

SEM OBSERVATIONS OF VOLCANIC ASH AT 500 M DEPTH IN THE MIZUHO ICE CORE (ABSTRACT)

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A visible volcanic ash layer was found at approximately 500.7 m depth in the Mizuho core (Y. FUJII and O. WATANABE; *Ann. Glaciol.*, **10**, 38, 1988). A 50 cm core sample which contained the ash layer was not included in the preliminary quantitative analyses of $\delta^{18}\text{O}$, microparticles by Coulter counter, electrical conductivity, pH and major ions, of which 50 cm length samples were taken at 2 m intervals all through the core (O. WATANABE *et al.*; JARE Data Rep., **181** (*Glaciology* 20), 79p., 1992). Most of the ash layer has been kept for detailed analyses using more sophisticated techniques in the near future. Recently, preliminary analyses of the ash by a scanning electron microscope (SEM) and also by energy dispersive spectra (EDS) have been done as presented here.

Several grams of ice were taken from a depth of 500.665–500.700 m where the ash concentration was visibly thick. The sample was cut and melted in the same way as we adopted in our SEM observations of microparticles contained in medium depth ice cores retrieved in Queen Maud Land, Antarctica (A. HIGASHI *et al.*; *Bull. Glacier Res.*, **8**, 1, 1990). Volcanic ash particles were collected on a Nucleo filter by filtering the melt water through it, and its small portion was adhered on a specimen holder of a SEM and coated with evaporated carbon in vacuum. The SEM is a JSM-T220, JEOL, attached to a QX-2000, Link for the EDS analysis. For the quantitative elemental analysis using EDS, a cobalt standard and ZAF4 program were used.

Several particles which look like vesicular tephra or volcanic glass shard in SEM photographs were analyzed quantitatively by EDS. Computed data of oxides plotted on a diagram of $\text{Na}_2\text{O}+\text{K}_2\text{O}$ vs. SiO_2 show that the present volcanic ash belongs to the non-alkaline area in the diagram. Compared with data of other ashes found in bare ice areas in the Yamato Mountains (T. KATSUSHIMA *et al.*; *Mem. NIPR, Spec. Issue*, **34**, 174, 1984) and at 100.8 m depth of the Vostok core and 303.44 m depth of the South Pole core (J.M. PALAIS *et al.*; *Geophys. Res. Lett.*, **19**, 801, 1987) on the same diagram, it is concluded that the present ash originated from South Sandwich Island.

J.M. PALAIS *et al.* (*ibid.*, 1987) estimated the age of ice, both at 100.8 m depth of the Vostok- and 303.44 m depth of the South pole core as 3200 BP from the accumulation rates, and concluded that ashes in both cores are correlated. Our estimate of 500.7 m depth of the Mizuho core is approximately 6000 years BP from the depth-age relationship obtained by M. NAKAWO *et al.* (*Proc. NIPR Symp. Polar Meteorol. Glaciol.*, **2**, 105, 1989). Therefore, differences in the composition of the present ash from others originating from the same South Sandwich Islands may be attributed to the difference of the time of eruptions.

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