

Teslin profesor Martin Sekulić u vrijeme njegova školovanja u Hrvatskoj

Tesla's professor Martin Sekulić during his education in Croatia

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SAŽETAK

Obilježavanje 150. obljetnice mature Nikole Tesle, između ostalog, bilo je posvećeno i Martinu Sekuliću, njegovu profesoru fizike koji ga je svojim inspirativnim predavanjima i eksperimentima zainteresirao za to područje znanosti. U karlovačkom naselju Rakovac, u neposrdnoj blizini Gimnazije Karlovac, tim je povodom postavljen mural s likom Martina Sekulića. Zajedno s obližnjim Teslinim muralom čini skladnu cjelinu. Martin Sekulić bio je vrlo svestran čovjek. U rakovačkoj Realki predavao je više različitih predmeta, aktivno promicao tjele vježbu i humanitarni rad, obavljao je dužnost ravnatelja te voditelja fizikalnog kabineta i učiteljske knjižnice. Objavljivao je znanstvene radove i postao dopisni član tada Jugoslavenske akademije znanosti i umjetnosti (danas Hrvatske akademije znanosti i umjetnosti). Bio je i zastupnik u hrvatskom Saboru.

SUMMARY

Remark at Nikola Tesla's 150th graduation anniversary was, among other things, dedicated to Martin Sekulić, the physics professor whose inspiring lectures and experiments planted the seeds of Tesla's interest in that subject. A mural bearing the likeness of Martin Sekulić was painted next to Tesla's old high school, the Karlovac Gymnasium in the Rakovac neighborhood. The location was suitable also because of Tesla's mural in the immediate vicinity. Martin Sekulić was a man of many interests. He taught different subjects in the Rakovac Realschule, also being in charge of the teachers' library and the physics classroom. He actively promoted sport and humanitarian work, and he spent a term as the school's headmaster. He published scientific papers, became a corresponding member of then the Yugoslav Academy of Sciences and Arts (today Croatian Academy of Sciences and Arts). He was also a member of Croatian Parliament (Hrvatski Sabor).

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KLJUČNE RIJEČI: **Martin Sekulić**, fizika, mural, Nikola Tesla, realka

UVOD

O životu i djelu Martina Sekulića u hrvatskoj znanstvenoj historiografiji nekoliko je radova koje su napisali istaknuti povjesničari znanosti. Među prvima o Sekuliću je pisao Vladimir Muljević [1], ali dosad najopsežniji ostaje Darko Žubrinić s nekoliko izvrsnih radova [2,3]. U časopisu *Prirodoslovlje* Ivica Vuković i Anđa Valent u svojem su članku [4], između ostaloga, ispravili i neke nedosljednosti vezane uz Sekulićevo obrazovanje u inozemstvu. Primjerice, u literaturi se provlači hipoteza da je Sekulić studirao u Beču – prvi ju iznosi Muljević, a kasnije je prenose i ostali [5]. Tu netočnost ispravljaju Vuković i Valent [4], jer Sekulić nije završio sveučilišni studij u Beču već Topničku akademiju u Olomoucu.

Martin Sekulić cijeli je radni vijek proveo u Rakovačkoj realki (današnjoj Gimnaziji Karlovac), koja se u vrijeme školovanja Nikole Tesle zvala Carska i kraljevska velika realka. Osamdesetih godina 19. stoljeća spaja se s Kraljevskom gimnazijom Karlovac u Kraljevsku veliku realnu gimnaziju u Rakovcu.

Kada su Gimnazija Karlovac i udruga Nikola Tesla Experience Center iz Karlovca obilježili 150. obljetnicu mature Nikole Tesle (slika 1), karlovačko naselje Rakovac u kojem se Tesla školovao ukrašeno je muralom posvećenom Martinu Sekuliću (slika 2), njegovu profesoru fizike. Vrijednu inicijativu udruge Nikola

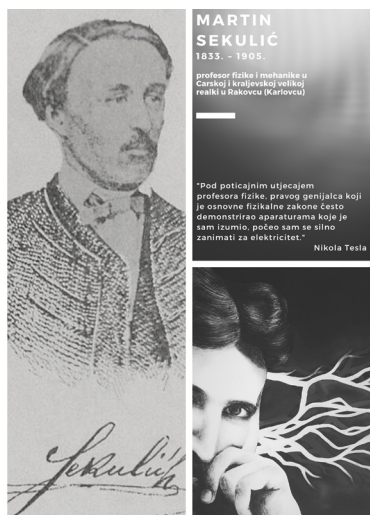
KEYWORDS: **Martin Sekulić**, mural, Nikola Tesla, physics, *Realschule*

INTRODUCTION

There are several papers on the life and work of Martin Sekulić in the Croatian scientific historiography written by prominent historians of science. Among the first to write about Sekulić was Vladimir Muljević [1], but so far the most comprehensive Darko Žubrinić, who published several excellent papers [2,3]. In the journal *Prirodoslovlje*, Ivica Vuković and Anđa Valent, in their article [4] corrected, among other things, some inconsistencies related to Sekulić's education abroad. For example, the hypothesis that Sekulić studied in Vienna – first put forward by Muljević, and later carried over by others [5] is prevalent in the literature. This inaccuracy is corrected by Vuković and Valent [4], because Sekulić did not complete his university studies in Vienna, but rather at the Artillery Academy in Olomouc.

Martin Sekulić spent his entire working life at the Rakovac Realka /Realschule (today's Karlovac „Gymnasium“ – high school), which was called the Imperial and Royal Great Realschule during Nikola Tesla's education. In the 1880s, it merged with the Karlovac Royal Gymnasium to form the Royal Great Realschule in Rakovac.

When the Karlovac Gymnasium and the Nikola Tesla Experience Center association from Karlovac celebrated the 150th anniversary of Nikola Tesla's graduation (Figure 1), the Karlovac settlement of Rakovac, where Tesla studied, was decorated with a mural dedicated to Martin Sekulić (Figure 2), his physics professor. The valuable initiative of the Nikola Tesla



Slika 1. Obljetnica Tesline mature u Gimnaziji Karlovac, plakat, Gimnazija Karlovac

Figure 1. Anniversary of Tesla's graduation from the Karlovac Gymnasium, poster, Karlovac Gymnasium



Slika 2. Mural posvećen Martinu Sekuliću, autor Leonard Lesić, Gimnazija Karlovac

Figure 2. Mural dedicated to Martin Sekulić, by Leonard Lesić, Karlovac Gymnasium



Slika 3. Mural posvećen Nikoli Tesli, autor Leonard Lesić, Gimnazija Karlovac

Figure 3. Mural dedicated to Nikola Tesla, by Leonard Lesić, Karlovac Gymnasium

Experience Center association was realized by the artist Leonard Lesić, who connected two of his murals. Sekulić's mural (Figure 2), 14 m high and 9 m wide, is located in the immediate vicinity of the mural with the image of the young Tesla (Figure 3), painted a few years earlier. Since Martin Sekulić also studied rainbows, this natural phenomenon was featured in the mural, and its connection to physics and mathematics is shown through colors and shapes.

THE TEACHING COUNCIL AT THE TIME OF NIKOLA TESLA'S SCHOOLING IN RAKOVAC REALSCHULE

During Nikola Tesla's education at the Imperial and Royal Great Realschule in Rakovac, the school principal was Sigmund Šoštarić noble Letovanić. In addition to his

Tesla Experience Center realizirao je likovni umjetnik Leonard Lesić, povezujući dva svoja murala. Sekulićev mural, visok 14 m i širok 9 metara, nalazi se u neposrednoj blizini murala s likom mladoga Tesle (slika 3), naslikanoga nekoliko godina ranije. Budući da je Martin Sekulić proučavao i duge, taj se prirodni fenomen našao na muralu, a njegova povezanost s fizikom i matematikom prikazana je bojom i oblicima.

NASTAVNIČKO VIJEĆE U VRIJEME ŠKOLOVANJA NIKOLE TESLE U RAKOVAČKOJ REALKI

U vrijeme školovanja Nikole Tesle u Carskoj i kraljevskoj velikoj realki u Rakovcu ravnatelj škole bio je **Sigmund Šostarić pl. Letovanić**. Osim ravnateljske dužnosti, održavao je nastavu iz predmeta prirodopis, matematika i fizika. Bio je član Zemaljskoga školskoga vijeća za hrvatsko-slavonsku Krajinu.

Nastavničko vijeće činili su nastavnici **Mio Brašnić** (povijest, zemljopis i njemački jezik), **Gjuro Fridrich** (prostorno risanje, čuvar učila za ovaj predmet), **Radoslav Grgić** (aritmetika), **Augustin Löffler** (matematika i fizika, gimnastika, voditelj meteoroloških opažanja u školi, čuvar gimnastičkih učila, dopisni član Matematičkoga društva u Pragu, pravi član Meteorološkoga društva u Beču), **Josip Jagunić** (rimokatolički vjeronauk i hrvatski jezik, član kotarskoga školskog vijeća), **Ivan Jamnicky** (kemija, njemački jezik, krasopis, čuvar

duties as principal, he taught natural history, mathematics, and physics. He was a member of the National School Council for the Croatian-Slavonian Krajina.

The teaching council consisted of teachers **Mio Brašnić** (history, geography and German), **Gjuro Fridrich** (three-dimensional drawing, custodian of teaching aids for this subject), **Radoslav Grgić** (arithmetics), **Augustin Löffler** (mathematics and physics, gymnastics, head of meteorological observations at the school, custodian of gymnastics teaching aids, corresponding member of the Mathematical Society in Prague, full member of the Meteorological Society in Vienna), **Josip Jagunić** (Roman Catholic religious education and Croatian language, member of the district school council), **Ivan Jamnicky** (chemistry, German language, calligraphy, custodian of the chemistry cabinet, full member of the Austrian Meteorological Society and corresponding member of the Gabelsberger Stenographic Society in Vienna), **Vincenz Knapp** (singing), **Emanuel Kregcz** (chemistry and physics, French and Italian, custodian of the chemistry cabinet), **Franjo Kreminger** (descriptive geometry, mathematics, German and Croatian stenography, member of the examination committee for general and civic schools in Petrinja, librarian and custodian natural history and geometry collections), **Loyst Möstl** (modeling), **Aron Reich** (Jewish religious education), **Martin Sekulić** (mechanics and physics, keeper of the physics cabinet), **Josip Angelo Spinca** (descriptive geometry and mathematics), **Petar Tomić** (geography, history and French), **Stjepan Vorgić** (geography, history and Croatian language, keeper of the geography cabinet) and

kemijskog kabineta, pravi član austrijskog Društva za meteorologiju i dopisni član Gabelsbergerovoga stenografskoga društva u Beču), **Vincenz Knapp** (pjevanje), **Emanuel Kregcz** (kemija i fizika, francuski i talijanski jezik, čuvar kemijskoga kabineta) **Franjo Kreminger** (nacrtana geometrija, matematika, njemačka i hrvatska stenografija, član ispitnog povjerenstva za opće i građanske škole u Petrinji, knjižničar i čuvar prirodopisne i geometrijske zbirke), **Loyst Möstl** (modeliranje), **Aron Reich** (židovski vjeronauk), **Martin Sekulić** (mekanika i fizika, čuvar fizikalnog kabineta), **Josip Angelo Spinca** (nacrtana geometrija i matematika), **Petar Tomić** (zemljopis, povijest i francuski jezik), **Stjepan Vrgić** (zemljopis, povijest i hrvatski jezik, čuvar kabineta za zemljopis) i **Nikola Živković** (pravoslavni vjeronauk, predsjednik duhovnog stola).

Osim nastavnčkih, razredničkih i drugih školskih obveza profesori su pisali stručne i znanstvene članke koje su objavljivali u školskim izvješćima čime su pridonijeli razvoju školstva i znanosti u Hrvatskoj.

OSVRT NA ŽIVOTOPIS MARTINA SEKULIĆA

Martin Sekulić rodio se u Lovincu, 29. rujna 1833., a preminuo je u Zagrebu, 14. travnja 1905. U vrijeme rođenja Martina Sekulića mjesto Lovinac, središte Krajiške satnije, zvalo se St. Michael (Sv. Mihovil). Svako veće kumpanijsko, a naročito pukovnijsko središte imalo je

Nikola Živković (Orthodox religious education, president of the spiritual table).

In addition to teaching, homeroom and other school duties, professors wrote professional and scientific articles they published in school reports, thereby contributing to the development of education and science in Croatia.

SHORT RETROSPECTIVE ON MARTIN SEKULIĆ'S BIOGRAPHY

Martin Sekulić was born in Lovinac on September 29, 1833 and died in Zagreb on April 14, 1905. At the time of Martin Sekulić's birth, the townlet Lovinac, the centre of the Border Company, was called St. Michael (St. Michael). Every larger company, and especially the regimental centre, had an elementary school which was compulsory for all male children over the age of seven. Thus, since 1779, there had been an elementary school in Lovinac which lasted three years (trivialka). Students with better academic performance could continue their education at the Border Regimental Mathematical Schools, which operated as training schools for cadets.

There were several such schools in Croatia. Sekulić was conscripted in 1849, and based on his age, it can be concluded that he attended the high school of cadets, because already in 1852 he started attending the Artillery Academy in Olomouc (K. K. Artillerie-Akademie zu Olmütz). In 1856 he was promoted to second lieutenant of the 2nd order of the light (Polish) artillery. At the academy, he acquired excellent knowledge of mathematics and physics, which enabled

osnovnu školu koju su obvezno pohađala sva muška djeca starija od sedam godina. Tako je u Lovincu još od 1779. djelovala osnovna škola koja je trajala tri godine (trivijalka). Učenici s boljim školskim uspjehom mogli su nastaviti školovanje u krajiškim pukovnijskim matematičkim školama koje su djelovale kao pripravnici škole za kadete.

Na području Hrvatske bilo je nekoliko takvih škola. Sekulić je 1849. unovačen, a prema dobi može se zaključiti da je pohađao srednju kadetsku školu jer je već 1852. počeo pohađati Topničku akademiju u Olomoucu (K. K. Artillerie-Akademie zu Olmütz). Godine 1856. promaknut je u potporučnika 2. reda lakog (poljskog) topništva. Na akademiji je stekao odlično znanje iz matematike i fizike, što mu je omogućilo uspješan rad izvan vojne službe koju je napustio godine 1858.

Pedagoški je rad Martin Sekulić započeo školske godine 1859./1860. kao asistent u Državnoj realci u Pešti. Nakon osnutka Carske i kraljevske velike realke u Rakovcu, dekretom ratnoga ministarstva od 24. kolovoza 1863. imenovan je njezinim profesorom (slika 4). U toj je ustanovi proveo svoj radni vijek do umirovljenja godine 1882. U popisu svih ravnatelja Realke od osnutka do godine 1881. navedeno je da Martin Sekulić u dva navrata „vrši dužnost ravnatelja“; u drugom semestru šk. god. 1863./1864. te od 12. studenog 1874. do 28. veljače 1875. (nakon smrti ravnatelja Sigmunda Šoštarića Letovaničkog do imenovanja dr. Matije Uhlira).

him to successfully work outside the military service, which he left in 1858.



Slika 4. Nastavnički zbor Carske i kraljevske velike realke u Rakovcu snimljen u siječnju 1868. godine, dvije godine prije početka školovanja Nikole Tesle. Martin Sekulić sjedi prvi slijeva, Gimnazija Karlovac

Figure 4. The teachers' assembly of the Imperial and Royal Great Realschule in Rakovac, photographed in January 1868, two years before Nikola Tesla began his education. Martin Sekulić is seated first from the left, Karlovac Gymnasium

Martin Sekulić began his teaching career in the 1859/1860 school year as an assistant at the State Realschule in Pest. After the establishment of the Imperial and Royal Great Realschule in Rakovac, he was appointed its professor by a decree of the War Ministry on August 24, 1863 (Figure 4). He spent his working life at that institution until his retirement in 1882. The list of all directors of the Realka from its establishment to 1881 states that Martin Sekulić „performed the duties of director“ on two occasions; in the second semester of the 1863/1864 school year and from November 12, 1874, to February 28, 1875 (after the death of director

Martin Sekulić bio je redoviti član Hrvatskoga pedagoško-književnoga zbora, strukovne udruge učitelja, pedagoga i prosvjetnih djelatnika. Stručne i znanstvene članke objavljivao je u Radu, znanstvenom časopisu Jugoslavenske akademije znanosti i umjetnosti (danas Hrvatska akademija znanosti i umjetnosti), pa je 24. studenoga 1873. izabran za dopisnoga člana u akademijinom Matematičko-prirodoslovnom razredu.

Znanstvene je radove objavljivao i u izvješćima Rakovačke realke. Školska izvješća, službene publikacije ondašnjih škola, od godine 1849. objavljuju znanstvene ili pedagoške rasprave svojih profesora ovisno o području kojim se bave. Tako je Martin Sekulić u izvješćima za 1875. i 1878. objavio radove: *Način iztraživanja prirodnih zakona i novi stroj umetaljka (Interpollationsmaschine)* (slika 5) i *Elementarni nauk o harmoničnom titranju* (slika 6).

MARTIN SEKULIĆ, TESLIN PROFESOR FIZIKE I...

Martin Sekulić bio je vrlo svestran čovjek. Osim fizike predavao je aritmetiku, geometriju, geometrijsko crtanje, kaligrafiju te izvodio praktične geometrijske vježbe izvan učionice za vrijeme ljetnih mjeseci. U Teslino vrijeme predavao je i matematiku te vodio fizikalni kabinet s iznimno bogatom zbirkom od 579 sprava.

Sljedećim je generacijama predavao i hrvatski jezik pa čak i tjelovježbu. Kao

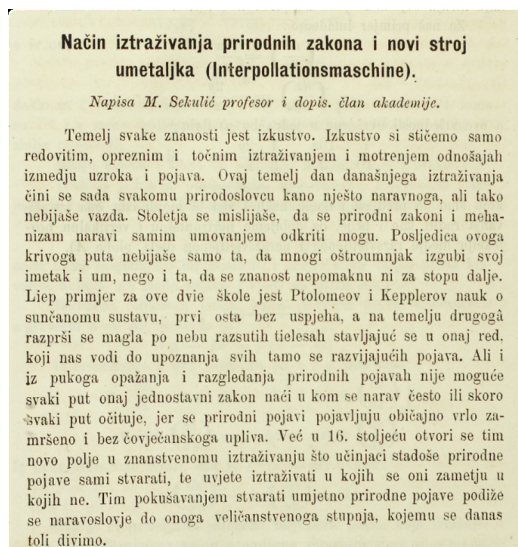
Sigmund Šoštarić Letovanički until the appointment of Dr. Matija Uhlir).

Martin Sekulić was a regular member of the Croatian Pedagogical and Literary Association, a professional association of teachers, pedagogues and educational workers. He published professional and scientific articles in Rad, the scientific journal of the Yugoslav Academy of Sciences and Arts (today the Croatian Academy of Sciences and Arts), and on November 24, 1873 he was elected a corresponding member of the academy's Mathematical-Natural Sciences Class.

He also published scientific papers in the reports of the Rakovac Realschule. School reports, the official publications of the schools of the time, have been publishing scientific or pedagogical discussions of their professors since 1849, depending on the field they are working on. Thus, in the reports for 1875 and 1878, Martin Sekulić published the following works: *The Method of Investigating Natural Laws and a New Interpolation Machine (Interpollationsmaschine)* (Figure 5) and *The Elementary Science of Harmonic Vibration* (Figure 6).

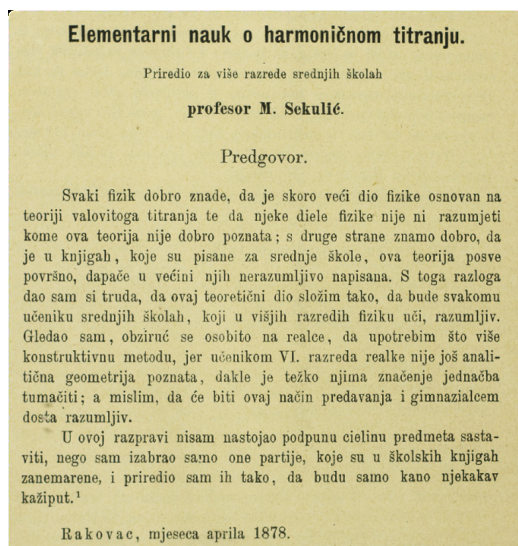
MARTIN SEKULIĆ, TESLA'S PHYSICS PROFESSOR AND...

Martin Sekulić was a very versatile man. In addition to physics, he taught arithmetic, geometry, geometric drawing, calligraphy, and performed practical geometric exercises outside the classroom during the summer months. In Tesla's time he also taught mathematics and ran a physics cabinet with an exceptionally rich collection of 579 devices.



Slika 5. Preslika naslovne stranice znanstvenog rada koji je Sekulić objavio u Godišnjem izvješću Carske i kraljevske velike realke u Rakovcu, 1875.

Figure 5. Copy of the title page of the scientific paper published by Sekulić in the Annual Report of the Imperial and Royal Great Realschule in Rakovac, 1875



Slika 6. Preslika naslovne stranice znanstvenog rada koji je Sekulić objavio u Godišnjem izvješću Carske i kraljevske velike realke u Rakovcu, 1878.

Figure 6. Copy of the title page of the scientific paper published by Sekulić in the Annual Report of the Imperial and Royal Great Realschule in Rakovac, 1878

član i predsjednik Društva za tjelovježbu „*Pokupski sokol*“ bio je vrlo aktivan u promicanju tjelovježbe.

Jedno je vrijeme Martin Sekulić bio i kustos učiteljske knjižnice, a u botaničkom vrtu ispred Realke postavio je nekoliko meteoroloških aparata pa je vršio funkciju „lektora“ meteorološke postaje. Kao član Hrvatsko-slavenskoga poljoprivrednoga društva neko je vrijeme predavao i poljoprivredu.

Gimnazija Karlovac ima stoljetnu tradiciju volonterskoga rada (slika 7). I na tom se području Martin Sekulić istaknuo kao tajnik godine 1874., a kasnije i potpredsjednik školskoga „Društva za podupiranje siromašnih realcah“.

Carska i kraljevska velika realka u Rakovcu spaja se 1882. s Kraljevskom gimnazijom Karlovac u Kraljevsku veliku realnu gimnaziju. U Ljetopisu godišnjega izvješća novonastale škole 1882./1883. navode se podatci o promjenama u učiteljskom zboru (slika 8) nakon spajanja Realke u Realnu gimnaziju. Između ostalih, profesor Martin Sekulić odlazi u mirovinu odlukom Kraljevske zemaljske vlade od 18. rujna 1882. Nakon umirovljenja posvetio se politici, pa 1897. postaje zastupnik u hrvatskom Saboru, a tu će dužnost obnašati do kraja života.

ZAKLJUČAK

Kada se govori o obrazovanju Nikole Tesle, u okviru obilježavanja njegovih okrughli obljetnica bilo mature, rođenja ili preminuća, ne smije se zaboraviti Mar-

He also taught Croatian and even physical education to subsequent generations. As a member and president of the Physical Education Society *Pokupsko's Hawk (Pokupski Sokol)*, he was very active in promoting physical education.

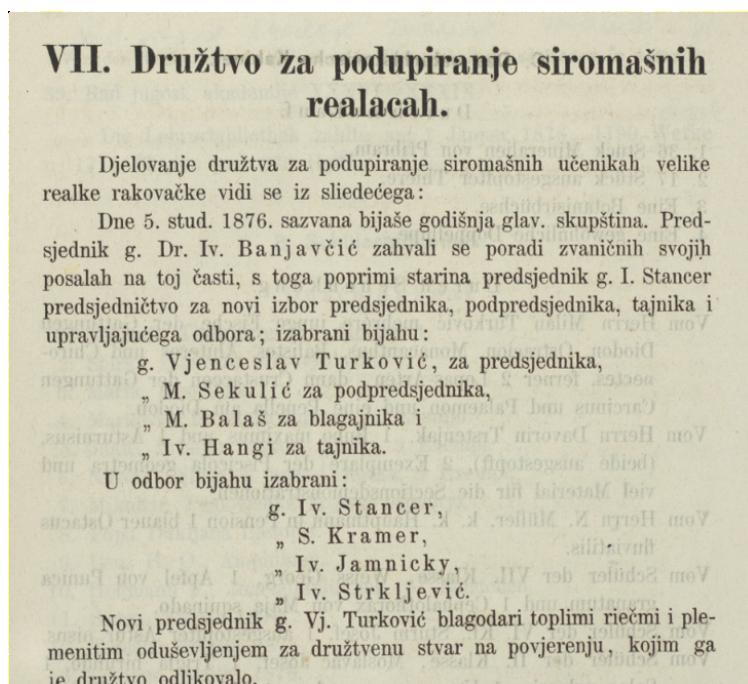
For a time, Martin Sekulić was also the curator of the teachers' library, and in the botanical garden in front of the School he installed several meteorological devices and acted as a „lecturer“ of the meteorological station. As a member of the Croatian-Slavic Agricultural Society, he also taught agriculture for a while.

The Karlovac Gymnasium has a centuries-old tradition of volunteer work (Figure 7). In this area, Martin Sekulić also distinguished himself as secretary in 1874, and later as vice-president of the school's „Society for Supporting Poor Realkas“.

The Imperial and Royal Great Realschule in Rakovac merged with the Royal Gymnasium Karlovac in 1882, to form the Royal Great Real Gymnasium. The Chronicle of the annual report of the newly established school for 1882/1883 provides information on changes in the teaching staff (Figure 8) after the merger of the Realschule into the Real Gymnasium. Among others, Professor Martin Sekulić retired by decision of the Royal Land Government of September 18, 1882. After retirement, he devoted himself to politics, and in 1897 became a member of the Croatian Parliament, a position he would hold for the rest of his life.

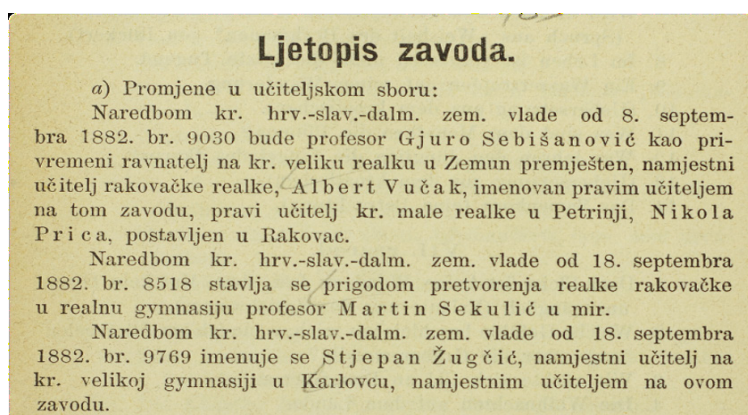
CONCLUSION

When talking about Nikola Tesla's education, in the context of celebrating his



Slika 7. Preslika bilješke iz Godišnjeg izvješća Carske i kraljevske velike realke u Rakovcu u kojoj se spominje Martin Sekulić kao potpredsjednik školskoga dobrotvornog društva, 1877.

Figure 7. Copy of a note from the Annual Report of the Imperial and Royal Great Realschule in Rakovac mentioning Martin Sekulić as the vice-president of the school charity society, 1877



Slika 8. Preslika bilješke iz Godišnjeg izvješća Kraljevske velike realne gimnazije u kojoj se spominje odlazak Martina Sekulića u mirovinu, 1883.

Figure 8. Copy of a note from the Annual Report of the Imperial and Royal Great Realschule in Rakovac mentioning Martin Sekulić's retirement, 1883

tina Sekulića, njegova profesora fizike. Sekulićeva svestranost, širina i interdisciplinarnost u pedagoškom radu uzor je i današnjim naraštajima nastavnika. Stoga je Martin Sekulić fascinirao i mladoga Nikolu Teslu izvođenjem čudesnih pokusa u školskom izvrsno opremljenom fizikalnom kabinetu, koji su nadahnuli i odredili njegovu budućnost.

IZJAVA O SUKOBU INTERESA

Ovaj rad u istom obliku nije objavljen niti ponuđen za objavljivanje nekoj drugoj periodičnoj ili neperiodičnoj publikaciji. Autori izjavljuju da nisu u sukobu interesa.

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milestone anniversaries, whether of his graduation, birth or death, one cannot forget Martin Sekulić, his physics professor. Sekulić's versatility, breadth and interdisciplinary nature in his pedagogical work served as a role model for today's generations of teachers. Therefore, Martin Sekulić fascinated the young Nikola Tesla by performing miraculous experiments in the school's excellently equipped physics laboratory, which inspired and determined his future.

CONFLICT OF INTERESTS STATEMENT

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