Recent Explosion Seismological Works in Japan

By

THE RESEARCH GROUP FOR EXPLOSION SEISMOLOGY

The Research Group for Explosion Seismology started its activity in 1950 when a big quarry blast of 50 tons was detonated at Isibuti, Iwate Prefecture in northeastern Honshu. The Group has developed since then and now more than hundred seismologists of various agencies and universities participate in the Group. They have carried out many number of observations in various parts of Japan and made a lot of contributions to the crustal structure in Japan. Since 1964, the financial support under the Upper Mantle Project has made it possible to adopt the method of observation on land and shooting in sea, as well as to improve the instruments. This method gives us the substantial increase of number of data and the powerful means to discuss the detailed structure with high accuracy. In this paper the recent result by the Group, especially that on the profile in northeastern Honshu, is described.

More than fifty shots were fired in the sea region off Kesenuma, Miyagi Prefecture, in March, 1965, the observation being made at

sixteen stations on land and a receiving vessel. In March, 1966, twenty shots were detonated in the sea off Oga Peninsula, Akita Prefecture, together with a shot on land at Tutihata Mine, Iwate Prefecture. The observation was carried out at almost the same stations as in 1965. Thus more than 600 records were obtained and analysed under the assumption of layered structure. The description of the procedure of analysis was already made in the paper by Hashizume, Oike, Asano, Hamaguchi, Okada, Murauchi, Shima and Nogoshi (1968).

The result is seen in Fig. 1, which indicates that the crust is composed of a sedimentary, granitic (6.0 km/sec) and basaltic (6.6 km/sec) layers. The velocity of Pn is determined to be 8.0 km/sec. The depth of Moho is 30 km in the central part and the crust tapers near the shore towards the ocean on both sides of Honshu Island. The transition from continental to oceanic structure occur in the vicinity of shore.

Fig. 1. Model of crustal structure along the profile. Numbers at sea mean the shot numbers and those on land the station numbers. Hatched parts designate surface or sedimentary layers. Thick hatched parts show that the existence of low velocity layers can be expected.

References

The Research Group for Explosion Seismology:
1968 Crustal Structure in the Profile across the
Northeastern Part of Honshu, Japan, as

Derived from Explosion Seismic Observations. Part 1. Observations of Seismic Waves Generated from the Off Kesenuma, the Off Oga Peninsula and the Tutihata Explosions. Bull. Earthq. Res. Inst.,

Univ. of Tokyo, Vol. 46, 529-605.
M. Hashizume, K. Oike, S. Asano, H. Hamaguchi,
A. Okada, S. Murauchi, E. Shima and M.
Nogoshi:
1968 Crustal Structure in the Profile across the

Northeastern Part of Honshu, Japan, as
Derived from Explosion Seismic Obser-
vations. Part 2. Crustal Structure. Bull.
Earthq. Res. Inst., Univ. of Tokyo, Vol.
46, 607-630.

(Received Dec. 11, 1968)