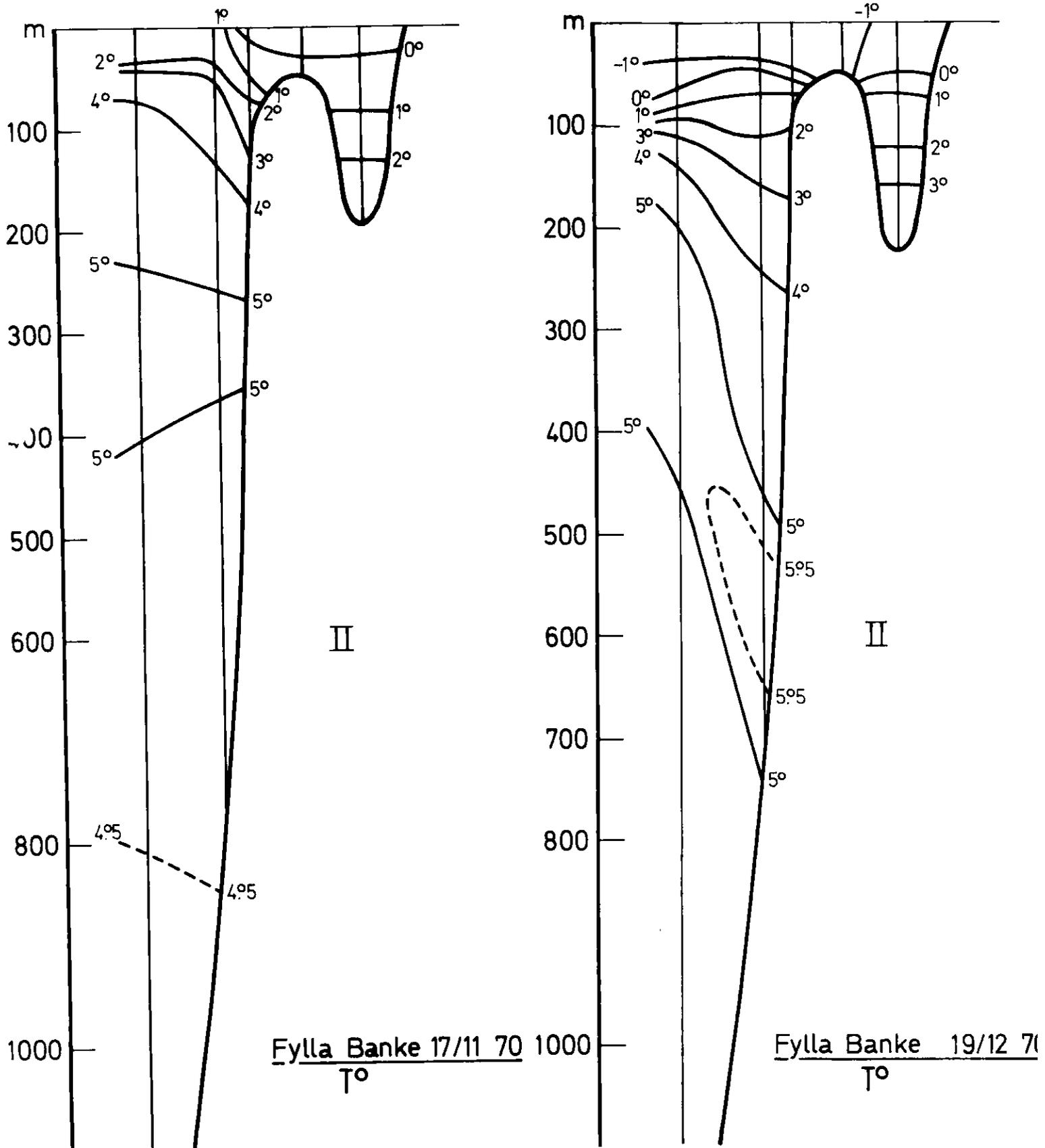


Figure 6. Temperature sections across Fylla Bank (II) in November and December, 1970.

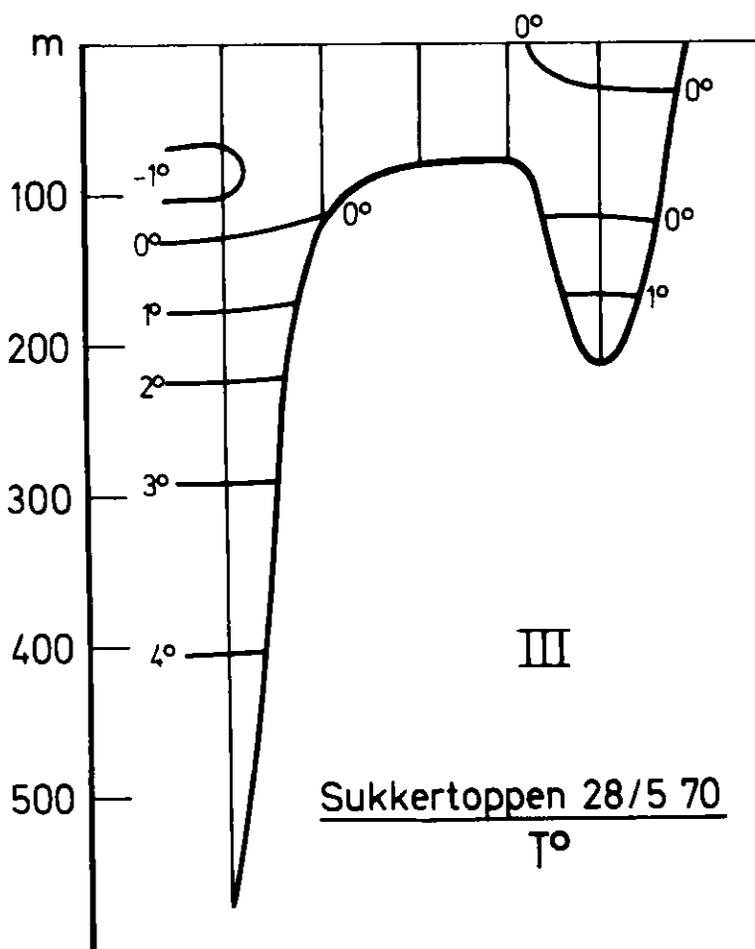
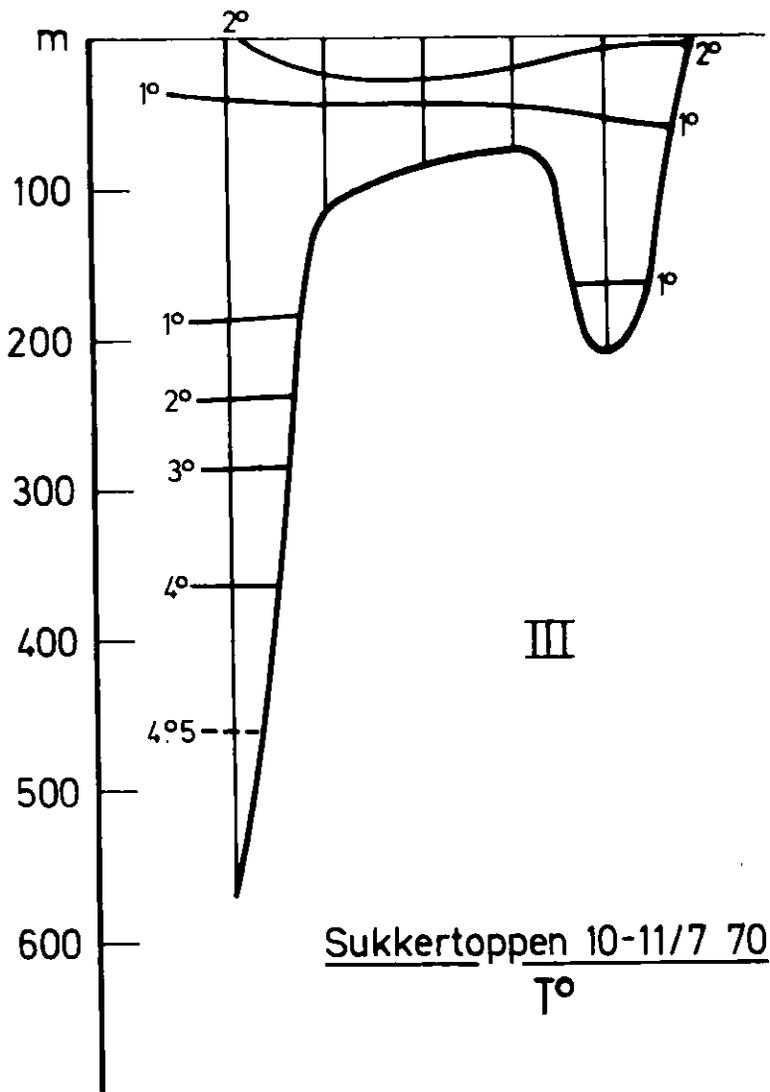


Figure 7. Temperature sections across Lille Hellefiskebanke (III) in May and July, 1970.

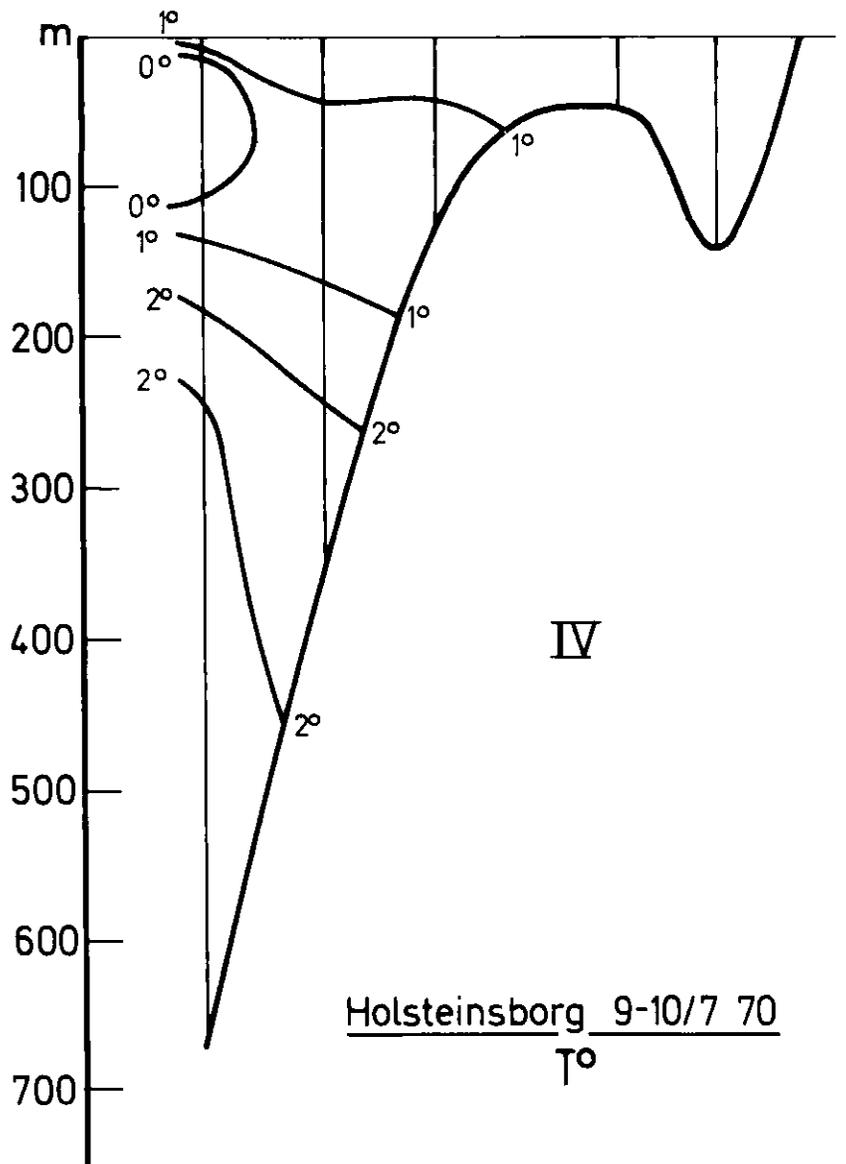
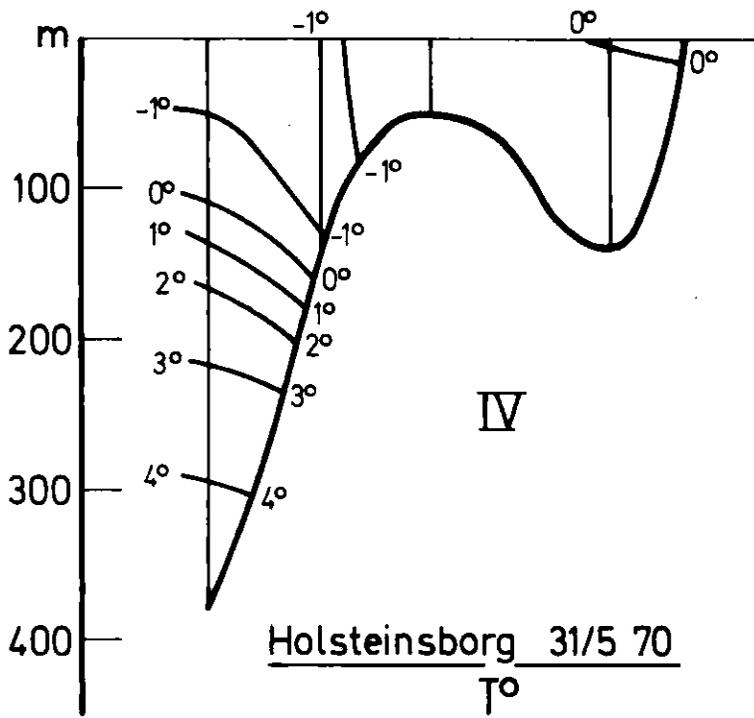


Figure 8. Temperature sections across Store Hellefiskebanke (IV) in May and July, 1970.

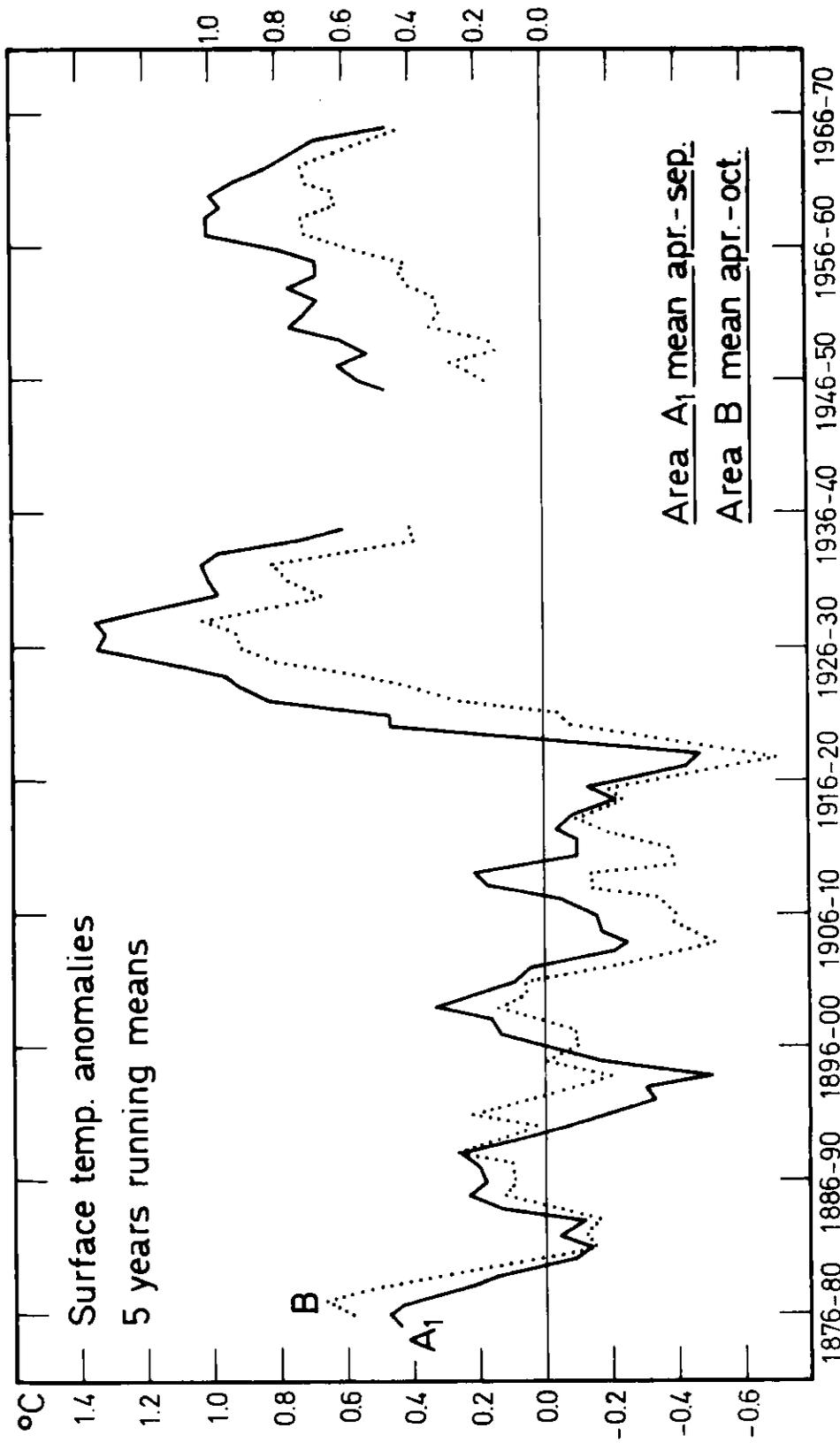


Figure 9. Sea Surface temperature anomalies, 5-years running mean value.

A₁ (full drawn curve): West Greenland area.

B (hatched curve): South Greenland area.