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I. Biology
by Paul M. Hansen

A. Cod Fry and Small Cod in Coastal Waters and on the Offshore Banks of West Greenland in 1961.

1. Occurrence of eggs and larvae.

Cod eggs were very scarce in the catches in 1 m stramin net, in 30 min. hauls with 100-50 m wire out in the Godthaab Fjord, as was also the case in the two previous years. Hauls were taken in January, February, March, April and May. The first cod eggs were taken 22 March in the inner part of the fjord but in small numbers. The best catch was 150 eggs. In the middle and last part of May cod eggs were more numerous. In two catches 1870 and 1427 cod eggs were taken respectively.

Investigations on the occurrence of cod eggs and larvae over Fylla Bank were carried out 24 April and 27 June. At each date hauls with 1 m stramin net, in 30 min. with 100-50 m of wire were taken on three stations: 1. Between the coast and the bank. 2. Over Fylla Bank. 3. Western slope of Fylla Bank.

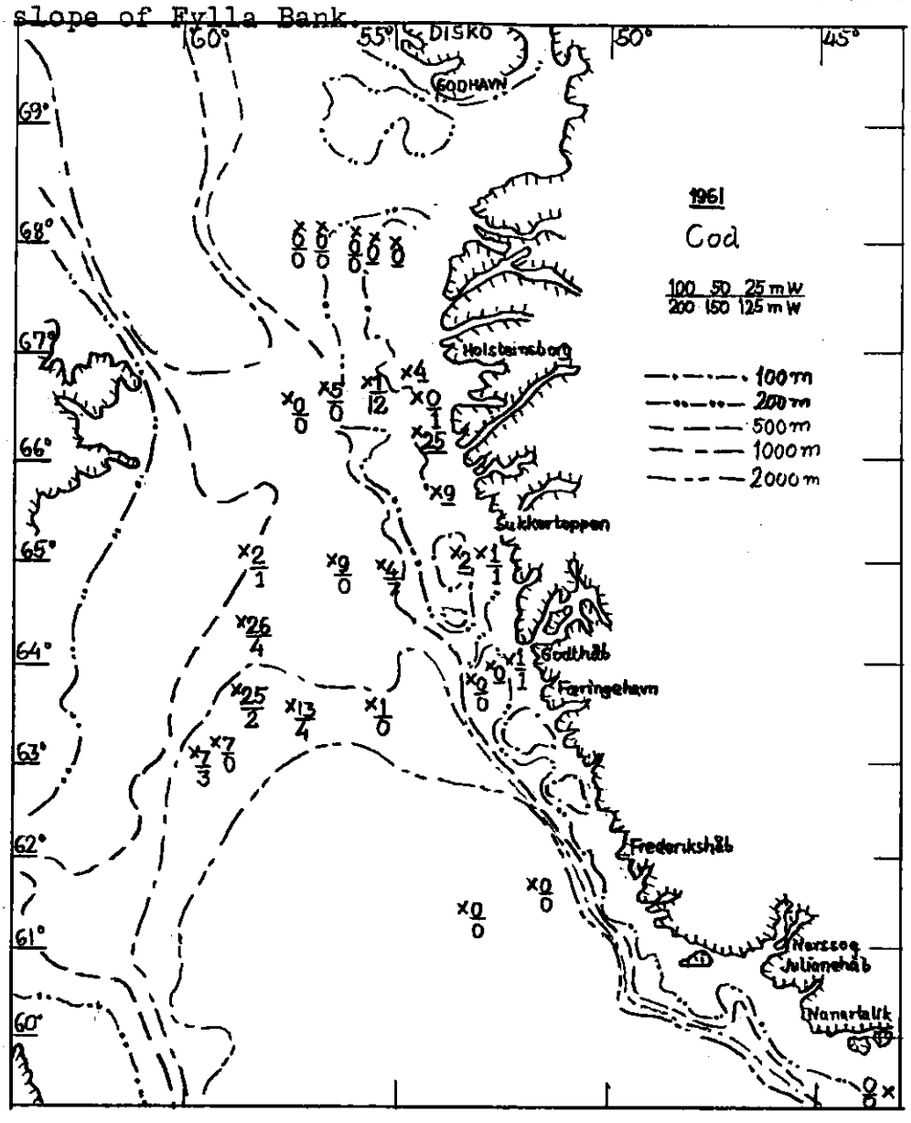


Fig. 1. Numbers of cod larvae caught per 30 minutes step-hauls with the 2m stramin net, 1961.

The results were: (No. of larvae are given in brackets)

| St. | 1 | 2 | 3 |
|---|---|---|---|
| 24 April | 79 (0) | 1 (0) | 787 (0) |
| 27 June | 0 (22) | 0 (14) | 0 (0) |

On Station 3, 441 cod eggs together with 1 larvae were taken 24 April in one haul with 300 m of wire out.

In Fig. 1 are shown the catches of cod larvae caught with 2 m stramin net by "Dana" in July. The numbers of cod larvae in the catches in Davis Strait were very small. The highest numbers were 26 larvae taken 26 July in two hauls with 100-25 m wire far west of Fylla Bank (63°43'N.58°42'W. and 64°24'N.58°37'W.) In a haul 28 July on 66°17'N. 54°29'W. with 100-25 m wire, 25 cod larvae were caught. On all the other stations with the exception of two, the numbers of cod larvae were below ten. The reason for the small catches may be the exceptionally large size of the larvae in July 1961. More than 66% are larger than 20 mm. Probably many of the largest larvae have escaped from the gear.

Owing to this fact it is impossible to form an estimate of the value of 1961 year-class.

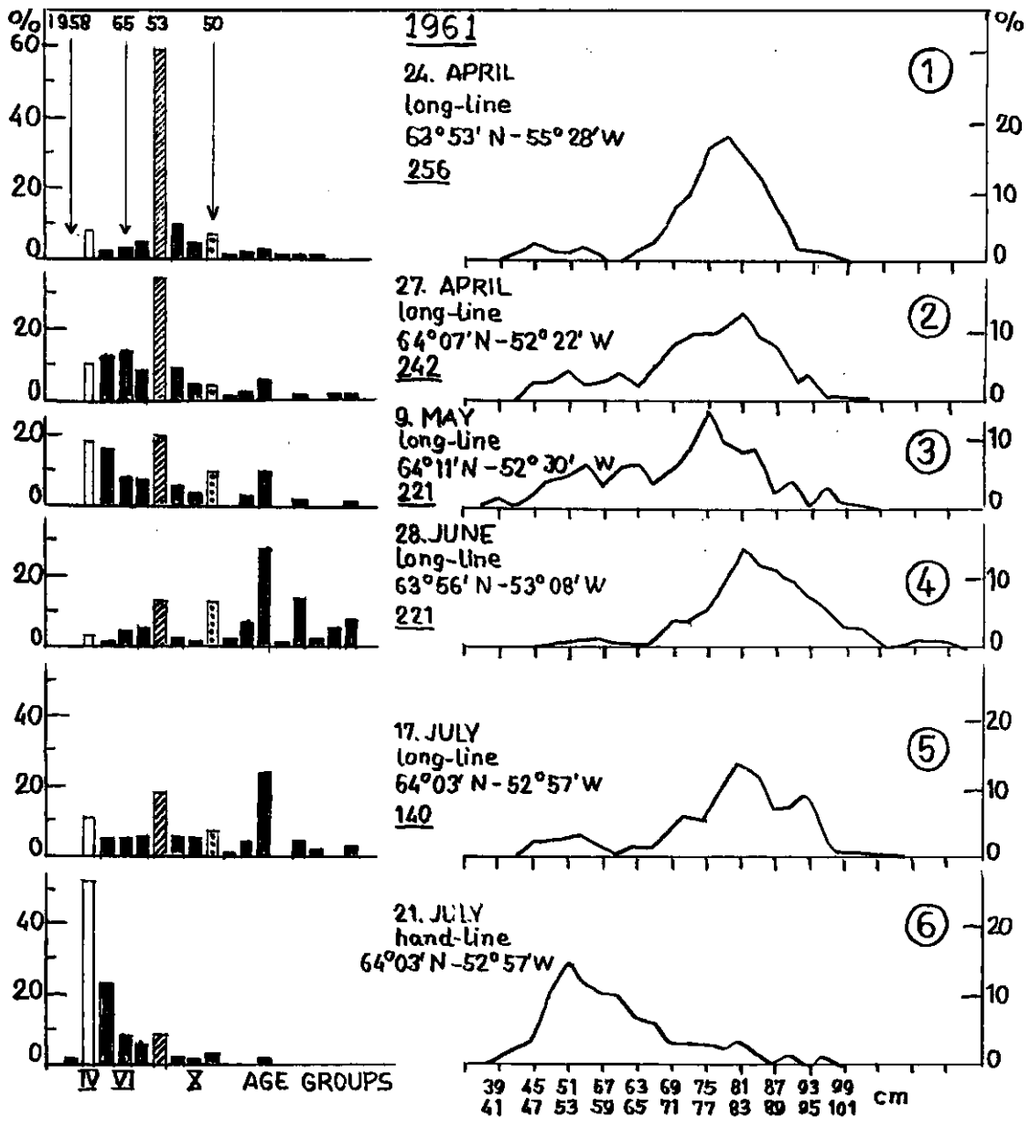


Fig. 2. Age-and length distribution of cod caught on long lines on oggdhotr banks in 1961.

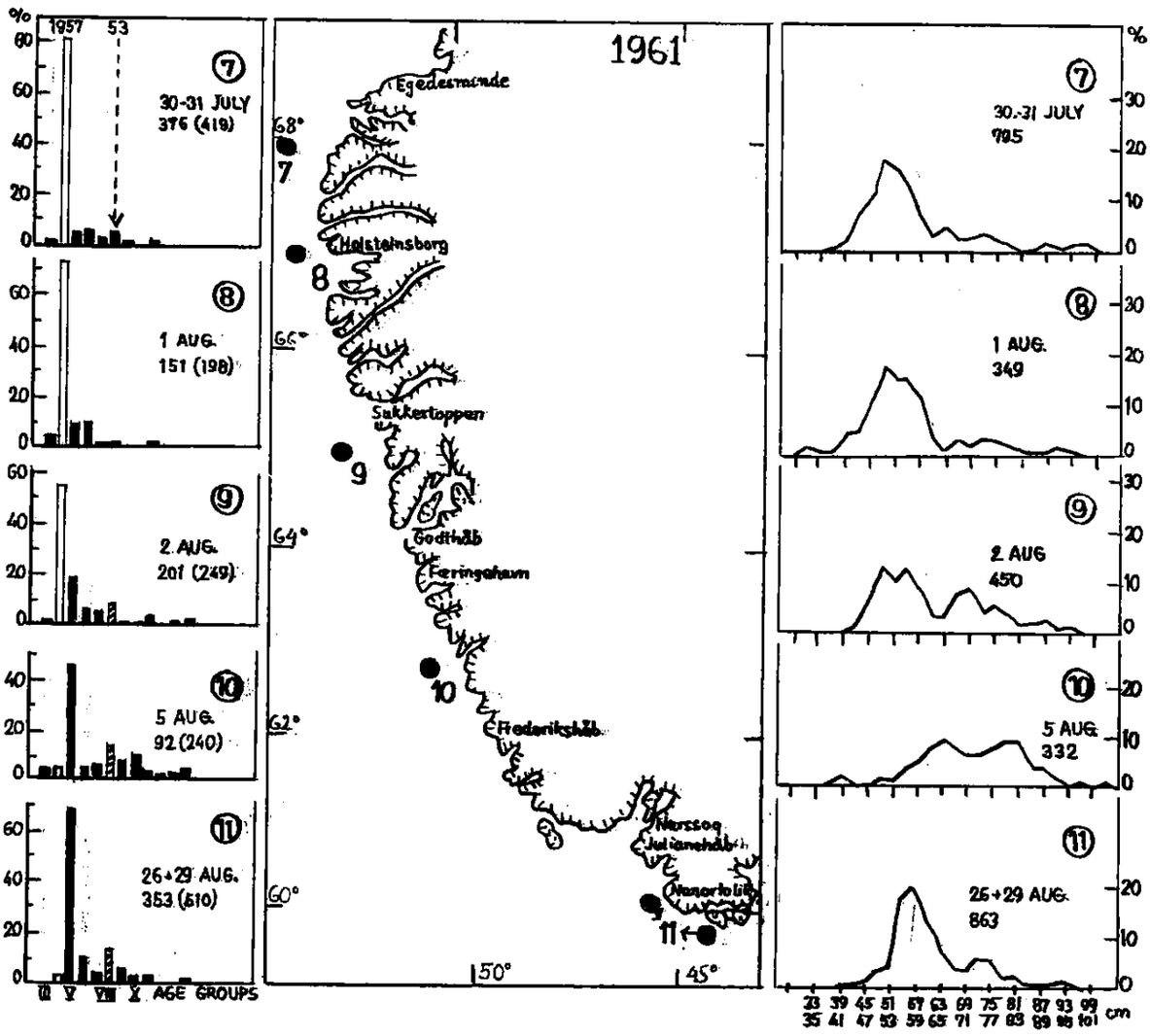


Fig. 3. Age-and length distribution of cod caught on hand line on offshore banks in 1961.

2. Occurrence of age-groups I, II and III.

Only two samples of small cod were collected in 1961. One sample (64 individuals) was taken with shrimp trawl in the coastal area south of Godthaab (1 D) 10 February. The sample contained practically only one single age-group, namely the III-group (1958 year-class). The other sample was taken with hand seine from the shore near Godthaab (1 D). This sample contained 771 small cod. The length frequencies show that the two age-groups I and II (1960 and 1959 year-classes) are represented in equal numbers.

Only few small cod were observed close to the shore in the coastal region in all divisions. The only exception was the harbour of Christianshaab (1 B) where large shoals of small cod occurred in July and August feeding on waste discarded from the shrimp plant. From the size of these small cod it was easy to distinguish three age-groups: I, II and III. The I-group was found in shallow water close to the shore, while the II- and III-groups occurred in deeper water at some distance from the shore. The II-group was found in the middle of the harbour and the III-group farther out near the entrance to the harbour. This phenomenon has been observed in the harbour of Christianshaab every year since the shrimp plant was built.

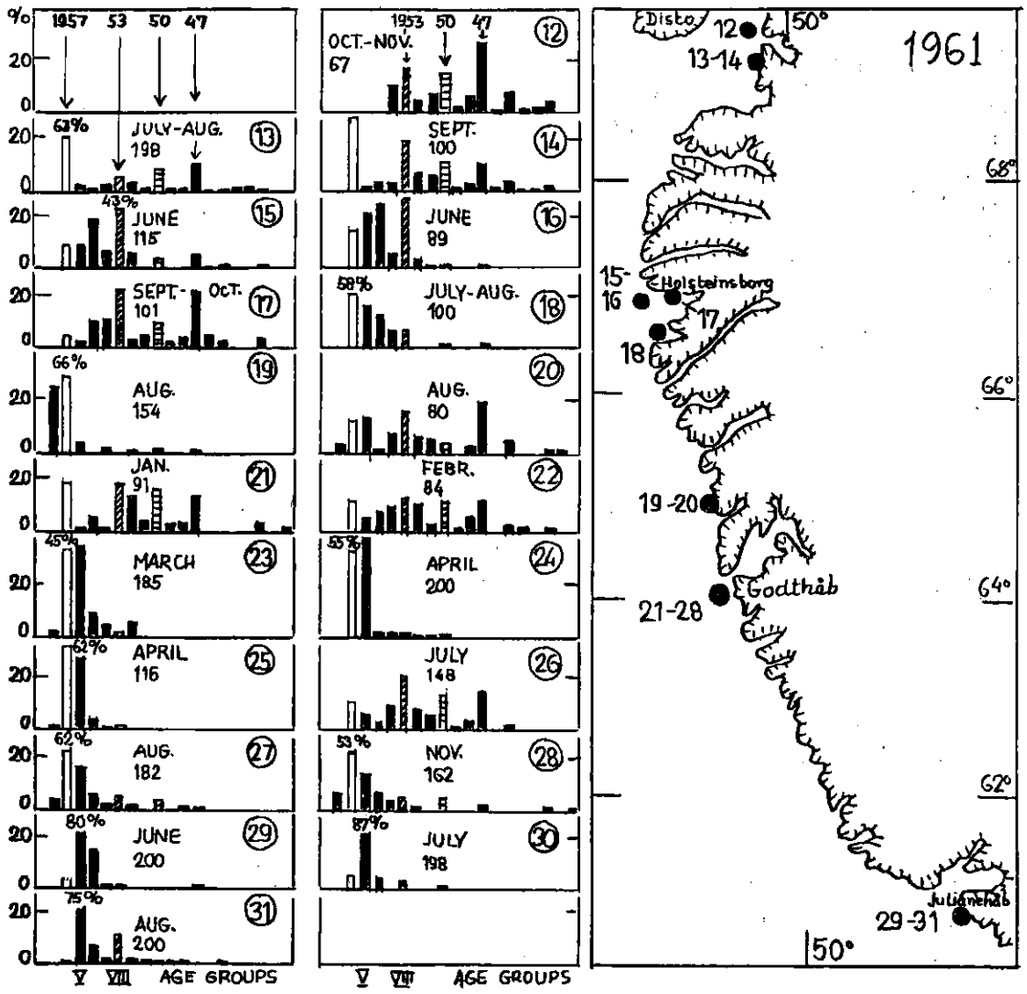


Fig. 4. Age distribution of cod caught in inshore waters and fjords in 1961.

B. Cod Investigations, Offshore Banks and Coastal Waters, West Greenland, 1961.(Commercial Fish)

1. Offshore banks.

Otoliths of 2101 cod were collected from the offshore banks: 1080 from long line catches on Fylla Bank by the "Adolf Jensen" in April-July; 1021 from hand line catches by the "Dana" and the "Adolf Jensen" 17 July - 5 August on Store Hellefiske Bank, Lille Hellefiske Bank, Fylla Bank and Dana Bank.

The age compositions and length frequencies are given in Fig. 2. Large old cod belonging to the year-classes 1953 and 1947 predominate in the long line catches.

In the two catches No. 1 from the western slope of Fylla Bank depth 270 m and No. 2 from the east of Fylla Bank depth 80-170 m, the 1953 year-class predominates with about 60% and 30% respectively. Both catches are taken in April when the spawning had nearly finished. The percentage of sexually immature cod were 11.4% (No.1) and 46.3% (No.2). The smallest amount of immature individuals was found in the catch from the western slope of Fylla Bank in the spawning area. Of the cod spawning this year 95.6% (No.1) and 93.9% (No.2) were spent and 4.4% (No.1) and 6.1% (No.2) had ripening milt or roe.

In sample No.3, Fylla Bank, May, the 1953 year-class is still predominating but only with 19.4%; the second and third largest year-classes are 1957 (17.6%) and 1956 (15.4%).

In sample No.4, west of Fylla Bank, 120-325 m, June, the old 1947 year-class predominates with 27.6%. The second best is the 1945 year-class with 13.1%, followed by the 1950 and 1953 year-classes, both with 12.2%.

The samples Nos 5 and 6 are from catches taken 17th and 21st of July east of Fylla Bank, depth 75-130 m. In No.5, which is from a long line catch the 1947 year-class predominates with 23.6%, the 1953 year-class is represented with 17.9% and 1957 with 11.4%. Sample No.6, which is a hand line catch, is quite different in age composition from No.5 although it is taken in the same place and depth. The 1957 and 1956 year-classes together make up about 75% of the sample. 1957 constitute 52.2% of the sample.

The mean ages, lengths and weights of cod from the six samples are as follows:

| Sample Nos. | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Mean age | 8.3 | 7.7 | 8.0 | 12.7 | 9.9 | 5.2 |
| " length | 76.3 | 74.4 | 71.7 | 86.1 | 79.6 | 61.0 |
| " weight | 3.8 | 3.8 | 3.4 | 6.3 | - | - |

The age compositions and length frequencies of cod in hand line catches from "Dana" are given in Fig. 3. The 1957 year-class predominates strongly in the samples from the two northern banks, Store and Lille Hellefiske Banks. In sample No.7 from the northern Store Hellefiske Bank (68°00'N.) the 1957 year-class amounts to 81.2%, while it amounts to 73.8% in sample No.8 (66°53'N.). In the sample from Lille Hellefiske Bank the 1957 year-class still predominates with 54.8%.

The sample from Dana Bank is quite different from the samples of the northern banks in age and size composition. The 1956 year-class predominates with 43.2% while the 1957 year-class only amounts to 4.9%. The length frequency graphs in Fig. 3 show clearly that the number of larger cod increase gradually in the samples from north to south. In the samples from Store Hellefiske Bank by far the largest number of cod are too small to be of any value in the fishing industry.

Sample No. 11 is from the Nanortalik and Cape Farewell regions. In this sample the 1956 year-class predominates with 67.4%.

2. Inshore waters and fjords (Fig. 4).

20 samples were taken from coastal areas as follows:

| Division | A | B | C | D | F |
|---|---|---|---|---|---|
| Nos. | 12 - 14 | 15 - 18 | 19 - 20 | 21-28 | 29 - 31 |

All samples from Divisions C and D, and sample No.16 from B, are from catches taken by "Adolf Jensen". All other samples are from catches landed by Greenland fishermen.

A. Sample No.12 is from a long line catch in deep water and consists of old year-classes with the 1947 year-class predominating (26.9%). The 1953, 1950 and 1954 year-classes amount to 16.4%, 14.9% and 10.4% respectively. In Nos. 13 and 14 1957 predominates with 63.1 and 28.0%.

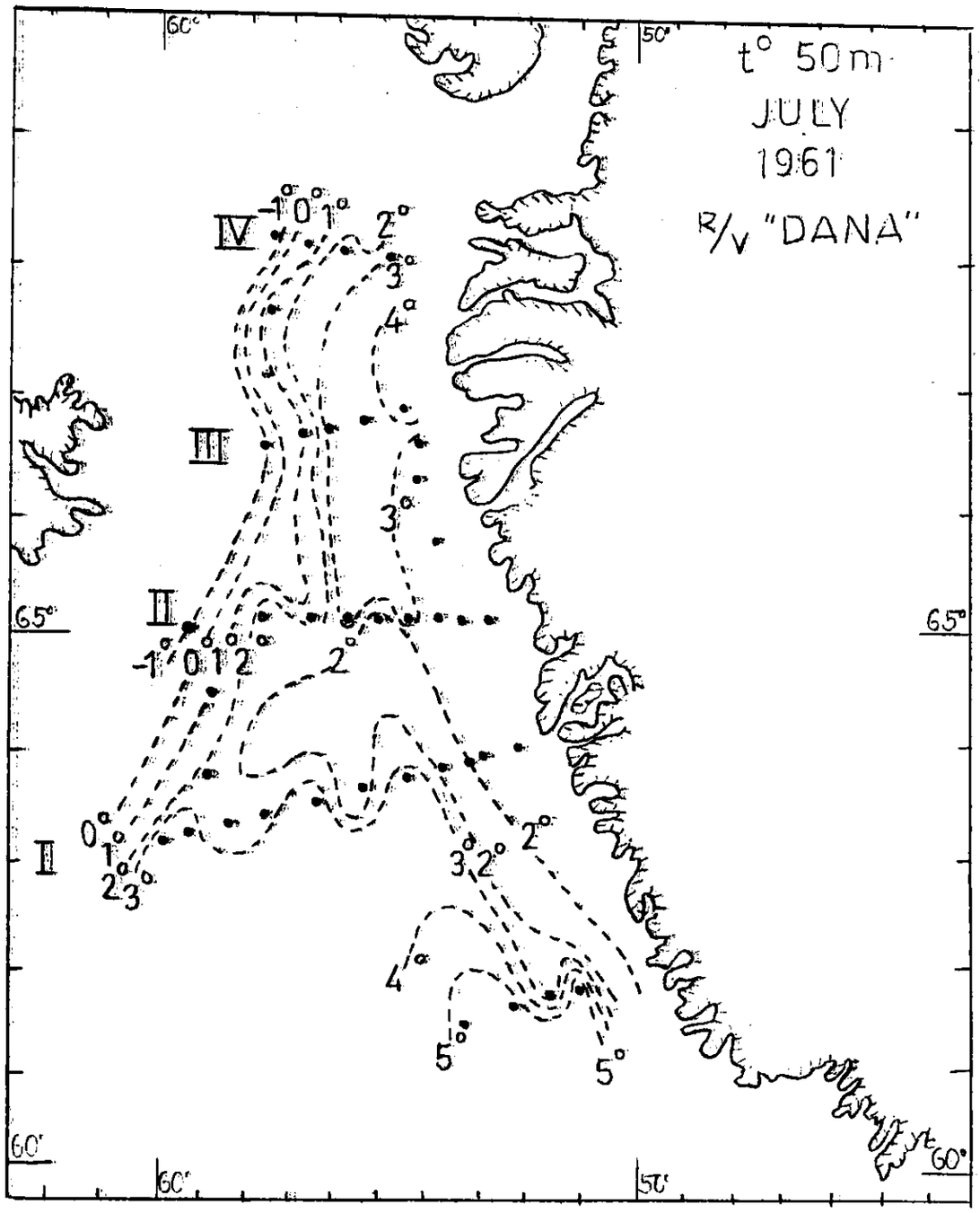


Fig. 5. Location of stations and distribution of temperature at 50 metres, July 1961.

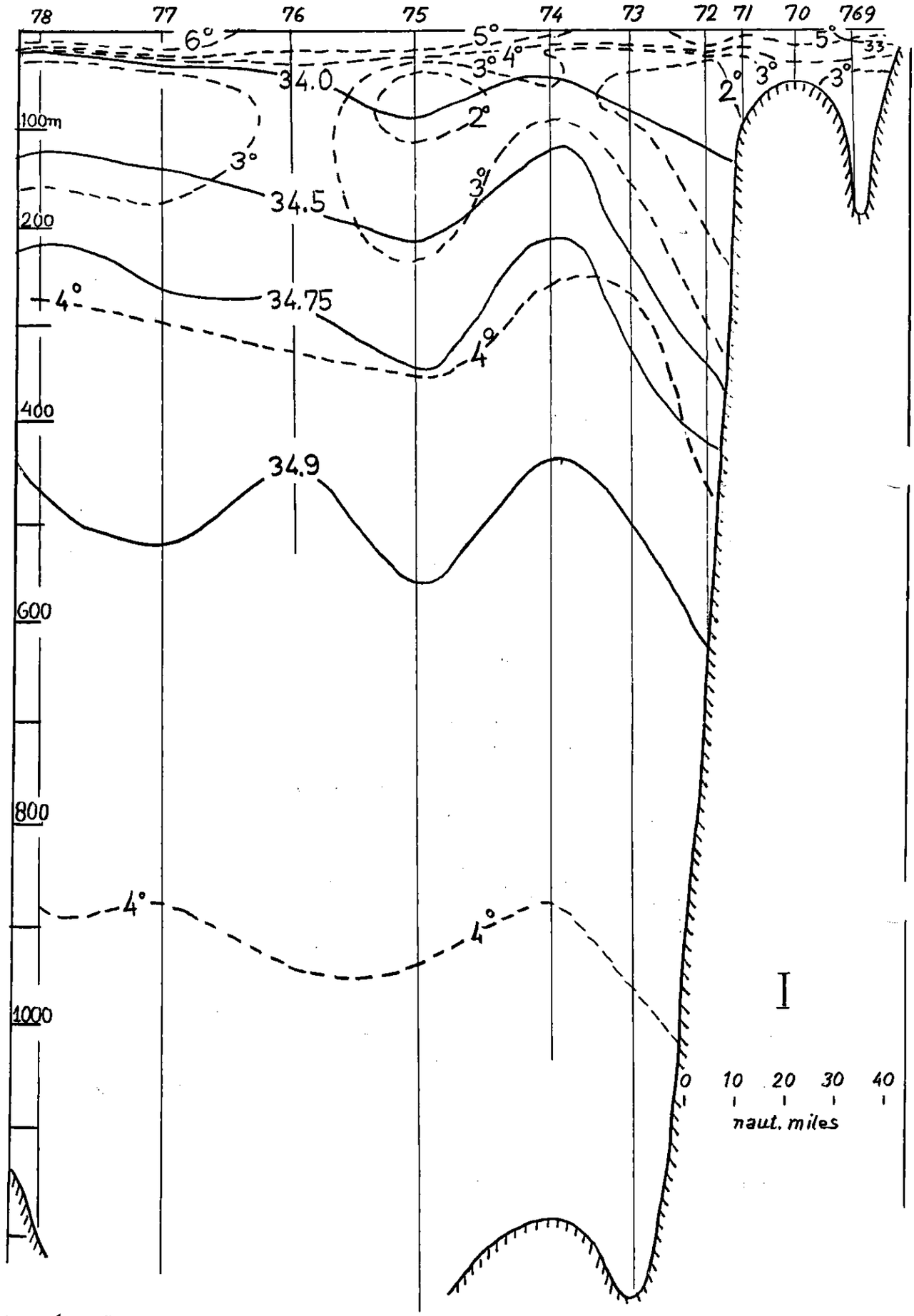


Fig. 6. Section I across Fylla Bank, July 24th to 26th, 1961 (the two western-most stations not shown).

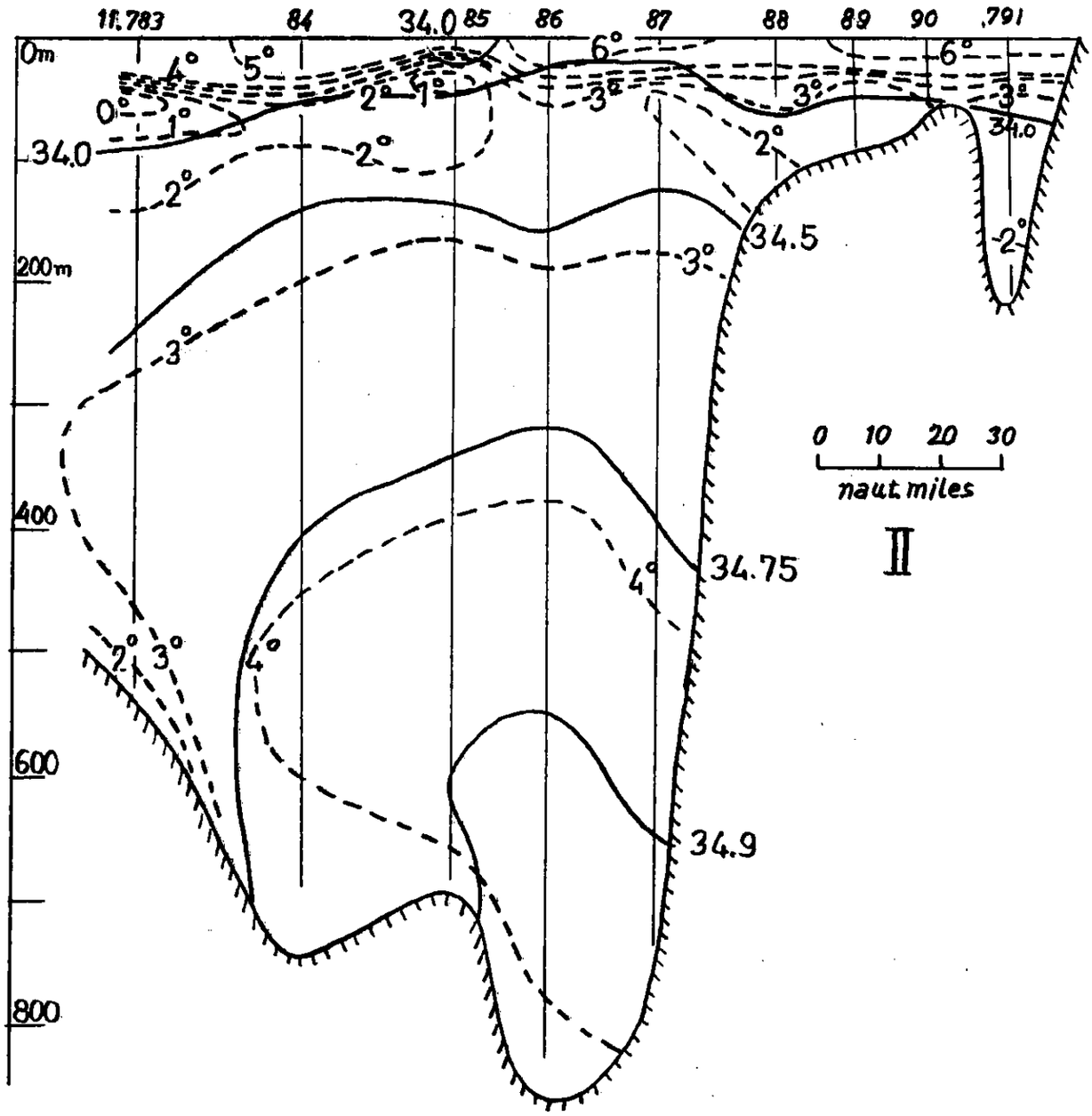


Fig. 7. Section II across Lille Hellefiske Bank, July 27th to 28th, 1961.

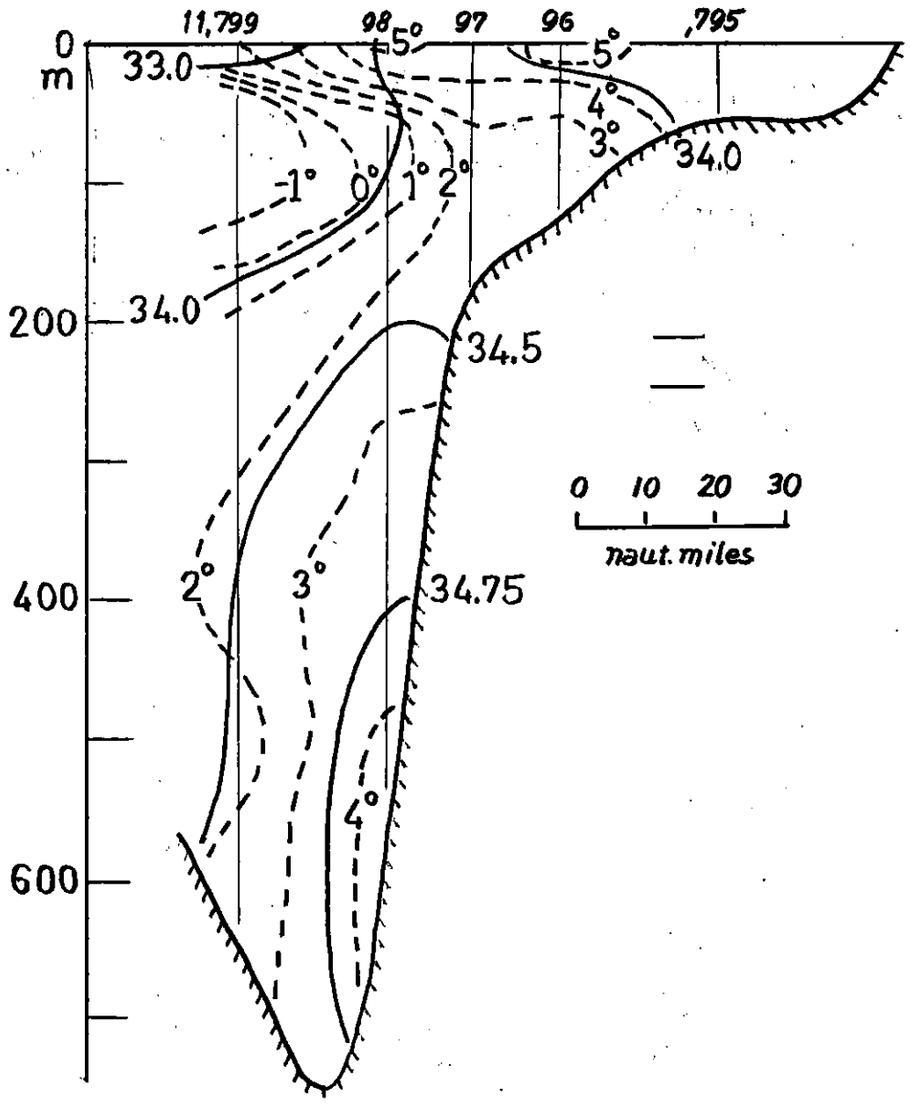


Fig. 8. Section III across Store Hellefiske Bank, July 29th, 1961.

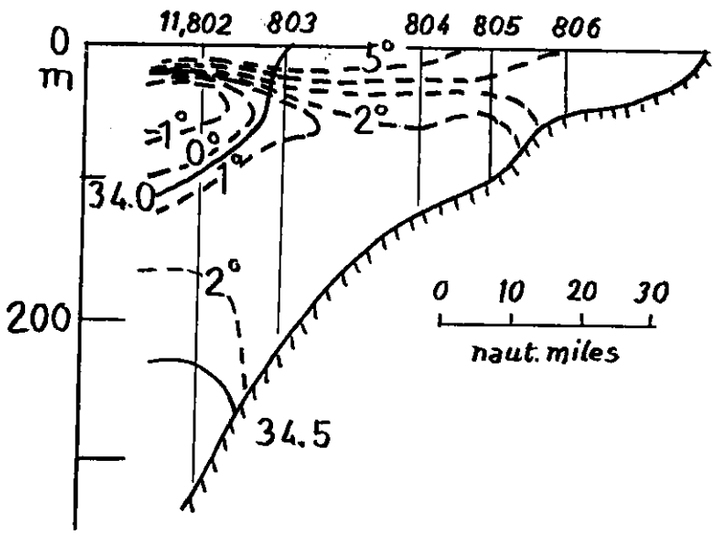


Fig. 9. Section IV off Egedesminde, July 30th, 1961.

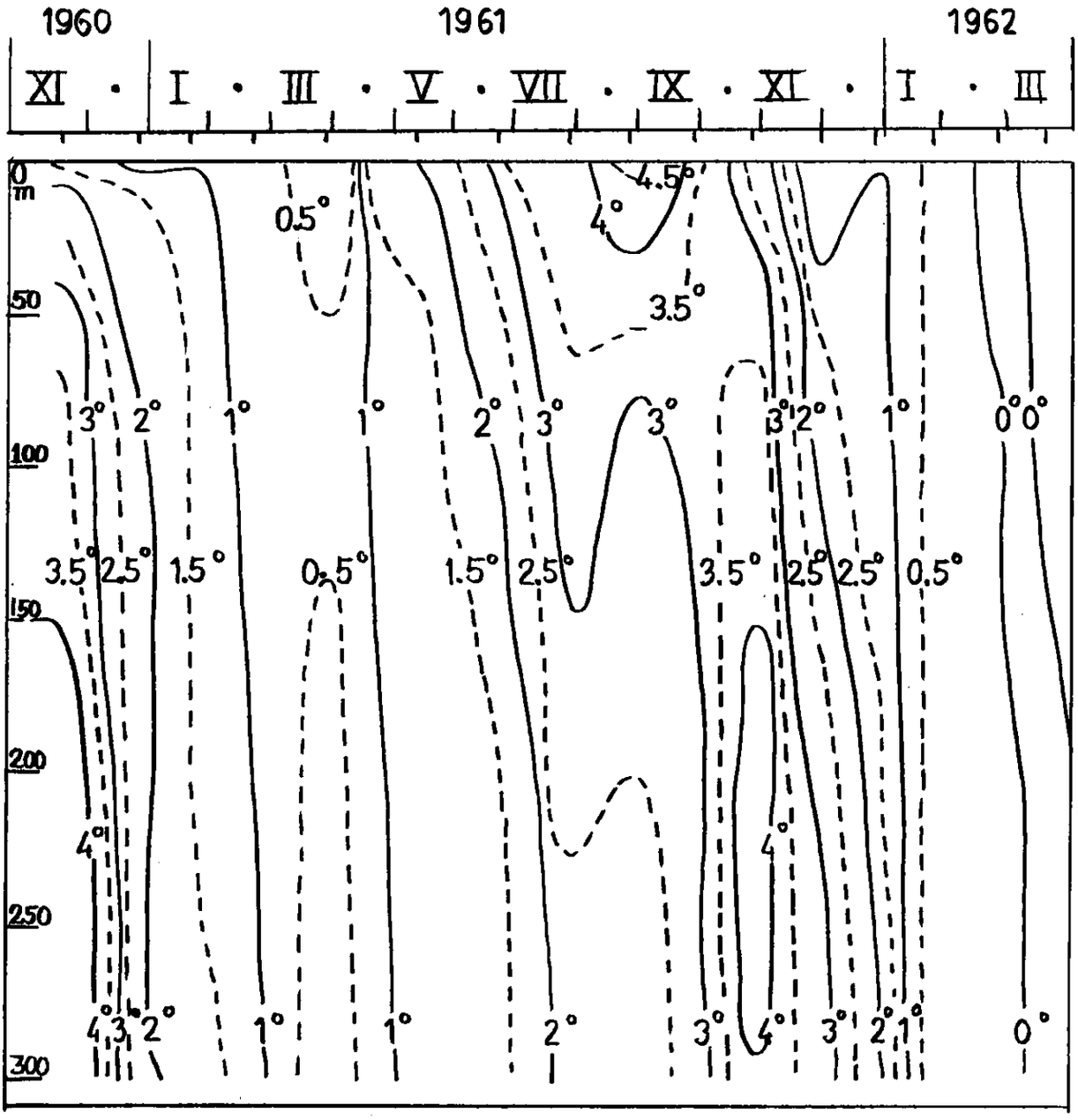


Fig. 10. Distribution of temperature at the entrance of Godthaab Fjord during 1961.

B. The 1953 year-class predominates in Nos. 15 and 17. In 17 it is followed very closely by 1947 year-class. Sample 16 is taken from a catch with shrimp trawl in which the predominating year-class is 1953 with 27%, close to are 1955 with 24.7% and 1956 with 21.3%. In sample 18 the 1957 year-class amounts to 58%.

C. The two samples 19 and 20 from this division are taken in the same place and at the same time. No.20 is from a long line catch, No.19 from hand line. As usual the long line catch contains older year-classes than the hand line catch. In No.20 the strongest represented year-class is 1947 with 20%, 1953, 1956 and 1957 are represented with 16.3, 13.8 and 12.5% respectively. No.19 contains only small young cod with 1957 strongly predominant amounting to 65.5%.

D. As mentioned before, all eight samples are from catches taken by "Adolf Jensen". Nos.21, 22, 26 and 29 are from long line catches, while Nos. 23, 24, 25 and 27 are from catches with hand line. In No.21 1953 and 1957 are of equal strength. In the long line samples Nos. 22 and 26 the 1953 year-class predominates, while 1957 predominates in No.28 with 53.1%. With exception of No.25 in which 1956 is strongest (62.1%) the hand line samples have 1957 as the predominating year-class with 1956 as the next best.

F. The three samples 29, 30 and 31 are characterised by the very strong predominance of the 1956 year-class amounting to 80, 87.4 and 75% respectively.

The old 1947 and 1953 year-classes are still of importance in the long line catches from deep water. Of the younger year-classes the 1957 and 1956 are by far the richest; the former chiefly occurs in the northern area, Divisions A, B and C. In D it is followed rather closely by 1956. In F 1956 is the richest year-class among the young cod, while 1957 is poorly represented. This difference in the occurrence of these two year-classes is in coincidence with the distribution of young cod found in 1959. (See ICNAF Ann. Proc. Vol. 10, page 33-34).

C. Redfish

The continued trawling experiments for small redfish in the Godthaab Fjord, which started in 1952, have been carried out in every month of 1961 with the exception of June. The total catch amounted to 9072 redfish. Length distributions of the samples will be presented in ICNAF Sampling Yearbook.

No tagging experiments have been carried out in 1961.

11 of the 281 redfish tagged in Qorqut in the Godthaab Fjord in 1960 have been recaptured in 1961. 5 were recaptured at the tagging locality. Another 5 at Kapisigdlit in the innermost part of the fjord about 30 miles from Qorqut. Of special interest is a recapture taken by an Icelandic trawler south of Fiskenaes Bank (62°55'N.52°05'W.), 11 August 1961. The fish was tagged 24 May 1960 at Qorqut. Total lengths at tagging and at recapture were 43.5 cm and 44.5 cm respectively. This recapture probably indicates that the stock of redfish in the Godthaab Fjord is not a local one.

## II. Hydrographic Conditions off West Greenland, 1961
by F. Hermann

In 1961 the M/C "Adolf Jensen" worked the Fylla Bank section in April and June. R/V "Dana" worked the sections over Fylla Bank, Lille Hellefiske Bank, Store Hellefiske Bank and off Egedesminde in July. The positions of the "Dana" stations are shown in Fig. 5. Furthermore the standard station at the entrance of Godthaab Fjord was worked throughout the year by M/C "Adolf Jensen" and M/C "Tornaq".

Fig. 5 shows the distribution of temperature at 50 metres in July. A comparison with earlier years observations shows that the water temperature all over the area was considerally higher than usual. Of the last ten years only the year 1960 shows water temperatures nearly as high as those found in July 1961 in the surface layers.

Over the shallow part of Fylla Bank (40 metres) the temperature was on 24th April 0.5°C, on 27th June 3.1°C and on 24 July 3.9°C. The hydrographic situation in July is further illustrated by the sections I to IV (Figures 6 to 9). The sections show that the minimum temperature in the polar component of the West Greenland current, found off the western slope of the banks in section I and II, was higher than usual. The Irminger component of this current was well developed.

The variation of the temperature throughout the year at the station at the entrance of Godthaab Fjord (64°07'N-51°53'W) is shown in Fig.10. Also here relatively high temperatures prevailed. No temperatures below zero were observed and a strong inflow of warm bottom water seems to have taken place in October-November. In the first months of 1962 a strong cooling of the water has taken place and subzero bottom temperatures were recorded in March 1962.

## III. W. Greenland. Researches by the Danish Institute for Fishery and Marine Research - Faroe Division.
by J. S. Joensen.

Investigations of catches were carried out on board the Faroese commercial trawler "Skálaberg" (955 br.t.) fishing on the W.Greenland Banks from 21 May to 17 June 1961. During these 27 days the trawler made 327 hauls (320 hours). The total catch was 925 tons round fresh, close to 3 tons per one hour.

The catch was salted on board, and only cod over abt. 45 cm were used. The used part of the catch was 750 tons round fresh. 175 tons or 19% of the total catch was discarded. This discarded part included:

| | | |
|---|---|---|
| Small cod (below 45-50 cm) | - | ca. 118 tons |
| Wolffish (3 species) | - | ca. 36 tons |
| American Plaice | - | ca. 20 tons |
| Redfish | - | ca. 1 ton |

The length distribution of the discarded cod was as follows:

| cm | No. |
|---|---|
| 12-14 | 1 |
| 18-20 | 1 |
| 21-23 | 1 |
| 24-26 | 2 |
| 27-29 | 10 |
| 30-32 | 29 |
| 33-35 | 51 |
| 36-38 | 90 |
| 39-41 | 211 |
| 42-44 | 288 |
| 45-47 | 182 |
| 48-50 | 47 |
| 51-53 | 11 |
| 54-56 | 2 |
| 57-59 | 1 |
| 60-62 | 1 |

The collected data includes a total of 10,532 cod; 7,432 cod were measured and otoliths were taken from 3,100 cod.

Fig. 11 shows the age-and length distribution of the cod. In the northern divisions, 1B and 1D, the IV-Group (1957 year-class) predominates, whilst in the south the 1956 year-class is completely dominating, constituting almost 60% of the used part of the catch.

By far the largest part of the discarded cod consists of the 1957 year-class; this year-class is thus still more predominating than it appears from Fig. 11, which only shows the used part of the catch.

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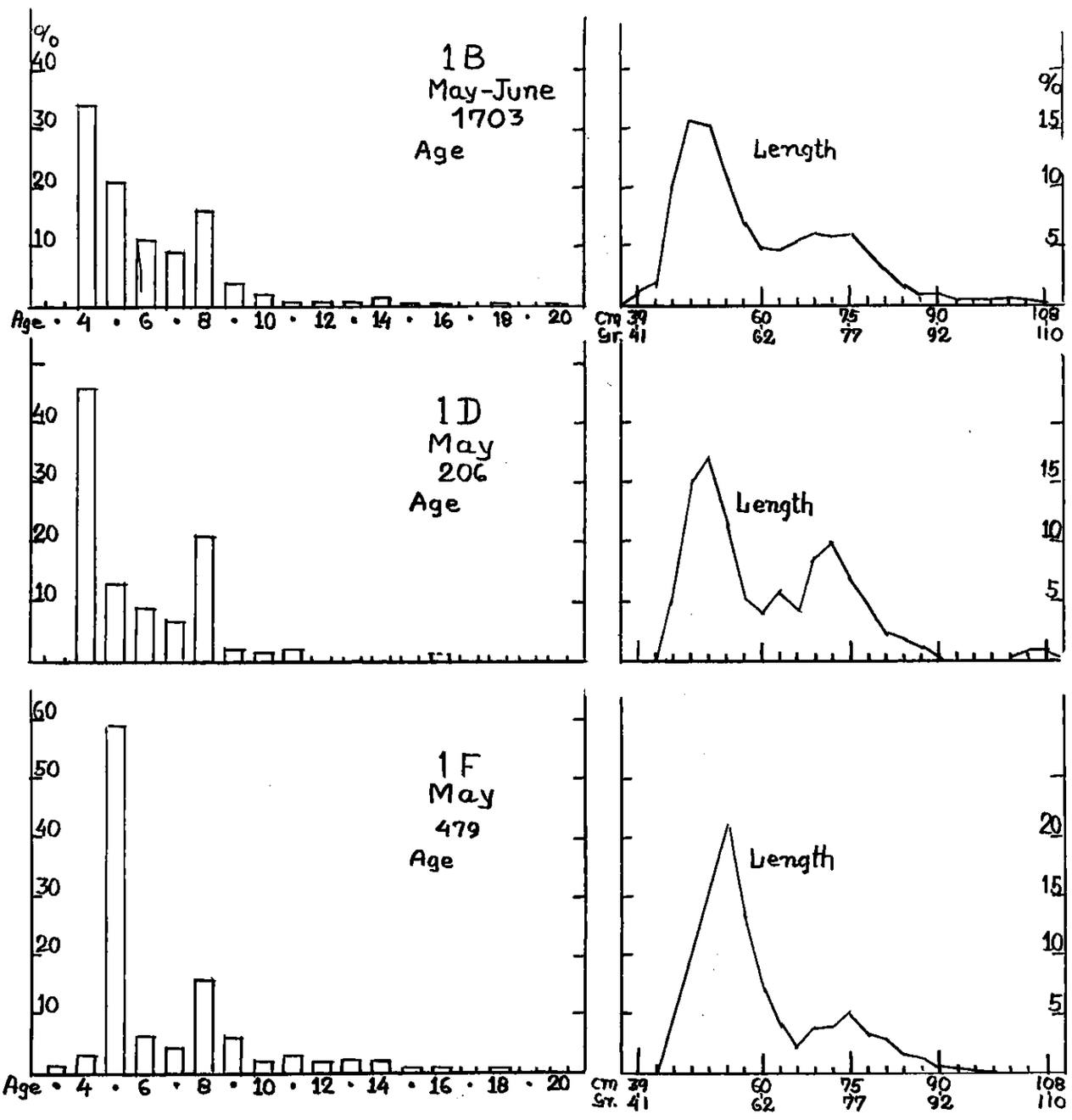


Fig. 11. For explanation see text second paragraph above.