# 3 EARTH-PHYSICAL RESEARCH

The time-variations of the D, H and Z *components of the magnetic field* have been continuously recorded by two sets of La Cour variometers in the Tihany Geophysical Observatory. Magnetic data have been forwarded to the International Data Centres. The hourly average values are going to be published in the Annual Report of the Observatory.

Besides the La Cour type instruments a set of variometers with electrical output have been recording the magnetic elements as well.

The *hourly values* for the period of 1966–73 are stored on punched tapes.

The *ionospheric research* has been continued in cooperation with, the Geophysical Department of the Budapest University. The hourly recording of whistlers has been going on. During the Antarctic international VLF propagation study additional whistler observations were carried out. Recorded data have been forwarded to the Moscow and Washington Data Centres. *Statistical distribution of whistler occurrences* was analysed (Fig. 39).

To have more information on the structure of the plasmasphere dynamical spectral analysis and electron density data were correlated with different geophysical parameters ($\Sigma$ Kp, H).

To investigate *the spatial variation of the magnetic field,* observations were carried out on the first order magnetic base points.

*Gravity tidal recordings* carried out in cooperation with the Soviet Academy's Institute of Earth Sciences have been completed, the data analysed. It has been concluded that the previously observed phase lag of the Gs–11 No. 190 gravimeter was caused by the photo multiplier of the instrument. To improve our recordings a capacitive sensor element was built into the gravimeter. With the transformed instrument a 80 days long series was recorded in Bonn.

The research of the inner structure of the Earth has been continued.

In *geodetic gravimetry* the investigations of Sharpe gravimeters were going on. The effect of external vibrations, static and dynamic temperature variations were studied (Figs. 40, 41).

Our geophysicists took part in the observations of the *International Gravity Base Net* established in Eastern-Europe to study the secular variation of gravity. The measurements were carried out by Czech, German, Hungarian, Polish and Soviet experts using 20 various types of gravimeters (ten GAG–2, three Askania Gs–12 and one Worden Geodesist).

To monitor recent crustal movements gravity observations were carried out on points of high precision leveling network.

The *seismic crustal research* profile of 1967 proved the deepening of the Moho discontinuity under the Bakony Mts. To get more details a transverse shooting system was chosen, where shots and recordings were carried out along two parallel lines. Their distance was determined by the appearence of the critical reflection.

The lines could be located in valleys (Fig. 42) while the depth poits of the wide angle reflections were under the elevated area. Shot-point spacing was 9,2 km, distance of lines: 70,5 km. From one shot-point four spreads were recorded by the digital field equipments SDT–2 and SD–10/21.

During data processing, different filters were applied. The best result was achieved by a 13 Hz low-pass filter, combined with five-channel mixing (Fig. 43). The marks of similar forms show arrivals from horizons of presumably similar origin.

The depth section, constructed from the time section is presented on Fig. 44. The first discontinuity, of about 20 km depth is supposed to be the Conrad (C), the second one can be related to the Moho. The latter is in fact a zone of four reflections ($M_1$, $M_2$, $M_3$, $M_4$), where $M_1$ is rather doubtful. The deepest part of this zone is under the mountains.

Several of the arrivals refer to dipping reflecting horizons. These can be studied by both depth- and time-sections together.