

International Scientific Conference 18th Ružička Days “Today science, tomorrow industry”, September 16–18, 2020, Vukovar, Croatia

NOBEL LAUREATE RUŽIČKA AND *RUŽIČKA DAYS*¹ From Vukovar to the Nobel Prize and Back

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This issue of *Chemical and Biochemical Engineering Quarterly (CABEQ)* is dedicated to the 18th *Ružička Days* held September 16-18, 2020 in Vukovar. *Ružička Days* have been held in Vukovar since 1978, apart from the 8-year-period of the Greater Serbian aggression against Croatia, during which the city and the eastern part of Croatia were occupied. Naturally, this scientific and professional conference was named after Leopold (Lavoslav) Ružička, since he was a native of Vukovar. Therefore, a short review of his life and work will be presented in this article, as well as a brief history of *Ružička Days*.

A native of Vukovar

Leopold (Lavoslav) Ružička was born on September 13, 1887 in Vukovar to father Stjepan Ružička and mother Amalija Sever. At that time, Vukovar was a prosperous economic, cultural, and administrative centre. It was also the centre of the Srijem County, which was founded in 1745, and stretched between the Danube and Sava rivers, from today's borders of Osijek-Baranja County and Vukovar-Srijem County in the west up to Zemun in the south-east, and was under the authority of the Croatian ban (governor of Croatian lands) in Zagreb. Vukovar was also the centre of the Eltz family estate since 1736. Craft industries, fishery, shipbuilding, and cattle and cereal trade for the entire western Srijem were well developed in Vukovar in the late 19th century. Due to its position on the banks of the Danube River, Vukovar was at the time, as it is today, the largest river port in Croatia and since 1878, the city has had organized railway transport as well. Organized education was established in the 1730s, the Apprentice School and the Grammar School were founded, the first in 1886 and the latter in 1891. Around twenty singing, sport, and charity organizations were active at the time, and a weekly magazine entitled *Sriemske novine* came out regularly. Therefore, Vukovar had a recognizable economic and cultural identity at the time. Wealthy civic families, such as the one of Stjepan Ružička, implemented the European way of life into their own. Leopold's father Stjepan earned respect from the Vukovar society by being an outstanding craftsman – a cooper, and also a social and political fig-

ure, a true Croatian patriot. Ružička was growing up in such circumstances until November 19, 1891, when his father suddenly died and his company went bankrupt. Left with nothing, Amalija and her two sons moved to Osijek in 1891, where they lived in the same household with their aunts Katarina and Ema Prukner.

Life and education in Osijek

Ružička's mother Amalija continued caring for her sons devotedly in the years that followed, about which Ružička himself wrote: “After father's death, mother returned to her hometown of Osijek. I attended primary school there for four years and classical grammar school for eight years. In both of these schools, Croatian was the official teaching language. I was good at Latin and Greek, but not at chemistry and descriptive geometry.” He continued: “For a while I attended public school in an old building next to the clergy house in Upper Town before moving to a new building in Jäger Street. At that time, it was definitely one of the best-equipped public schools in the country. (...) When the time came to make the first important decision in my life, to attend real grammar school or classical grammar school, mother asked all her cousins and acquaintances for advice. I remember well that many of them strongly advised her to send me to grammar school since I was a good student. Widespread opinion of the time, a bit different from the one today, was that classical grammar school provided better education than real grammar school. (...) Even though we didn't have a lot of science subjects in (classical) grammar school, only a bit of chemistry, later in life as a chemistry student I al-

¹Translator: Marina Tomas, mag. philol. angl.



Fig. 1 – Ružička in Vukovar (1), Osijek (2), and Karlsruhe (3) to Zürich and the Nobel Prize (4)



Fig. 2 – The building of Classical Grammar School in Osijek, today's Economic Administrative High School with the plaque dedicated to Ružička

ways appreciated the education I had received in that grammar school. Even though I didn't get the knowledge of the basic chemistry, I compensated this flaw by working hard at college."²

After four grades of public school, Ružička attended Royal Classical Grammar School in Tvrđa in Osijek from 1898 to 1906. The building, in which Economic Administrative High School is situated today, was built in 1882 on the land donated by prominent bishop Josip Juraj Strossmayer, and designed by the famous architect Hermann Bollé.³

Even though three eminent figures in the fields of culture and science were connected to this building, nobody paid much attention to it until 2020, when the City of Osijek accepted a proposition from city council member Professor Srećko Tomas, PhD, and put up a plaque on it on July 6, 2020. The plaque is there to remind the citizens of the original location of the Classical Grammar School which the first Croatian Nobel laureate attended, and to mark the 80th anniversary of Ružička winning the Nobel Prize for Chemistry.⁴

²Ružička, L., Uspomene iz mladosti, in: Gimnazija Vukovar 1892. – 1942.: Spomenica pedesetogodišnjice opstanka državne realne gimnazije u Vukovaru, Vukovar, 1942., pp 17–19.

³Damjanović, D., Biskup Strossmayer, Iso Kršnjavi, Herman Bollé i izgradnja zgrade kraljevske velike gimnazije u Osijeku, *Peristil* 49 (2006) 129.

⁴Tomas, S., Spomen-ploča Ružički u Osijeku: 80 godina od dodjele Nobelove nagrade, *Kem. Ind.* 69 (2020) 438.

College days and the beginning of scientific work in Karlsruhe

Commenting on his decision to enrol at college in Karlsruhe, Ružička said: “After graduating from high school and knowing that chemistry isn’t as developed in Austria-Hungary as it is in Germany and Switzerland, especially in Zürich, I wanted to enrol at the Polytechnicum, but I was asked to pass the exams in chemistry and descriptive geometry. Since I knew nothing of descriptive geometry, I enrolled at the High Technical School in Karlsruhe because they accepted me without testing. (...) When I was eight to ten years old, I firmly decided to become a priest, a Catholic priest, of course, since I was a Croat. (...) I thought it over a lot back then, and finally I decided to dedicate my life to chemistry.”⁵

Ružička also had other reasons to leave Austria-Hungary: “I grew up an orphan in Croatia and I was a fervent patriot, which prevented me from enduring conditions in the old Austrian monarchy. (...) In my opinion, unhealthy relationships were established in the universities around the monarchy and that was an unsuitable environment for serious studying. Political relations reflected mostly on higher education and led to constant tensions between the Slavic and the Austrian students. I wanted to leave this surrounding and fully dedicate myself to scientific work. I can’t say with certainty why I chose to study chemistry. Perhaps one of the external causes was the opening of a sugar refinery in Osijek where I was hoping to get a position. I abandoned that idea soon after the beginning of my studies because I felt a desire to fully dedicate myself to chemical research.”⁶ Due to his modest income, Ružička tried to finish college as soon as possible. Therefore, he completed his undergraduate study programme after only two years, in 1908, and his graduate study programme on December 12, 1910. At the same time, he was working on his PhD thesis in preparative organic chemistry under the mentorship of Hermann Staudinger (1881 – 1965), the later Nobel Prize winner. He obtained his doctoral degree in 1910 at the early age of 23 with a dissertation called “Über Phenylmethylketen”. After that, he became Staudinger’s personal assistant at the High Technical School in Karlsruhe, testing active ingredients of insecticide plant *Pyrethrum cinerariifolium* (Dalmatian pellitory). Ružička and Staudinger isolated pyrethrin from the flowers of Dalmatian pellitory and determined its structure, but had not published it in an article until 1924. Pyrethrins and

their synthetic analogs are still used today as insecticides.⁷

Ružička’s life and work at the ETH in Zürich

In 1912, Ružička started working with his mentor Staudinger at the Eidgenössischen Technischen Hochschule (ETH) in Zürich, Switzerland. He worked as his associate until 1916 when he started his individual work, also at the ETH. He became private docent in 1917 at the ETH, and docent in 1920 at the University of Zürich. In 1923, he became honorary professor at the ETH.⁸ He also worked outside the ETH. In 1926, he briefly worked in the research laboratory of the fragrance factory M. Naef et Cie in Geneva. From 1926 to 1929, he worked as a professor at the University of Utrecht in the Netherlands. In 1929, he returned to the ETH where he worked as a professor and head of the laboratory of organic chemistry until his retirement in 1957.⁹

During his career, Ružička published an impressive 577 research papers and five more after he retired (1971 – 1973), making a total of 582 papers. They can be divided in ten chapters: I. Various papers; II. Macrocyclic compounds; III. Natural products of plant origin; IV. Natural products of animal origin; V. Monoterpenes; VI. Sesquiterpenes; VII. Diterpenes; VIII. Triterpenes; IX. Steroids, and X. Lectures, scientific papers, biographical memoirs.¹⁰

Ružička described his contribution to the world of science in the following words: “My first works were focused on finding scent principles of natural musk and civetone, and as a result, I proved the existence of compounds with a large number of atoms in a molecule ring. Then I explained the structure principles of terpenic compounds, which are very common in nature. I discovered the basic method of their synthesis, and even today, chemists find new compounds that belong to that group. Finally, I managed to produce artificial sex hormones, and I developed the method of synthesizing androsterone and testosterone. Those were three main areas of

⁵Kadić, A., Profesor Lavoslav Ružička, Hrvatska revija XXVII (1977) 252.

⁶Ružička, L., Uspomene iz mladosti, in: Balenović, K., (ed.), Leopold Ružička Centennial 1887–1987, Rad JAZU, 443, Kemijske znanosti, Volume 7, Zagreb, 1989, pp 17–19.

⁷Tomas, S., 40 godina Ružičkinih dana, Vukovar 1978. – 2018., Hrvatsko društvo kemijskih inženjera i tehnologa Zagreb, Prehrambeno-tehnološki fakultet Osijek, Gradski muzej Vukovar, 2018, pp 47–51.

⁸Balenović, K., Leopold Ružička: stara domovina i kemija u Hrvatskoj 1918.–1988., in: Balenović, K. (ed.), Leopold Ružička Centennial 1887–1987, Rad JAZU, 443, Kemijske znanosti, Volume 7, Zagreb, 1989, pp 133–142.

⁹Trinajstić, N., Leopold Ružička (1887.-1978.) – prvi Hrvat dobitnik Nobelove nagrade, in: Tucak, A., Mutnjaković, A., Kralik, G. (eds.), Perivoj hrvatskih velikana – rondel učenika Gimnazije u Osijeku, Družba, Osijek, 2007, p 46.

¹⁰Prelog, V., Jeger, O., Lavoslav Ružička, 1887.–1976., (translated by Fleš, D.), Izdanja Kemije u industriji, Zagreb, 1987, pp 21–22.

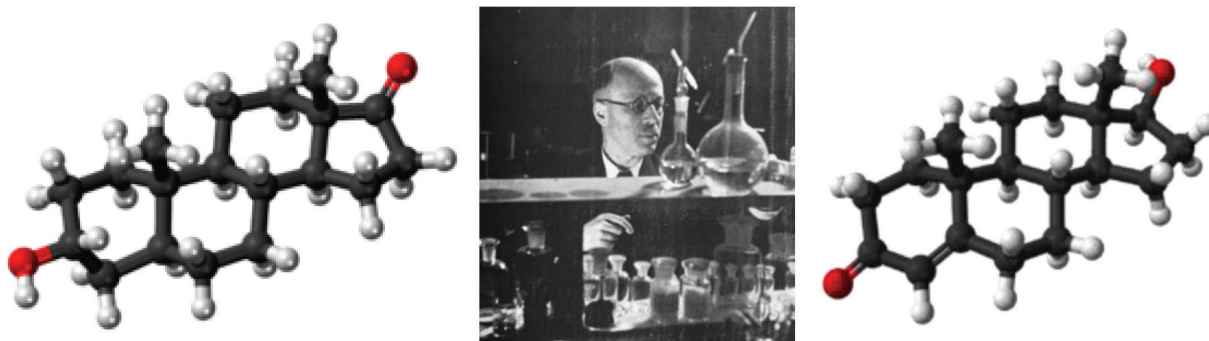


Fig. 3 – Ružička in the organic chemistry laboratory surrounded by structural formulas of androsterone (left) and testosterone (right), probably his most important discoveries



Fig. 4 – Ružička receiving the Nobel Prize on January 16, 1940 at the ETH, and his acceptance speech

my scientific work and I earned the Nobel Prize for each.”¹¹ On March 16, 1940 there was a celebration in Zagreb in honour of Ružička’s Nobel Prize, during which Ružička gave a lecture called “From Dalmatian pellitory to sex hormones” in which he emphasized that: “...in the diploma presented to me by the Swedish Academy, words such as hormones and scents were not mentioned, only purely chemical terms “polymethylenes” and “higher terpenoids”, words that mean little to the general public.”¹²

Apart from the greatest recognition, the Nobel Prize in Chemistry, “Ružička was awarded honorary doctorates at many universities and colleges, as well as honorary memberships in various science academies and institutions, such as The Pontifical Academy of Sciences and The Academy of Sciences of the Soviet Union. (...) Great discoveries in the field of organic chemistry will forever remain connected to Ružička’s name (terpenes, steroids, high

molecular carbohydrates in fragrances, the first artificial synthesis of male steroid sex hormones androsterone and testosterone, etc.). His pioneer work makes a starting point for today’s new research in the fields of medicine and biochemistry. Apart from his extensive and successful work in the fields of science and technology, this Nobel laureate takes credit for founding the Laboratory of Organic Chemistry (LOC) at the ETH, which made an important part of his life work. Thanks to the generous and competent education of his own academic generation, Ružička was able to pass on a completely effective and large institute to his successor at the end of his career. Ružička was the pioneer of his time when it came to building and organizing the institute. Similar concepts are gradually being developed in Europe today. Ružička’s successor at the chair and in the Laboratory of Organic Chemistry (LOC) was Croat Vladimir Prelog, who also gained international reputation.”¹³ In 1975, Prelog also won the Nobel Prize for Chemistry. After Prelog’s era,

¹¹Jovašević, D., Nobelovac iz Vukovara – Sto godina od rođenja Lavoslava Ružičke, *Vjesnik* 47 (18 September 1987) 14.

¹²Ružička, L., Od dalmatinskog buhača do seksualnih hormona, *Tehničke znanosti* 20 (2016) 8.

¹³Petričević, J., Nobelovac prof. Leopold Ružička 80-godišnjak, *Hrvatska revija* XVI (1967) 323.



Fig. 5 – Part of Ružička's memorial house collection in Vukovar on December 9, 1977, and Ružička's wife Gertruda visiting the museum on June 7, 1978 accompanied by the museum's director Vlado Horvat

many other Croatian chemists gained additional work experience in Ružička's laboratories practicing laboratory techniques in organic chemistry, without which "it would be difficult to make progress in organic chemistry of the time in Zagreb".¹⁴

Sketches from the history of Ružička Days

Ružička died in 1976 and was buried in Zürich. He visited Vukovar, which he left as a 4-year-old, on two occasions, in 1963 and 1965. He was then presented with an idea to make a memorial house in his birth house, which he enthusiastically accepted. This splendid idea was realised by Vukovar Municipal Museum headed by Vlado Horvat. However, the project progressed slowly, and Ružička died before the opening of the memorial house on December 9, 1977 (Ružička's 90th birthday).¹⁵

Unfortunately, the memorial house as well as the Ružička's entire birth house, were completely destroyed in the Greater Serbian aggression in 1991, and the whole collection was either destroyed or had disappeared.

Parallel to the realization of Ružička's memorial house project, the idea of starting *Ružička Days* was born. It happened at the meeting of Vera Johanides, Nenad Trinajstić, Leo Klasinc, and Vlado Horvat in the office of Professor Johanides at the Faculty of Food Technology and Biotechnology of the University of Zagreb in the spring of 1977. They imagined *Ružička Days* as a scientific and professional conference held every two years in Vukovar,

starting the following year 1978.^{16,17,18} The first *Ružička Days* took place on December 7–8, 1978, and were held regularly every year. Unfortunately, after the Greater Serbian aggression in 1991, Ružička's birth house and memorial house were completely demolished, while the whole city was almost entirely destroyed by the Yugoslav National Army and Serbian paramilitary formations. The founding of *Ružička Days* in Vukovar was a great idea, the power of which is reflected in the fact that even the 1991 war aggression in Croatia failed to prevent the conference from happening. It is true though that the 7th *Ružička Days* were supposed to take place in Vukovar in 1991, but instead were held in Bizovačke toplice in 1993. The next conference was held at the same place in 1996. However, after the peaceful reintegration of Croatian Danube region, the conference returned to its hometown in 1998, and has been held there to this day. Furthermore, as part of the post-war reconstruction of Vukovar, Ružička's house was also renovated, and it has become a home again for the great Ružička and *Ružička Days*. A large multimedia hall was built in the yard of his house, and it has since become the centre of various cultural, scientific, and social events.

¹⁴Balenović, K., Leopold Ružička: stara domovina i kemija u Hrvatskoj 1918.–1988., in: Balenović, K. (ed.), Leopold Ružička Centennial 1887–1987, Rad JAZU, 443, *Kemijske znanosti*, Volume 7, Zagreb, 1989, pp 133–163.

¹⁵Horvat, V., Šulc, B., Ružička i Vukovar, *Kem. Ind.* **43** (1994) 189–191.

¹⁶Trinajstić, N., Leopold Ružička (1887.–1978.) – prvi Hrvat dobitnik Nobelove nagrade..., in: Tucak, A., Mutnjaković, A., Kralik, G. (ed.), Perivoj hrvatskih velikana – rondel učenika Gimnazije u Osijeku, Družba, Osijek, 2007, p 51.

¹⁷Hubalek, I., Jedanaest 'Ružičkinih dana' (crtece za povijest o 11 znanstveno-stručnih skupova održanih od 1978. do 2004., in: Tomas, S. (ed.) XII. Ružičkini dani – Zbornik radova i sažetaka, Hrvatsko društvo kemijskih inženjera i Prehrambeno-tehnološki fakultet Osijek, Osijek, 2008., pp 10–12.

¹⁸Tomas, S., Moć jedne ideje – Ružičkini dani u Vukovaru, Zbornik sažetaka Međunarodnog simpozija „Život i postignuća prof. emeritus Vere Johanides“, Sveučilište u Zagrebu, Prehrambeno-biotehnološki fakultet, Zagreb, 2011, pp 48–49.

Table 1 – Past annual conferences of Ružička Days

SI.No	Date and venue	Chairman of the Scientific and Organizing Committee
I	December 7–8, 1978, Vukovar	Barbara Zovko
II	December 18–19, 1980, Vukovar	Petar Milanković
III	May 27–28, 1982, Vukovar	Vladimir Husar
IV	May 17–18, 1984, Vukovar	Barbara Zovko
V	May 22–23, 1986, Vukovar	Dražen Gvozdenović
VI	May 17–19, 1989, Osijek	Ninoslav Bertić
VII	September 23–24, 1993, Bizovačke Toplice	Filip Kljajić
VIII	June 27–28, 1996, Bizovačke Toplice	Ivan Butula
IX	June 18–19, 1998, Vukovar	Zvonimir Janović
X	June 8–9, 2000, Vukovar	Mladen Proštenik
XI	June 28–29, 2004, Vukovar	Vlasta Piližota
XII	September 18–19, 2008, Vukovar	Srećko Tomas
XIII	September 16–17, 2010, Vukovar	Drago Šubarić
XIV	September 13–15, 2012, Vukovar	Ante Jukić
XV	September 11–12, 2014, Vukovar	Drago Šubarić
XVI	September 21–23, 2016, Vukovar	Ante Jukić
XVII	September 19–21, 2018, Vukovar	Srećko Tomas
XVIII	September 16–18, 2020, Vukovar	Ante Jukić



Fig. 6 – Since 2008, Ružička Days have been held in the multimedia hall in his restored birth house

Eighteen *Ružička Days* have been held altogether to this day.¹⁹

Fourteen people altogether have been Chairmen of the Scientific and Organizing Committee. Professor Srećko Tomas, PhD and Professor Drago Šubarić, PhD were chairmen twice, and Professor Ante Jukić, PhD, a native of Vukovar, three times. Another notable figure is Ivan Hubalek, MSc, who devotedly and actively participated in all organizing committees from 1978 to 2020.

¹⁹ Tomas, S., 40 godina Ružičkinih dana, Vukovar 1978. – 2018., Hrvatsko društvo kemijskih inženjera i tehnologa Zagreb, Prehrambeno-tehnološki fakultet Osijek, Gradski muzej Vukovar, 2018, pp 279–281.

Ružička Days achieved greater relevance in 2010 (13th *Ružička Days*), when the European Federation of Food Science and Technology (EFFoST) and The International Union of Food Science and Technology (IUFoST) became the co-organisers of the conference, alongside the Croatian Society of Chemical Engineers and the Faculty of Food Technology Osijek.²⁰

Since 2012, co-organisers of the conferences have become EuCheMS – European Association for Chemical and Molecular Sciences and European

²⁰ Tomas, S., Planinić, M., Bucić-Kojić, A., Pavić, N., Hubalek, I., Nobelovac Ružička kao izvor nadahnuća, Vukovarski zbornik 7 (2012) 76.

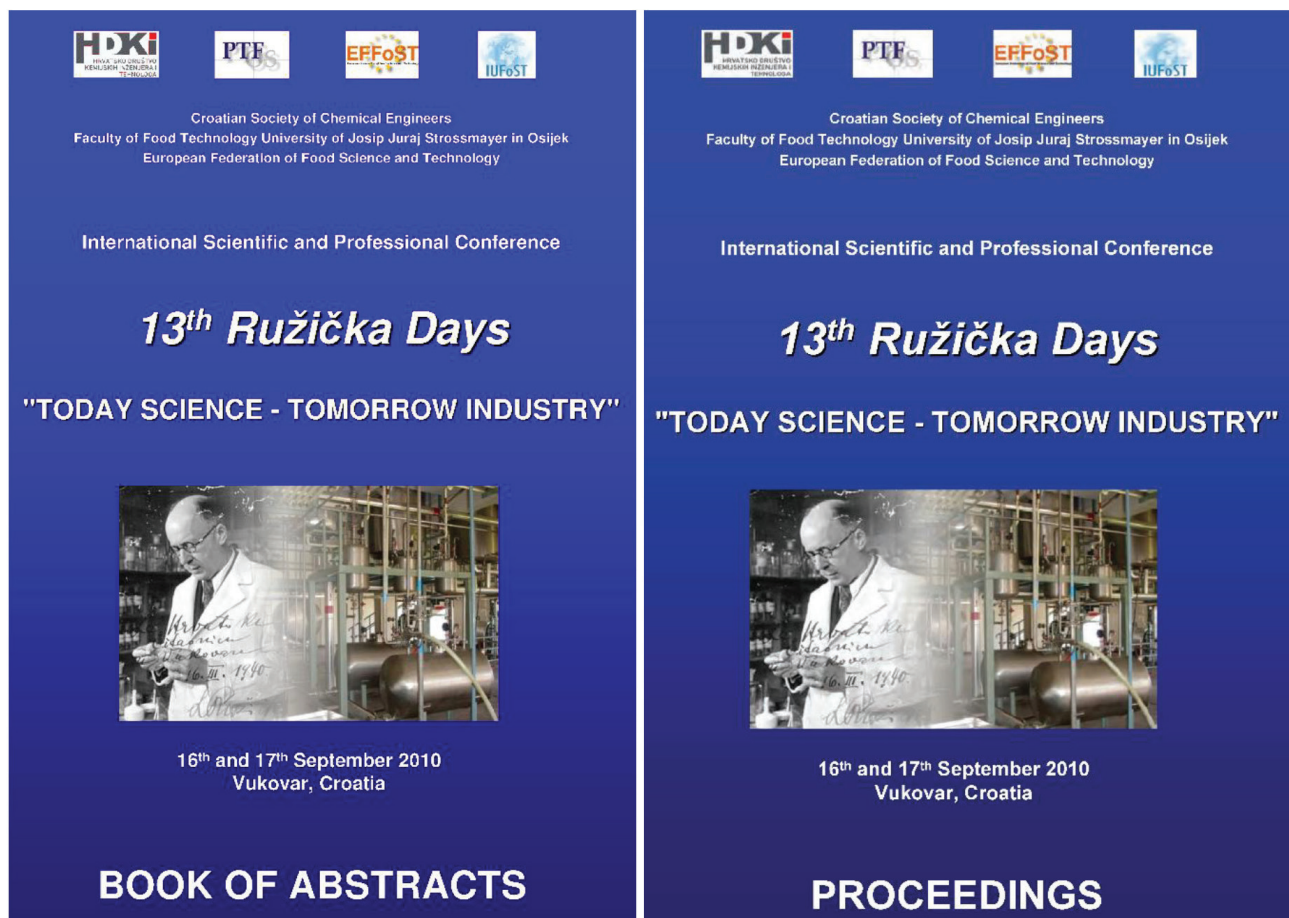


Fig. 7 – Book of Abstracts and Proceedings of the 13th Ružička Days

Hygienic Engineering & Design Group – EHEDG.^{21,22,23,24} Also, since 2010, the proceedings of the conferences have been published in English. In six published proceedings from 2010 to 2020, 230 research papers have been published on 2,500 pages. Taking into consideration the edition of 100 copies, it makes a total of 250,000 printed pages. All Books of Abstracts contain around 2,900 pages. When one adds all the conference leaflets, invitations, letters, and the like, one comes to the number of 4,000 pages. Adding around 150 copies of all previously listed per conference, one comes to the total number of 600,000 pages. Around 850,000 pages have been published by now together with the Books of Abstracts and other supporting materials.

²¹ Archives of the congress Ružičkinci dani, Prehrambeno-tehnološki fakultet Osijek (ARD-PTF).

²² Jukić, A. (ed.), XIV. Ružičkinci dani, Zbornik sažetaka, Hrvatsko društvo kemijskih inženjera i Prehrambeno-tehnološki fakultet Osijek, Osijek, 2012.

²³ Šubarić, D. (ed.), XV. Ružičkinci dani, Zbornik sažetaka, Hrvatsko društvo kemijskih inženjera i Prehrambeno-tehnološki fakultet Osijek, Osijek, 2014.

²⁴ Tomas, S. (ed.), XVII. Ružičkinci dani, Zbornik sažetaka, Hrvatsko društvo kemijskih inženjera i Prehrambeno-tehnološki fakultet Osijek, Osijek, 2018.

Since 2008, within the international conference *Ružička Days*, the Meeting of Young Chemists is also held, where high school students present papers in the field of chemistry. To this day, seven such meetings have been held, and 131 young students have participated with 48 papers.

18th Ružička Days, Vukovar, September 16–18, 2020

The Scientific and Organizing Committee of the 18th *Ružička Days*, composed of chairman Ante Jukić, vice-chairman Jurislav Babić, vice-chairman Vesna Ocelić Bulatović; Đurđica Ačkar; Ljubica Glavaš-Obrovac; Dajana Kučić Grgić; Senka Vidović; Marjana Simonić; Miroslav Šlouf and Zora Pilić,²⁵ faced a great challenge organising the conference. At the beginning of 2020, the world faced a pandemic caused by the virus *SARS-CoV-2* and the destiny of the 2020 conference was uncertain. However, the organisers did not lose faith that it

²⁵ Jukić, A., (ed.), 18. Ružičkinci dani: Danas znanost – sutra industrija, međunarodni znanstveno-stručni skup, Knjiga sažetaka, Hrvatsko društvo kemijskih inženjera i Prehrambeno-tehnološki fakultet Osijek, Osijek, 2020, Impressum.



Fig. 8 – 5th Meeting of Young Chemists, Vukovar 2016: participants with gifts and the award jury



Fig. 9 – 18th Ružička Days: the third conference notification, Book of Abstracts, and the poster for the Meeting of Young Chemists

would be possible to organize it even in such circumstances. They showed this by symbolically putting a mask on Ružička's face in the third circular. It was a sign to potential participants that 18th Ružička Days will be held in compliance with epidemiological safety measures, and so it happened. Over 250 participants attended the conference; there were five plenary sessions, three invited lectures, ten multiple lecture sessions, three sponsored lectures and 142 poster presentations; also, the 7th Meeting of Young Chemists was held on September 16, 2020, at which 22 participants from Croatia and Bosnia and Herzegovina presented their work.²⁶

Conclusion

It is well-known that good ideas do not die, more precisely, the accomplishments based on good ideas do not die. One can conclude after 42 years that Ružička Days are the product of a good idea.

The conference survived the end of socialism and the transition to democracy. More importantly, it survived the Greater Serbian aggression, destruction of Ružička's birth house and his memorial house, and, quite recently, the global coronavirus pandemic. The confirmation of all this is the number of lectures held at the conference up to the 18th Ružička Days (September 16–20, 2020): 120 plenary lectures, i.e., invited lectures given by 206 respected lecturers; 189 other oral presentations; almost 1,000 poster presentations, and 6 round table discussions. People who presented their work are Nobel laureates, academics, university professors, scientists, and engineers from Croatia and abroad. Here is the list of plenary and invited lecturers: Zoran Adžamić, Günter Allmaier, Marijan Andrašec, Janez Ažman, Branimir Bajac, Peter Balogh, Siniša Ban, Goran Baranović, Rado Barović, Egon Bauman, Ana Belščak, Ivica Bilege, Mate Bilić, Ivica Blažević, Tomislav Bolanča, Nenad Bolf, Stan-ko Borčić, Skeie Borghild, Josip Borošić, Josip Bosiljkov, Tomislav Bosiljkov, Juraj Božičević, Mladen Bravar, Richard Braun, Mladen Brnčić, Ana Bucić-Kojić, Ivan Butula, Lidija Colombo,

²⁶Jukić, A., Međunarodni znanstveno-stručni skup 18. Ružičkinci dani "Danas znanost – sutra industrija", 16. – 18. rujna 2020., Vukovar, Hrvatska, *Kem. Ind.* 69 (2020) 677.

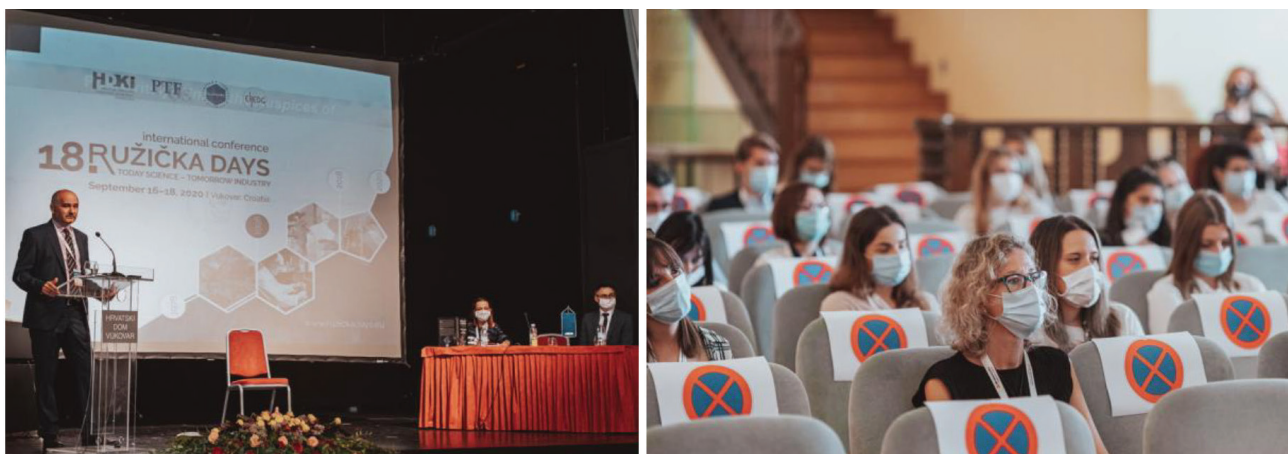


Fig. 10 – Opening ceremony of the 18th Ružička Days in Hrvatski dom Vukovar on September 17, 2020



Fig. 11 – 7th Meeting of Young Chemists, Vukovar, September 16, 2020: Experienced chemists and chemical engineers attentively listen to the presentations of the young ones

Matija Cvetnić, Bogdan Cvjetković, Igor Čatić, Dragutin Čop, Rozelindra Čož Rakovac, Milan Čuvalo, Ivan Damjanović, Aleksandar Dedijer, Wolf-Dieter Deckwer, Igor Dejanović, Žarko Dolinar, Hongjuan Dong, Tomislav Dragičević, Miljenko Dumić, Senka Đaković, Slobodan Đokić, Vlasta Eles-Ljubić, Matko Erceg, Wilfried Erler, Albert Eschenmoser, Marie Feuerstein, Tomislav Filetin, Dragutin Fleš, Tatjana Gazivoda Kraljević, Zigfrid Gereke, Ljubica Glavaš-Obrovac, Janvit Golob, Bogdan Goričnik, Zvonimir Grobenski, Josip Guja, Volker Hecht, Elmar Heinzle, Hartwig Höcker, Takanobu Higashiyama, Jasmin Hirschmann, Vlado Horvat, Barbara Horváth, Janez Hribar, Vladimir Husar, Mihailo Jačović, Tomislav Jakopčić, Marijan Jakšić, Milan Jakšić, Zvonimir Janović, Jasenka Jelenčić, Andrej Jereb, Igor Jerković, Damir Ježek, Đuro Josić, Sven Karlović, Grace Karminski Zamola, Branislav Kenć, Tomislav Klapac, Filip

Kljajić, Edvard Kobal, Ana Kojaković, Slobodan Končar-Đurđević, Nikola Kopčić, Aleksandra Kornhauser, Barna Kovács, Spomenka Kovač, Davor Kovačević, Dragan Kovačević, Željko Knez, Jasna Kniewald, Zlatko Kniewald, Dietrich Knorr, Sandra Kraljević Pavelić, Nenad Krekić, Christian Kubicek, Željko Kučan, Dajana Kučić Grgić, Valery P. Kukhar, Mirko Kuleš, Stevan Kulić, Hrvoje Kušić, Nenad Kuzmanić, Stjepan Lisjak, Ana Lončarić Božić, Ivica Losso, Tomislav Lovrić, Eugen Marčelić, Martina Marchetti, Vladimir Marić, Darko Marinac, Tatjana Marinović, Hilde Marit Østlie, Marinko Markić, Sanja Martinez, Miroslav Matasović, Helena Jasna Mencer, Martina Mihalj, Martina Miloloža, Maja Molnar, Michael Narodslawsky, Andrea Nesterović, Mirjana Novak Stankov, Neda Ortner, Davorka Pajc-Liplin, Branko Pancer, Pavao Pavličić, Martin Petrek, Zora Pilić, Vlasta Piližota, Jasenka Piljac Žegarac, Mirela Planinić, Milenko

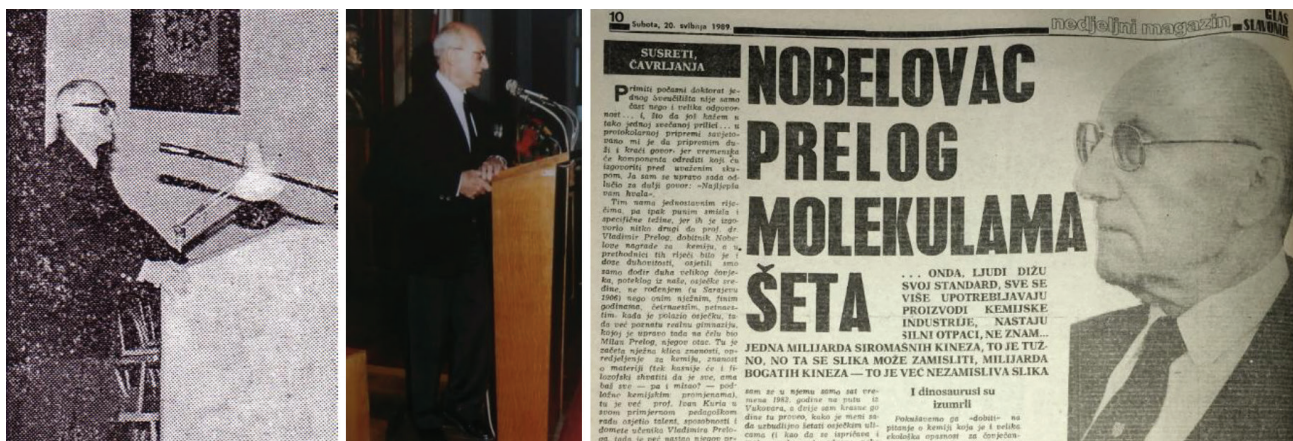


Fig. 12 – Nobel laureate Prelog as the main plenary lecturer at the 3rd Ružička Days in Vukovar in 1982, at the 6th Ružička Days in Osijek in 1989, and an article about him in *Glas Slavonije*

Plavšić, Vera Plužarić, Janez Ponebšek, Velimir Pravdić, Nobel laureate Vladimir Prelog, Viktorija Prevarić, Ljiljana Primorac, Tomaž Požrl, Hrvoje Požar, Boris Prohaska, Radmilo Protić, Marenka Radoš, Silvana Raić-Malić, Jasmina Ranilović, Vesna Rek, Marko Rogošić, Marin Roje, Davor Romić, Stjepan Sabljak, Phillippe Sauvegrain, Gerhard Schlemmer, Ulrich Schubert, Ernst Schwinum, Josip Sečen, Aleksandar Sečenji, Vahid Sendijarević, Marija Sigurnjak, Viktor Simončić, Miroslav Slačanac, Ivan Slapničar, David Matthew Smith, Tomislav Smolić, Michael Sperling, Vladimir V. Srdić, Tamara Stipčević, Aleksandra Stjepanović, Biljana Stojanović, Dunja Šamec, Božidar Šantek, Dragutin Šimun, Josip Šimunić, Josip Šimunović, Mojca Škerget, Igor Štagljar, Mario Štefanić, Branka Šulc, Vitomir Šunjić, Nenad Trinajstić, Lidija Valek, Đurđa Vasić-Rački, Marina Tišma, Stana Tokić, Srećko Tomas, Branko Tripalo, Carlo I. G. Tuberoso, Zorica Veksli, Darko Velić, Milanka Vico-Stevanović, Žaneta Ugarčić, Šime Ukić, Elvira Vidović, Rajko Vidrih, Željko Vrbanović, Jelena Vukmirović, Marija Vuković Domanovac, Wolfgang Winkler, Nenad Zečević, Bruno Zelić, Mirko Zelić, Gjurica Zorić, Biserka Žinić.^{27,28} These are 206 prominent people, some of which presented their work at several conferences. However, the

name that stands out most on the list is the one of the Nobel laureate Vladimir Prelog. He participated at the 3rd *Ružička Days* in Vukovar in 1982, and at the 6th *Ružička Days* in Osijek in 1989, when he received an honorary doctorate from the University of Osijek. It is a well-known fact that Prelog was Ružička's long-time collaborator, who supported the idea of opening Ružička's memorial house in Vukovar from the beginning, as well as the work of the *Ružička Days* conference.

The conferences were organized by the Scientific and Organizing Committees with a total of 410 members, and there were 3,450 participants at the conference. These respectable figures have been an incentive for the development of economy and society in general, especially in the fields of chemistry, chemical and biochemical engineering, food technology, medical biochemistry, pharmacy, ecology, etc. Since the 13th conference held in 2010, Proceedings and Books of Abstracts, previously published as a whole, have been published separately, containing peer-reviewed papers in English, which undoubtedly improved the quality of the conference.²⁹ Therefore, the memory of the great native of Vukovar, and our first Nobel laureate Leopold (Lavoslav) Ružička, has been effectively kept alive by *Ružička Days*.

²⁷ Tomas, S., 40 godina Ružičkinih dana, Vukovar 1978. – 2018., Hrvatsko društvo kemijskih inženjera i tehnologa Zagreb, Prehrambeno-tehnološki fakultet Osijek, Gradski muzej Vukovar, 2018, pp 277–560.

²⁸ Jukić, A., (ed.), 18. Ružičkini dani: Danas znanost – sutra industrija, međunarodni znanstveno-stručni skup, Knjiga sažetaka, Hrvatsko društvo kemijskih inženjera i Prehrambeno-tehnološki fakultet Osijek, Osijek, 2020, pp II–III.

²⁹ Tomas, S., Sudbina Ružičkinih dana tijekom Domovinskog rata, in Brekalo, M. et al. (eds.), Treći međunarodni interdisciplinarni znanstveno-stručni skup "Domovinski rat, njegove gospodarske, demografske i socijalne posljedice i perspektive na području hrvatskog istoka", Knjiga sažetaka, Institut društvenih znanosti Ivo Pilar, Područni centar Osijek, 2016.