

THE SCIENTIFIC SESSION “HISTORY OF SCIENCE AND TECHNOLOGY — CURRENT CONCERNS” (May 12, 2023, Brasov, Romania)

The Brasov Branch of the Romanian Committee for the History and Philosophy of Science and Technology (CRIFST) of the Romanian Academy organized a scientific session “*History of Science and Technology — Current Concerns*”^{*} at the Natural Gas Documentation and Information Center in Mediaș, Romania. Apart from historians and other specialists from Romania, the session was attended by two researchers from Ukraine, whose presentations brought more aspects on the current issues of science and technology history studies. Here we give a summary of some presentations that were sustained and incited much debate.

Ass. prof. Alla Lytvynko, leading researcher from G.M. Dobrov Institute for Scientific and Technological Potential and Science History Studies of NAS of Ukraine, Kyiv, in the report “*A summary of the debates at the XXVIII Ukrainian Conference ‘The history of science and technology in crisis periods of social development’*” made a review of the institute’s activity concerned the young historians conferences.

Understanding that science history studies have a significant worldview meaning, G.M. Dobrov Institute of scientific and technical potential and history of science NAS of Ukraine and the Ukrainian Society of Historians of Science, jointly with the National and Branch Academies of Sciences of Ukraine, the Council of Young Scientists of the Ministry of Education and Science of Ukraine, research institutes, universities, libraries, industrial companies, technological and scientific museums, historical preservation centers, has organized annual scientific conferences of young historians of science and technology since 1989.

The conferences discuss science as a phenomenon of national culture, the role of youth in the history of science and technology and the consolida-

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tion of the Ukrainian nation, the global significance of intellectual activities, the history of science and technology in crisis periods, the modernization of science and technology policy, and the ways for restoration of science and technology sector in Ukraine after the war of Russia against Ukraine.

Every year, the conferences bring together about 100 young and experienced researchers, from students to academics, which emphasizes the continuity of knowledge. The participants represent about 50 institutions and 20 cities and villages of Ukraine and other countries: Romania, France, Germany. The conference program includes a professional excursion, at which participants visited the Museum of Medicine, the Museum of Water, the Museum of the Astronomical Observatory of Kyiv University, the National Herbarium of Ukraine, the Natural Sciences Museum, the O. Palladin Memorial Museum, the State Polytechnic Museum, the Museum of the History of Magnetic Record Technology, the Memorial museum of academician Eu. Paton, Museum of History of the Paton Electric Welding Institute.

Participation in the conference raises the students' awareness of the role and history of science, technology and education in Ukraine and the world as a component of culture, as well as of the current state of scientific research. Such activities stimulate the involvement of young people in research and foster their research skills and the scientific outlook.

Prof. Volodymyr Sklyar, head of the Department at the Ukrainian Studies, Cultural Studies and History of Science at National Technical University «Kharkiv Polytechnic Institute», in the report *“Outstanding results of the studies on the history of sciences at Kharkiv Polytechnic Institute”* showed the University history, underlying the contributions of the great personalities.

The National Technical University “Kharkiv Polytechnic Institute” (NTU “KhPI”) is the successor of the Kharkiv Practical Technological Institute (KhPTI), established in 1885, the Kharkiv Technological Institute (KhTI) since 1898. Its founder and first director was professor V. Kyrpychov who became the director of the newly established Kyiv Polytechnic Institute (now I. Sikorsky NTUU “KPI”) in 1898. Currently, NTUU “KPI” and NTU “KhPI” are among the top HEEs in Ukraine, laying foundations for the domestic higher technical education system and the network of research institutes with technical profile.

In 1885, the KhPTI had only 30 lecturers, including 10 professors, and only 125 students. Currently, 1,400 teachers, more than 200 professors and 900 associate professors work at NTU “KhPI”, 14,000 students study in 10 educational and scientific institutes, mainly of a technical profile. It has post-graduate and doctoral courses, 16 specialized academic councils for defense of doctoral theses, more than 30 scientific directions. The Russian-Ukrainian war and destruction of university buildings could not prevent the university staff from activities in lecturing and research.

In 2004, the Department for History of Science and Technology (the Department for Ukrainian Studies, Cultural Studies and History of Science since 2018) was created on the initiative of prof. L. Tovazhnyansky, rector of NTU “KhPI”, and with support of the G.M. Dobrov Institute for Scientific and Technological Potential and Science History Studies of the NAS of Ukraine. The department was headed by prof. L. Byesov in 2004–2011, and by prof. V. Sklyar since 2011. The history of science section of the department is headed by prof. S. Tkachenko. The department operates a postgraduate program in the specialty 032 “History and archaeology”. The guarantor of the postgraduate educational program is prof. O. Tverytnikova.

The specialized academic council on defense of PhD theses in the specialty 07.00.07 “History of science and technology” was working at KhPI National Technical University in 2009–2015. 4 doctors and more than 20 candidates of sciences were trained in the department for nearly 20 years.

Most part of their dissertations are devoted to analysis of science and technology achievements of leading KhPI researchers. In particular, O. Tverytnikova's PhD thesis is focused on the work of prof. P. Kopnyayev, the founder of electrical engineering science and education at KhPI, whereas her doctoral thesis explores the history of electrical engineering science in Ukraine in the second half of the 20th century. The PhD thesis of M. Gutnyk identified the main achievements of KhPI's researchers in the second half of the 20th century, with making emphasis on scientific, educational and organizational contributions of the University's leading researchers.

The dissertation of S. Radoguz is dedicated to the first director of the KhPTI, prof. V. Kyrpychov, and the dissertation of V. Kamchatny deals with I. Osypov, an outstanding chemist and KhTI rector. Research material of science historians working in the department is used in preparing monographs on the history of NTU “KhPI”. M. Gutnyk and O. Tverytnikova published a monograph dedicated to the first directors and rectors of KhTI.

The team of university's historians has fruitful contacts with the leading centers for history of science in Ukraine, especially with the G.M. Dobrov Institute for Scientific and Technological Potential and Science History Studies of the NAS of Ukraine (prof. Yu. Khramov and ass. prof. A. Lytvynko), the State University of Infrastructure and Technologies (prof. O. Pylypchuk), Hryhorii Skovoroda University in Pereiaslav (prof. N. Kotsur), the Oles Honchar Dnipro National University (prof. V. Savchuk).

Dr. Puiu Chisăliță, associated professor from Transilvania University of Brașov, president of Smart Energy Association, in the contribution “*The impact of the war on the natural gas sector in Romania and Europe*” brought many arguments regarding the impact of the war on the natural gas sector in Romania and Europe.

The energy sector had to face challenges in 2023 due to the Russian-Ukrainian war: stopping the gas flow to Western Europe; the maximum

historical price for gas and electricity; significantly reduced flow of crude oil to EU; partially suspended liberalization of the gas and electricity market, going contrary to the central EU principle of «free movement of goods and people»; reaching the maximum price of important liquefied natural gas; admitting the fact that “life is going on” even without Russian energy imports.

Energy security is a concept that has become popular in the political discourse over the last decade, but at the pragmatic level the measures taken have not reflected an equivalent level of ambition. In a pragmatic sense, energy security involves alternative sources and routes of supply, as well as the integrity of specific transport infrastructure. The outbreak of the war in Ukraine put on the agenda seeking for sources that would significantly reduce dependence on Russian gas. There is a seemingly insurmountable gap between political aspirations and pragmatic technical and financial realities, at least if we operate with short-term scenarios.

Regarding dependencies, Romania is a state that benefits from the favorable context compared to certain EU countries or the community average. However, a common, coherent and realistic strategy is required for the transition to take place without dramatic costs or structural damage to the European economy. So, a deep understanding of the causes of the complicated situation of today is opportune, both from a geopolitical perspective and an imperative need to highlight the particularities of the architecture of the energy sector: Europe's energy stability before February 2022, resource conflicts, importance of differentiating between Green Deal as a media project and a strategic one, main alternatives to Russian energy sources, the role and potentials of “green” technologies, revitalization of the nuclear dimension, Romania's independence and energy security.

Dr. Irina Mastan, a CRIFST member, devoted the presentation “*The Museum of Memories from Communism Braşov — Private cultural initiative in public space*” to one of the few private museums in Romania exhibiting daily life in the communist period.

In the last decade of the 20th century, the private initiative in heritage conservation and display broke the boundaries of private collections with exclusive access. The presence of diverse organizations is increasingly more visible in public space. Private museums have complex socio-cultural roles, often functioning as community barometers. Flexible, diverse, modern and innovative, these institutions cater to community's demands and preferences.

As a product of the community, the Museum of Memories from Communism in Braşov (MadC) is one of the few private museums in Romania. Born out of the need to experiment the recent past through the senses, the museum offers a different perspective of Romanian Communism compared to the traditional one. Created by contributions from within the community, MadC has an important social component: its activities and income sup-

port children from vulnerable environments. Irina Mastan's presentation describes the journey of the two founders to creating the youngest private museum in Romania.

Ioana Borșan, Transilvania University of Brasov, director of Brasov Science Museum, in the presentation "*Brașov Science Museum — Interactivity, beyond artifacts*", highlights the need to develop interactive museums that have a great impact on young people.

Brasov Science Museum is a bridge between the theory of science and the applicability of phenomena in everyday life. Through the interactive exhibition hosted by the museum, visitors can discover all the three phases of science: its history, its present and its applications in new technologies. In a period with the increasing dynamics of the lifestyle, museum employees seek from opportunities to create an interactive exhibition allowing enthusiasts to experience astronomy, biology, anatomy, physics, mathematics, and various technologies. The need for interactivity in museums, with using active modules, is emphasized.

Prof. Marius Bența, Mircea Cristea Technical College, Brasov, a CRIFST member, in the presentation "*Museums and collectors in Transilvania*" makes a retrospective review on the activities of great collectors of artworks and technical artifacts in Transilvania.

In almost all Romanian cities there have always been art enthusiasts collecting paintings, silverware, furniture, carpets, ethnographic objects, books or icons. Collections made in Transilvania were later offered as donations to establish museums. Such museums, as well as the currently existing memorial houses, can be found in all Transilvanian areas: Timișoara, Arad, Oradea, Baia Mare, Sighet, Cluj, Sibiu, Brașov, Sighisoara, Făgăraș, Târgu Mureș, Alba, Lipova and many others.

Timotei Cipari (in Blaj), Simion Mihali-Mihalescu, Iacob Muresianu, Axente Sever, Aron Pumnul, George Barițiu, Gheorghe Șincai, Samuel Micu, Petru Maior, I. Buteanu had an important role in creating some collections in the 19th century, all from Alba. Their collections include rare books, furniture, paintings and silverware. Vivid examples of them are an ethnographic collection of the teacher Pamfil Albu from the village of Lupșa or an earlier (almost a century before) collection (later museum) of books and comparative art of Benku Franciscus in Aiud. The collection of the Roman-Catholic bishop Bettyamy Ignatie, dated from the end of the 18th century, was transformed in 1912 into the Battyaneum Museum.

Six collectors in the city of Brașov, with Iulius Teutsch as the initiator, founded "Society of Brașov Collectors" around 1873—1874. Iulius Teutsch, a salami maker, and Br. Deuhel, an alcohol producer, donated all their collections of historiographies (documents, medals, weapons) and ethnography to the museum in Brașov. Another Transilvanian collections were ones of

Gh. Cernea in Ploș-Ardeal and Gh. Radocea in Bucium-Făgăraș, some of the largest Romanian ethnographic collections of furniture, dishes, costumes, carpets and icons belonging to all regions of the country, as well as the Karoly Szocs collection and a beautiful collection of Transilvanian ethnographic art.

Sibiu is a leader in terms of private collections donated to the state. If we mention Samuel Brukenthal, his collection along with others in Romania is included in the great art dictionaries and encyclopedias. The museum collection, opened in 1790, displayed over a thousand works of art. The museum includes paintings by famous artists such as Jan van Eyck, Memmling, Titian, Dürer and others, as well as an admirable collection of books and firearms. The Siberian collections were also enriched with the donations of A. Breckner, S.A. Royse, M. Fuss, J. Bindersi, M. Akner.

Due to the passion for collecting and preserving artistic and technical artefacts, the collectors of the 17th—19th centuries laid the foundations of present-day museums.

Dr. Horia Salcă, researcher of the National Collections Center Wroughton (Science Museum of London), a CRIFST member, devoted the presentation “*Researching the personal archive of George Constantinescu at Science Museum Wroughton*” to an archive study based on records of life and work of the great engineer George Constantinescu.

After the launch of the Battle of Britain during the Second World War, numerous airfields appeared in U.K. to support aircraft production and aerial counteroffensives. One of them, located in Wroughton, near Swindon, in Wiltshire (England), was used mainly for the assembly and storage of aircraft during the Second World War. It had three main asphalt runways of 1,430 m, 1,050 m and 1,110 m, numerous hangars, bunkers, workshops and administrative buildings. Once disabled by the British Ministry of Defense in 1972, it was handed over in this year to the Royal Navy and became the Royal Naval Aircraft Yard Wroughton, which was reused for a short period during the Falklands War.

Over 220 hectares of the former airfield have belonged to the Science Museum Group and the National Collections Centre since 1979, which housed the museum's large-object storage and library. A 50 MW solar farm was built on about 67 hectares of the airfield in 2016, with over 150,000 solar panels. This was a joint project of Public Power Solutions (a commercial arm of Swindon Borough Council) and the Science Museum Group. A collection of approximately 35,000 objects is currently stored in six hangars and a purpose-built store. It includes the world's first hovercraft, magnetic resonance imaging scanners, computers, de-activated nuclear missiles and much more.

The collection of the Science Museum Library and Archives were relocated to new facilities on the site in 2007. It was in 2018 that the site was rebranded as the National Collections Center, to reflect its use by the Science

Museum Group as its primary collections management facility. The 26,000 m² purpose-built facility was finished in 2021, to house and provide access to over 400,000 collection objects.

The objects in the collection currently stored at the National Collections Center include: Saunders-Roe Nautical Hovercraft (SRN1); Douglas DC-3 aircraft; Ford Edsel motor car; Boeing 247 aircraft; de Havilland Comet 4B G-APYD, Hawker Siddeley HS-121 Trident 3B G-AWZM (British airliner produced by Hawker Siddeley) and Lockheed Constellation N7777G airliner; a double-decker bus; a TV detector van; the world's first amphibious hovercraft; early 20th century electric vehicles; the wood press, the last hot metal printing press in Fleet Street.

Prestigious articles in the collections of the Science Museum Library & Archives collections are as follows: Charles Babbage's notebooks, engineering plans, certificates, social diary and letters; Barnes Wallis's plans for the bouncing bomb; Pearson PLC engineering papers and photographs; Walt Patterson nuclear collection; Humphry Davy's letters; George Parker Bidder's papers; The New Cyclopaedia or Universal Dictionary of the Arts and Sciences (Rees's Cyclopaedia) and others.

From the Romanian perspective, it is particularly important that the Wroughton collections include the personal archive of George (Gogu) Constantinescu, the Romanian-British scientist, engineer and inventor. Donated to the Science Museum by his son, Ian Constantinescu, in 1996, it was stored in 165 boxes, with some containing documents not yet identified.

This archive of G. Constantinescu collected between 1910 and 1965 contains correspondence, manuscript notes, photographs, drawings, patent specifications and printed leaflets relating to Constantinescu's work: interrupter gear, application of sonics, the torque converter, railcars. Thanks to Jessica Bradford, head of Collections and Principal Curator for the Science Museum, with oversight of the Library and Archive Collections in London and at the National Collections Center (NCC) in Wroughton, Dr. Horia Salcă started research into the George (Gogu) Constantinescu Papers at NCC at the beginning of March 2023, covering more than 600 pages of documents, a tiny share of the huge volume of documents left by the great genius of Romanian origin.

Prof. Nicolae Bulz, associate researcher of Romanian Academy, a CRIFST member, devoted the presentation "*Hermann Oberth — The labyrinth of life: from the Rocket Science and Astronautics towards Philosophy*" to the contributions of Hermann Oberth, born in Romania, to the rocket science and astronautics.

Hermann Julius Oberth was one of the founders of the rocket engineering and astronautics. He was born in June 25, 1894, in Sibiu, Romania, and died on December 28, 1989, Feucht near Nürnberg, Germany, at the age of 95. Hermann Oberth studied medicine at Munich University till 1914. He

took part in the First World War as a military physician. After 1918 he studied physics in Munich, but his PhD thesis “Onto the rockets science” was rejected being appreciated as “utopist”, and in Cluj his PhD on the same topic was received with prof. Augustin Maior as a supervisor.

Much detail is known about Hermann Oberth's PhD-related research, his public experiments conducted in Berlin and their influence, his family home venue and removal from Medias and Sibiu (Romania) to Vienna, Dresden, Switzerland, Italy and U.S. in the postwar period, where he stayed till 1962 and “retired” from research effort. (His stay in U.S. coincided with the years of confrontation between U.S. and the Soviet Union due to Cuba, the so called “rockets crisis”.) After that, he and his family settled in Feucht near Nürnberg (Germany) for almost a quarter of century.

However, there is fewer known information about Hermann Oberth's last period of life, when his philosophical effort was resulted with published books. There are some significant comments and elaborated analysis. Because the original works (mostly books) were content-elicited from the background of Hermann Oberth's long-term professional experience at rocket construction and astronautics, they contain a coherent and cohesive introspection and critical societal analysis. The following works are less commonly known and commented, probably for not being adequately understood (most of them are in German): “Forschung und Jenseits”, 1930; “Das Mondauto”, 1959; “Stoff und Leben. Betrachtungen zum modernen Weltbild”, 1959; “Katechismus der Uraniden. Haben unsere Religionen eine Zukunft? Gedanken aus philosophischen Vorträgen und zum Teil noch unveröff”, 1966; “Politik und Kunst”, 1975 (Schriftenreihe der Deutschen Akademie für Bildung und Kultur in München, Heft 10); “Kakokratie”, 1976; “Unsere Lehrmeister aus dem Kosmos”, 1983; “Primer for Those Who Would Govern”, 1987. This presentation contains an analysis of the cognition and contemporary perspective on the abovementioned works.

Prof. Alexandru Herlea, president of International Committee for the History of Technology (ICOHTEC), president of Casa Romaneasca Association, a CRIFST member, brought into discussion Petre Sergescu's contribution in the development of history of science discipline and its international promotion in the presentation “*One hundred and thirty years since the birth of Petre Sergescu — mathematician, historian of sciences, personality of the XXth century*”.

Pierre (Petre) Sergescu (1893—1954), a mathematician and a historian of science, was an illustrious personality of the 20th century, both in professional and ethical terms; an excellent organizer and a committed intellectual, promoter of the great European values attached to its origins.

Pierre Sergescu has played a leading role in the development of science and technology history in theoretical and institutional terms. He was a driving force of the international collaboration in this field, played a central role

in the resuscitation of the International Academy of History of Sciences (IAHS), being its president and perpetual secretary, contributed in the establishment of the International Union of History of Sciences (UIHS) of which he was secretary-general. He was editor-in-chief and director of the edition "International History of Science Archives", and was engaged in many other activities in the field of science, its history, teaching and dissemination.

He played a key role in the life of Romanian emigration after the Second World War in Paris: denounced the Soviet occupation of Romania and the terror unleashed by the communists, highlighted the profoundly European character of this country. He was the president of "Association des Roumains Professeurs des Universités" in Paris, the president and director-general of "Fondation Royale Universitaire Charles I", and was dedicated to the assistance of refugees, being a member of the association "Caritatea Romaneasca" (CAROMAN).

Angela Păuceanu, museographer of the Natural Gas Museum of Medias, focused on the largest fire in the Romania's methane gas industry in her report *"Itinerant exhibition: The fire from Copșa Mică — 90 years since the biggest fire in The History of Romania"*.

In 1909 natural gas was accidentally discovered on the current territory of Romania (at Sărmășel in Mureș county), which led to the first European development of a new the natural gas industry. Along with this, the exploitation of new gas fields begins, including the Copșa Mica field. On Valea Șomârtului (a valley that was near the town of Copșa Mică), at "Holy Water" and near the forester's house, on the Nicu stream, emanations of natural gas have been reported since ancient times.

In 1932, negotiations began between the Sibiu City Hall and the Anonymous Society on Actions for the exploitation of SONAMETAN natural gas regarding the introduction of gas to Sibiu. After long negotiations, when the two partners decided to start drilling, they found that a larger amount of gas is required to be laid off from the Copșa Mică Deposit, which was designated as a supply base. Thus, the immediate realization of the well was initiated 5 Little Copșa Mică.

Prof. Elena Helerea from Transilvania University of Brasov, a senior member of IEEE, a CRIFST member, president of Brasov Branch of CRIFST, made a synthesis on the conditions of establishment and affirmation of the Romanian Committee for the History and Philosophy of Science and Technology (CRIFST) in the presentation *"Romanian Committee for History and Philosophy of Science and Technology (CRIFST) and NOESIS magazine at the 50th anniversary of the first publication"*.

The analysis covers the background of creating CRIFST within the Romanian Academy, with highlighting contributions of great personalities, CRIFST members to the establishment and development of history and phi-

losophy of science and technology. It is shown that after 1955 the internal and external conditions became favorable for the expansion of cooperation between the Romanian Academy and international bodies in the field of history and philosophy of science. The Romanian Committee for the History and Philosophy of Science (CRIFS) of the Romanian Academy was established in 1956—1957 as an instrument for the promotion of history and philosophy of science and cooperation with international bodies in the field.

It was on March 28, 1957 that the Bureau of the Presidium of the Romanian Academy approved the CRIFS structure formed by eight personalities, the designation of academician Mihai Ralea as CRIFS president and philosopher Athanase Joja (1904—1972) as CRIFS vice-president. On August 20, 1957, the Secretary of the International Union for the History and Philosophy of Science (IUHPS), René Taton (1915—2004), confirmed the accession of the Romanian Academy to the IUHPS through the newly created committee within the Romanian Academy. It was recommended to divide this committee into two sections, following the model of the IUHPS structure, with a division of history of science and a division of philosophy of science. Athanase Joja, professor of logic, had to work hard to staff the two commissions. As a result, CRIFS was organized into two separate commissions: The Commission for the History of Science, chaired by the academician Stefan Bălan (1913—1991), and the Commission for the Philosophy of Science, chaired by the academician Grigore Moisil. In the following years, CRIFS through its two commissions affiliated to IUHPS encouraged research in history and philosophy of science.

A further reorganization of CRIFS took place after the historic year of 1989, when CRIFS became CRIFST, including technology as a field of study. In the meeting of the Romanian Academy on February 7, 1992, the president, academician Mihai Drăgănescu (1929—2010), proposed the reorganization of CRIFS by establishing a new division, which would help boost research in the history of technology. A new structure of CRIFS was approved. It became the Romanian Committee for the History and Philosophy of Science and Technology (CRIFST) with three divisions: The Division for History of Science, chaired by academician Gleb Drăgan; the Division for Logic, Methodology and Philosophy of Science, chaired by academician Mircea Malița; the Division for History of Technology, chaired by academician Horia Colan.

Nowadays, CRIFS / CRIFST has large-scale cooperation with the International Union of History and Philosophy of Science and Technology (IUHPST) and International Committee for History of Technology (ICOHTEC). The year of 2023 marks the 50 years anniversary of the publication of the first issue of “Noesis” journal (founded in 1973) as a representative publication of CRIFST.

Summing up, it should be noted that such events contribute to international communication, development of professional skills and studies in history of science and technology across the world.

The Scientific Session made the following conclusions:

- Presentations and debates taking place at the Scientific Session highlighted the importance of studies in history of science and technology in the current context. It can bring new contributions related to values, culture and civilization and mobilize great masses of young people and professionals in opening new ways of action to guarantee the sustainable environment.

- Research in the history of science and technology should continue with focus on interactions between technology and current socio-economic trends and actions aiming to preserve the science and technology heritage by using adequate methods of museization.

- The interest in innovation and the prestige of research work can be stimulated through organizing courses, lectures and active debates, promoting best experiences of researchers, engineers and technicians, in order to attract young people to the field of engineering. The effort of the members of the Romanian Committee for the History and Philosophy of Science and Technology and the Association of Engineers from Romania has already been effective, with history of technology included in the curricula beginning with the academic year 2023/2024 in technical university education in Romania.

- By expanding local and international collaborations, the session brought added value that will be capitalized on at future international scientific events and projects.

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