

EARLY ENGINEERS AND ARCHITECTS BORN ON THE TERRITORY OF PRESENT NORTH MACEDONIA

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Summary. This article presents the initial results of the ongoing research into the early engineers and architects born in the past on the territory of present North Macedonia, who graduated before the establishment of the country on 2 August 1944, prior to the founding of the first Technical Faculty in Skopje in 1949. The majority of the identified engineers and architects were men who graduated within the interwar period from the Technical Faculty at the University of Belgrade (Serbia), founded in 1846. Women started entering engineering and architecture in the 1930s. Some of the early graduates pursued their professional careers elsewhere. Three graduates of Riga Polytechnic Institute (Latvia) were identified, who had their degrees recognized by the Technical Faculty in Belgrade, as well as one Serbian woman, an engineer, and an architect who briefly lived in Riga within the researched period. This study contributes to the history of engineering and architecture in North Macedonia.

Keywords: North Macedonia, early engineers and architects, RPI, prior to 1944.

Introduction

The territory of current North Macedonia was part of the Ottoman Empire between c. 1371 and 1912. During the turbulent period of the 1st and the 2nd Balkan Wars (1912–1913), as well as World War I (WWI) and World War II (WWII) the territory was part, initially, of the Kingdom of Serbia and in the interwar period – of the Kingdom of Serbs, Croats and Slovenes that in 1929 became the Kingdom of Yugoslavia. Federal Unit Macedonia within the Federal and Democratic Yugoslavia was proclaimed on 2 August 1944. Later, it remained part of the former Socialist Federal Republic of Yugoslavia as the Socialist Republic of

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Macedonia until the proclamation of independence on 8 September 1991. The country changed its name from the Republic of Macedonia to the Republic of North Macedonia on 12 February 2019 in response to objections by the Hellenic Republic to the original name that prevented the country from joining NATO and the EU.

The formal tertiary education in engineering including architecture in North Macedonia became possible only in 1949 when the Technical Faculty comprising the Departments of Civil Engineering and Architecture was founded and became part of the University of Skopje (now the Saints Cyril and Methodius University in Skopje). The first generation of students completed their five-year full-time studies in engineering leading to the title '*diplomiran inženjer (dipl. inž) – дипломиран инженер (дипл. инж.)*' (Graduate Engineer) by the mid-1950s. Therefore, all engineers and architects originating from this territory in the past were educated elsewhere.

This pilot study focuses only on those engineers and architects who were born in the past on the territory of present North Macedonia but were educated outside its present borders before the end of WWII. It is expected that the identification of these early engineers and architects will contribute to the understanding of the development of engineering in North Macedonia and encourage further research into their individual achievements and contributions.

Methodology

The research to date has focused on identifying the early formally educated engineers and architects born on the territory of present North Macedonia, who graduated before 2 August 1944 when Federal Unit Macedonia was proclaimed. Desktop research was carried out to establish their main personal details, the year, and the place of graduation. For this, available directories of graduate students from the Technical Faculty of the University of Belgrade (Serbia), the Faculty of Architecture of the University of Zagreb (Croatia), and the Faculty of Architecture of the University of Ljubljana (Slovenia) were consulted. These were complemented with available publications covering the history of engineering and architecture by the Museum of Science and Technology in Belgrade, the Macedonian Academy of Science and Arts, and books by the late Professor Georgi Konstantinovski (1930–2020), and other available publications and internet resources.

The presented list of early engineers and architects born on the territory of present North Macedonia was established using the 1939 Directory of Graduate Engineers and Architects by the

Technical Faculty at the University of Belgrade [1], complemented by the information from the book «Architects of Macedonia (XVIII–XX Century)» by Professor G. Konstantinovski [2], and other available sources. The main challenges were associated with the scattering of the potential sources of information in Türkiye, Serbia, North Macedonia, Croatia, Slovenia, and other countries and different languages of the materials used, including Arabic for the period of the Ottoman Empire. Furthermore, up to the end of WWII, it was a common practice for the people living on the territory of present North Macedonia to be issued a new birth certificate when the control of the territory was transferred from one to another country. During this process, their names and surnames were often changed to align with the language of the ruling country. In practice, this means that often the name and surname of the same person may have been recorded differently throughout their lives. The additional difficulty is associated with the 1919 change from the Julian to the Gregorian Calendar on the territory of North Macedonia, which makes establishing the correct dates challenging since it is not clear which calendar is used in date references.

The early engineers and architects presented in this paper include only those for whom there was at least a single source available about their place of birth. Throughout the research, other engineers and architects were identified whose name and surname allowed assuming that they may have been born on the territory of present North Macedonia. However, they were not included in the study since it was not possible to confirm their place of birth.

Brief History of Early Engineering Education in the Region

As formal education in engineering and architecture on the territory of North Macedonia became available only in 1949, those who graduated before 2 August 1944 could do it only outside its territory, like, for instance, within the Ottoman Empire or the former Kingdom of Yugoslavia that were mostly in control of the territory until 1944, or other countries.

Within the Ottoman Empire, Istanbul Technical University (ITU) in Istanbul (Türkiye) is considered to be the oldest engineering school founded in 1773 as the Imperial School of Naval Engineering that led to the establishment of the Imperial School of Military Engineering in 1795. The scope and the name of the school changed in 1883 and 1909 when it became a public engineering school [3]. The training of architects within ITU commenced in 1884 [4]. In 1882, the Mimar Sinan Fine Arts

University was established in Istanbul (Türkiye) as the first Academy of Fine Arts in the country offering education in arts and architecture [5].

Within the «western» part of the territory of former Yugoslavia (encompassing present Slovenia, Croatia, and Bosnia and Herzegovina), which was under the Austro-Hungarian Empire rule until the end of WWI, the oldest engineering school was the Austro-Hungarian Naval Academy established in Rijeka (then Fiume, Croatia) that in 1889 became Imperial and Royal Naval Academy. It operated until 1914 when it was moved to Vienna (Austria) [6]. In 1919, the High Technical School was established in Zagreb (Croatia); in 1926, it became the Technical Faculty within the University of Zagreb [7]. In the same year (1919), the Technical Faculty of the University of Ljubljana, Slovenia, was established [8].

In the eastern part of the territory of former Yugoslavia (comprising present Serbia, Montenegro, North Macedonia, and Kosovo), the oldest school is the Engineering School at the Lyceum in Belgrade (Serbia), founded in 1846, that in 1863 became the Technical Faculty of the High School in Belgrade and later, in 1905 – of the University of Belgrade. Initially, due to the limited resources and teaching staff, the studies lasted for three years, they aimed to provide only the foundations of technical education whilst allowing the most promising students to carry on their studies abroad. The studies were extended to four years from 1863 [9]. All other engineering schools on the territory of the entire former Yugoslavia were established after WWII.

Ottoman Empire Period (1371–1912)

The research to date has been able to establish only a few formally educated engineers and/or architects born on the territory of present North Macedonia during this period. Probably, the earliest mentioned engineer practicing but not born on this territory is Sterie Guşa Ciumetti (1870, Veria, Ottoman Empire (now Greece) – 1933, Bucharest, Romania) (see Figure 1 (a), p. 102) who was educated in the Polytechnic University in Bucharest (Romania) (founded in 1818) as a bridge and road engineer before returning to Bitola (then – Monastir). There, he taught mathematics at the local Lyceum where he was a former student and practised as an engineer. A stone bridge on the River Dragor in Dovledžik near Bitola built at the turn of the 20th century is an example of his work (see Figure 2, p. 103). During the turbulent years of the Balkan War and WWI, he moved to the north of the Balkan Peninsula along the present Bulgarian-Romanian border. He was appointed the first Head of

the County Technical Service in Silistra (Bulgaria) and later appointed Inspector General of Bridges and Roads in Constanta (Romania) [10].

Three engineers and/or architects born on the territory of present North Macedonia that graduated during this period were identified (see Table 1).

Table 1

List of engineers and architects born in the past on the territory of present-day North Macedonia who graduated during the period of the Ottoman Empire [2, 11, 12]

No	Year Grad	Name and surname	DOB, POB, DOD, POB	Subject	University
1	1896	Petar J. Popović	25 May 1873, Prilep, Ottoman Empire (now North Macedonia)–4 February 1945, Belgrade, Yugoslavia (now Serbia)	Architecture	Belgrade
2	1904	Naum Torbov	18 November 1880, Gopeš, Ottoman Empire (now North Macedonia)–2 June 1952, Sofia, Bulgaria	Architecture	National University of Arts Bucharest
3	1910	Josif M. Mihajlović	28 April 1887, Teresonče, Ottoman Empire (now North Macedonia)–11 March 1941, Skopje, Kingdom of Yugoslavia (now North Macedonia)	Architecture	Belgrade



Figure 1. From left to right: (a) engineer Sterie Ciummeti, (b) architect Petar J. Popović, (c) architect Naum Torbov (cropped), and (d) architect Josif M. Mihajlović (cropped).

P. J. Popović (Figure 1 (b)) and J. M. Mihajlović (sometimes also listed as Josif Mihajlović-Jurukovski) (Figure 1 (d)) both graduated from the Technical Faculty in Belgrade in 1896 and 1910, respectively. P. J. Popović

started working for the Ministry of Construction in Belgrade in 1897 and passed the State Exam in 1901. Later he became the Head of the Ministry of Construction and Public Works (1919–1927) and an Honorary Professor of Medieval Serbian and Byzantine Architecture at the Technical Faculty in Belgrade (from 1919). Probably one of his most prominent works is the Ruski Car (Russian Tsar, named after Alexander II of Russia) – a mixed commercial-residential building in Belgrade (1922–1925) on Knez Mihjalova Street, designed together with Dragiša Brašovan (1887–1965). His main professional contribution to the territory of present North Macedonia is related to the conservation works on historic monuments, like the cravanserai / caravan saray / roadside inn/han, Kuršumli An in Skopje (Figure 3, p. 104), and the Memorial Church (Chappel) with Ossuary in Štip (1926) that was lost during WWII. In recognition of his prominent work and contribution to architecture, he became a member of the Serbian Royal Academy (now Serbian Academy of Arts and Sciences) in 1925, and in 1926 – a corresponding member of Jan Masaryk Academy of Labour in Prague [11].



Figure 2. Stone bridge on the River Dragor near Dovledžik in Bitola by engineer Sterie Ciumetti (1916).

Unlike P. J. Popović, J. M. Mihajlović took more opportunities and continued his education in Italy, the USA, France, and the UK before returning to the Kingdom of Serbs, Croats, and Slovenes. After a period in Belgrade, Serbia, he moved to Skopje where he served as a Mayor twice in the period between 1920 and 1941. As a Mayor, he played a pivotal role in transforming Skopje from an oriental kasbah/town into a Europe-inspired regional capital. During his mandate, Skopje got a new master plan and city centre (see Figure 4, p. 104), water supply and drainage were improved, the first power station, the first man-made

lake and hydroelectric power station, a new railway station, airport, and a number of other key buildings were built. As an architect, he will be remembered for his Red Cross and the Labour Exchange buildings [2].



Figure 3.
Kuršumli An
(Inn/Han) from
the Ottoman
Period in
Skopje
(pre-1963).



Figure 4.
Aerial Photo of
the City Square
in Skopje
(pre-WWII).

Similar to P. J. Popović, N. Torbov left the territory of present North Macedonia as a child, with P. J. Popović growing up in the Principality of Serbia and N. Torbov – in the Principality of Bulgaria. After completing his studies at the National University of Arts (founded in 1854) in Bucharest (Romania), he returned to Bulgaria and took a post at the Ministry of Public Building in Sofia before being appointed as the Head

of the Department of Architecture at the Sofia Municipality in 1906 and commencing private practice in 1908. He became one of the most prominent architects of that time in Bulgaria, who designed a number of public and residential buildings throughout the country, including probably the most prominent one, Sofia Central Market Hall (1911) (see Figure 5). Unlike P. J. Popović and J. M. Mihajlović, it is not known whether he contributed any architectural work to the territory of present-day North Macedonia [12].

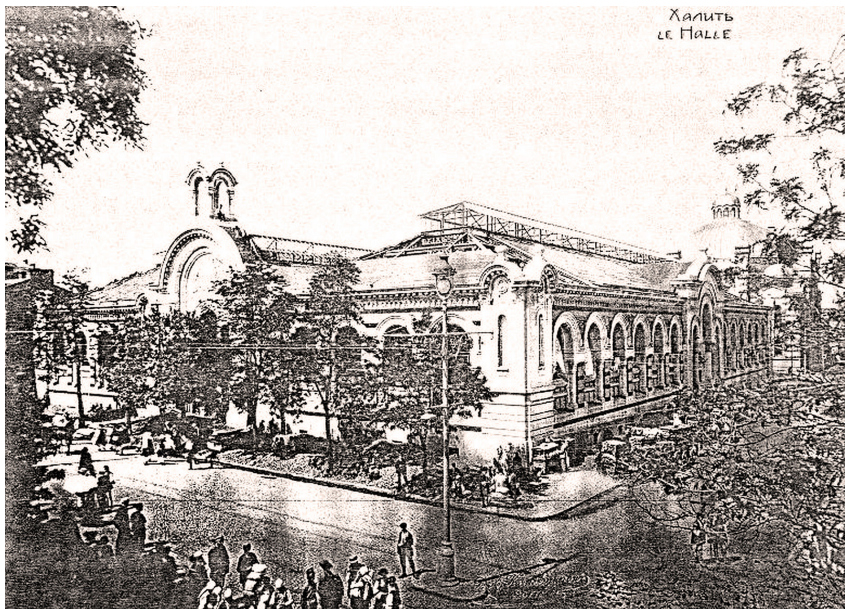


Figure 5. The Market Hall in Sofia (Bulgaria) by architect Naum Torbov (1912).

Period Between the Balkan Wars (1912–1913) and the WWI (1914–1918)

So far, the research has identified only one engineer who graduated during these turbulent times. Gligorije Tomić (1886, Kruševo, Ottoman Empire (now North Macedonia)–1971, Belgrade, Yugoslavia (now Serbia)) graduated in architecture from the University in Belgrade in 1914. Upon passing his professional exam, he returned to Skopje to set up his own practice that was active until 1941. After WWII, he worked initially as an architect for the Railway Transport Company (*Železničko trnasporno pretprijatie - ŽTP*) before becoming Deputy Head at the Ministry of Construction. During his professional career, he designed several

residential, public, and commercial buildings, as well as military barracks in Skopje and across North Macedonia. One of his most prominent buildings is the Ibni Pajko Dom (Centre) building in Skopje (1937) (Figure 6) [2].



Figure 6. The Medieval Stone Bridge in Skopje with the Ibni Pajko Building in the background (left hand side) by architect Gligorije Tomić (1950s) [9].

Kingdom of Serbs, Croats, and Slovenes (1918–1928)

In the aftermath of WWI, the Kingdom of Serbs, Croats, and Slovenes was formed providing a period of relative stability. During this period, Technical Schools / Faculties within the University of Zagreb and Ljubljana were formed offering more opportunities to study engineering and architecture within the country.

Table 2

List of engineers and architects born on the territory of present-day North Macedonia who graduated during the Kingdom of Serbs, Croats, and Slovenes (1918–1928) [1, 2]

Abbreviation: N/A – data not available

No	Year Gard	Name and surname	DOB, POB, DOD, POB	Subject	University
1	1920	Dragoljub A. Gazikalović	11 June 1889, Skopje, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
2	1921	Ahilo I. Džadžević	25 March 1891, Gevgelija, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
3	1921	Vladimir S. Petrović	24 December 1890, Labunište, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
4	1922	Velimir Dj. Stavrić	31 October 1894, Skopje, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
5	1922	Čedomir A. Gazikalović	20 April 1894, Skopje, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
6	1924	Stojmir S. Simić	21 April 1896, Kratovo, Ottoman Empire (now North Macedonia)–N/A	Architecture	Belgrade
7	1924	Sotir T. Tomić / Sotir T. Tomoski	16 February 1899, Bitola, Ottoman Empire (now North Macedonia)–30 November 1985, N/A	Architecture	Belgrade
8	1924	Vladimir R. Ristić	12 October 1898, Resen, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
9	1925	Veljko V. Veljković	12 August 1896, Kučkovo, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade

No	Year Gard	Name and surname	DOB, POB, DOD, POB	Subject	University
10	1925	Gligorije T. Tašković	20 June 1901 or 3 July 1901, Bitola, Ottoman Empire (now North Macedonia)–21 August 1963, New York, USA	Civil Engineering	Belgrade
11	1925	Dimitrije Karadžić	21 June 1897, Štip, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
12	1926	Mihailo K. Nebreklijević	30 October 1894, Prilep, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
13	1926	Kosta D. Hadžiev	10 May 1902 Ohrid, Ottoman Empire (now North Macedonia)–2 November 1973, N/A	Hydro Engineering	Vienna University of Technology
14	1927	Stevan A. Gazikalović	8 February 1900, Skopje, Ottoman Empire (now North Macedonia)–1975, Belgrade, Yugoslavia (now Serbia)	Architecture	Belgrade
15	1927	Dimitrije A. Simončević	25 February 1895, Ohrid, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
16	1927	Todor S. Spasić	11 January 1902, Bitola, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
17	1927	Borivoje J. Popović	28 April 1899, Tetovo, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
18	1927	Haralampije N. Fukarević	13 August 1901, Prilep, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
19	1927	Djordje J. Ivanović	19 January 1897, Prilep, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade

The majority of engineers and architects with a confirmed place of birth on the territory of present North Macedonia graduated from the University of Belgrade with the exception of K. D. Hadžiev who was trained as a hydro engineer at the Vienna University of Technology (Austria) founded in 1815 (Table 2, pp. 107–108). The later part of this period saw the emergence of the early graduated mechanical and electrical engineers. Apart from K. D. Hadžiev, who contributed with his engineering and building projects to his native Ohrid, civil engineer G. T. Tašković and architects S. T. (Tomić) Tomoski and S. A. Gazikalović are considered to be among the most prominent representatives from this period. They contributed significantly to the post-WWI rebuilding efforts on the territory of present-day North Macedonia.

Kingdom of Yugoslavia (1929–1940)

The largest number of engineers and architects graduated in this period (Table 3, pp. 110–113). Again, the majority of the identified graduates come from the University of Belgrade. There are some uncertainties about Isajlo J. Jovanov-Nikolovski's qualification. Based on the available information it is assumed that he completed a higher technical education in construction, which appears to be a vocational qualification at a level between that of a secondary technical school and a university degree. This qualification allowed him to proceed to the State Exam and upon completion, he was able to undertake design and construction of the buildings.

Although the majority of graduates are men, for the first time three women were identified as the earliest engineering women graduates born on the territory of present North Macedonia. The first one, Ms. S. Rifat Güreyman, obtained a degree in civil engineering at Istanbul Technical University in Istanbul (Türkiye) in 1933 whilst the other two, Ms. J. Dj. Naumović and Ms. R. Č. Vohoska, graduated in architecture from the University of Belgrade in 1934 and 1938, respectively.

Table 3

List of engineers and architects born in the past on the territory of present-day North Macedonia who graduated during the Kingdom of Yugoslavia (1929-1940) [1, 2, 13]

Abbreviation: N/A - data not available

No	Year Grad	Name and surname	DOB, POB, DOD, POB	Subject	University
1	1927	Kiril D. Žernovski	21 September 1897, Debar, Ottoman Empire (now North Macedonia) – 28 November 1972, Skopje, Yugoslavia (now North Macedonia)	Civil Engineering?	Zagreb
2	1929	Lambra P. Kovačević	12 October 1900, Labunište, Ottoman Empire (now North Macedonia) – N/A	Architecture	Belgrade
3	1929	Kosta T. Šorković	25 July 1902, Bitola, Ottoman Empire (now North Macedonia) – N/A	Civil Engineering	Belgrade
4	1929	Ćira L. Lazarević	3 March 1894, Kavadarci, Ottoman Empire (now North Macedonia) – N/A	Civil Engineering	Belgrade
5	1929	Bojan S. Sanjević	2 February 1899, Štip, Ottoman Empire (now North Macedonia) – N/A	Civil Engineering	Belgrade
6	1929	Zlatko A. Artonović	17 December 1906, Kriva Palanka, Ottoman Empire (now North Macedonia) – N/A	Mechanical & Electrical Engineering	Belgrade
7	1929	Momičilo P. Kozomarić	7 January 1901, Tetovo, Ottoman Empire (now North Macedonia) – N/A	Mechanical & Electrical Engineering	Belgrade
8	1930	Petar H. Vlahčević	29 June 1898, Štip, Ottoman Empire – now North Macedonia – N/A	Civil Engineering	Belgrad
9	1930	Mihailo A. Ačević	26 August 1903, Veles, Ottoman Empire (now North Macedonia) – N/A	Mechanical & Electrical Engineering	Belgrade
10	1932	Djordje Z. Kardaljević	1 May 1905, Bitola, Ottoman Empire (now North Macedonia) – N/A	Civil Engineering	Belgrade

No	Year Grad	Name and surname	DOB, POB, DOD, POB	Subject	University
11	1932	Lazar M. Mihailović	1 April 1907, Tetovo, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
12	1932	Milan M. Djunković	24 December 1902, Bašino Selo, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
13	1932	Jordan Dj. Pandilović	18 November 1906, Tetovo, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
14	1932	Isajlo J. Jovanov-Nikolovski	21 January 1910, Tresonče, Ottoman Empire (now North Macedonia)–26 July 1963, Skopje, Yugoslavia (now North Macedonia)	Construction (<i>qualification and graduate engineer/architect</i>)	Higher Technical School in Belgrade
15	1933	Metodije J. Nočević	25 December 1902, Prilep, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
16	1933	Apostol D. Sotirović	17 March 1904, Mavrovo, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
17	1933 or 1934	Djordje V. Vasiljević / Georgi Vasilev	13 March 1908 or 13 March 1909, Strumica, Ottoman Empire (now North Macedonia)–1965, Belgrade, Yugoslavia (now Serbia)	Mechanical & Electrical Engineering	Belgrade
18	1933	Ms Sabiha Rifat (<i>married</i> Gürayman)	1910, Bitola, Ottoman Empire (now North Macedonia)–4 January 2003, Izmir, Türkiye	Civil Engineering	Istanbul Technical University
19	1934	Ms Jovanka Dj. Naumović	6 January 1911, Bukočajani, Ottoman Empire (now North Macedonia)–N/A	Architecture	Belgrade
20	1934	Metodije M. Petković	13 February 1910, Bitola, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
21	1934	Penčo L. Zafirović	7 April 1910, Veles, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
22	1934	Tiberije Dj. Kirijas	5 May 1908, Trnovo, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade

No	Year Grad	Name and surname	DOB, POB, DOD, POB	Subject	University
23	1934	Ignjat J. Krstić	21 December 1906, Požarane, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
24	1935	Rista N. Talević	14 September 1909, Bitola, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
25	1935	Veselin S. Dičić	2 May 1908, Skopje, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
26	1935	Lazar M. Hristov	15 March 1914, Veles, Kingdom of Serbia (now North Macedonia)–N/A	N/A	Belgrade?
27	1936	Dragoljub S. Sotirović	10 April 1905, Mavrovo, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
28	1936	Branko F. Djukić	19 June 1912, Prilep, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
29	1936	Petar S. Nikolić	29 June 1911, Bitola, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
30	1936	Rista L. Mukajetović	10 July 1907, Kavadarci, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
31	1936	Ćirilo I. Jovanović	20 December 1911, Kavadarci, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
32	1937	Milorad D. Macura	9 March 1914, Skopje, Kingdom of Serbia (now North Macedonia)–1989, Belgrade, Yugoslavia (now Serbia)	Architecture	Belgrade
33	1937	Dimitrije A. Ilić	22 October 1907, Kavadarci, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
34	1937	Elio I. Koen	15 August 1912, Skopje, Ottoman Empire (now North Macedonia)–N/A	Technology Engineering	Belgrade
35	1937	Dragutin M. Jovanović	20 September 1914, Skopje, Kingdom of Serbia? (WWI) (now North Macedonia)–N/A	Civil Engineering	Belgrade

No	Year Grad	Name and surname	DOB, POB, DOD, POB	Subject	University
36	1937	Jaćim P. Perić	23 August 1914, Skopje, Kingdom of Serbia? (WWI) (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
37	1937	Rahamin N. Beraha	1 January 1912, Skopje, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
38	1937	Alfred L. Melamed	28 August 1913 Kumanovo, Kingdom of Serbia (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
39	1937	Bogoljub B. Urošević	26 April 1911, Skopje, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
40	1937	Konstantin L. Zordumis	24 January 1914, Kumanovo, Kingdom of Serbia (now North Macedonia)–N/A	Architecture	Belgrade
41	1937	Mladen T. Stefković	23 December 1909, Skopje, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
42	1938	Ćirilo D. Djordjvić / Kiro Georgjevski-Dejan	15 August 1910 or 15 July 1910, Prilep, Ottoman Empire (now North Macedonia)–30 April 1986, Skopje, Yugoslavia (now North Macedonia)	Architecture	Belgrade
43	1938	Vladimir T. Kamenjarević	2 May 1914, Veles, Kingdom of Serbia (now North Macedonia)–N/A	Civil Engineering	Belgrade
44	1938	Hristifor-Rista V. Desanović	3 November 1907, Bitola, Ottoman Empire (now North Macedonia)–N/A	Civil Engineering	Belgrade
45	1938	Samo J. Rafajlović	15 March 1913, Skopje, Ottoman Empire? (1st Balkan War) (now North Macedonia)–N/A	Technology Engineering	Belgrade
46	1938	Ms Ratislava Č. Vohoska	18 August 1914, Skopje, Kingdom of Serbia? (WWI)–N/A	Architecture	Belgrade
47	1938	Nikola N. Manojlović	25 January 1911, Dojran, Ottoman Empire (now North Macedonia)–N/A	Mechanical & Electrical Engineering	Belgrade
48	1938	Rista A. Vasiljević	17 October 1913, Veles, Kingdom of Serbia (now North Macedonia)–N/A	Technology Engineering	Belgrade

Apart from architects, civil, mechanical and electrical engineers, during this period the early generations of technology (chemical) engineers started emerging. Some of the graduate engineers and architects became prominent figures in their field in North Macedonia, like Professors K. D. Žernovski and T. Dj. Kirijas, I. J. Jovanov-Nikolovski (Secretary of the Review Commission at the Ministry for Construction), G. Vasilev (Minister for Construction and Minister for Industry), K. Georgievski-Dejan (Minister for Industry and Minister for Communal Services) in North Macedonia [2]. Others became prominent architects in Serbia, like M. D. Macura [14], or prominent civil engineers, like S. Rifat Güreyman in Türkiye where she was also the first female civil engineer. In Türkiye, she was appointed Chief Construction Engineer at the Ministry of Public Works and was engaged, among other matters, in the 10-year project to build the Anitkabir Hürriyet Tower, the Mausoleum for the Türkiye's founding father, Mustafa Kemal Atatürk (1881, Thessaloniki, Ottoman Empire (now Greece)–1938, Istanbul, Türkiye) [13].

World War II in the Territory of North Macedonia (1940–1944)

During WWII, the studies were disrupted by the war which in turn resulted in the fact that very few engineers and architects were able to complete their studies. Boris A. Čipan (27 March 1918, Ohrid, Kingdom of Serbia? (WWI)–31 March 2012, Skopje?, North Macedonia) is the only identified graduate in this period. He graduated in architecture from the University of Belgrade in 1941 and became one of the most prominent architects, conservators, and professors of architecture in North Macedonia with the building of the Macedonian Academy of Sciences and Arts in Skopje being his most prominent project [2].

Connection of Engineers Born in the Territory of North Macedonia with Riga Technical University

So far, no early engineers or architects from the territory of present-day North Macedonia who studied or graduated from Riga Polytechnic Institute (RTI), now – Riga Technical University (RTU), Riga (Latvia), were identified. However, the research identified three graduates of Riga Polytechnic Institute who had their degrees recognized by the Technical Faculty of the University of Belgrade in the Kingdom of Yugoslavia (Table 4) [1].

Table 4

List of engineers and architect who graduated from Riga Polytechnic Institute that had their degrees recognised by the University of Belgrade, Serbia) [1, 15, 16, 17]

Abbreviation: N/A – data not available

No	Year Rec.	Name and surname	DOB, POB, DOD, POB	Subject	University
1	1932	Antolije I. Hmara	1878, Don Republic, Russian Empire–N/A	Architecture	Riga Polytechnic Institute, 1906
2	1935	Sergije I. Trofimov	1888, Riga, Russian Empire (now Republic of Latvia)–N/A	Mechanical Engineering	Riga Polytechnic Institute, 1913
3	1938	Konstantin Mironov	1890, Riga, Russian Empire (now Republic of Latvia)–N/A	Technology Engineering	Riga Polytechnic Institute, 1912

It should be assumed that the youngest of the mentioned three RPI graduates, *K. Mironov*, was the son of *Nikolajs Mironovs*, the owner of the commercial school in Riga, and graduated from the mentioned commercial school in 1907 together with the later first Foreign Minister and second Prime Minister of the Republic of Latvia, *Zigfrīds Anna Meierovics* (1887–1925), who studied commerce at RPI. *K. Mironov*'s fellow student was chemist *Eižens Rozenšteins* (1886–1933), later a professor at the University of Latvia, who also graduated from *N. Mironovs*' commercial school with a silver medal in 1907 [18]. *K. Mironov* graduated from RPI with distinction, but the author has not been able to find more information about him. It is possible that his career took place outside of Latvia.

Furthermore, the research identified that *Aleksej N. Žukov*, born on 31 October 1910 in Riga, Latvia, graduated as a mechanical and electrical engineer from the Technical Faculty at the University of Belgrade on 13 October 1938 [1].

The research also identified that one of the most famous early women engineers and architects from Serbia lived in Riga for a certain period of time. *Jovanaka Bončić-Katerinić* (22 June 1887, Niš, Kingdom of Serbia (now Serbia)–27 December 1966, Belgrade, Yugoslavia (now Serbia)) as a student of architecture at the University of Belgrade was granted a scholarship to attend Technische Hochschule Darmstadt (TH). There she successfully completed two degrees: one in architecture and one in engineering. She is considered to be the first woman graduate of TH-Darmstadt and the first women university-trained engineer in Germany in 1913. In 1914, she moved to the Russian Empire where she married a fellow Darmstadt student of architecture from Russia, *Andrei Katerinić* (?–?). Between 1914 and 1922, they lived in the Russian Empire including St. Petersburg, Riga, Moscow, Kiev, and Odessa. As during this

time she had three sons, it is not known if she practiced whilst there. Upon her return to the Kingdom of Serbs, Croats, and Slovenes, she re-joined the Ministry of Construction in Belgrade, Serbia, where she became the Head of the Department for University Construction. Apart from some secondments during WWII, she remained with the Ministry of Construction from where she retired in 1945 with a legacy of a number of public buildings including the Cultural Centre Banski Dvor and the National Monument of Bosnia and Herzegovina, both in Banja Luka, as well as the Teacher Training School and the School of Veterinary Medicine, both in Belgrade [19, 20].

Conclusions

The paper has presented the initial findings of ongoing research aimed at identifying the early engineers and architects who originated in the past from the territory of present-day North Macedonia. So far, 72 engineers and architects have been identified with the majority of them graduating from the University of Belgrade (Serbia), the oldest Technical Faculty from the territories of the former Yugoslavia, and a smaller number from other universities in the former Yugoslavia and Europe. The majority of the early engineers and architects were men graduating in the later part of the 19th century, with women entering these professions starting from the 1930s. These early engineers and architects along with those coming from other parts of former Yugoslavia and abroad were the founding members of the engineering professions on this territory, which ultimately led to the creation of the Skopje Section of the Yugoslavian Association of Engineers and Architects in March 1920. Their numbers and expertise were strengthened by the policies of the former Kingdom of Serbs, Croats, and Slovenes, later the Kingdom of Yugoslavia, that promoted the education of engineers and architects in Western Europe after WWI and allowed for either a temporary stay or a settlement of the refugees from the 1917 October Revolution and the subsequent Civil Wars in Russia (1917–1923).

The real number of engineers and architects who graduated within the observed period is likely to be higher than reported here, due to the absence of sufficient information from other universities in the region to confirm the origin of their graduates. All of the identified architects in the paper are graduates of engineering schools, apart from Naum Torbov who is a graduate of a fine arts school.

The research to date has not identified any engineers or architects born on the territory of present North Macedonia who studied at Riga Polytechnic Institute or graduated in Riga prior to 1944. However, three graduates

from Riga Technical University who had their degrees recognised in the Kingdom of Yugoslavia by the Technical Faculty at the University of Belgrade were identified, as well as one person born in Riga who graduated from the Technical Faculty of the University in Belgrade. In addition, an early Serbian woman engineer and architect who lived briefly in Riga was also identified. The paper provides a brief indication of the personal contributions and achievements of these early engineers and architects that can be expanded further through ongoing and subsequent research.

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Vladimir B. Ladinski

Pirmie inženieri un arhitekti, kas dzimuši pašreizējās Ziemeļmaķedonijas teritorijā

Rakstā sniegts ieskats par pirmajiem inženieriem un arhitektiem tagadējās Ziemeļmaķedonijas teritorijā, kuri absolvējuši augstskolu pirms valsts izveidošanas 1944. gada 2. augustā, kā arī pirms pirmās Tehniskās fakultātes dibināšanas Skopjē 1949. gadā. Lielākā daļa apzināto inženieru un arhitektu ir vīrieši, kuri starpkaru periodā absolvējuši 1846. gadā dibināto Belgradas Universitātes (Serbija) Tehnisko fakultāti. Sievietes inženierzinātnēs un arhitektūrā ienāca pagājušā gadsimta 30. gados. Daži no pirmajiem absolventiem savu profesionālo karjeru turpināja citviet. Noskaidroti trīs Rīgas Politehniskā institūta (Latvija) absolventi, kuriem Belgradas Universitātes Tehniskā fakultāte ir atzinusi iegūto grādu, kā arī viena serbiete, inženiere un arhitekte, kura apskatāmajā periodā neilgu laiku dzīvoja Rīgā. Pētījums atklāj līdz šim maz zināmus Ziemeļmaķedonijas inženierzinātņu un arhitektūras vēstures aspektus.

Atslēgvārdi: Ziemeļmaķedonija, pirmie inženieri un arhitekti, RPI.

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