

REPORT
OF
HYDROGRAPHIC RESEARCHES

No. 4, Dec., 1968

TOPOGRAPHY OF THE PHILIPPINE TRENCH

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Received 15 August, 1968

Abstract

In 1965 and 1966 the *Takuyo* carried out soundings and took fourteen profiles of topography from the Philippine Trench and adjacent regions.

These results are presented in Figs. 1A and 1B. Topographical features of the Philippine Trench are similar to those reported for trenches in the northwest Pacific.

1. Introduction

Sounding data were collected in the east of the Philippines by the *Takuyo* during the cruises for the Cooperative Study of the Kuroshio in the western Pacific in July to August 1965 and 1966. The present paper is a report on the topography of the Philippine Trench and vicinity.

2. General description of the Philippine Trench

The axis of the Philippine Trench is approximately NNE to SSE in trend. Northward off Luzon the V-shaped trench transforms to the broad trough-like depression, and southward the trench stretches to the east of Halmahera. The deepest part of the trench have been reported to be the Cape Johnson Deep (10,497 m) by Wiseman and Ovey (1955), but basins deeper than 11,000 m are described in the General Bathymetric Chart of the Ocean, recently prepared by the Hydrographic Office of the Netherlands. On the whole, the Philippine Trench and its vicinity have not been adequately sounded to draw the topography in detail.

3. Results and Discussion

Figs. 1A and 1B show the profiles of the topography off the east of the Phil-

ippines, which are traced from echograms taken by the *Takuyo*. Fig. 1A is mainly profiles off Luzon in the northern part over the trench province.

In sections A and B, the basin floor of the seaward part is relatively hilly, but that of west or shoreward part is comparatively flat. Step-like terrain is partly recognized with the scarp of several tens to a few hundred metres in height through the sections. The broad swell on which seamounts and/or floor gaps develop, is found in sections C, D and E. Step-like terrain or the floor gap is interpreted as a fault origin.

Fig. 1B is profiles of the trench proper. Section G shows the topography of the northern end of the trench, and the very deep, narrow gorge which is remarkably found at the trench does not develop.

Sections H, I and J run off Samar to the Philippine Trench. In section H the wall of 6,000 to 8,000 m in depth on the shoreward side of the trench is steeper, with slope of 19° , one of the steepest slopes taken by the *Takuyo*, than the wall of the seaward side, with slope of 5° . The deep inner gorge that is similar, but large in scale, to those found in the Ramapo Deep by Fisher (1954) is recognized in the trench bottom in section I. The broad swell in parallel with the trench axis is not found on the sea floor of the seaward side of the trench, but small narrow depression (Iwabuchi, 1968) exists, which is interpreted as a fault origin.

Sections K and L are profiles slightly south of the Cape Johnson Deep, with small benches at a depth of 8,200 m in section K, 4,000 m and 6,000 m in section L, respectively. Sections M and N are east of Mindanao. About 5,000-m bench being 8 km wide is shown in section M. Two remarkable seamounts are recognized on the ocean floor having rough relief of small hills and troughs in section N.

Throughout the sections across the trench axis, flat floor is not found, so that the accumulation of thick sediment is not expected in the Philippine Trench.

4. Summary and Conclusions

Profiles of the topography of the Philippine Trench and vicinity were taken by the *Takuyo*. These results are presented in Fig. 1. The trough off Luzon is hilly in some place. On the sea floor of the seaward side of the trough off Luzon, develops the broad swell having seamounts and step-like topography.

Benches exist on the wall of the shoreward side of the Philippine Trench. They are 4 to 12 km wide and at the depth of about 4,000 to 8,000 m. On the sea floor of the seaward side of the trench, the broad swell does not develop, but small narrow depressions and step-like topography with the floor gap exist, which is interpreted as a fault origin.

The thick sediment is not expected in the Philippine Trench.

(Surveying Section)

References

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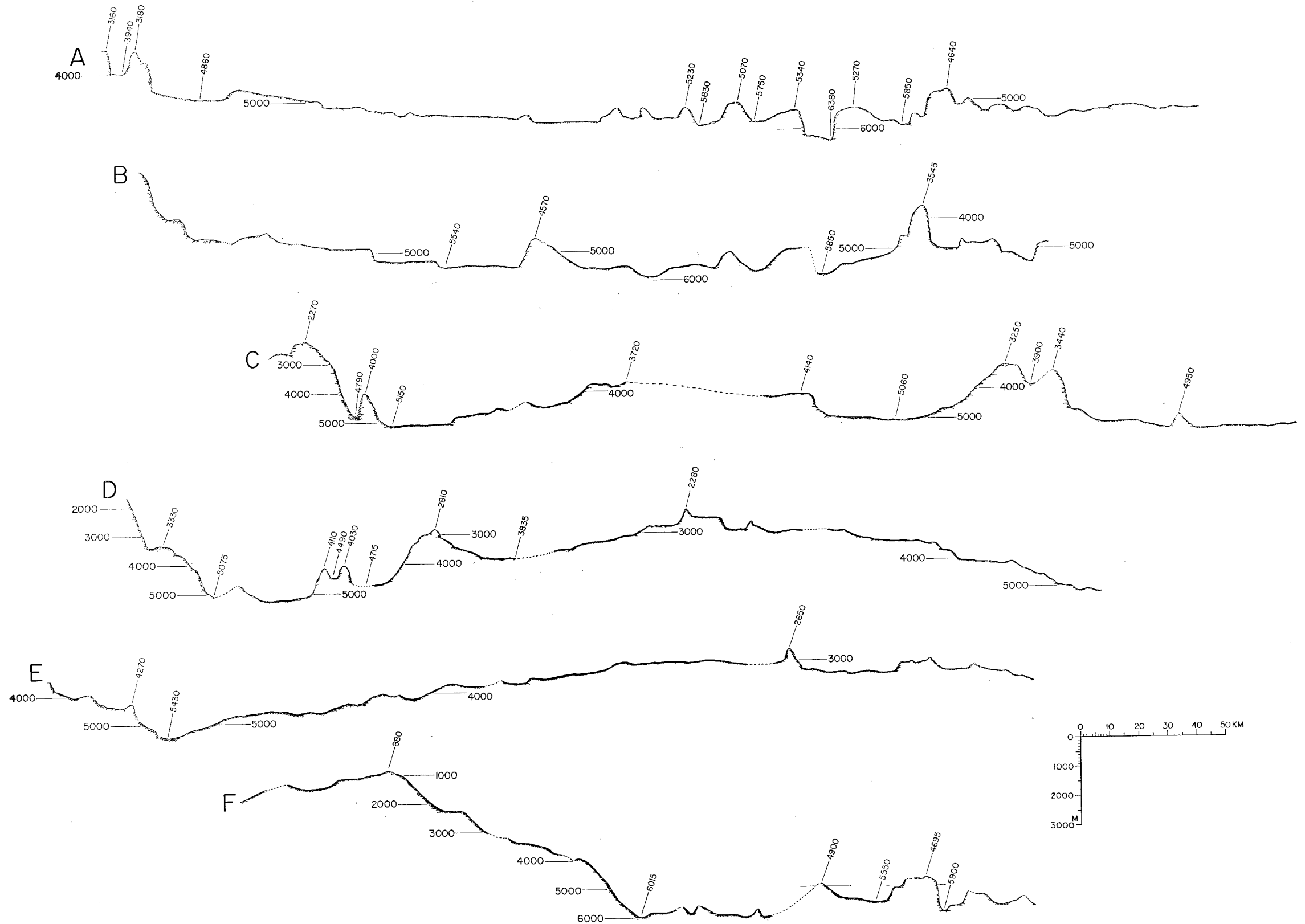


Fig. 1A. Six topographic profiles across the trough and the broad swell off Luzon. Positions are indexed on the Fig. 1B.

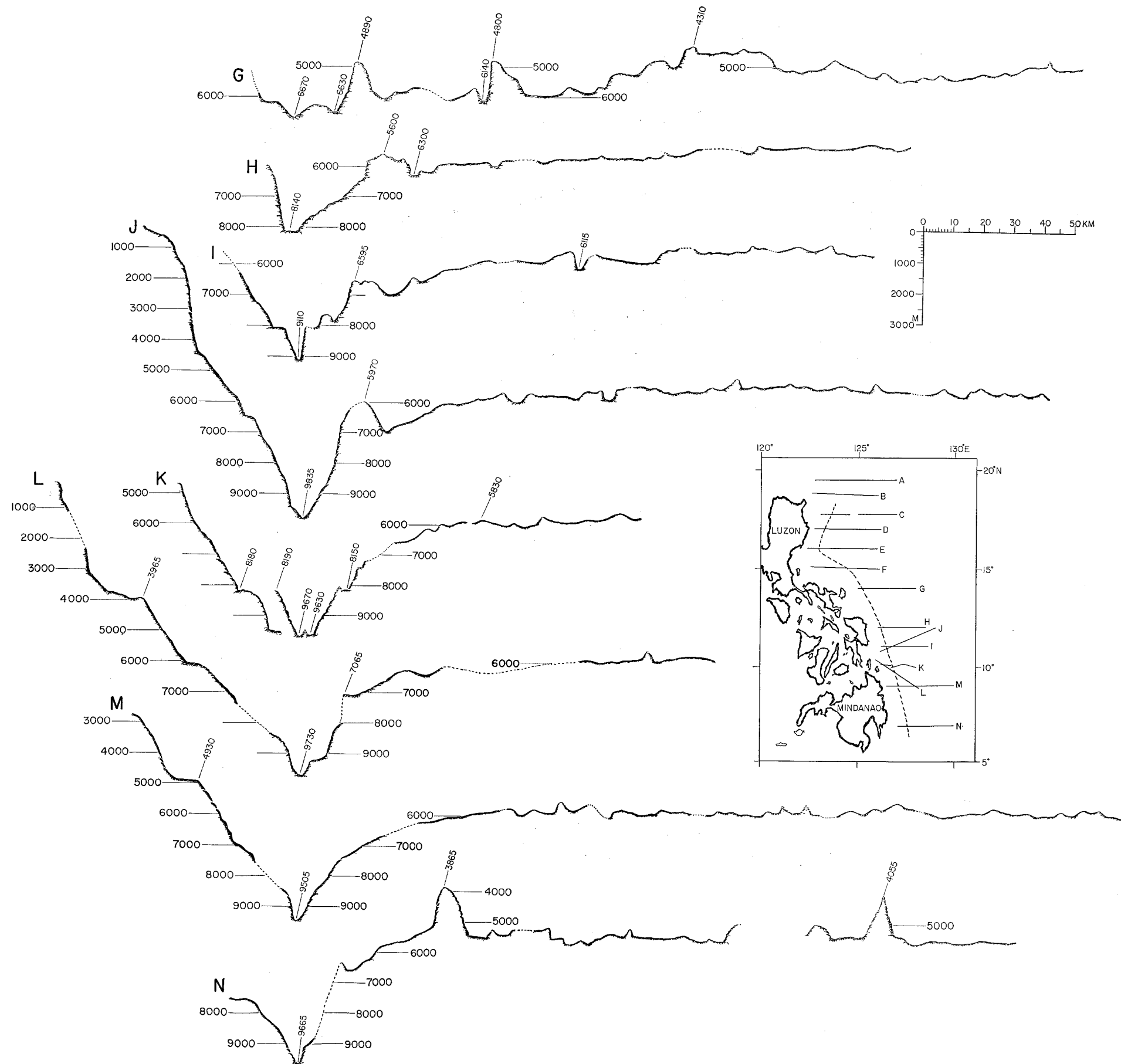


Fig. 1B. Eight topographic profiles across the Philippine Trench.