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Mathematical education in the province of Vojvodina within the Habsburg Monarchy

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MATHEMATICAL EDUCATION IN THE PROVINCE OF VOJVODINA WITHIN THE HABSBURG MONARCHY

ALEKSANDAR M. NIKOLIĆ

Abstract: In the history of education in Vojvodina and the history of mathematics as its part, the Serbs play the most prominent role until the end of World War II. In the Habsburg Monarchy, and in Vojvodina as its province, the school curricula, text-books and teaching methods were determined by the monarch's order. The main characteristics of mathematics education in Vojvodina during this period were that it was not conducted by trained mathematicians and that the prevailing methodology was oriented towards the practice of doing calculations without the theoretical bases in algebra or geometry.

AMS Subj. Class. 01A50, 01A55, 97-03

Key words: mathematics, education, teaching, Habsburg Monarchy, Vojvodina, Serbs

1 Introduction

Vojvodina, as a multinational and multicultural southern part of the Austro-Hungarian Empire, was regarded as a province by all its citizens but the Serbs. For the imperial authorities it was merely a part of the Military Border as a defence line towards the Ottoman Empire. By the end of the 18th century, awareness was born among the Serbs that Novi Sad could become a cultural and educational centre, not only for the Serbs from Vojvodina but also for the Serbs from the other side of the Danube and Sava rivers, who were living under the Turkish rule. Religious-national communities of Hungarians, Germans and Croats had their cultural and educational centres – Pest, Vienna and Zagreb – where they could go for higher education, so they did not feel a need for such institutions in Vojvodina. These are essential reasons why the Serbs played a central role in the history of education in Vojvodina, and the history of mathematics as its integral part, until the end of World War II.

The development of the entire educational system in the territory of Vojvodina and in its now-days capital Novi Sad is inseparable from the socio-economic living conditions which, at the turn of the 19^{th} century, were characterized by a gradual accumulation of wealth among a certain number of Serbian merchants, craftsmen, priests, lawyers, etc. They became the bearers of the ideas of enlightenment and the activities of cultural and educational dissemination. This Serbian middle class made great efforts and offered a significant financial aid for the establishment of primary-trivial and religious schools. The final result of their efforts was the establishment of the Serbian Orthodox Grammar School

in Sremski Karlovci (1791), the Clerical High School (1794), and the Novi Sad Serbian Grammar School (1810).

The development of mathematics in any region as well as in Vojvodina must be observed in the context of overall cultural-historical climate, and when evaluating the importance and level of the development of mathematical sciences one must differentiate between the scientific contributions of certain top mathematicians born in that region, and the social conditions and scientific environment in the country. Although these two are not necessarily on the same level, naturally a scientific environment is stronger if the number of scientific contributions contained in it is higher. And if and to what extent someone is socially capable of producing scientific information depends on the development and organisation of scientific institutions, educational system, the level of scientific education of the nation, and the existence of scientific literature.

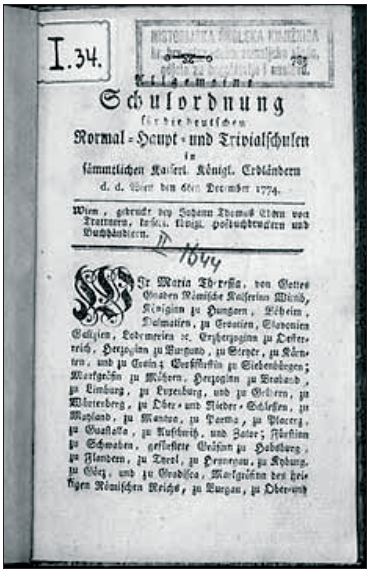
2 Mathematics in primary and secondary schools

The first schools in Vojvodina mentioned in records as early as 1726 were Roman-Catholic primary schools in Novi Sad, and in 1731 there was the Lower Gymnasium Latin-Slavic School of the Birth of Christ founded and maintained by Bishop of Bačka Visarion Pavlović. Bishop Pavlović and the Serbian Orthodox Church Community were aware of the fact that only solid education in the Latin language can ensure a better future for the Serbian people in the Habsburg Monarchy. Considering the fact that Serbs, in Novi Sad of that time, were a majority and in addition richer than other religious-national communities, it can be assumed that popular schools in Serbian existed as well, regardless of the fact that the first written records about them date from 1748. In 1789, the Roman-Catholic Royal Grammar School was opened. Since only one Serbian teacher, Andrej Gemza, was employed in this institution from September 1789 to May 1795, the particularities of Serbian language were not taken into consideration, so not many Serbs attended it. Therefore, the foundations of enlightenment and renaissance of the Serbian people in Vojvodina were established only with the opening of teacher course and school in Sombor, and grammar schools in Sremski Karlovci and Novi Sad.

There are three crucial elements which can pinpoint the beginning of a systematic study of mathematical education in Vojvodina during the Habsburg's rule. The first of them is a series of Decrees and normative acts passed at the initiative of Austrian Empress Maria Theresa (1717–1780), which provided legal framework of the primary school system and curriculum for the Serbs in Vojvodina, the same as in the entire Habsburg Monarchy. The second was the publication of the first mathematical book in the Serbian vernacular authored by Vasilije Damjanović (1734–1793), while the third crucial element was the establishment of a teacher training course named Norma in the free royal town of Sombor.

2.1 Educational Regulations and Decrees

After the Seven Years' War (1756–1763), at the dawn of the enlightenment period, the jurisdiction over the educational affairs was in the firm hands of Church. In order to provide such education for the young generations that would be in the spirit of the ruling House of Habsburg and the Monarchy itself, it was decided that the highest governing bodies of the Monarchy should assume the education of the young as a State affair and thus take it over from the hands of Church authorities. Empress Maria Theresa even made personal statements that education was no longer a 'religiosum', as it had been up to then, but a 'politicum'. A series of Educational Regulations and Laws – Normal-Patent (1771), Regulation on the Improvement of Illyrian and Romanian Orthodox Elementary or Trivial Schools in Imperial-Royal Hereditary Lands (Regulae Directivae für die deutschen Normal-Haupt und trivial Schulen in sämmtlichen Kaiser-Königlichen Erbländern) (1774), School Constitution (Schul-Patent) (1776), General Education System for Hungarian Kingdom and Annexed Provinces (Ration educationis totisque rei literariae per regnum Hungariae et provicias eidem adnexas) (1777) – introduced a mandatory general elementary education.


I. 34.

Schulordnung

für die deutschen

Normal-Haupt- und Trivialschulen

in

sämmtlichen Kaiserl. Königl. Erbländern

d. d. Wien den 6ten December 1774.

Wien, gedruckt bey Johann Thomas Edlen von Trattnern, kaiserl. königl. postprivilegirten und Buchhändlern. 1644

Wir Maria Theresia, von Gottes Gnaden Römische Kaiserinn Wittib, Königinn zu Hungarn, Böheim, Dalmatien, zu Croatien, Slavonien Gallizien, Lodomerien ꝛc. Erzherzoginn zu Oesterreich, Herzoginn zu Burgund, zu Steyer, zu Kärnten, und zu Crain; Gefürstete zu Siebenbürgen; Marggrafinn zu Mähren, Herzoginn zu Brabant, zu Limburg, zu Luxemburg, und zu Geldern, zu Würtenberg, zu Ober- und Nieder-Schlesien, zu Mayland, zu Mantua, zu Parma, zu Piacenz, zu Guastalla, zu Auschwitz, und Zator; Fürstinn zu Schwaben, gefürstete Gräfinn zu Habsburg, zu Flandern, zu Tirol, zu Hennegau, zu Kyburg, zu Görz, und zu Gradisca, Marggrafinn des heiligen Römischen Reichs, zu Burgau, zu Oberund


RATIO EDUCATIONIS TOTIUSQUE REI LITERARIÆ PER REGNUM HUNGARIÆ PROVINCIAS

TOMUS I.

VINDOBONÆ, TYPIS JOAN. THOM. NOB. DE TRATTNERN, SAC. CÆS. REG. MAJ. TYPOGR. ET BIBL.

MDCCLXXVII.

1777

School system came under the State wing and was severed from Church, so secular contents, and therefore mathematical as well, were incorporated into the school curricula. Thus, all the nationalities and religious communities in the multinational state such was the Monarchy were given approximately the same opportunities for education and development as the Germans, Hungarians and Catholics had. Schools became the leading factor in the dissemination of knowledge and science among the general public. The reform of the

Serbian primary schools was led by Teodor Janković Mirijevski in Banat, Stefan Vujanovski in Srem, Slavonija and Croatia, and Avram Mrazovič in Bačka. They all had first completed a normal programme and course for primary school principals in Vienna.

2.2 The first Serbian Arithmetics

The first mathematical book created in Vojvodina was Vasilije Damjanović' "The New Serbian Arithmetic or a Simple Way towards Reckoning" (Новая сербская ариθметика или простое наставление къ хесапу) printed in 1767 in the print shop of Dimitrije Teodosije in Venice. In the period from 1747 to 1753 Damjanović attended Lyceum in Pozsony (Bratislava) where his teacher of mathematics was Christian Peschek. It is known that he travelled a lot throughout Europe and that he studied in Venice. He was a municipal judge and a senator in Sombor. Zaharija Orfelin (1726–1785) Serbian poet, writer, historian, engraver and book printer, wrote that Damjanović' knowledge of arithmetic as well as of Latin, German, French, Italian, Greek, Rumanian and Hungarian languages was outstanding.

As far as we know, seven copies of Damjanović' Arithmetic have been preserved. Three of them are stored in the Matica Srpska Library in Novi Sad, one in the National Library in Skopje, one in the National Library in Belgrade, one in the library of the Serbian Academy of Arts and Sciences in Belgrade and one in the Museum Library in Osijek. Arithmetic has 368 pages of text written in the Church Cyrillic script and consists of two parts divided into 6 and 7 chapters respectively.


Новая
сербская
АРИѲМЕТИКА
или
Простое наставление къ Хесапу
Изъ разныхъ Книгъ собрано, новыми примѣры
краткимъ образомъ изложено, и на
употребленіе Сербскія учащія
ности издано
отъ
ВАСИЛІЯ ДАМЯНОВИЧА.
Въ Млетцкахъ 1767.

The first Serbian Arithmetic from 1767

In the first four chapters of the first part it deals with the basic mathematical concepts – pronunciation and writing of digits and numbers, counting, Arabic and Roman numerals, basic arithmetic operations, different signs and abbreviations for monetary units, ordinal numbers and measures. The fifth chapter deals with fractions, called fragmented numbers by the author, and operations with them. Damjanović explains conversion of fractions into mixed numbers, shortening of fractions and the procedure with double fractions through various examples. The instruction for shortening of fractions by rounding of denominator and numerator is particularly interesting. For example, a fraction 19/47 is to be shortened. The procedure, "translated" into modern terminology looks like this: the denominator 47 is divided by the numerator 19. The result is added to the denominator and 1 is added to the numerator, and, if possible, the fraction is shortened. If this is not possible the procedure is repeated. Once we get a fraction 20/49 which cannot be shortened, 2 is added to 49 and 1 to 20. Thus we get a fraction 21/51, which, as Vasilije Damjanović says, is not much different from the initial 19/47. With this procedure, the ratio between the numerator and denominator stays approximately the same, since the numbers added to them have approximately the same ratio. If larger numbers are considered, Damjanović suggests that it is enough to add 1 both to numerator and denominator and then, if possible, shorten the fraction, since this does not change its value significantly. All the mathematical contents of the first part are supported with numerable examples from everyday trade.

In the second part there are examples of the simple and complex rule of three with integers and fractions solved by multiplication and division, as well as explanations of the inverse rule of three and double rule of three. This is all applied on the examples taken from everyday trade practices through interest rate computation, bill of exchange computation, calculation of mixtures, divisional calculation, calculating average. The last chapter of this part is devoted to the calculus which is not necessary for tradesmen, but "for the young to sharpen one's wits on it". The examples of that are of the following kind: Asked how old he is, a man reply that when 1/2, 1/4 and 1/8 of his ages are added to his age, the result is 120. How old is he?

Analysing the description and the explanations of four basic operations with numbers, it could be seen that the mathematical signs for addition, subtraction, multiplication and division were not used. A vertical dash | is used instead of the sign equality, but also instead of decimal point (40|20 makes 40 1/5). It also seems that the author knew of commutative rule in operations of addition and multiplication, and of neutral element for these two operations. In the table of multiplication twice three occurs but three times two does not, and neither does one multiplied by any other number.

Although mathematical contents of the first Serbian Arithmetic was not on a high scientific level, its significance lies in the very fact that it was not only the first arithmetic but also one of the first books ever written and printed in the Serbian vernacular. As the Arithmetic was not prescribed by the educational authorities, it was never used as a school text-book. However, it seems that it had not even been intended for schools, but primarily for the use by tradesman, the fact that the author emphasized in the preface to his book. The calculus books by Avram Mrazovič (1794), Atanasije Demetrovič Sekereš (an adaptation of Felbiger's text-book, 1777), and Jovan Došenović (1809) played a similar, enlightening role,

but they were also the first text-books used by teachers for teaching and pupils for learning mathematics. Thanks to these books as well as some other translated text-books, the basic terms and elementary mathematics became part of the regular curriculum of trivial schools, the only Serbian schools in Vojvodina of that time.

2.3 Mathematics education in Norma

In 1777 in Sombor, Avram Mrazovič (1756–1826), the son of Serbian Orthodox priest educated in Pesta and Vienna, founded the Serbian National Primary School, starting in 1787 a practical three-month teacher training course called Norma, thus enabling the appearance of the first trained Serbian teachers in Vojvodina. Norma operated as a three-month course until 1811, and in 1812 a school for teachers was opened in Szentendre called Regium Pedagogium Nationis Illiricae (Preparandija), which moved back to Sombor once again in 1816.

Avram Mrazovič (1756–1826)

The school building where Norma started

Based on the requirements of the teaching profession and in accordance with the general level of knowledge, the mathematical study programme in Norma included only the four basic operations, basic measures and monetary values used in the Habsburg Monarchy, as well as the methods of teaching mathematics. Mathematics was taught at Norma after the Mrazovič' text-book "The introduction in science of numbers" (Руководствије к науције числителној) from 1794. The text-book is divided into five parts. In the introductory part it deals with the basic concepts in mathematics – digits, numbers, Arabic and Roman numeral systems, positional numerical systems, ordinal numbers, signs for the four basic operations, fractions and equations. The first chapter explains the four elementary operations on the set of natural numbers, offering rules and techniques of calculating with practical examples. The second chapter deals with named numbers, transformations and calculating with units of measurement, and calculating with monetary units. The third chapter explains fractions and mixed numbers, and calculating operations with them. The fourth chapter brings the rule of three, proportional values, divisional

calculation applied on everyday practices, calculation of mixtures. The subject matter in the book is given in 'portions' and seems as a programmed material. The explanations are prevailingly verbal with few examples, but it offers an excessive application of the subject matter. The text-book offers tables of basic calculating operations at the end. It is interesting to note that the pupils in Primary School were divided in classes – primers, readers, spellers, grammatists – and that each group of pupils had their own level of calculus to study, following the chapters in Mrazovič' book.

Mathematical study programme at Serbian Preparandija was far more serious than that of Norma. Mathematics was taught for three semesters. In the first semester through the subject Oral reckoning and Arab numbers, in the second semester the subject Arithmetic and continuation of reckoning was studied, and in the third semester the study programme comprised algebra and geometry. The first professor of mathematics subjects was Vasilije Bulić (1786–1826), otherwise the student of medicine. He even wrote the mathematics school text-book "Reckoning book and geography" (Предложенија численице трегубе и землеописанија, Budim, 1814) which was corrected and supplemented and published in Vienna (1836) and Novi Sad (1840) under the title "The Way of reckoning" (Наставленија числителна).

Until 1814 teachers' education lasted for 15 months, and after 1814 it was prolonged to two years – the model which survived until 1848. The education of future teachers became three years long in 1871 and four years long in 1896. From the academic 1861/62 the mathematical programme included, besides arithmetic and calculus, the study of geometry. It was taught in two courses dealing with angles, triangles, quadrilaterals, Pythagorean Theorem, area measuring, measuring and computing by proportions. The transfer to the three-year system of education was marked by the introduction of exponentiation, roots, combinatorics, progressions, linear equations, and elements of algebra in the programmes of mathematical studies. The mathematical education was, under the influence of mechanistic teaching methods of Adam Ries(e) (1492–1559) (Rechnun auf der Linien und Federn, Berlin, 1522) and his followers, mainly practice oriented, without theoretical bases in algebra and geometry and it was not conducted by trained mathematicians. It was not before the late 19th century that the ideas of Swiss educator Johann Heinrich Pestalozzi (1746–1827) and German pedagogue Adolf Disterveg (1790–1866), the founders of the contemporary teaching of mathematics, were introduced.

Methodical instructions for teaching mathematics intended for teachers were prescribed as long ago as 1776 in the entire Habsburg Empire. The mandatory two-volume text-book by the influential German pedagogue and educational reformer Johann Ignaz von Felbiger (1724–1788) entitled "Nothwendiges Handbuch für Schulmeister der illlirschen nicht unirten Trivial-Schulen in den Kaiser-Königlichen Erbländern" (Ručnaja knjiga potrebna magistrom iliričeskih neunitskih malih škol v Cesaro-Kraljevskih gosudarstvah, Vienna, 1776) was translated by Teodor Janković Mirjevski and was known as "The Handbook for Teachers". The 12th Chapter of the second volume is dedicated to mathematics. We bring the entire text of the Chapter.

CHAPTER XII ON RECKONING (ON MATHEMATICS)

Part I

Paragraph 1

In Reckoning a school teacher should not teach more than this:

a) Correct notions about numbers and different ways of calculating, or about different possible transformations with numbers.

b) Established rules of procedures with all four kinds of calculating operations and in all such cases where calculation and the result of calculation are needed.

c) Achieve skill in using the rules and develop the ability to apply them whenever needed.

Part II How teachers are to teach reckoning to their pupils

Paragraph 1

It is a duty of a teacher to set the rules from the mathematical book as an integral content, and then to teach it in segments. By frequent reading and testing they should be made understandable (for pupils). The next rule should never be tackled before the previous one has been sufficiently explained through a number of examples, and pupils accustomed to calculating employing the rule without effort. One school blackboard is needed for this. It is where a teacher conducts calculations, especially when presenting an aspect of a mathematical operation for the first time, or when later asks a student to do an example exercise. A teacher should not be satisfied only with the examples given in the book, but should always try to think of several good and useful examples before lessons, and give such examples to the pupils to practice. In doing so, real prices of items should always be used in calculating.

Paragraph 2

A teacher should have in his possession various mathematical books to take examples from, because it is difficult to design them alone. When explaining a calculating operation, he should show the ways in which pupils can adopt knowledge in the shortest and the most reliable way, without any waste of time. He, personally, has to master the rules of mathematics thoroughly and transfer correct knowledge to pupils, and not to do any other way. The first example, as already mentioned above, he shall do personally on the blackboard. Once he does that, he shall write a similar problem on the board and ask one of the pupils to calculate in front of him slowly, neatly and aloud, while the others do the same on their hand boards. Finally, he shall dictate an example to them which they shall not be doing on the blackboard, but individually in silence.

Paragraph 3

While they are practicing, a teacher monitors pupils to see if they have set the problem correctly and written the numerals clearly, if they have calculated correctly or not. If he sees the result is correct, he shall say nothing; if he notices mistakes, he shall only say it is wrong without revealing where the mistakes are. The most he can reveal is if the mistake is in adding or subtracting or alike. It goes without saying that a teacher must be sure himself first – he must know the procedure and the result by heart, or have them written down in advance. This latter is especially important when pupils are doing problems which are not uniform and when they can set the problem with different numbers.

Paragraph 4

When pupils, one after the other, have finished the task, a teacher checks their exercises, preferably two or three at a time.

Paragraph 5

When teacher checks or corrects, with pupils' exercises in front of him, he should always pay attention to whether the numerals are correctly and properly shaped, as well as if they are written in the correct lines and rows, under each other or next to each other, so that it is immediately clear which numeral belongs where, and he should draw students' attention to this when he notices mistakes.

Paragraph 6

Examples should be of no other kind than taken from and adapted to everyday life, while measurements and currencies shall always be those used in the Imperial-Royal countries – due attention should always be paid to this.

Paragraph 7

Pupils should be taught to develop an ability to notice where in different cases the differences in numbers stem from, so that they can compute the result for each given example by themselves.

Paragraph 8

To prevent forgetting, each pupil must have their own reckoning notebook to write the completed examples in it – several for each calculating operation. Each Saturday, revision must be organised, and such pupil notebook should be shown at the general examination, so that not only the teacher's taste but also the pupil's exercises could be seen from it, and taken into consideration.

Although mathematical education was systematically included in the curricula and practices of Serbian primary (trivial) schools from the end of the 18th century in Vojvodina, it was pragmatically reduced only to what was needed in everyday life of a farmer or a town dweller, and thus, without any idea about its influence on thinking, the way of reasoning or forming a spiritual profile of the graduates. It was all conducted according to the rules laid out in text-books and the methodology which was applied throughout Central Europe. Such modest teaching of mathematics was where everything ended without an aspiration to go deeper into other sciences. Therefore, it can be considered that the real foundations for a further development of mathematics as well as other sciences in Novi Sad and Vojvodina were laid only with the establishment of the Grammar Schools – gymnasiums in Sremski Karlovci and Novi Sad in the early 19th century.

2.4 Mathematics education in secondary schools

From the very foundation of the gymnasiums, arithmetics and mathezis (algebra and geometry) were constant subjects in the curricula. The first teachers of these school subjects in the Novi Sad Grammar School were Ignjat Jovanović (1818–1853), Atanasije Teodorović (1824–1833), Atanasije Nikolić (1832/33), Lazar Lazarević (1830–1846), Nestor Isaković (1832–1857), and Dimitrije Janković (1835–1837). When the Grammar School was elevated to a full eight-year school, the first mathematics teachers were Jovan Petrović (1865–1867), Vasa Pušibrk (1865–1910), Vasa Đurđević (1867–1872), and Dr Milan Dimitrijević (1867–1870). They all taught other school subjects besides mathematics, depending on their knowledge and educational background. Teaching mathematics, they mostly worked after the translated books written by Franc Močnik (1814–1892), a Slovenian mathematician and pedagogue. In the late 19th century, as a school counsellor and supervisor, Močnik had a great influence on the development of the mathematical education in primary and secondary schools of Austro-Hungary. His text-books "Lehrbuch der Algebra" (The Algebra Text-book, 1850) and "Lehrbuch der Geometrie" (The Geometry Text-book, 1850), with over 30 editions, had a great impact on the later Serbian text-books and through them on the development of education.

Gymnasium in Novi Sad as it looks today

The library of the just founded school had 12 books from the field of mathematics whose numbers grew constantly to reach some 105 mathematical volumes by the end of the 19th century. By the end of World War I, mathematics was taught by Aleksandar B. Popović (1871–1877), Branko Nikolić (1873–1875), Stevan Nedeljković (1873–1878), Andreja M. Matić (1875–1918), Marko Krečarević (1877–1889), Stevan Milovanov (1878–1920), Stanko Zamurović (1909–1920), Jovan Bakiš (1918–1920), and the first text-books signed by some of them, as "Calculus-Arithmetic for the First Three Grades of Grammar School and for Higher Girls' School and Other Similar Schools" (after Močnik) published in 1888 by A. Matić, appeared. Of special importance were the books "High School Geometric Drawing" after Mendlik and Schmidt, 1892; "High School Algebra I–III", after Močnik and Wagner, 1900–1901; and "Geometry" after Wagner and Močnik, 1901, by S. Milovanov. The first volume of Algebra covers calculating operations and equations of the first degree, the second deals with roots, numerical systems and logarithms, while the third deals with progressions, higher degree equations and combinatorics. Geometry presented planimetry, plane trigonometry, analytical geometry, solid geometry and spherical trigonometry. So it is obvious that the level of mathematics at school system was significantly higher.

Let us mention Bogdan Gavrilović (1863–1947) and Rradivoj Kašanin (1892–1989), only two greats of mathematics who matriculated from the Serbian Orthodox Great Gymnasium (Grammar School), as the Novi Sad Grammar School was called in the period between 1865 and 1920. Gavrilović' ancestors came to Vojvodina from Herzegovina in the early 18th century. His grandfather was a teacher and a primary school principle and his father Aleksandar was a teacher and principle of the Serbian Orthodox Great Gymnasium in Novi Sad. Gavrilović matriculated in 1881 from the Novi Sad Grammar School on the Nestor Dimitrijević endowment scholarship as the best student of the Gymnasium. At the Department of Pedagogy of the Faculty of Philosophy of the University of Pest, where he studied mathematics, physics and astronomy as a Tekelijanum protégé and scholarship holder, he passed the elementary teachers' exam in 1883. He spent the following three years in university centres of Germany, France and Switzerland seeking broader scientific and cultural education. During 1885 he spent some time in Prague, where he attended the School of Gymnastics and Fencing.

Bogdan Gavrilović (1863–1947)

Upon his return to Pest, Bogdan Gavrilović passed the University exams in mathematics (1886), experimental physics and astronomy (1887) as a condition for receiving a doctor's thesis. He published his PhD Thesis in Hungarian in 1886, defending it in 1887 when he received the title of a Doctor of Mathematics. After completing his education, he left for Belgrade where he was immediately appointed a mathematics suplent (assistant professor) at the Faculty of Philosophy of the Great School of Belgrade by a decree. He was given a full tenure in 1892, and continued teaching for as long as fifty years. He was a regular member of Serbian Royal Academy from 1905, being its President from 1931 to 1937. Bogdan Gavrilović will be remembered as one of the main advocates in favour of establishing the University of Belgrade and a leading organiser of mathematical education at this time.

Radivoj Kašanin (1892–1989)

Radivoj Kašanin started to attend gymnasium in Osijek (today in Croatia) (1902–1905) and continued it in Novi Sad Grammar School. Here he was admittedly under a great influence of his mathematics teacher Stevan Milovanov. After the matriculation in 1910, he left Vojvodina to study mathematics and astronomy in Vienna, Zagreb and Budapest, as was customary at that time. The decisive influence on his mathematical future exerted his professor Wilhelm Wirtinger (1865–1945) in Vienna, and professors Vladimir Varićak (1865–1942) and Juraj Majcen (1875–1924) in Zagreb. After World War I, he left for Paris where he graduated in Mathematics from the Sorbonne in 1921. That same year he left for Belgrade, where he received his PhD in 1924 under Prof Mihailo Petrović. Kašanin was a professor at the Technical Faculty of the University of Belgrade for years, and a regular member of Serbian Academy of Sciences from 1955.

The Serbian Higher School for Girls deserves a special mention. Such schools offered the highest level of education for girls at that time as they could not attend gymnasiums (grammar schools) in Austro-Hungary. In the academic year of 1886/87, Mileva Marić (1875–1948), who was to become the assistant and life partner of Albert Einstein in his most

Mileva Marić Einstein (1875–1948)

prolific period of life, entered this institution. She was taught mathematics by professor Aleksandar Jorgović, who was impressed by her talent and mathematical knowledge, which he emphasised on many occasions. As it was customary for well-off girls of that time to seek higher education abroad, Mileva Marić went to Zürich, and will stay remembered as the first Serbian woman who received the highest education in mathematical sciences.

However, as the mathematician and historian of mathematics Dragan Trifunović nicely note down, it is a fact that her personality emerged out of the tradition of educated Vojvodinians growing up in the intellectual oases of Sombor, Novi Sad, Osijek, Kikinda, Timisoara, Pest, Vienna, Kharkov and Petrograd, and that her work and ambition accumulated all the potency, desire and knowledge of mathematics, physics and general culture from these parts. Several years after Mileva Marić left the school, it was attended by the great Serbian poetess Isidora Sekulić (1877–1958), who would later graduate from the Department of Pedagogy of the University of Pest and take the state exam for high school teachers of mathematics in Austro-Hungary.

3 Efforts for the establishment of a higher school

The idea of founding an institution of higher education in the Serbian language in the Habsburg Monarchy dates back from 1774. At that time, the Viennese court offered to the Synod and the Serbs in Hungary to establish a Higher Theological School through mediation of the Illyrian Court Deputation and the Assembly Commissioner Baron Matezen. The primary reason for this was not the authorities' desire to provide Serbs with the education in their mother tongue, but to stop frequent leakage of young Serbian boys to spiritual studies in Orthodox Russia, if possible. The Serbs took this opportunity to, through a special commission consisting of Marko Servicki, Monastery Fiskalis (attorney) Jovan Muškatirović and the Principal of Serbian Schools from Banat Teodor Janković Mirjevski, ask to establish not only a theological school, but a 'general popular' school as well. Hoping for a positive outcome, they took concrete preparatory steps for opening these schools, so the Orthodox members of the Senate and Committee of Novi Sad decided to allocate a lot, in the vicinity of the nowadays Saint Nicolas Church in Novi Sad, free of charge, for erecting a building for this purpose. There were also suggestions for professors for all the planned school subjects, among whom Jovan Avakumović from Szentendre, the ancestor of Vojislav G. Avakumović (1910–1990), one of the most prominent Serbian mathematicians, was planned to assume the position of the professor of mathematics and philosophical sciences. However, the plans for the foundation of a general public school remained fruitless due to a strong protest of the Hungarian court office addressed to Empress Maria Theresa, who then revoked the earlier order for establishing a higher school in Novi Sad.

New attempts by Vojvodinian Serbs to acquire their University, under the name of Academy, were carried out during the 1848/49 revolution and the short-termed Dukedom of Serbia and Tamiš Banat. Patriarch Josif Rajačić suggested at that time that the Serbian University in Dukedom should consist of four Faculties – of Philosophy, Law, Medicine and Theology – and that it should be located in Sremski Karlovci. This time the idea met the opposition of the Viennese court so the idea of the Serbian University failed once again. Similar ideas were voiced again in 1861 at the Annunciation National-Church Assembly in

Sremski Karlovci, when Count Petar Čarnojević suggested that a Serbian Law Academy could be established in this city. Only a couple of months later, at the celebration of a hundredth anniversary of birth of Sava Tekelija, the first Serbian doctor of law, the founder of the Tekelijanum, president of the Matica srpska, philanthropist, noble and rich merchant, the idea was revisited by Serbian writer Jovan Đorđević, and political leader of Serbs in Vojvodina Svetozar Miletić, who advocated it before the celebration participants. Even the Hungarian Academy of Sciences envoy, Baron Friedrich Podmanicki, supported them at the celebration. A Fund-Rising Committee was established, which was also to perform other activities in regard to the establishment of the Law Academy, and Bishop Platon Atanacković provided a building for its operation. It is the nowadays building of the Academy of Sciences. Nevertheless, the intentions of Vojvodinian Serbs to get a higher education establishment fell through for the fourth time. The opposition of Viennese authorities was too strong and in spite of all the activities and efforts of Svetozar Miletić and his followers, it could not be overcome once again.

Cultural-educational life of the Serbian people in Vojvodina became even more difficult after the Dual Monarchy was established (the Austro-Hungarian Compromise) in 1867, when Hungary earned the right to independently establish its authority in all spheres of internal political life. In spite of a strong pressure of Hungarian authorities and powerful nationalistic circles who created a very unfavourable cultural-political climate for the establishment of a Serbian University in Vojvodina, Lajos Motchary (Mocsáry), a renowned Hungarian politician of democratic orientation revived this idea in the early 20th century, but being alone and without supporters around him, he could not realise his plans. So Vojvodinians had to wait until the end of World War I, the break-up of the Habsburg Monarchy and the establishment of the Kingdom of Yugoslavia to get the first faculty, and the end of World War Two to found its own university.

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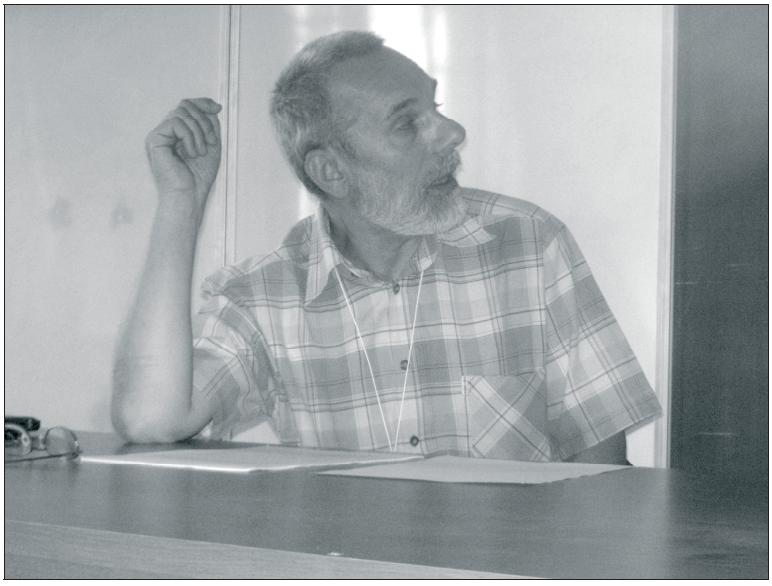

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