

HISTORY OF THE METEOROLOGICAL OBSERVATIONS IN DEBRECEN

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Abstract

Debrecen was among the first cities in Hungary where meteorological observatories were established, although the weather station of our University was put into operation 80 years ago, Meteorological observations have a much longer history in the city. In the present paper history of the meteorological observations and stations worked in the city has been reviewed with special emphasis on the meteorological observatory of the University of Debrecen.

An amateur meteorologist, Károly Tamássy, who was a pharmacist by profession, had carried out the first instrumental observations in the city between 1854 and 1869 (Szász 2001). His Observatory was situated near the center of Debrecen. His observations were sent to the Weather Center in Vienna, from where he got instructions for the measurements. His original weather registers can be found in the archives of the Hungarian Weather Service.

The next milestone in the history of the meteorological observations in Debrecen is the foundation of the Higher Agricultural Education Institute of Debrecen in 1868. An agrometeorological observatory was established in the gardens of the institution at Pallag, 4 km North off the city in the same year. The observatory was a member of the climatologic observatory network of the Hungarian Meteorological Institute from 1870. It was the one and only weather station of Debrecen for decades. Examinations were carried out there by the founder of the institution Béla Tormai and later Zsigmond Zalka, who has compiled the first monograph on the climate of Debrecen. Research at the agrometeorological observatory focused on the factors that govern the microclimate of different plant stands (Justyák, – Kéri, – Szász 2001).

The István Tisza University of Sciences was founded before World War I. Climatology was a subject in the education program of the Institute of Geography. Its lecturer was Dénes Berényi (Figure 1), who had a broad spectrum of activity within the field of Meteorology.



Figure1. Dr. sen. Dénes Berényi (1900-1971), founder of the Meteorological Observatory of the University of Debrecen
(Source: Archives of Department of Meteorology of the University of Debrecen)

He established a meteorological station in 1927 (Figure 2), what started its operation in 1928. The observatory of the University became a member of the weather station network of the Hungarian Meteorological Institute [3]. It had operated according to the climate observations protocol of the Hungarian Weather Service. Its observation series can be found in the archives of the Hungarian Weather Service. Till 1950 there were simultaneous observations at the two weather stations.



Figure2. The establishment of the Meteorological Observatory of the University of Debrecen in 1927 (Source: Archives of Department of Meteorology of the University of Debrecen)

The observatory has been situated at the sport fields of the University right on the border of the forest of the Nagyerdo and the city. Its urban environment has become densely built up gradually.

Professor Berényi and Antal Réthly, the chairman of the Hungarian Meteorological Institution had analyzed its time series. Data compared to those that were measured at Pallag, had revealed the impact of built up on the meteorological elements, mainly the effects of the urban heat island. The measurements were carried out by prof. Berényi in 1928-29. These examinations based on comparison of data measured at the building of the Department of Geography of the University in the city center and in the sports grounds of the University in the suburbs at a distance of 3 kilometers. It was found that strong heat islands (thermal difference between the city and its environment) can develop under anticyclonic conditions, when skies are clear and wind is mild. The mean maximum difference between the two sites was 3.7 °C (Berényi D. 1930)

Some special research programs were carried out at the Observatory of the University in the 1930's. Professor Berényi compiled daily local weather forecasts and maps, monthly weather reports and annals published in the local press for the environment of Debrecen (Szász G. 2007).

High altitude wind measurements were carried out at the airport from 1929, which were the first pilot balloon experiments in Debrecen. Results, which were the first contributions to the three dimensional weather modeling in Hungary, were published in Hungarian and German scientific journals (Berényi, 1933).

He established a network of four local climate stations for agro- and forest meteorological purposes in different environments in the vicinity of Debrecen at that time (Figure 3). The network had operated till World War II.

In October 1944 Debrecen found itself in a special position again: it became the capital of the country after almost a hundred years. During the soviet siege of Budapest, Debrecen became the center of the Hungarian Meteorological Institute.

Professor Berényi was the head of the service till mid 1945. He had to reorganize the weather service in the soviet-controlled part of the country.

Meteorological observations became hard to carry out under the military occupation but Professor Berényi somehow could maintain the continuity of the observations at Pallag and the weather station of the University.

The airport of the city became a soviet military airbase in 1946. Somewhat later civil aviation was restarted in the country and in the city in the frame of the MASZOVLET Soviet-Hungarian airlines. Both required a meteorological observatory near the airfield. It was finally organized in the form of a „sub station” of the meteorological station of the University with the lead of Tibor Benko. In 1950 the weather station of the airbase became independent. From that time there were three weather stations in operation in the city.



Figure 3. A forest micro climate station of Professor Berényi's network at Gút, near Debrecen in the 1930's. (Source: Archives of Department of Meteorology of the University of Debrecen).

The present order of the meteorological observatories of Debrecen had evolved by the mid 1960's. The weather station of the airport became the main observatory of the Hungarian Meteorological Service with the lead of Tibor Benko and from 1982 Mihály Jákfalvi.

The agrometeorological observatory worked at Pallag till 1956 and after 1961 at Kismacs with the lead of Professor Gábor Szász.

The observatory of the University became a secular climatologic observatory, with the lead of Professor Dénes Berényi, from 1968 Professor János Justyák and from 1991 Dr. habil. Károly Tar. New programs, like the forest climate project of Síkfokút were not connected to the weather station of the University. The reason for that shift was partly that the environment of the observatory gradually became densely built up as it can be seen in figure 4, what made impossible to use it as a standard climatologic station. On the other hand, its densely built up urban environment makes the climatologic observatory of the University suitable for the role of an urban climatologic observatory in the future.



Figure 4. Since its foundation the environment of the climatologic station of the University of Debrecen has become densely built up in the East, South and West.
(Source: Archives of Department of Meteorology of the University of Debrecen and the photo of the author).

Today new roles for the climatologic station take shape. On one hand the collection of meteorological instruments of the observatory are used in the practical meteorological education of students of geography and Geosciences (Figure 4).



Figure 5 The collection of meteorological instruments at the Meteorological Observatory of the University
(Source: photos of the author)



Figure 5 The new automatic urban climate station at the Meteorological Observatory of the University
(Source: photos of the author)

On the other hand, its highly urbanized environment makes it suitable to operate as an urban climate station in the frame of one of the current research programs of the Department of Meteorology. That role is supported by the new automatic weather station mounted at the observatory (Figure 5).

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References

BERÉNYI D. 1930: A városi háztömbök hatása az éjjeli lehulésekre. Az Idojárás 34. évf. új sorozat6. évf. 3-4 füz. Pp 46-49. Budapest, 1930

BERÉNYI D., 1933: Die aerologischen und meteorologischen Verhältnisse im östlichen Teil der grossen ungarischen Tiefebene (Alföld) bei mediterranen Zyklonen. in: Beiträge zur Physik der freien Atmosphäre 20. köt. Pp 84-122. 1933

SZÁSZ G. 2001: Bevezető előadás in Szász G. (szerk.) Dr. sen. Berényi Dénes születésének 100 éves jubileumi ünnepsége. Debrecen pp. 7-23. Debrecen, 2001

JUSTYÁK J., DR. KÉRI M., DR. SZÁSZ G. 2001: Dr. Berényi Dénes professzor életútja, munkássága in Szász G. (szerk.) Dr. sen. Berényi Dénes születésének 100 éves jubileumi ünnepsége. Debrecen pp. 25-33. Debrecen, 2001

SZÁSZ G. 2007: A debreceni meteorológiai megfigyelések és kutatások története – manuscript