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Report of the ICNAF larval herring cruise, Anton Dohrn,
November 1974, in Georges Bank-Gulf of Maine areas

by

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Within the scope of the ICNAF Joint Larval Herring Survey in 1974, R.V. "Anton Dohrn" worked up the areas of Nantucket Shoals and Georges Bank during November 16-23. The area off Nova Scotia and the coastal Gulf of Maine had to be left out as a brake down of the engine prior to the cruise caused a time delay of 10 days. This report summerises the results regarding the distribution and abundance of larvae for size groups separately and the length frequency distribution of the larvae in both areas covered. Preliminary charts of temperature and salinity distribution indicate the hydrographic situation at the time of sampling.

Methods

Standard sampling methods were used (see appendix of Res. Doc. 73/115 and Circular letter 74/29). The additional notes given in Res. Doc. 74/16 for the 1973 cruise apply to this 1974 cruise as well. It may be noted that further improvement has been made with regard to sampling near the bottom. A new V-fin depressor made of aluminium allowed sampling down to 1 m above the bottom. In the normal procedure the gear was lowered until the depressor touched the ground and than retrieved again. Only in bad weather and over rough ground a minimum distance of 2 or 3 m was kept for safety.

Results

Figure 1 shows the sampled station and the sequence in which they have been worked up. As in the previous years, generally samples from .505 mm mesh size have been analysed. One sample (station 84) has been lost and for station 91 no final length measurements are yet available but only a separation into three size categories.

A summary of the distribution of larvae for different size categories is given in figure 2. The area of distribution is fairly well covered except to the west. No significant numbers of larvae were encountered beyond the 200 or 100 m isobath as in 1973 when the area of distribution extended exceptionally far eastwards. The two centers of larval production, one in the area of Nantucket Shoals the other on the northeastern part of Georges Bank, become obvious by the very high proportion of small larvae. (Please note the logarithmic scale when comparing heights of columns as index of abundance.) For somewhat larger larvae (>10 mm) these centers do not remain distinct.

Nevertheless, overall length frequency distributions are given for Georges Banks and Nantucket Shoals separately (fig. 3) as done in previous reports for comparison purposes (i.e. 74/105, 74/15). As no final length measurements are yet available for the very important station 91, the length distribution on this station was estimated according to that on station 90 and the known separation into three size categories. The final data may thus slightly change the overall length distribution for Georges Bank. The general picture, however, will not be changed, showing no very distinct hatching groups except of the predominant group of small larvae (<10 mm). This figure may serve for comparison with results of the other cruises carried out in the 1974 survey.

Calculated numbers of larvae per 10^2 m sea surface are given for larvae of all sizes and three size categories separately in figures 4 - 7. In Nantucket Shoals area peak numbers of larvae of <10 mm and 10 - <15 mm in length compare similar to those in 1973 at half a month earlier, whereas on Georges Bank they are

obviously lower. In both cases they exceed those numbers encountered half a month later in 1973. Larger larvae (15 mm) show no comparably high concentration on single stations as in beginning of November and December in 1973. But total abundance estimate for this size category differs not much from that obtained in the previous year in both areas (see table 1). In accordance with the time of sampling -in the second half of November- the total abundance of smaller larvae (15 mm) in 1974 lies somewhere inbetween the October/November and the December cruise of 1973; in the area of Nantucket Shoals it corresponds more closely to the higher value of the earlier cruise. A more conclusive between years comparison has to be based on the data of all cruises carried out during the 1974 survey; however, according to these results, it may be assumed that the production of larval herring in 1974 corresponds more with that of 1973 than with the obviously lower production in 1971 and 1972.

Table 1: Estimates of abundance of larval herring ($n \cdot 10^{-9}$) in November 1974 compared to October/November and December 1971-1973. (Two significant digits given)

Area	sizes (mm)	1971	1972	1973	1974
Nantucket Shoals	<10	10 Nov-12 Nov	31 Oct- 3 Nov	28 Oct - 31 Oct	16 Nov - 18 Nov
	10- <15	49	230	1200	770
	≥15	?	170	250	230
	all	?	38	160	170
		500	440	1600	1200
Georges Bank	<10	12 Dec-17 Dec	28 Nov- 4 Dec	4 Dec - 8 Dec	18 Nov-23 Nov
	10- <15	3.6	3.6	39	600
	≥15	20	130	76	410
	all	48	36	180	300
		71	170	250	1300
Georges Bank	<10	3 Nov- 8 Nov	5 Nov- 9 Nov	2 Nov - 6 Nov	18 Nov-23 Nov
	10- <15	160	50	2000	600
	≥15	?	61	970	410
	all	520	150	3600	300
					1300
Georges Bank	<10	4 Dec- 12 Dec	6 Dec- 13 Dec	11 Dec- 18 Dec	
	10- <15	0.6	0.2	58	
	≥15	1.8	5.0	56	
	all	180	47	550	
		190	52	660	

Fig. 1

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Cruise Track

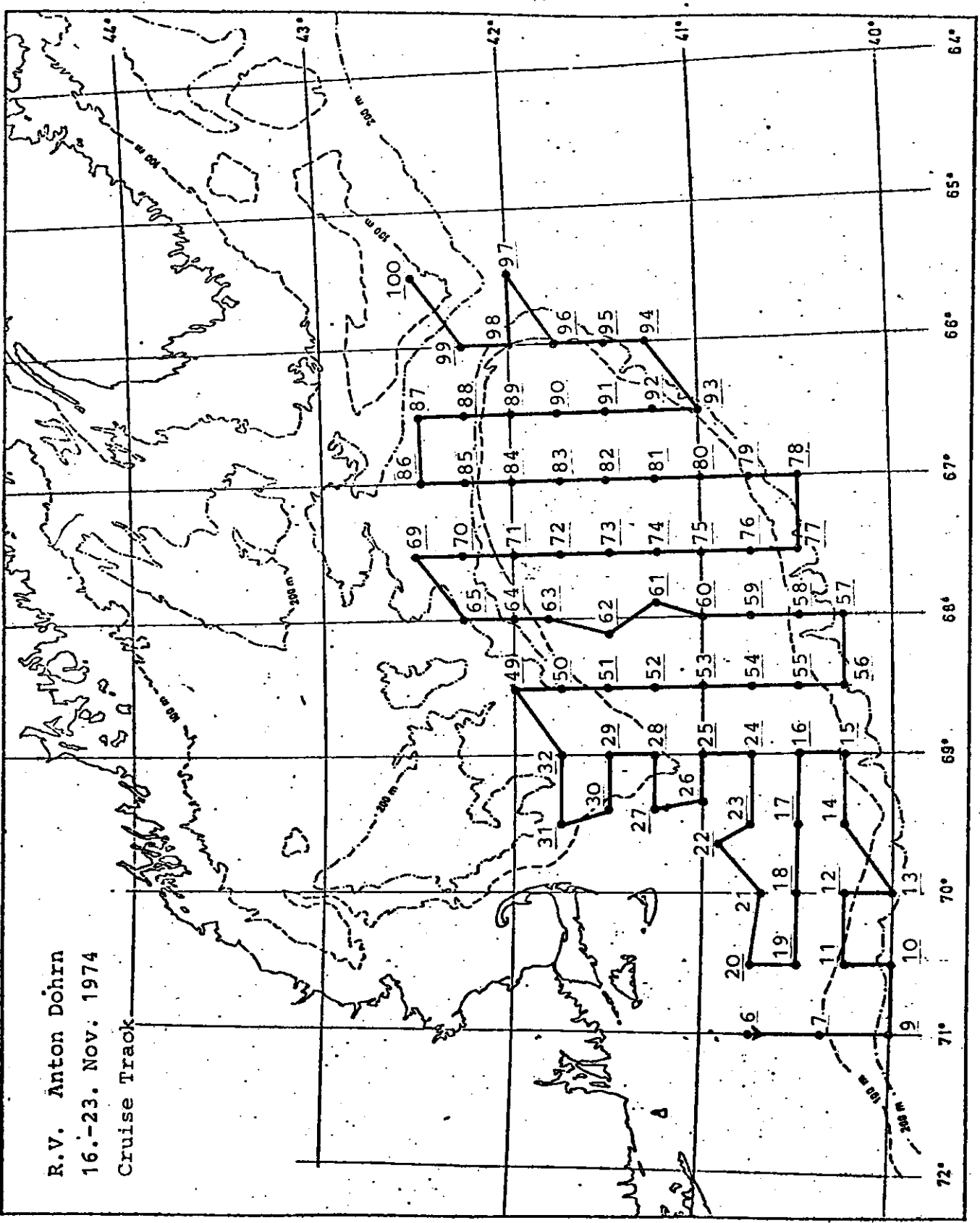


Fig. 2

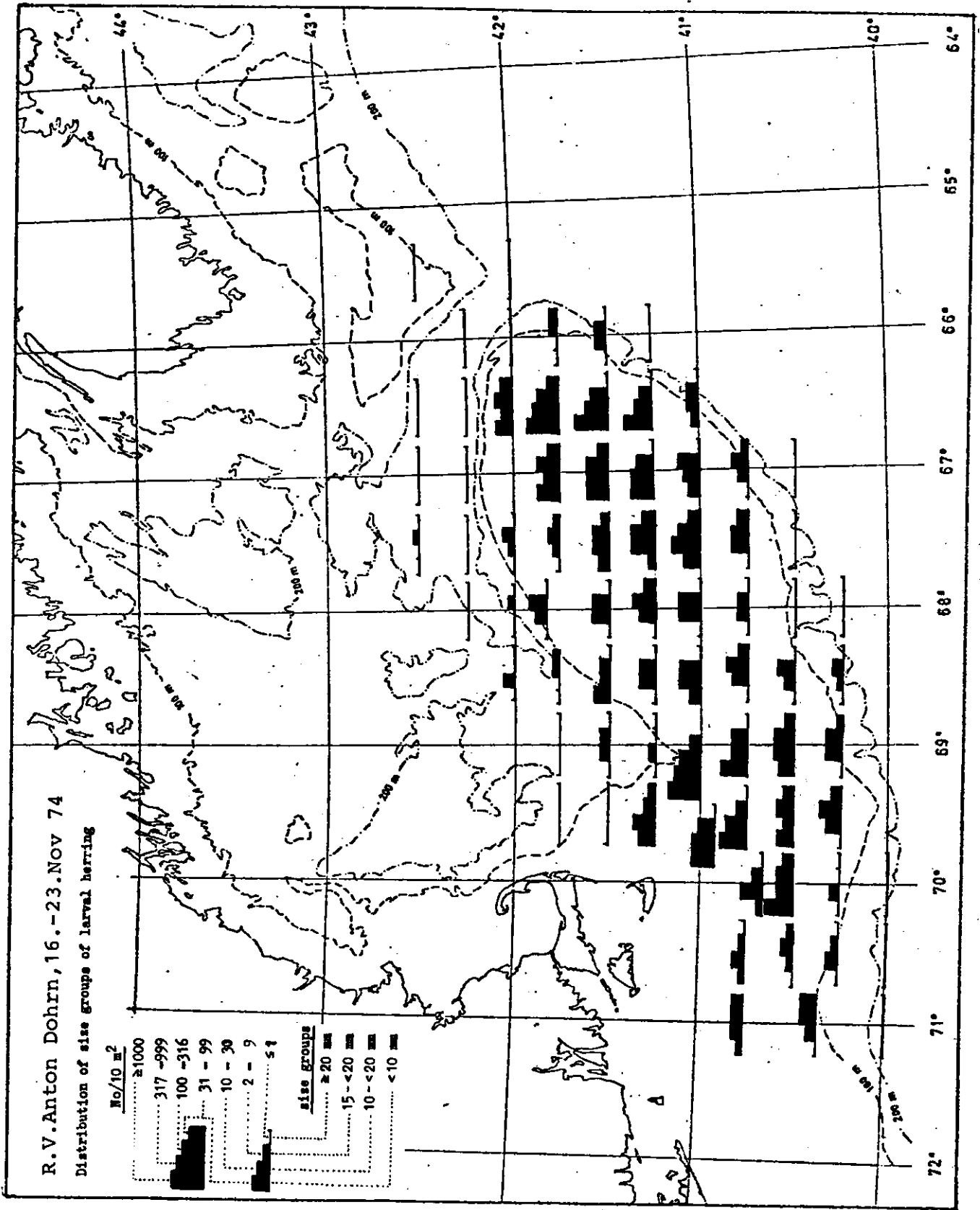


Fig. 3 Length frequency distribution

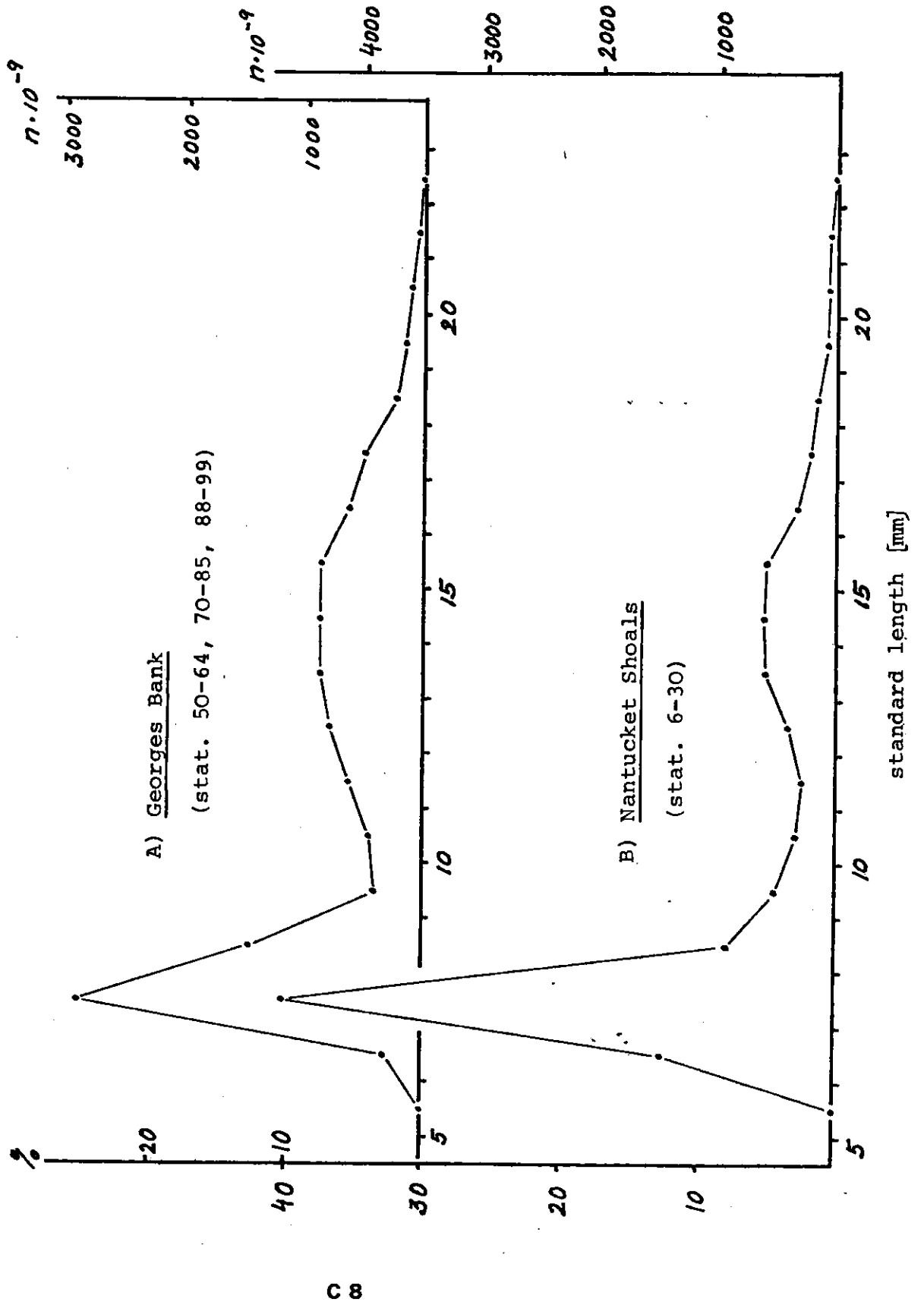


Fig. 4

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Larval

Herring

all sizes

NO / 10 m²

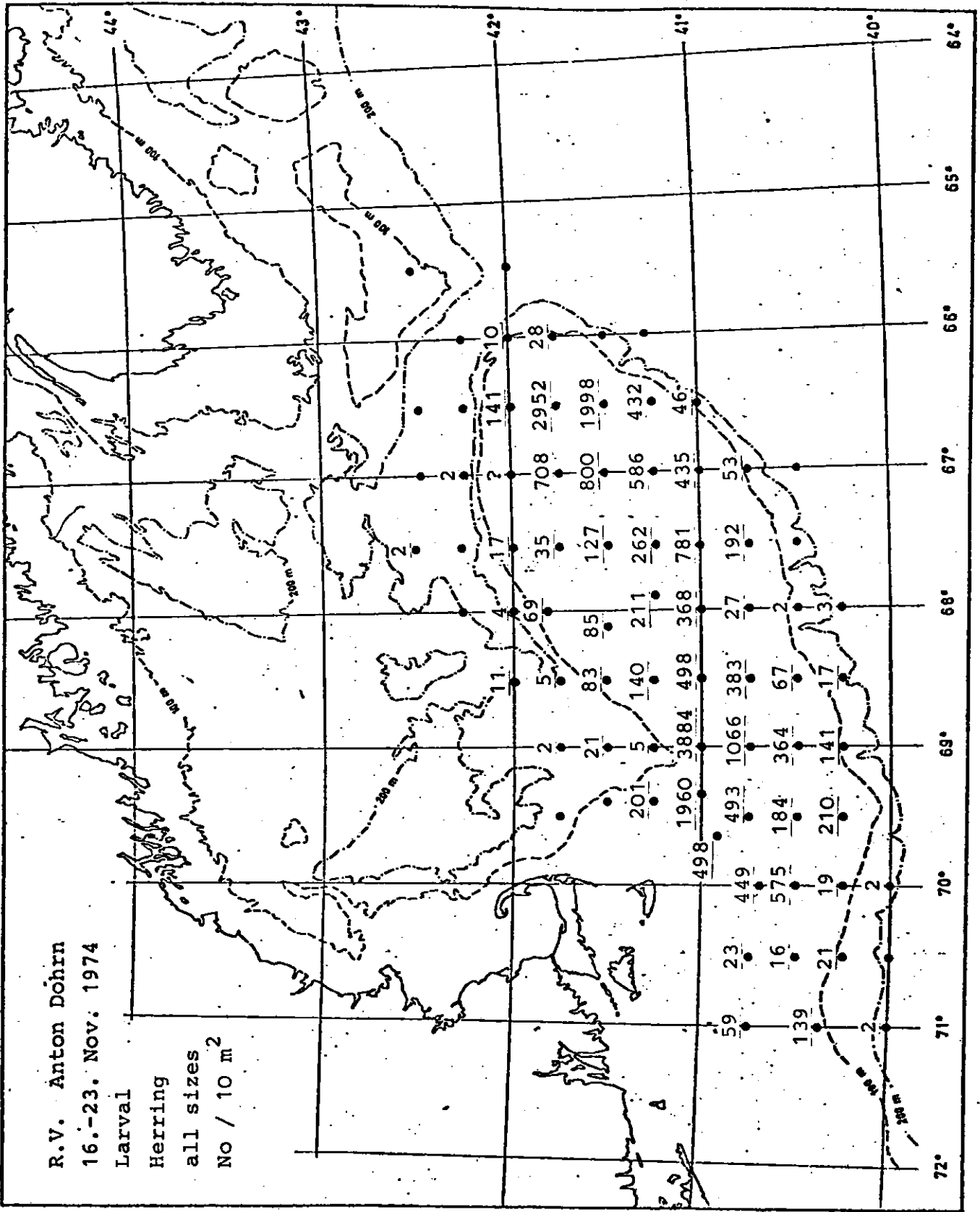


Fig. 5

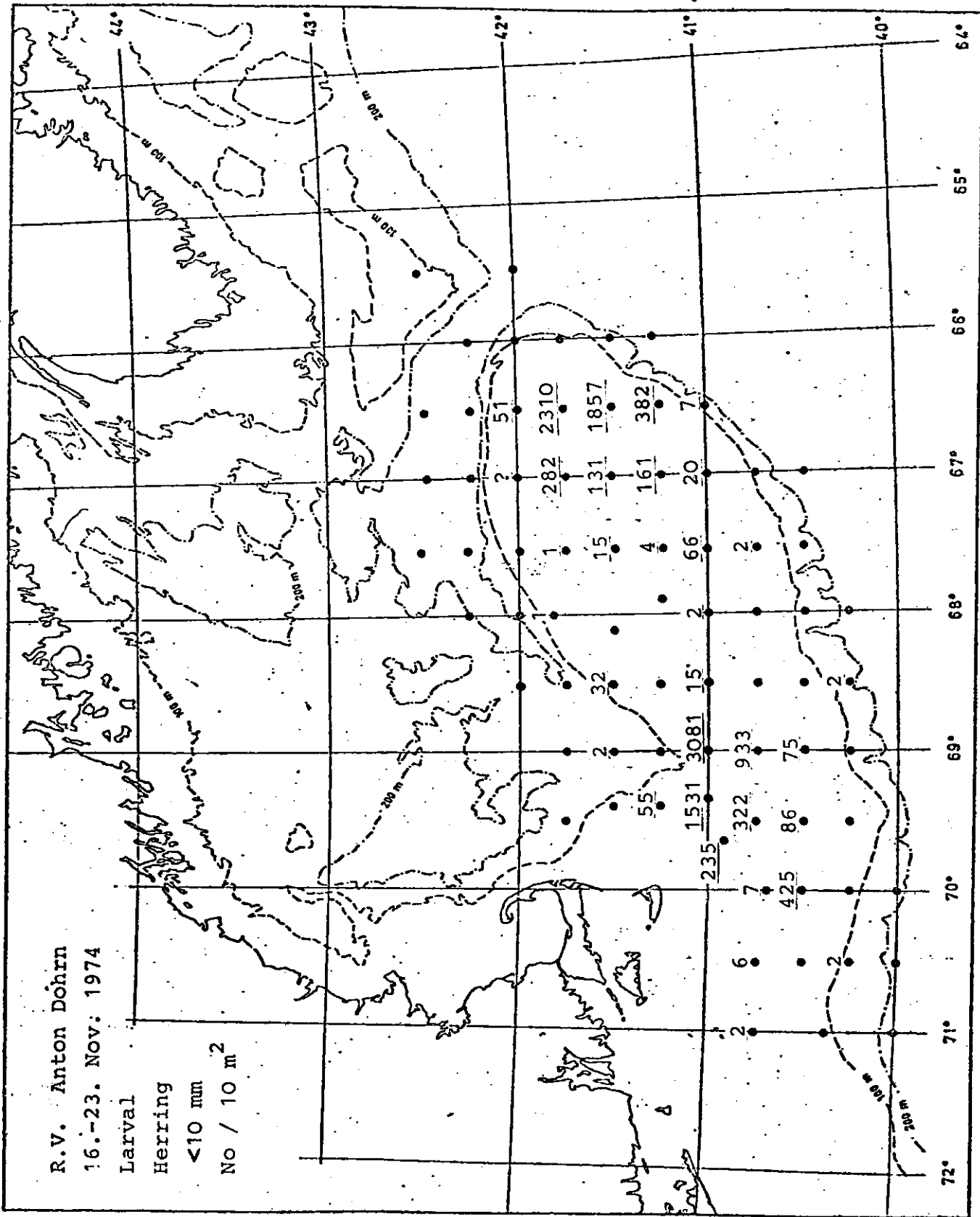


Fig. 6

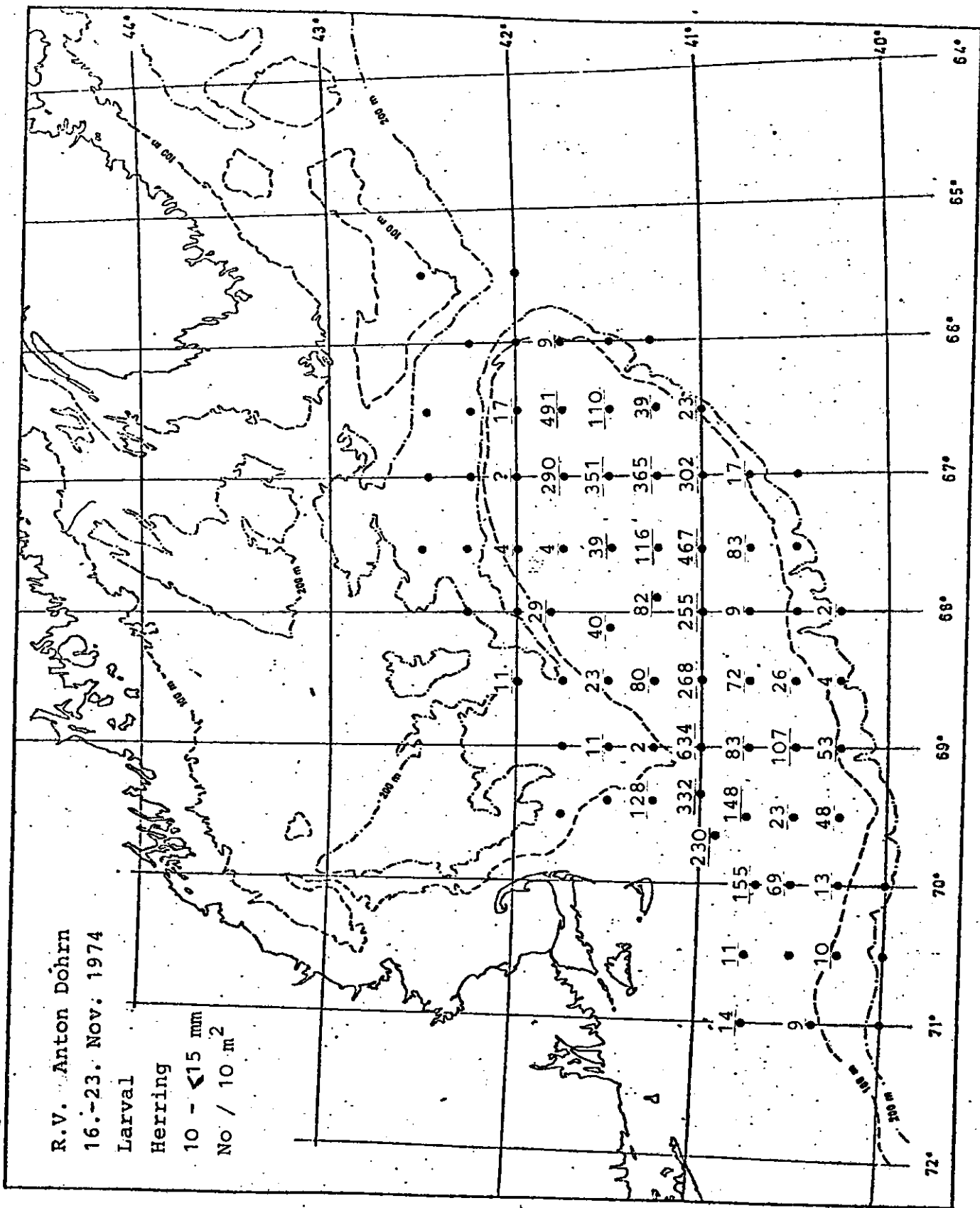


Fig. 7:

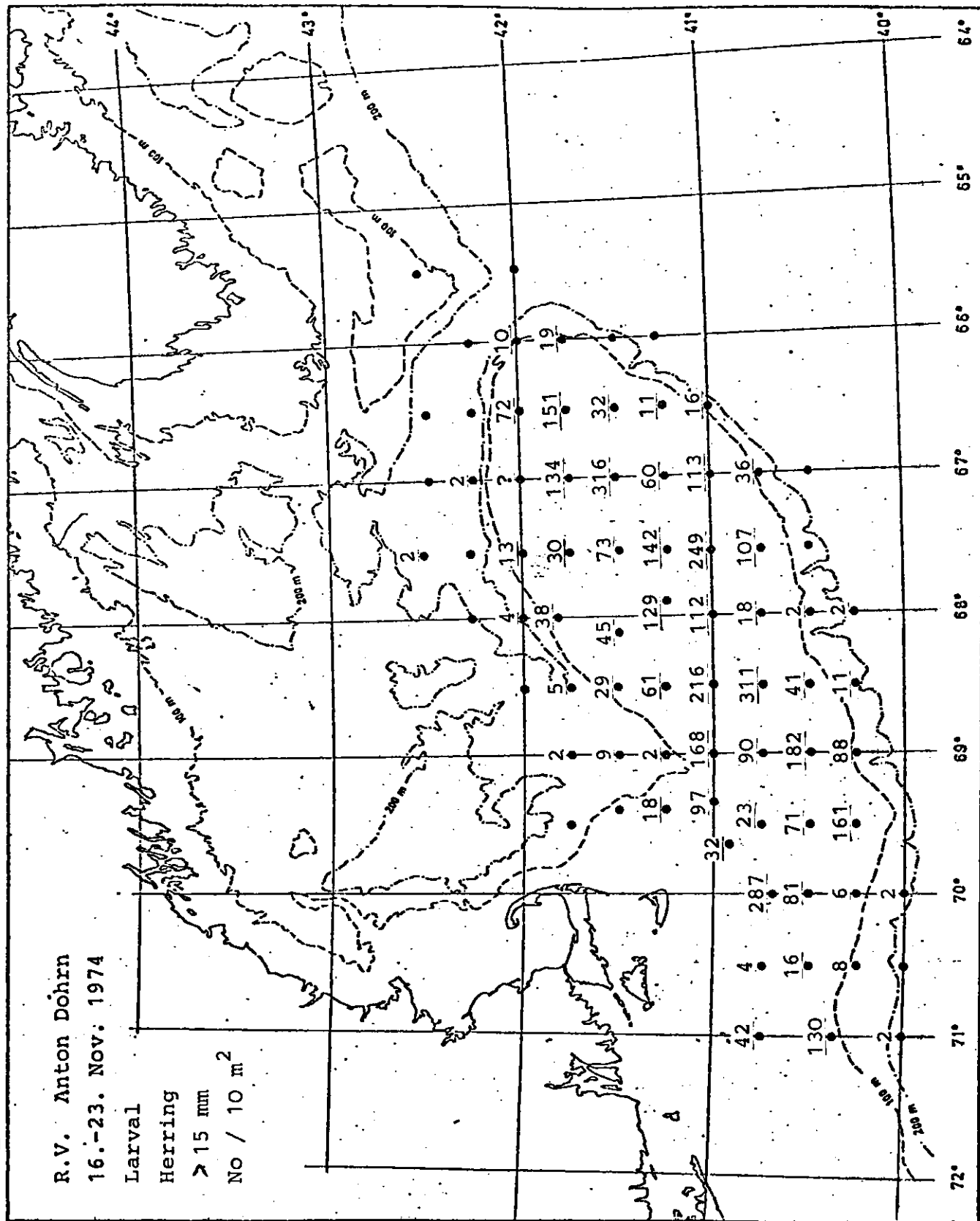


Fig. 8

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t°C

Surface

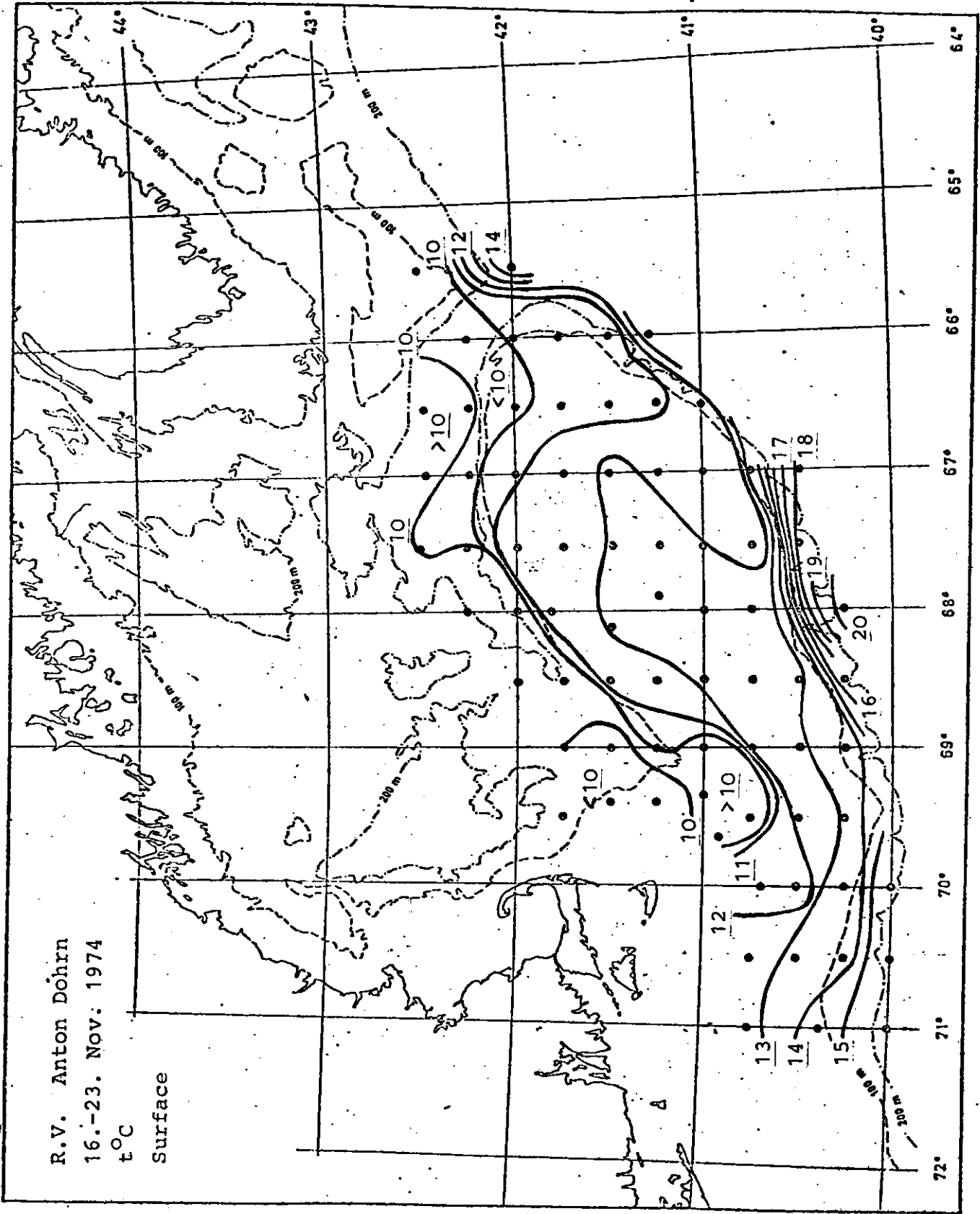


Fig. 9

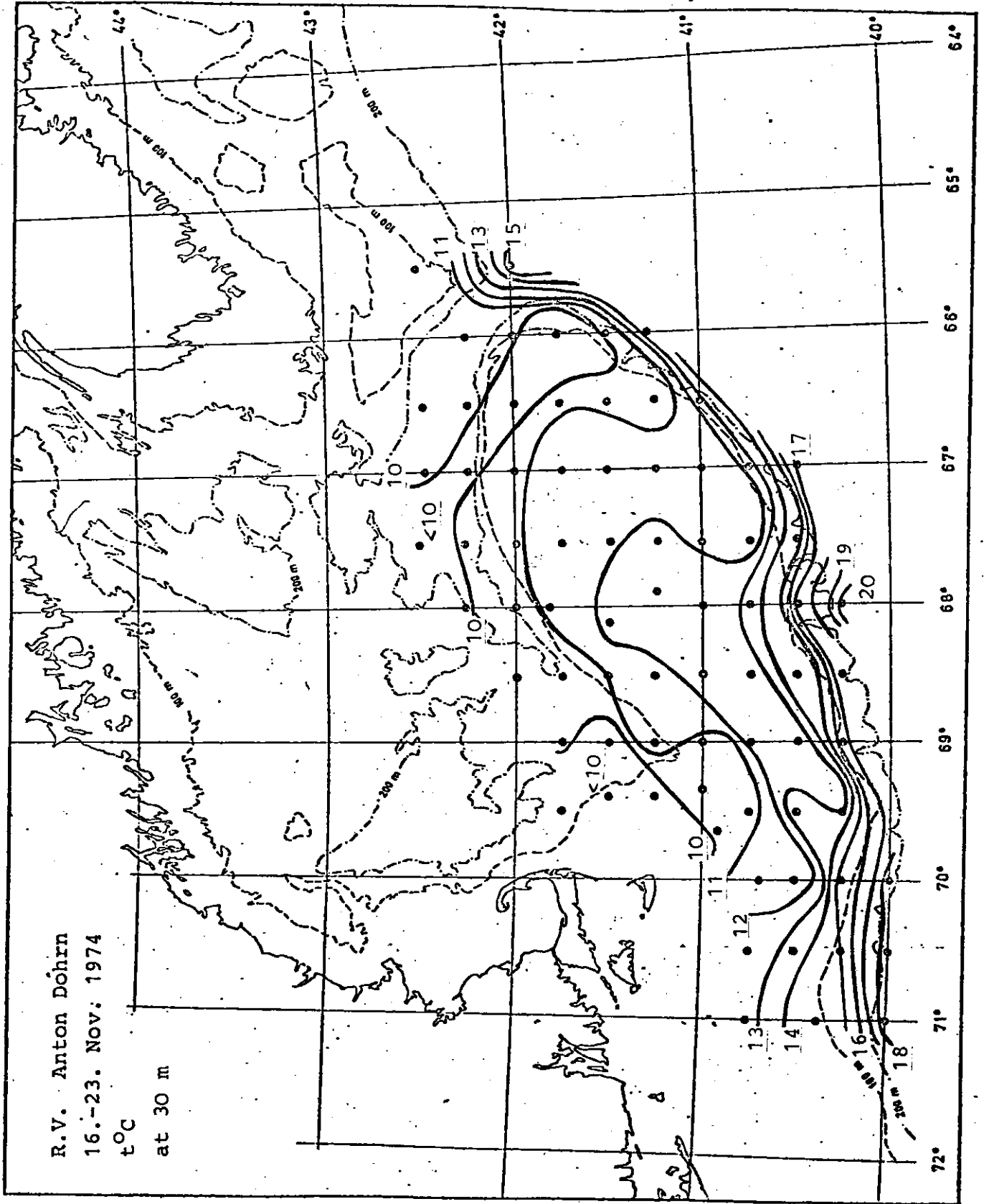


Fig. 10

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S&O Surface

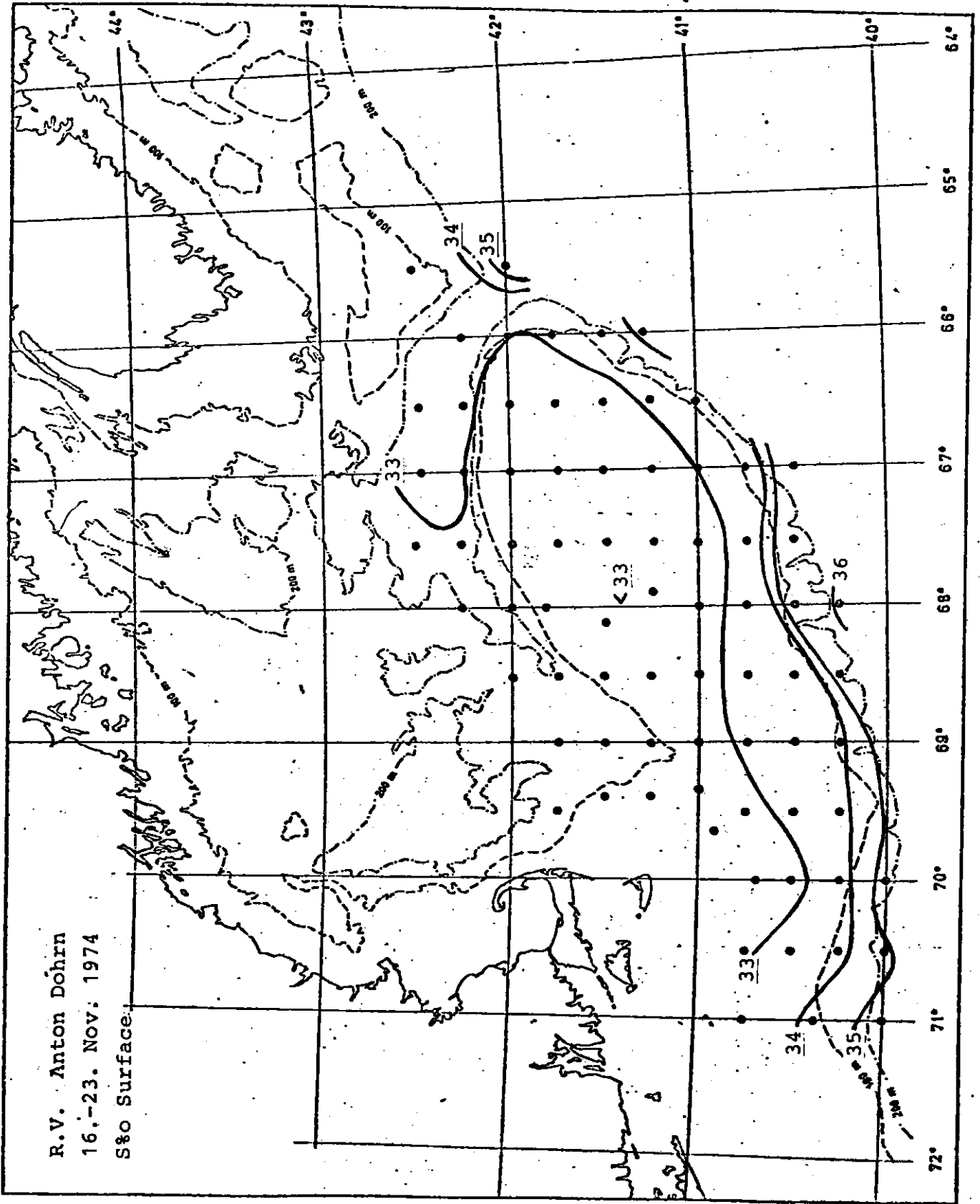


Fig. 11

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S&o at 30 m

