

## II. BATHYMETRIC SURVEY

*Masafumi Inoue and Eiichi Honza*

Several geographical provinces are distinguished in the surveyed area of the Japan Sea. These are: the continental shelves, ridges and troughs along the coast of the Tohoku area, the Oki Ridge, Kita-Oki Bank and Oki Trough, and the Yamato Basin, Japan Basin and Yamato Ridge (Fig. II-1). Almost all these features have a NE-SW or ENE-WSW trend.

### **Oki Ridge, Kita-Oki Bank and Oki Trough**

The southern extension of the Oki Ridge forms Oki Island where Neogene sedimentary and volcanic rocks overlie a basement gneiss. Oki Trough is approximately 1,500 m deep but is shallower than Yamato Basin to the NE of Oki Ridge, which exceeds 2,500 m in depth. The U-shaped profile of the Trough suggests that it is filled by sediments. A few terraces which can be seen on the top of the Oki Ridge may represent relic features formed before the main subsidence phase.

### **Yamato Ridge and Yamato Basin**

The Yamato Ridge is divided into three banks—Yamato (northeast), Kita-Yamato (northwest) and Takuyo Banks (northeast) and, plunging to the southeast, the Kita-Yamato Trough. Yamato Ridge is rather rugged which may suggest outcrops of basement rocks although several smooth, tilted terraces are also observed in the profile of the Yamato and Kita-Yamato Banks. The dip direction of the terraces suggest a tilt movement toward the NE. Yamato Ridge, approximately 20 km across, is similar in width to the Yamato Basin. The seabed topography of the Yamato Basin is also uneven due to numerous knolls and the Toyama Deep-sea Channel. The Basin which gradually deepens NW, reaches a maximum depth along the foot of the Yamato Bank, suggesting that sediments were probably supplied mainly from the Japan mainland (Fig. II-2).

### **Continental shelves along the Tohoku area, Okushiri, Sado Ridges and Toyama Deep-sea Channel**

Many discontinuous ridges and troughs lying parallel to the coast of the Tohoku area are observed between Sado Island, in the south, Okushiri Island to the north. These were well correlated with the continental borderland by MOGI (1972). The Okushiri and Sado Ridges are traced onto the shelf where they form banks with an echelon arrangement which were tilted toward the west (SAKURAI and SATO, 1972; HONZA *et al.*, 1977). Continental shelves are narrower in the northern part of the Tohoku area than in southern area where Wakasa Ridge northwest of the Noto Peninsula, forms a relatively wide shelf (Fig. II-3).

The Toyama Deep-sea Channel develops northward from Toyama Bay across the Yamato Basin and into Japan Basin. The channel is only partly situated central part of the Yamato Basin. But sometimes runs through more elevated parts which may imply that much of the sediment is supplied along the length of the channel.

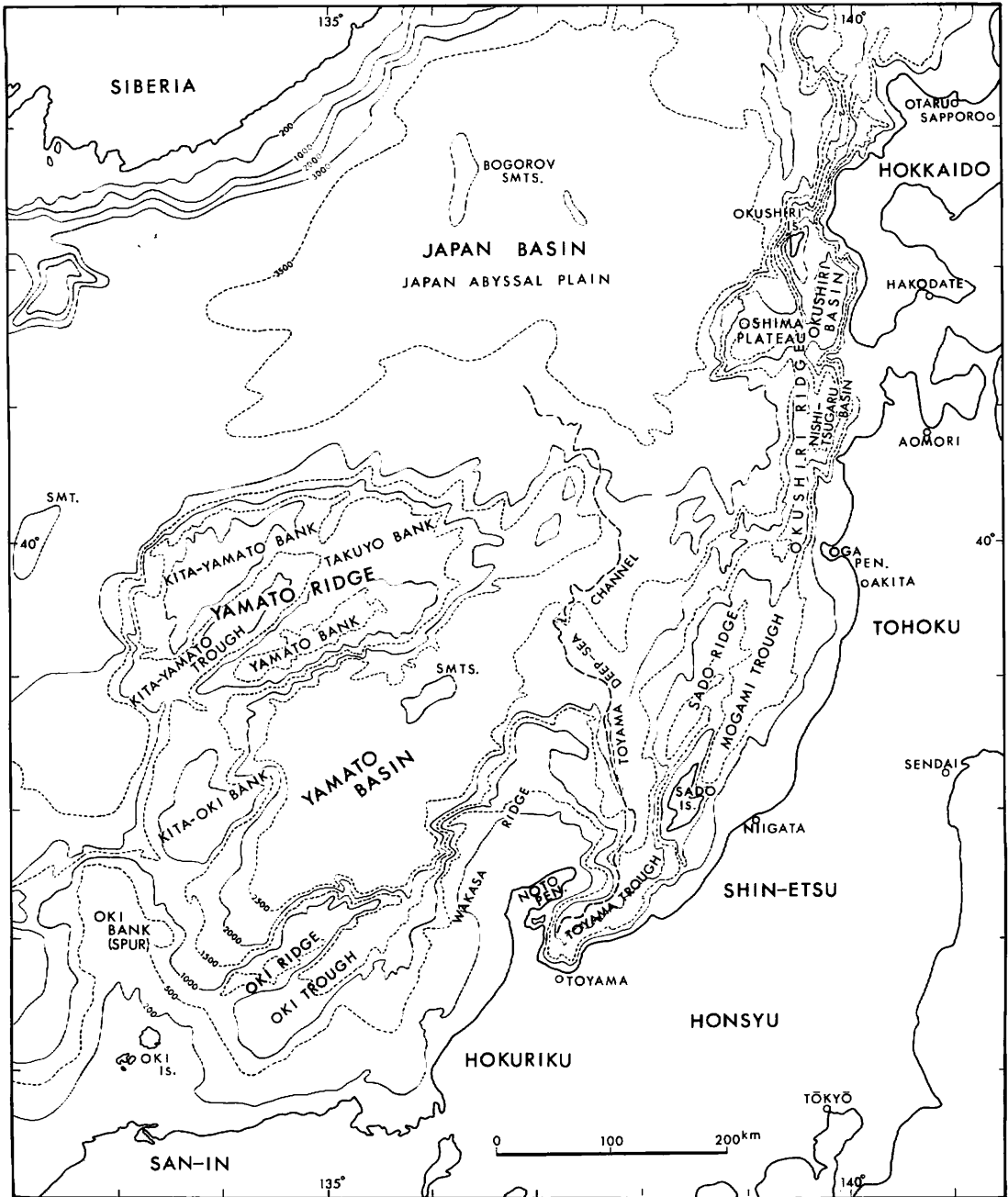


Fig. 11-1 Physiological provinces of the surveyed area in Japan Sea.

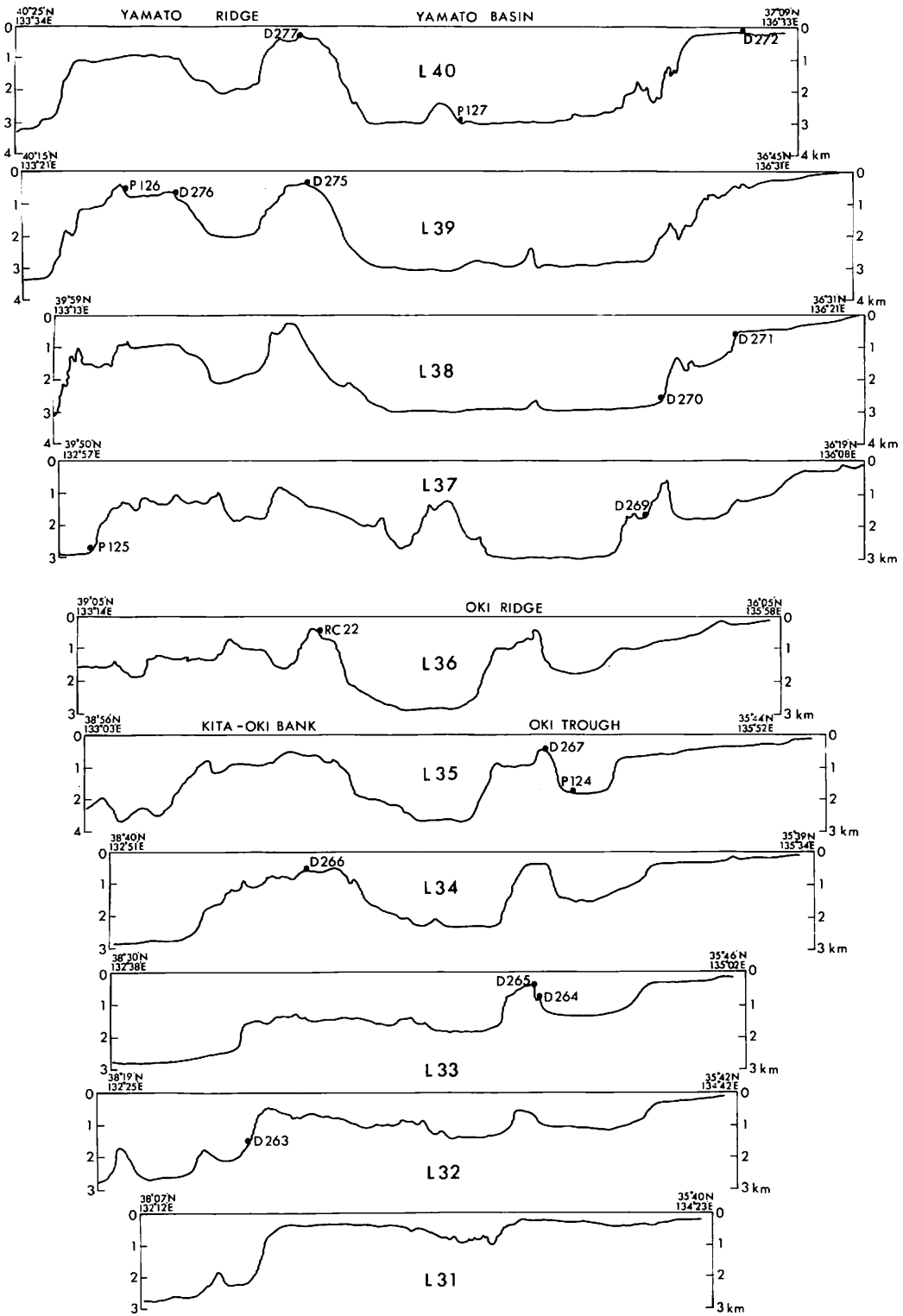


Fig. II-2 Topographical profiles on the southern part of the surveyed area (L31-L40).

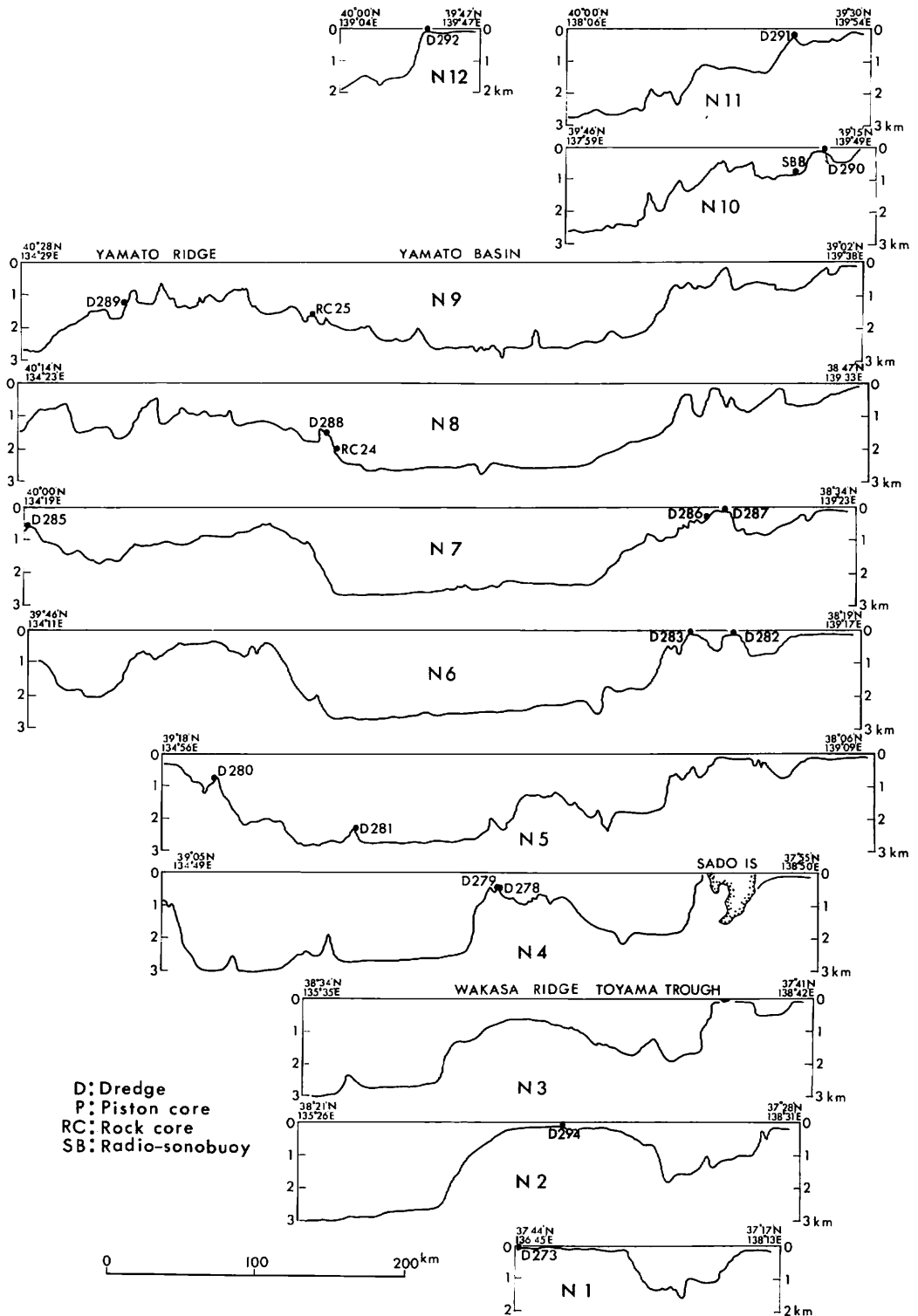


Fig. II-3 Topographical profiles in the central part of the surveyed area (N1-N12).

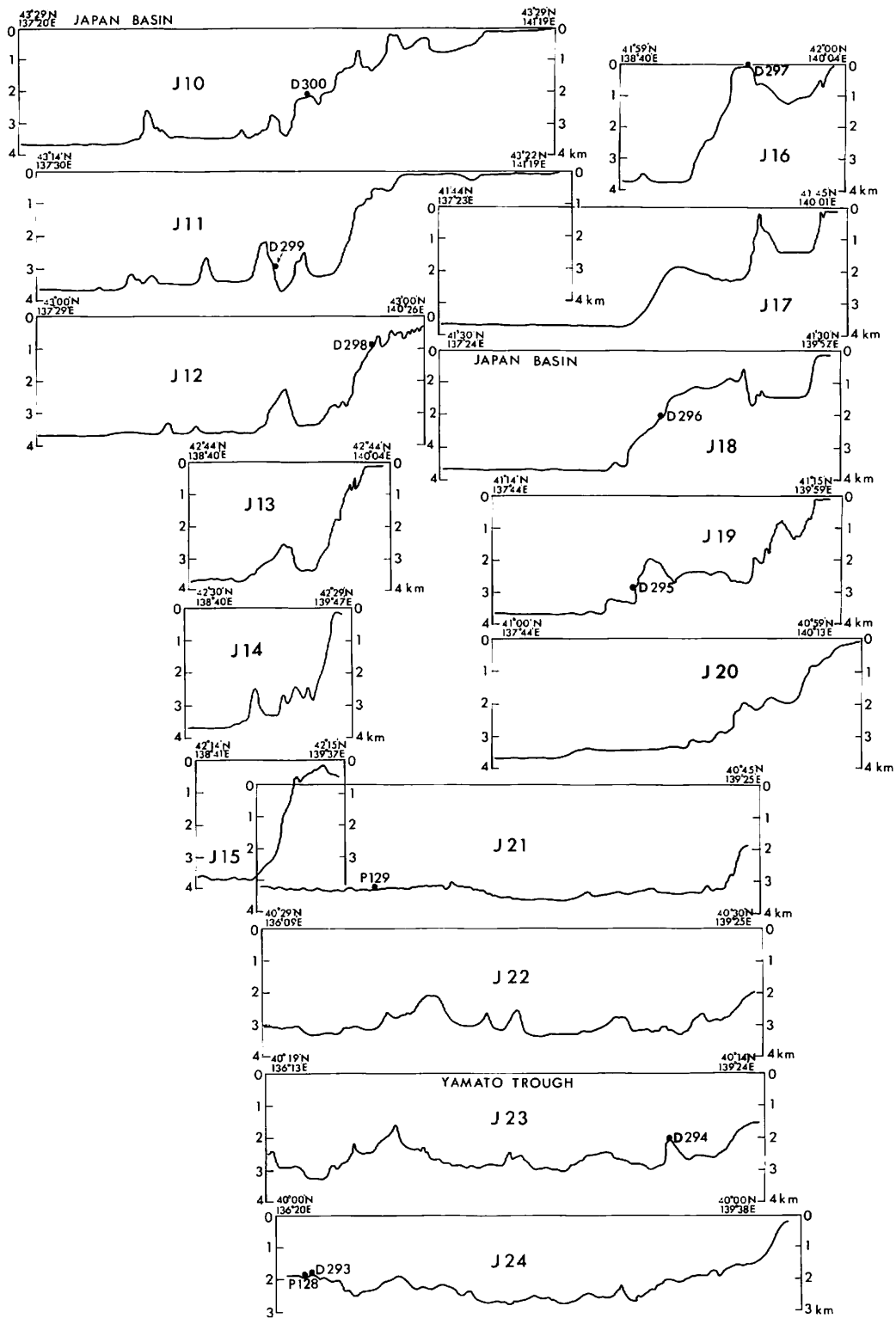


Fig. II-4 Topographical profiles in the northern part of the surveyed area (J10-J24)

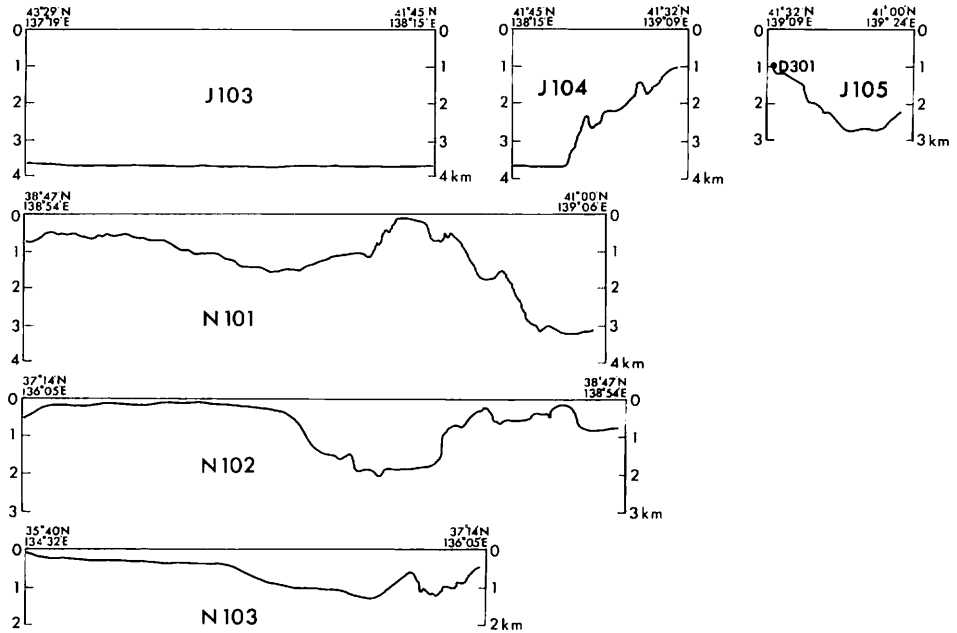


Fig. II-5 Topographical profiles in the longitudinal lines in the surveyed area (J103-J105, N101-N103).

### Northern Japan Basin

The Japan Basin gradually deepens toward the east and is deepest adjacent to the Oshima Peninsula of South Hokkaido where water depth exceed 3,500 m (Fig. II-5). The very flat and smooth surface of the Basin is produced by turbidite layers supplied by sediments from the Siberian coast (HONZA *et al.*, 1977).

### References

- HONZA, E., KAGAMI, H., and NASU, N. (1977) Neogene geological history of the Tohoku Island Arc System. *Jour. Oceanogra. Soc. Japan*, vol. 33, p. 297-310.
- MOGI, A. (1972) *Bathymetry of the Kuroshio Region. Kuroshio-Its physical Aspects.* In K. YOSHIDA (*ed.*), Tokyo Univ. Press, p. 53-80.
- SAKURAI, M. and SATO, T. (1971) Submarine geological structure and history of the Mogami Trough. *Jour. Geol. Soc. Japan*, vol. 77, p. 489-496.