

ASTRONOMICAL AND METEOROLOGICAL OBSERVATORY AND ITS ASTRONOMICAL WORK UP TO THE END OF THE FIRST WORLD WAR

From 1887 until 1924, for 38 years, in Belgrade existed Astronomical and meteorological observatory, when divided into separate Astronomical and Meteorological observatory. This paper deals chronologically, by years, with the past of Observatory, and in particular with its astronomical work ending with the year 1918. We did not go further, because there was no time to handle complex issues related to the acquisition of astronomical and other instruments after the First World War. The reason for this work is the 125th anniversary of its founding.

Astronomical and meteorological observatory was founded by Milan Nedeljković in 1887. After finishing his studies on the Department of Science and Mathematics of High School in Belgrade in 1877, he completed and postgraduate studies in science in Paris, from 1879 to 1884.

For the establishment of the Observatory, of importance were the international environment, in particular the pressure of International Meteorological Organization on Serbian Government and the agricultural character of our country. Due to this, in introduction, the attention has been paid to the development of Astronomy and Meteorology in Europe, especially to protagonists and to institutions of these sciences in the time of education and working period of Milan Nedeljković. Astronomical part, of this, primarily meteorological observatory, existed thanks to Milan Nedeljković, who was an astronomer by vocation – for example, after finished school, he asked to study Physics and Astronomy. While studying in Paris, he finished Astronomical school of the Paris Observatory – he was an alumnus of the first generation, 1881-1884, when it became a three-year school.

The original astronomical and meteorological observatory was located in a private house in the Western Vračar. With meteorological observations Nedeljković began on 1 July, 1887, and continued them on 1 May, 1891, on the permanent observatory, which was built about 350 meters south-east of it.

Before the construction of the Permanent Observatory Milan Nedeljković wanted to build on Topčider plateau a big astronomical and meteorological observatory. Although the committee for the selection of place has been founded, this expensive and unrealistic idea was quickly abandoned.

In the year 1888, on the four-leaf paper he outlines a more realistic observatory, but with shortened astronomical content. It has five buildings - the main building and four pavilions: meteorological, geomagnetic, photographic and mechanical workshop, and in the middle of the park the meridian one, which was the smallest.

As the realization of this project would be too expensive, the Ministry of Construction, under yet unclear circumstances, has built only the building of today Meteorological Observatory, which M. Nedeljković so called from the beginning, hoping to build soon its main building, in which he intended first of all to work and live. As the main building was never built, "Meteorological Observatory" was all the time, from 1891. up to 1924, the seat of the Permanent astronomical and meteorological observatory.

Yet in the time when it was temporary, the observatory possessed some minor astronomical instruments, serving to M. Nedeljković "to show celestial objects to his disciples."

In order to determine the exact time and geographic coordinates, he realized the idea of "Small Astronomical Observatory", which had a meridian and altazimutal pavilion. First he acquired altazimut (1896?), and in 1897, he equipped the meridian pavilion. He intended to bill the work on these important jobs from the State, for example, from Railways and the Army, but these plans came to nothing.

The exact time he began to determine in the April of 1898, but only for the needs of the Observatory (it was especially needed for its subsequent seismological work), and not for the purpose of public clocks, telegraphs. Railway, for example, was taking over the time "free of charge" from Zemun railway station then in Austro-Hungary.

Although in 1899 was accepted the collaboration with the Geographic Department of the Ministry of Army, and with Department of Geodesy at the High School, there was nothing of the joint work on astronomical triangulation of Serbia. M. Nedeljković, who within the frame of this project started to work on determination of the latitude and longitude of the Observatory, has been retired in the mid-1899 after the attempt of assassination of King Milan on Ivanjdan (Day of St. John the Baptist).

Although M. Nedeljković returned to work at the end of next year, he never pursued the determination of coordinates – justifying this with the meteorological duties. During the absence of Nedeljković, 1899/1900, the Observatory has led by his rival and critic Djordje M. Stanojević, another Serbian astronomer and meteorologist, also educated in Paris.

At the end, astrogeodetic survey of the Kingdom of Serbia has been made by Army, on the head with capable astrogeodesist Stevan Bošković, who seven years was prepared in Russia for this task. In Nedeljković Observatory, he was only interested for a portable Bamberg universal instrument. Unfortunately did not get it.

In addition to the determination of the exact time, the Observatory: 1 was a "workshop" for practical training for the students of the High School, and students from the University from the year 1905, for which M. Nedeljković was a professor of Astronomy and Meteorology. Astronomical work with students of the High School at the beginning was without pavilion instruments and resembled to the popularization of astronomy; 2 played the role of the People's Observatory (on an artificial hill were located Bardu field glasses), where the most frequent guests were students, citizens and prominent persons - for example, in 1910, Halley's comet was observed. The popularization of astronomy was performed by the publication of popular articles and booklets; 3 was a place where during a certain period, the solar activity "in connection with meteorological and magnetic observations" was observed; 4 was also a place for observations, which in fact were performed by assistant Jelenko Mihailović, primarily concerning bolids, and which were published in the Bulletin of the French Astronomical Society; 5 was a place where work on ephemeris for various publications, institutions and individuals was performed.

We note finally that M. Nedeljković was dealing in the calendar reform (Projet de reforme du Calendrier, 1900) and that J. Mihailović published four technical works related to the astrophysical methods.

Professional observational work related to the determination of the exact time, which was the top of the astronomical work of the Observatory, took place also during the last years of the 19th and the first decade of the 20th century. Along with the reduction of the meteorological work starting with 1904, there has been a reduction of astronomical work, which has been hardly mentioned in the years of 1912-1918 wars.

The paper presents also a number of Nedeljković astronomical ideas and plans, from his engagement for the acquisition of new instruments, building of Observatory and its pavillions, engagement of needed staff up to his struggle for the survival of Observatory

(he seen the solution in its independence from the High School/University – an overview of his propositions of new laws that would lead to that goal), and his endeavor to preserve land of Observatory from different usurpers. His relation with Jelenko Mihailović, who in the field of astronomy, was focused primarily on its popularization, and Djordje M. Stanojević, who was critical to the Nedeljkić astronomical and meteorological work, are presented as well.

In addition to the astronomical events, outlined is also the main task of this, primarily Meteorological, Observatory (in 1888, for instance, has been started establishing of a network of meteorological stations; 1895 started with measurements and notations of meteorological parameters each hour, in 1900. Dj. M. Stanojević started the publication of *Bulletin météorologique*, whose publishing M. Nedeljkić suspended in the same year, after his return, and in 1902. was started with *Bulletin Mensuel*, which won praises from the most prominent meteorologists of that time. In 1903, as a headquarter, had almost 300 stations of II, III and IV order.).

Shortly is also reviewed and seismological work (macroseismic, from 1901 up to 1906, and microseismic, since 1904 up to 1910), and the work on geomagnetism (from 1904 up to 1910). These two services had their own pavillions.