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Romanian Research Report, 1967

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Subarea 5

Romanian fishing in the Northwest Atlantic in 1967 took place between 42°15'-40°15'N and 70°55'-65°45'W, in ICNAF Subarea 5.

Bottom trawl fishing was carried out between 30-80 m in the Nantucket Island region and between 60-175 m on Georges Bank.

The quantity of fish caught was 1,729 tons, of which 77.7% (1,344 tons) were Clupeidae.

Table 1 shows the species composition of the 1967 catch.

Table 1. Nominal catch by species and species groups in 1967.

Species groups	Individual species	Catch: metric tons, by species	Catch: metric tons, total group	Catch: percent, by species	Catch: percent, total group
Clupeidae	Blueback herring (Pomolobus aestivalis)	1,012	1,344	58.5	77.7
	Atlantic herring (Clupea harengus harengus)	332		19.2	
Gadidae	Cod (Gadus morhua)	10	56	0.57	3.2
	Haddock (Melanogrammus aeglefinus)	1		0.05	
	Silver hake (Merluccius bilinearis)	45		2.58	
Mackerel	Mackerel (Scomber scombrus)	109	109	6.3	6.3
Sharks and skates	-	70	70	4.0	4.0
Other unidentified species	-	150	150	8.8	8.8
Total		1,729	1,729	100.0	100.0

Table 2 shows that the catch in 1967 was lower than that of the previous years, 1965 and 1966. Catch per day averaged 23.3 tons in 1967, 34.8 tons in 1965 and 32.7 tons in 1966.

Table 2. Nominal catch and disposition in metric tons in 1965, 1966 and 1967.

Year	Total Catch	Portion frozen (for human consumption)	Portion processed (for industrial purposes)	Catch per day
1965	3,208	1,612	1,696	34.8
1966	3,433	1,938	1,495	32.7
1967	1,729	1,028	701	23.3

Table 3 shows that the decrease in catch is due to the lower catches of Clupeidae and Gadidae, in 1967, than in previous years. In 1965 and 1966 the average catch per day for Clupeidae (herring) was 24.7 tons and 24.3 tons respectively, and in 1967 the catch was only 18.1 tons per day.

Table 3. Total nominal catch and catch per day in metric tons in 1965, 1966 and 1967.

Species groups	Individual species	Total catch 1965	Total catch 1966	Total catch 1967	Catch/day 1965	Catch/day 1966	Catch/day 1967
Clupeidae	Clupea harengus Pomolobus aestivalis	2,277	2,553	1,344	24.7	24.3	18.1
Gadidae	Gadus morhua	562	573	56	6.1	5.4	0.75
	Melanogrammus aeglefinus						
	Merluccius bilinearis						

	Total catch 1967	Catch/day 1967
Gadus morhua	10	0.13
Melanogrammus aeglefinus	1	0.01
Merluccius bilinearis	45	0.64

The lower catches in 1967 are due to weather conditions, which altered the thermocline, thus keeping the summer herring shoals at intermediate depths and requiring mid-water fishing. They are due, also, to the dispersal of the herring shoals to the east, and to the lateness of the schooling for spawning. During the summer shoaling was limited and schools were scarce in the bottom water layer over Georges Bank.

Special research studies

Clupeidae. A distinction was made between the fishing and behaviour of the common herring (Clupea harengus harengus) and the blueback herring (Pomolobus aestivalis) caught in Div.5Z during 1967.

Atlantic herring (Clupea harengus harengus) were found in feeding and fattening concentrations mainly in the July-15 September period in the central and eastern part of Georges Bank between 41°05'-41°15'N and 66°37'-66°50'W; 41°25'-41°55'N and 66°06'-66°50'W; 41°45'-42°00'N and 66°10'-66°25'W.

Loose herring schools ranged horizontally between 4-50 m over depths from 50-100 m. The beginning of the spawning concentrations on Georges Bank in 1967 was about the fifteenth of September. The best fishing was between 30 September and 3 October. A single trawl haul in this period gave more than 30 tons.

For spawning purposes the herring moved from the eastern-central part to the northern part of Georges Bank. Some herring schools were thus caught on the northern part of the bank, between 41°47'-42°17'N and 67°05'-68°00'W. The big concentrations were between 41°47'-42°17'N and 67°05-67°25'W (Fig. 1).

During the fattening period, herring of 26-28 cm in length (6-8 years old) were dominant (73%). Basic food items were euphausiidae. Larger herring, 28-31 cm in length (over 8 years old), were found separately at a depth of 150 m, in canyons (Corsair Canyon), beside Argentina silus concentrations.

Table 4 shows the age distribution of herring caught in 1967.

Table 4. Percentage age composition of Atlantic herring catches on Georges Bank in 1967.

Age in Years	1	2	3	4	5	6	7	8	9	10	11	12
	-	-	-	0.6	1.3	18.0	29.0	26.2	14.0	7.3	2.0	1.6

The 6-8 year old fish are dominant. Also the 8-10 year old fish (28-31 cm in length) form an important percentage of the catches.

In the spawning period, herring of the length-classes, 26-28 cm and 28-31 cm, were found at the same depth.

Blueback herring (Pomolobus aestivalis) was the second most important Clupeidae in Div. 5Z. Concentrations were found south of Nantucket Island between 40°20'-41°00'N and 69°35'-71°00'W. Here, they remained in large concentrations until 10-15 September when they scattered and left the area. From the end of August to about 15 September, blueback herring were found separately in large concentrations between 40°25'-40°57'N and 70°10'-70°55'W (Fig. 1). Here the catch at this time was over 45-50 tons/day. After 15 September the blueback herring left the area.

Table 5 shows the age distribution of blueback herring caught in 1967.

Table 5. Percentage age composition of blueback herring catches south of Nantucket Island in 1967.

Age in Years	1	2	3	4	5	6
	-	14.6	24.7	33.0	16.1	11.6

The 3-4 year old fish were dominant (57.7%).

Gadidae. The Gadidae represented by cod (Gadus morhua) and silver hake (Merluccius bilinearis) were caught as a by-catch average about 1 ton per trawl haul in the herring catches. The large cod and haddock concentrations were found to the north of Georges Bank, between 41°45'-42°10'N and 42°10'-42°17'W, and 67°05'-67°20'W, during July and August.

Concentrations of the two species was partly due to the presence of Ammodytes americanus, a bottom fish which constituted a good feeding item for the Gadidae northward of Georges Bank.

The dominant lengths were 40-45 cm for haddock and 50-60 cm for cod. Young cod concentrations dominated by those 15-23 cm in length were identified mainly between 41°05'-44°33'N and 66°35'-66°50'W. Cod of 21-27 cm in length occurred more frequently in the night catches.

Haddock of 32 cm average length were caught in the Nantucket area.

Mackerel (Scomber scombrus) were found in addition to blueback herring in the south Nantucket area. Larger concentrations were found in August and September, south of a zone between 40°20'-41°00'N and 69°40'-70°20'W, and especially between 40°20'-40°30'N and 69°40'W. Their average length was 27.3 cm.

Other species, especially sharks, skates and flatfishes, in addition to Gadidae (haddock particularly) replaced the Clupeidae in the bottom zones when they migrated to the surface layer. This migration took place especially during the night and in the strong foggy and clouded days.

Observations on climatic and oceanographic conditions

Meteorological conditions. The fishing area in 1967 was characterized by lower temperatures than in previous years. Thus, in July and August, average temperatures were between 14.4°C and 17.8°C on Georges Bank and 20.1°C and 20.7°C south of Nantucket Island.

The winds blew from the S, SW and E, most of the time, at strength 3-4 on the Beaufort scale. The winds from the N, NE and NW blew a few days in September at strength 5 on the Beaufort scale.

The hurricanes were recorded earlier and more frequent and they influenced the water temperature and the mixing processes. Of the hurricanes, DORA's low pressure centre contributed substantially to water (exchange) mixing.

Water temperature. On Georges Bank the temperatures were generally low from July to October, 11.2° to 14.7°C at the surface and 6.2° to 9.2°C at a depth of 70-100 m.

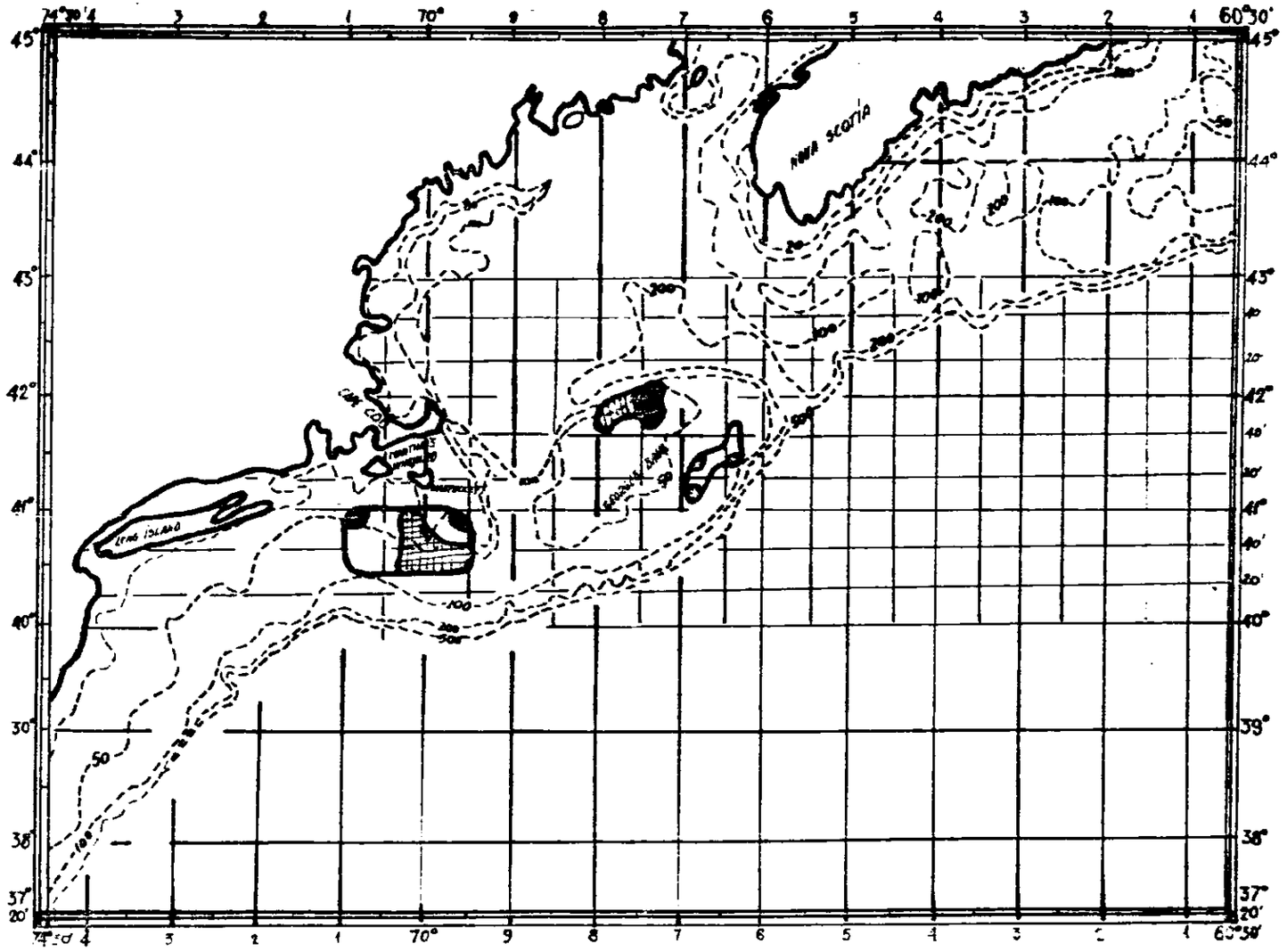
The thermocline was situated at about 10 to 15 m during the summer and confined the herring in the surface layers.

In the Nantucket region,due to the warm current, average temperatures were greater (20.3°C) and were conducive to blueback herring and mackerel concentrations. At the end of August average temperatures had dropped to 19°C and continued to drop to an average of 14.4°C in September. With this lowering of the temperature the blueback herring left the area during the autumn.

During the summer the thermocline remained near the bottom at a depth of 25-30 m ensuring a large blueback herring concentration and permitting good catches at this depth.

Figures 2 and 3 show the temperature distribution and the location of the thermocline over Georges Bank and in the Nantucket area.

The vertical migrations, as well as the concentrations on the bottom of the Clupeidae in Div.5Z,were determined, in addition to the temperatures, by the concentrations of food organisms made up of Calanoidae and Euphausiidae, bottom invertebrates and bottom fishes such as Gadidae, sharks and rays, etc.



Clupea harengus
spawning concentrations (● maximum)
feeding concentrations (⊛ maximum)

Pomolobus aestivalis
feeding concentrations (⊕ maximum)

Fig. 1. Distribution of blueback and Atlantic herring in Subarea 5 in 1967.

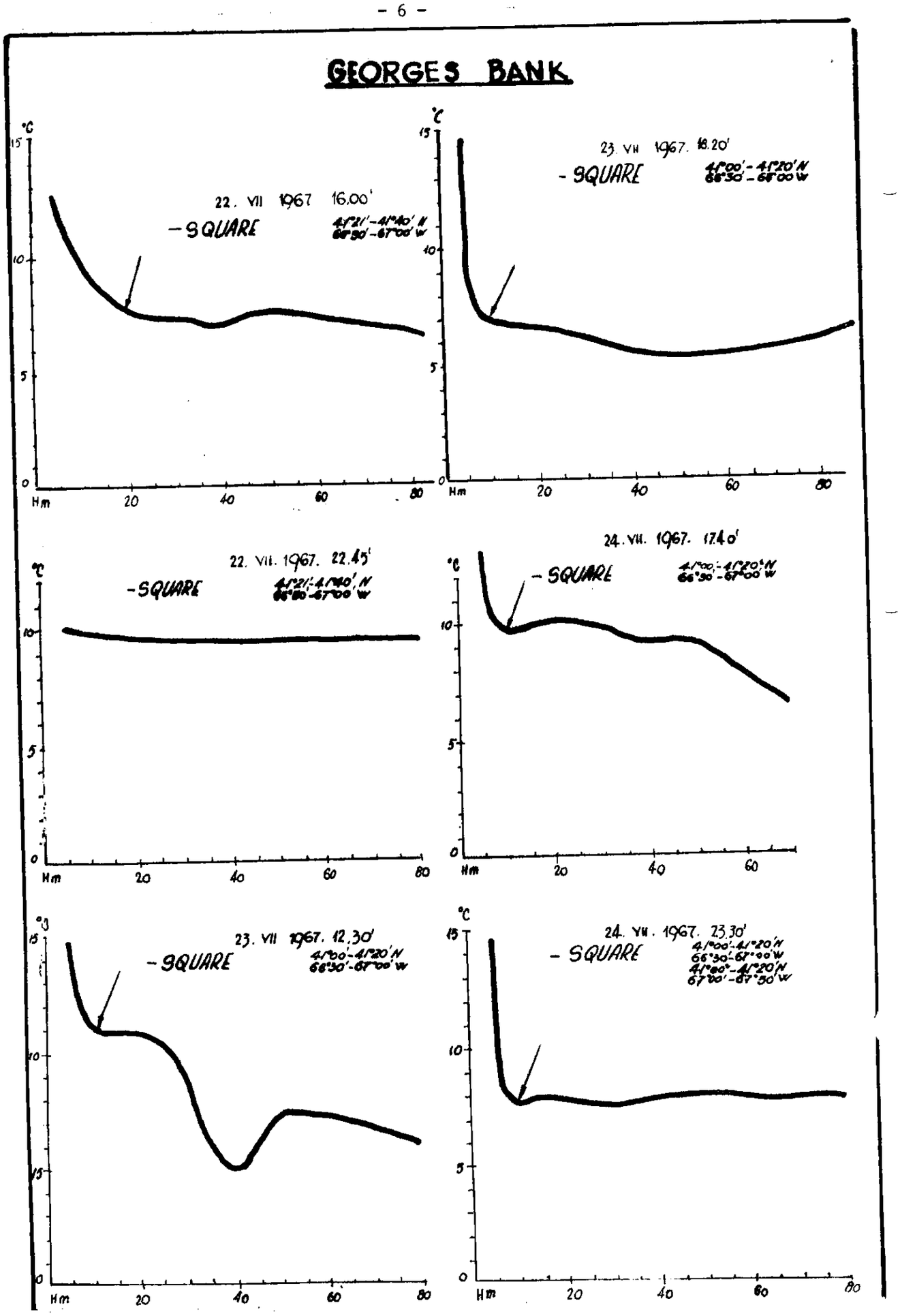


Fig. 2. Temperature/depth relationship at various locations over Georges Bank, July and October 1967.

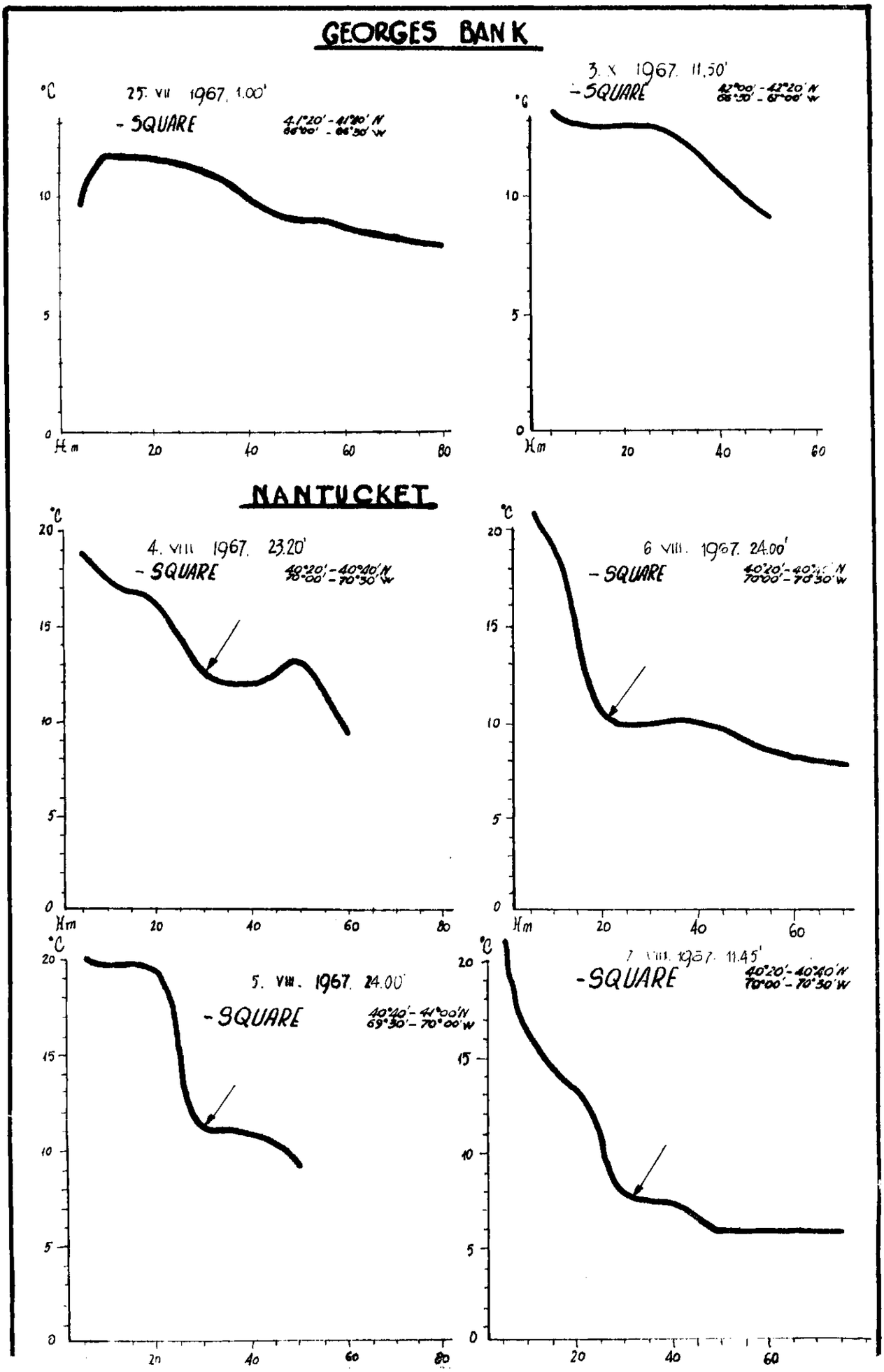


Fig. 2 (cont'd). Temperature/depth relationship at various locations over Georges Bank, July and October 1967, and in the Nantucket area, August 1967.