

# MODE *HOT LINE* NEWS

Number 7

June 9, 1972

## TEMPERATURE PROFILE CONTRASTS

Gordon Volkmann made a pair of STD lowerings on either side of the chain of hills shown in Figure 1. There are two properties of note in the temperature profiles (Figure 2).

There is a significant difference in the temperature profile of the Antarctic Bottom Water below about 4700 m on either side of the chain of hills. Station 4, to the west and closer to the abyssal plain, showed colder water at depth.

A second interesting property is the variable temperature gradient throughout the Antarctic Bottom Water layer.

Volkmann hopes to return to the area in October to outline these features with more lowerings. At that time he expects the conductivity circuit in the STD to be working so that the density structure across the area can be defined. Volkmann welcomes suggestions on experimental strategy for his return visit.

### Station Data: Knorr Cruise 26

Station 4	0310 GMT, 26 May 1972 28°10'N 68°41'W
Station 5	0821 GMT, 27 May 1972 28°10'N 68°27'W

## DYNAMIC HEIGHT MAPS

Richard Scarlet has supplied some results of dynamic height calculations from the first MODE-O STD density cruise. The station pattern was repeated three times, and two sets of maps of the dynamic topography are given here: one set with the dynamic topography between 500 and 1500 m (Figure 3) and the other set between 1500 and 3600 m (Figure 4). The calculated heights are shown at the station positions, and contours have been sketched in. (The contour interval is 5 dynamic mm. A slope of 10 dynamic mm/10 km is equivalent to a current shear of 14.6 cm/sec.) The cross near the center of each map marks the position 28°N 70°W.

The STD calibrations used for these calculations are in a fairly satisfactory state. Instrumental errors within the group of heights shown are probably less than 3 dynamic mm; absolute error limits are two or three times as wide.

Note the high persistence of the pattern between Stations 14-24 and 25-35 in the 1500 to 3600 m range.

The patterns indicate more than a simple uniform slope of the dynamic topography, but as in some other MODE-O studies, the 100-km scale seems too small for a complete picture.

## TEMPERATURE-SALINITY MICROSTRUCTURE

Richard Scarlet has produced plots of potential temperature vs. salinity for his MODE-O STD lowerings, and two representative samples are shown. Cast 14 (Figure 5) shows salinity deviations as large as .01‰. Below a potential temperature of 4°C, such features are absent from cast 15 (Figure 6). The following generalizations can be made for the collection of temperature-salinity profiles: below 3°C, features such

as those in cast 14 are fewer and smaller and at 2.5°C, salinity seems generally repeatable to  $\pm 0.002$ ‰.

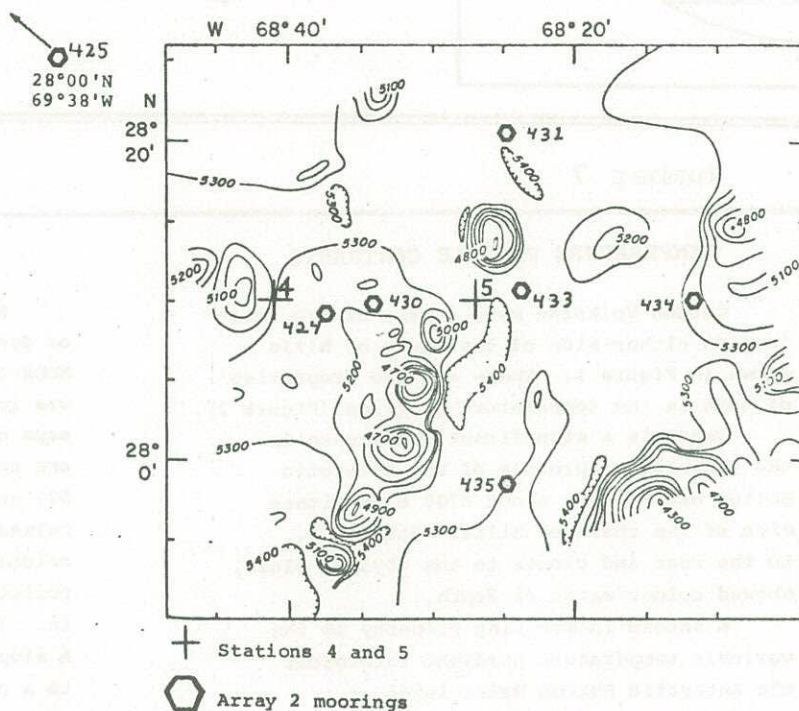
Scarlet has been unable to find instrumental causes for features such as those in cast 14, so the presumption is that they are real.

The positions of the casts were:

cast 14	27°59'N 69°30'W
cast 15	28°01'N 69°39'W



Figure 1



### ARRAY 2 RETURNS

Array 2, which was set in March, 1972, was successfully recovered by Knorr in May. It comprised ten current meters on five sub-surface moorings (Figure 1).

Surface site moorings 424 and 425 were set in February, 1972. Mooring 424, which had three current meters, was successfully recovered. Mooring 425, which had four current meters, was not on station and is presumed lost.

Data from the recovered instruments, six of which are the new vector-averaging current meters, are being processed at Woods Hole. Those who are interested should contact Susan Tarbell about the progress of the data processing. We expect to have some results from Array 2 in future issues of this Newsletter.

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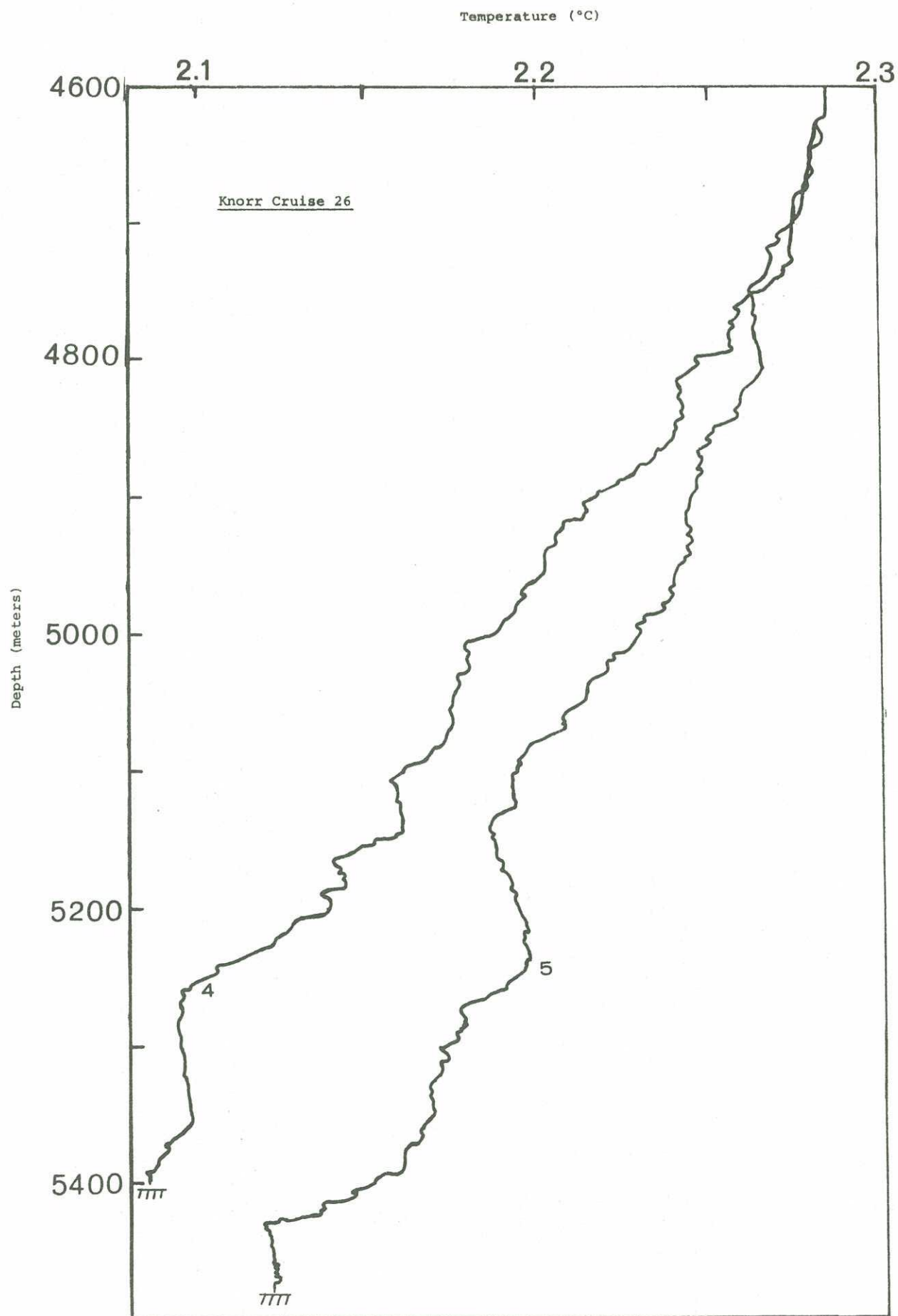
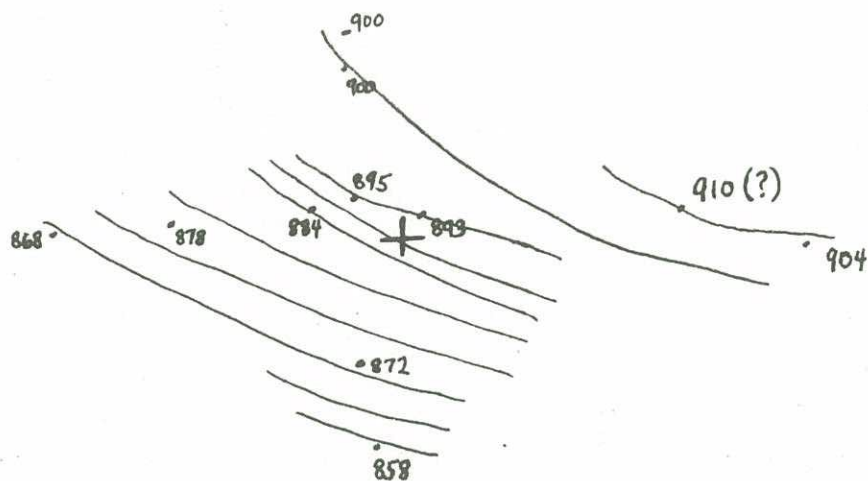
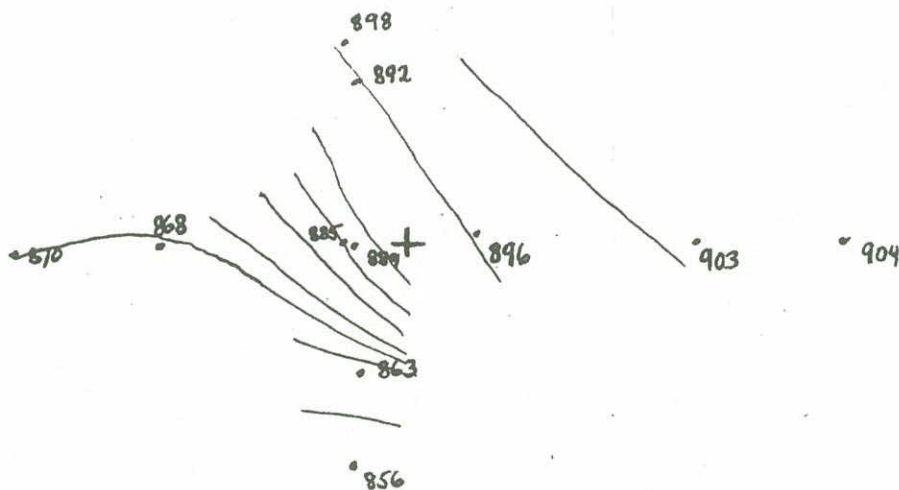


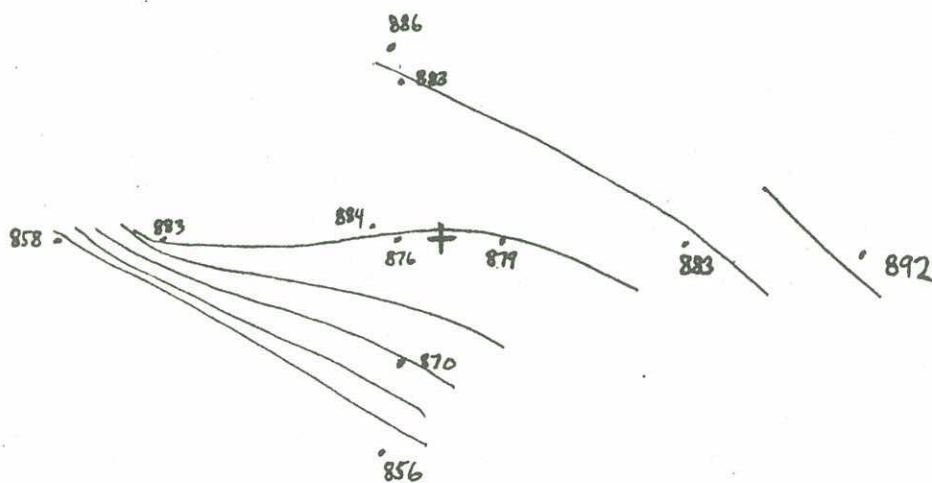
Figure 2



Stations 14-24  
10-12 November 1971



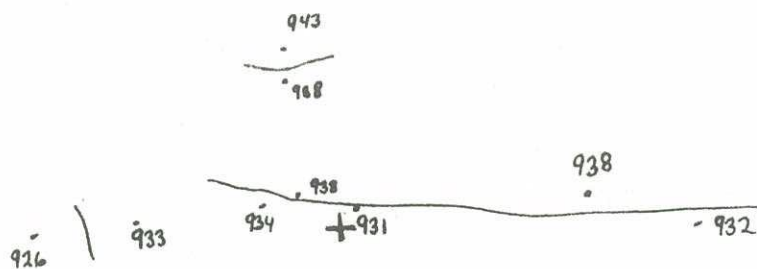
Stations 25-35  
13-14 November 1971



Stations 36-46  
15-16 November 1971

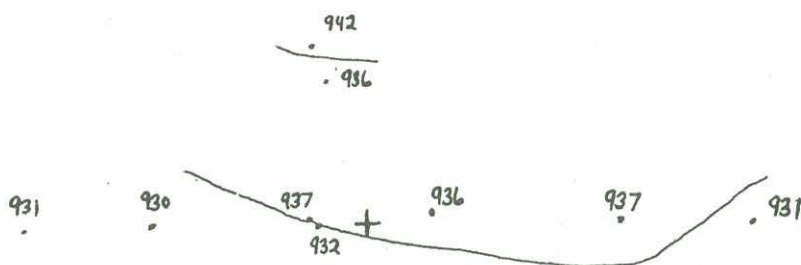
Figure 3  
Dynamic millimeters  
500-1500 meters

10 km



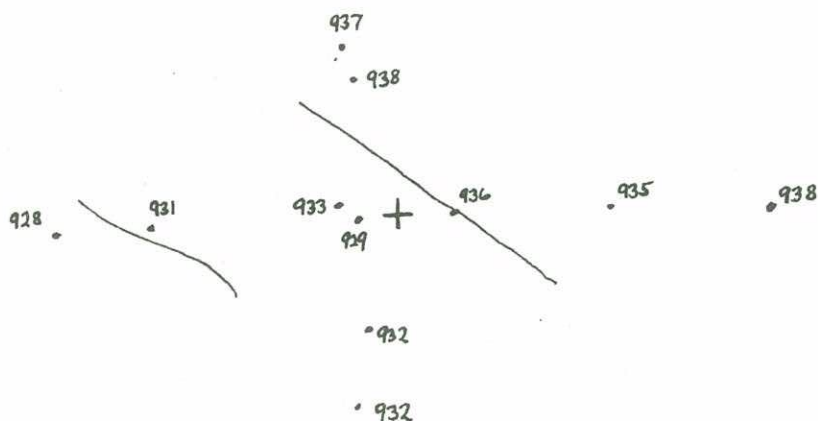
Stations 14-24  
10-12 November 1971

934  
935



Stations 25-35  
13-14 November 1971

933  
934



Stations 36-46  
15-16 November 1971

Figure 4  
Dynamic millimeters  
1500-3600 meters  
10 km



CAST 14

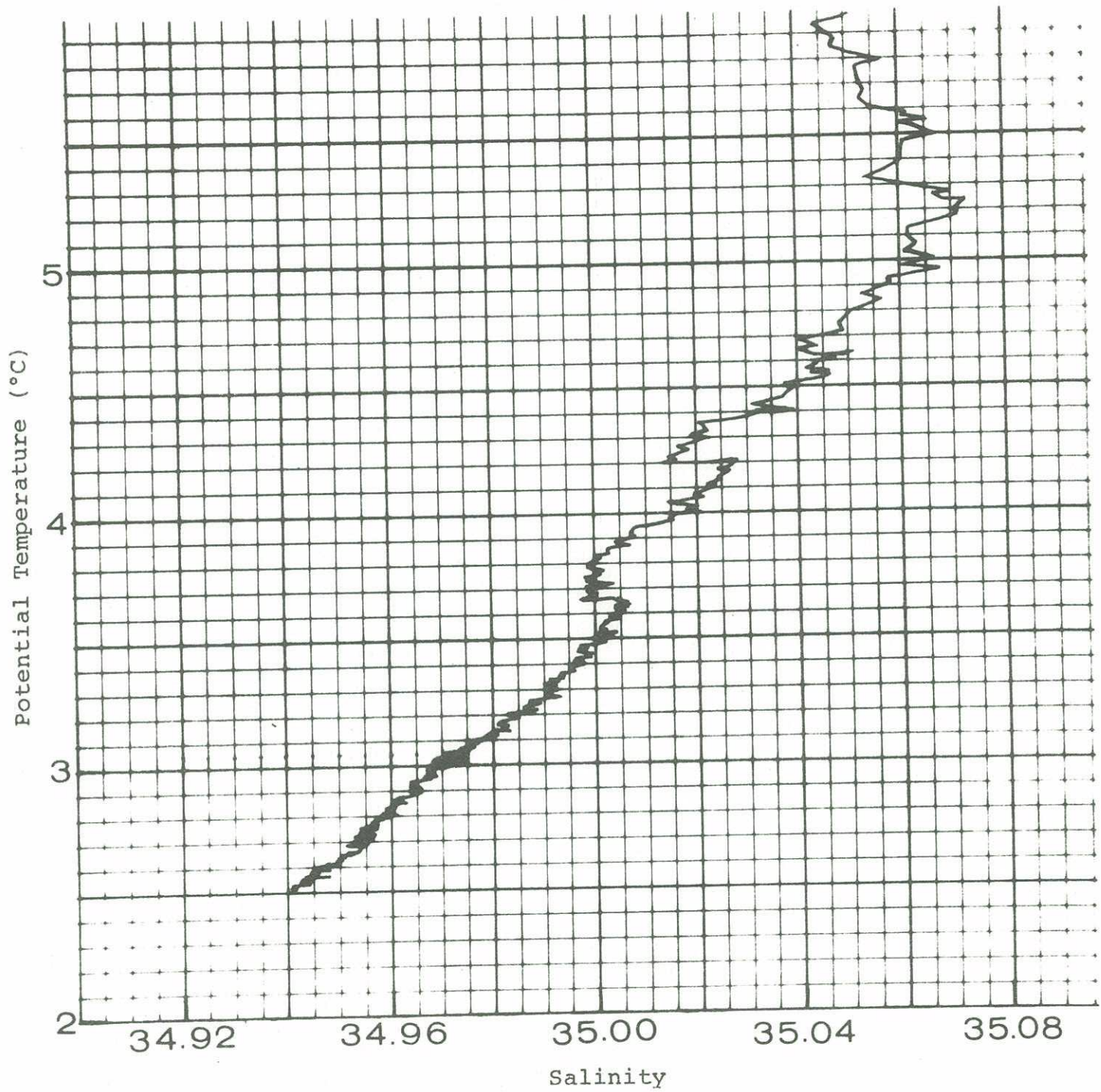


Figure 5

# CAST 15

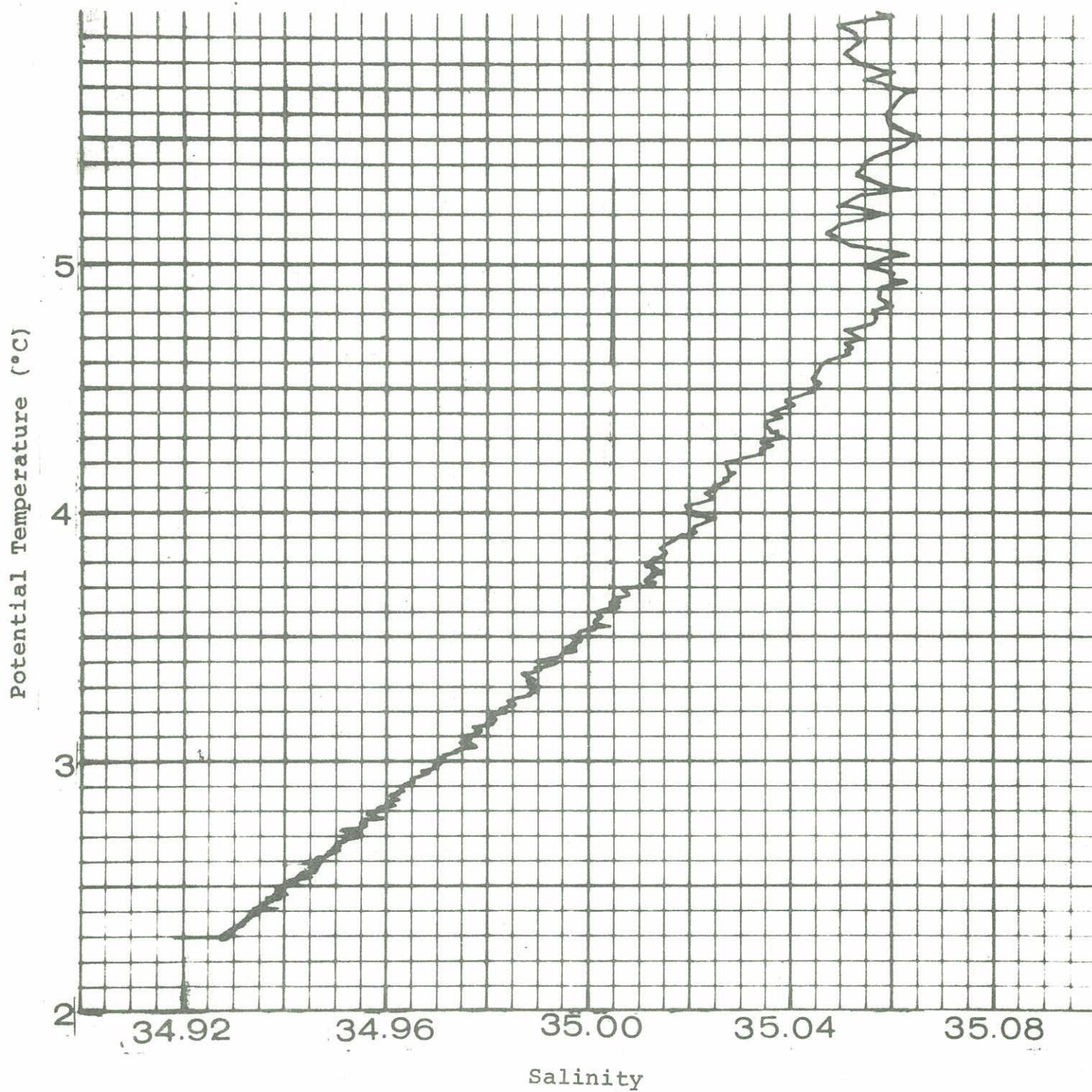


Figure 6