HISTORY OF MAGNETIC OBSERVATION

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The continuous recording of geomagnetic field was started in Hungary in Ógyalla (today Hurbanovo, Slovakia) at the end of the 19th century. In 1918 Ógyalla was annexed to Czechoslovakia. From 1918 till 1938 geomagnetic recording was restricted to the recording of declination. Between 1938 and 1945 Ógyalla belonged again to Hungary. The Hungarian Institute of Meteorology restarted the systematic measurement of the geomagnetic field under the leadership of Prof. Dr. György Barta at the end of 1938. After World War II, as Ógyalla became again part of Czechoslovakia, Prof. Barta started a provisional observatory in Budakeszi, and made efforts to establish a new geomagnetic observartory in Tihany. Thanks to his activity the new Observatory of the Eötvös Loránd Geophysical Institute in Tihany began his recording activity in 1954.

The International Geophysical Year 1957–1958 brought about the idea to establish a second geophysical observatory in Hungary by the Geophysical Research Laboratory of the Hungarian Academy of Sciences. The main aim was to record the natural electromagnetic field in a wide range, including variations of atmospheric, ionospheric, magnetospheric and extraterrestrial origin. Therefore we had to find a place with quiet geological conditions being free from man-made electric disturbances, and where the latter condition could be maintained in the future, too. We found a place, where these conditions were fulfilled, near to the southern shore of the Lake Fertő, between the villages Fertőboz and Hidegség. The place has been in the neighbourhood of Nagycenk, where count István Széchenyi the founder of the Hungarian Academy of Sciences is buried, therefore the Observatory was always called: Geophysical Observatory near Nagycenk, and is named now Széchenyi István Geophysical Observatory of the Hungarian Academy of Sciences.

The environment of the observatory has legal protection against industrialization causing vagabond currents.

The recording of earth (telluric) current was started in 1957 with instruments produced in the Laboratory. It was, however, necessary to complete earth current recordings with those of the geomagnetic field, too.

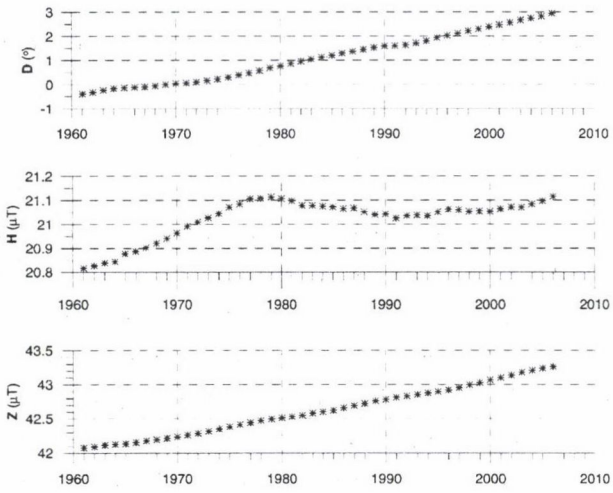

Fig. 1. The yearly means of geomagnetic absolute values in D, H and Z in the Observatory Nagycenk between 1961 and 2006

Geomagnetic instruments, namely variometer sets for recording H, D and Z components, as well as those for the measurement of the absolute values of these components had to be imported from abroad. This was not an easy thing among the economical conditions of the country in the late fifties. Two antimagnetic houses had to be built for the measurements, one for the continuous recordings (called relative house) and the other for the measurement of the geomagnetic absolute values (called absolute house). They were built from limestone, the roof from reed.

The continuous recording of the geomagnetic components H, D and Z, and the weekly measurement of the absolute value of these elements were started in July, 1960. The instrumentation was: two variometer sets of the type La Cour (made in Denmark) recording to 30 × 40 cm photo-paper sheets, two QHM-s (quartz-horizontal-magnetometer), one BMZ (balance-magnetic-zero) (also made in Denmark), a magnetic declinatorium and an Earth inductor (Askania). The magnetic declinatorium originally served in the Observatory Ógyalla, then in Budakeszi and in Tihany, but was later replaced by a magnetic theodolite in Tihany. Nevertheless, it was a very accurate instrument, and easy to handle. The Hungarian Television made a report in the Observatory in the late seventies, in course of which this old instrument was the most successful for the reporters, the longest report dealt with the measurement of magnetic declination by means of this ancient declinatorium.

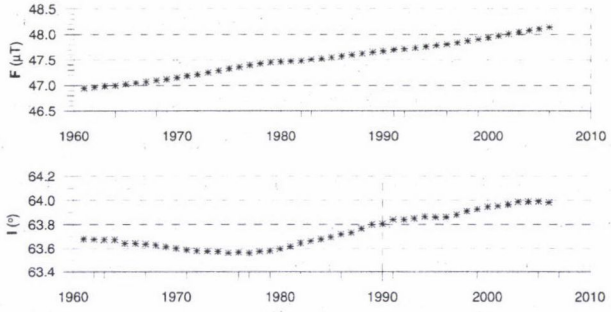

Fig. 2. The yearly means of the geomagnetic total field F, and the Inclination angle I in the Observatory Nagycenk betyween 1961 and 2006

The QHM and BMZ instruments were compared in several geomagnetic observatories. Comparison measurements were made each years with Tihany, but several times in Niemegk (formerly GDR), too. The transport of the magnetic instruments into a foreign country was often rendered difficult by customs. When I travelled to Niemegk in 1967, I was ordered to get down from the international train in border station Sturovo (CSR) in order to make a declaration on the instruments being in my luggage, for which I had already get a customs permission in Sopron. Fortunately this formality took only about 15 minutes and the train waited till I came back.

The conventional magnetic instruments described formerly, were used until 1989. From 1989 till 1991 the measurements of magnetic absolute values were made with a vector proton magnetometer developed in the Observatory Niemegk. Since 1991 absolute measurements have been made by a triaxial fluxgate magnetometer a proton magnetometer (ELSEC 820).

Digital recording of the geomagnetic variations was also started by an ARGOS system (bought from the British Geological Survey) in 1991. The analogous photographic recording was run parallel during about one year.

Observatory reports of geomagnetic data has been published each year since 1961. As the observatory had in the first times the main aim of the continuous monitoring of the Earth's electromagnetic field of external origin, the chapter Geomagnetism was compiled in coincidence with the chapter Earth Currents. The activity indices reported were determined according to a linear scale, which increased by 7 nT broad steps. Only monthly and yearly averages of the absolute values of the elements were given. Since the beginning of the nineties, however,

as the participation in INTERMAGNET was started. Since that the reports on geomagnetic measurements are compiled in accordance with the requirement of INTERMAGNET. Activity indices have been determined according to Bartels.

Besides the yearly publication of geomagnetic data in the Observatory Reports, we have direct contacts with other obeservatories, too. Since the end of the seventies special events (SSCs and solar flares) have been reported to the Ebro Observatory (Spain). Close connections and data changes took place from time to time with the Observatories Wien-Kobenzl, Niemegk, Prahatice, Belsk, Hurbanovo.

It is of interest to show the trend of the geomagnetic secular variation in the Observatory. In order to that the yearly mean values of the geomagnetic elements were plotted for the last 45 years, i.e. from 1961 until 2006. Figure 1 shows the yearly means of declination, of the horizontal and vertical components. A continuous increase in Z (and consequently in the total field (F), too, see Fig. 2), and an eastward trend in declination can be observed, while the trend of increase was stopped in H (horizontal intensity) in the late seventies, and even a small decrease arose until 1992. Since that the increasing trend appears again, but only in smaller degree. Thus the angle of Inclination (I) increased between 1978 and 2003 (Fig. 2).