

**ICE-CORING AT MIZUHO STATION, ANTARCTICA, AND CORE ANALYSES:
A CONTRIBUTION FROM THE GLACIOLOGICAL RESEARCH PROGRAM
IN EAST DRONNING MAUD LAND, ANTARCTICA**

by

H. Narita

(Institute of Low Temperature Science, Hokkaido University, Sapporo 060, Japan)

S. Mae and M. Nakawo

(Department of Applied Physics, Faculty of Engineering, Hokkaido University, Sapporo 060, Japan)

Y. Fujii and M. Yoshida

(National Institute of Polar Research, 9-10, 1-chome, Kaga, Itabashi-ku, Tokyo 173, Japan)

K. Kawada

(Department of Physics, Toyama University, 3190 Gofuku, Toyama 930, Japan)

and

A. Higashi

(Division of Natural Sciences, International Christian University,
10-2, Osawa 3-chome, Mitaki-shi, Tokyo 181, Japan)

ABSTRACT

Between May 1983 and July 1984 glaciological parties of the 24th and 25th Japanese Antarctic Research Expeditions (JARE-24 and 25) carried out ice-core drilling using a thermal drill, down to 700.5 m depth at Mizuho Station (70°41'53"S, 44°19'54"E), as a part of the Glaciological Research Program in east Dronning Maud Land, Antarctica.

The thermal drill, 3.9 m long and capable of taking a core 1.5 m long and 130 mm in diameter, is an improved version of a drill used by JARE-15 in 1975. The most important improvement was the monitoring system during drilling, for which a micro-computer was fitted in the drill. By using this system, such accidents as heater burn-out, tank overflow and failure of water suction would immediately be brought to our attention. The drilling speed was about 1.6 m/h, when the optimum output was 3.6 kW. The core recovery rate was above 99%.

The core quality was good down to a depth of 80 m. Between 80 and 120 m, cracks were found at intervals

of 0.15–0.5 m, and horizontal cracks were found continuously at intervals of 0.01 m or less.

Immediately after the core was pulled, the stratigraphy was observed and bulk density was measured. A dust band, presumably volcanic particles, was seen at only 500.2 m depth during stratigraphic observation. The following analyses were carried out at Mizuho Station within a month of recovery:

- (1) Density determination by the hydrostatic method.
- (2) Measurement of total gas content.
- (3) Thin-section analyses, including observation of cracking around air bubbles and the crystalline texture, and ice-fabric studies.

The 700.5 m core has been brought to Japan, and the following analyses are now under way:

- (1) Oxygen-isotope ratio.
- (2) Concentration of microparticles.
- (3) Electric conductivity.
- (4) Chemistry of soluble impurities.