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THE DEVELOPMENT OF THE BELGRADE ASTRONOMICAL OBSERVATORY BETWEEN 1887 AND 1941

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In the late seventies and early eighties of the XIX century with the territorial enlargement of the Principality of Serbia, which was followed by a change in her state status, at first as an independent principality and then as a kingdom (1882), arose material conditions allowing the foundation of institutions corresponding to economic and cultural necessities of a relatively ascending state community. An astronomical observatory is among such institutions. The reasons for its foundation were strengthened by forming the Cathedra of Astronomy and Meteorology at the Philosophical Faculty of the Belgrade Grand School in 1880 where after his return from a specialisation in these subjects in France came Milan Nedeljković in 1884. In late that year he took part in in the framework of a commission formed for the purpose of founding a network of meteorological stations throughout Serbia. From this unrealised project arose Nedeljković's initiative in founding in Belgrade a provisory observatory where astronomical, meteorological, geophysico- seismological and geomagnetic observations would have been performed and which would have been a centre of the network of meteorological stations. Such an observatory was founded by the Education Ministry in early 1887 and Nedeljković became its director. This post belonged to him till 1924, except during 1899 and 1900 when the director was Djordje Stanojević. The newly formed observatory was under the Grand School, i. e. under the University from 1905. It was situated within a private house in Belgrade where started the first meteorological observations in the middle of 1887. In 1891 the Observatory was moved into another building foreseen for it and which occupied an area of 1.8 *ha*. Today at that place is the Hydrometeorological Centre of Serbia. According to the data published in "Srpski tehnički list" No 1 for 1890, page 28 the preliminary price of this building was estimated to the sum of 30 222.39 expressed in the Serbian that-time currency.

Ten years after the foundation of the Observatory in the consideration of its activity it was emphasized that during this period of ten years it had missed both the personnel and money for performing the current activities (Mihailović, 1897). As for the network of meteorological stations, which was in a fast expansion beginning with 1894 working coordinated by the Observatory, it should be said that the time spent by an average observer at a meteorological station was between one and four years (Nedeljković, 1898; Djokć, 1996).

Between 1900 and 1904 the observations performed at numerous meteorological stations including the observatory, as well, were published in the observatory's publication named at first "Bulletin météorologique de l'Observatoire astronomique et météorologique de Belgrade-Serbie" and then renamed as "Bulletin mensuel de l'Observatoire Central de Belgrade". After this period the publishing of the results was interrupted, but the observations at the Observatory and meteorological stations were continued till the beginning of the First World War. Under the direction of the occupants during the war the Observatory was active from early 1916 by the autumn of 1918 and the results of the meteorological observations performed at it and at the meteorological stations served to V. Conrad, a Vienna meteorologist, for the purpose of studying the climatology of Serbia.

Though the Observatory was an institution of the Belgrade Grand School and afterwards of the Belgrade University, Nedeljković endeavoured to regulate its status as an independent institution through two law proposals from 1890 and 1904, but they never passed the parliament procedure. Compared to the meteorological observations the astronomical ones were insignificant. The Observatory had at its disposal some small astronomical instruments (three universal ones, altazimuth, a 45 *mm* transit instrument, a 5' Bardou refractor) and the latitude and longitude were determined with the altazimuth in 1897 and 1898 (Nedeljković, 1904). However, since the majority of these instruments was ruined during the First World War, after it Nedeljković, in Germany, between 1922 and 1924, began with procuring of a large collection of instruments, especially astronomical, using the funds due to the war reparations at the time when the new state - the Kingdom of Serbs, Croats and Slovenes, later on renamed as the Kingdom of Yugoslavia, - was formed. The total sum spent for the furnished instruments (astronomical, meteorological and geophysical) and equipment (books, machines, tools, furniture and mounting objects) exceeded 3.5 millions golden marks out of which 62.5% was foreseen for the purchase of astronomical instruments (Djokić, 1993) corresponding to 30 million that-time dinars (Mišković, 1929).

In early 1924 Nedeljković was retired and in the middle of the same year the Observatory was divided into two observatories - Astronomical and Meteorological - a decision in accordance with the newly arisen material conditions (Djokić, 1988). In view of Nedeljković's retirement in the following year of 1925 the Faculty of Philosophy of Belgrade University undertook steps towards appointing Dr Vojislav V. Mišković, astronomer at the Nice Observatory, practical-astronomy teacher and Observatory director. These positions were taken by Mišković in the autumn 1926 and his first endeavour was to found a Time Service at the Astronomical Observatory (Protić-Benišek and Djokić, 1989). Since one had to mount and activate a large number of astronomical instruments (650.350 *mm* and 200 *mm* refractors, three large 190 *mm* meridian instruments, 200 *mm* comet finder, 160 *mm* astrograph and a number of other smaller instruments) in conditions of permanently diminishing space at the existing location due to the broadenning of the city, during 1927 Mišković initiated an action of building a new observatory on the Fruška Gora at an altitude of 490 *m*. On the other hand at the old location were built one pavilion for the 200 *mm* refractor and two wooden ones for the 100 *mm* transit instrument and 70 *mm* astrolabe (with the latter one the geographic latitude of the Observatory was determined - Mišković,

1928) because this project was not realised during 1928. In a further phase of realising the building plan for a new observatory, in the middle of 1929, an area of 4 *ha* at the Eastern Vračar called Laudanov šanac (Laudan's trench) at an altitude of 252.75*m* was given by the Municipal Government to the University for the purpose of this building. The building, itself, was carried out according to the plans of Architect Jan Dubovi who made them following basic drafts and in cooperation with Mišković. It costed 4 057 449 dinars. The total credit was taken from "Državna hipotekarna banka" (State Mortgage Bank) in 1930 and its value was 9 557 000 dinars. In the mid 1932 the new observatory building was moved in. The observational activities were conditioned by the number and kind of mounted instruments (two refractors -650 *mm* and 200 *mm* - , 200 *mm* comet finder, 160 *mm* astrograph, 100 *mm* and 80 *mm* transit instruments). The results of the observations (sunspots, minor planets and comets, variable stars, meridian transits for the purpose of clock-correction C_p determining and meteorological elements) were published in "Bulletin de l'Observatoire Astronomique de Belgrade" which started in 1936. In addition to this publication the Observatory published also the following ones: "Annuaire" (1928), "Godišnjak našeg neba" (1929), "Mémoires" (1932), "Nautički godišnjak" (1933), "Publications" (1935) (within the parentheses are given the starting years).

The activity of the Observatory as a university institution was regulated by statutes published in 1936 and 1940. Between 1934 and 1941 the Observatory growth according to the available data was ascending by 1939 when it attained its maximum in the total number of employees (n), budget amount (B) and the number of published papers (N). In that time interval these elements were highly correlated. The correlation coefficient between the budget amount and the total number of employees is 0.99, between the total number of employees and the number of published papers it is 0.96, whereas between the budget amount and the number of published papers it is 0.94.

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