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Review

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CHEMICAL ANNIVERSARIES OF THE YEAR 2023 ASSOCIATED WITH CHARLES UNIVERSITY

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The article recalls important anniversaries associated with chemistry and Charles University. Personal anniversaries of individuals associated with chemistry and our oldest university include commemorations of the life milestones of Jan Jakub Václav Dobřenský of Černý Most (400 years since his birth), Johann Jakob Geelhausen (285 years since his death), Jan František Löw of Erlsfeld (375 years since his birth), Josef Bohumil Mikan (280 years since his birth), Jan Antonín Scrinci (250 years since his death), Stanislav Škramovský (40 years since his death), Jan Stanislav Štěrba-Böhm (85 years since his death), Karel Štulík (10 years since his death), Oldřich Tomíček (70 years since his death), and Adam Zalužanský of Zalužany (410 years since his death). Alongside these are the 375th anniversary of the publication of *Thaumantias, liber de arcu coelesti*, in which Jan Marek Marci of Kronland first described the decomposition of light by prisms, 185 years since Adolph Martin Pleischl moved from Prague to Vienna, and 180 years since the start of lectures on analytical chemistry at the Charles University.

Keywords: history of chemistry, Charles University

When Marcus Aurelius reminds us to speak approvingly of our teachers, this is even more true of those who taught us chemistry. After all, remembering our chemical predecessors, their contributions to the development of science[1], or important events associated with them is essential both to realize where we are coming from and where we are going, and to understand what of our actions is truly essential, what will endure for a long time and for the benefit of all. The qualities we admire in our teachers, and to which we claim the results of our work, thus also take the form of the key to our chemical identity. This is even more true in the present age of uncertainty brought to chemists by the pervasive chemophobia[2–5] that has still not been eradicated or tamed. Therefore, at least some anniversaries in 2023 linked to chemistry and its heroes[6] as well as to Charles University undoubtedly deserve to be mentioned here.

The oldest anniversary we remember this year is the commemoration of four hundred and ten years since the death of one of the **important pioneers of our chemical thinking, Adam Zalužanský of Zalužany**, a Czech physician and professor of the Faculty of Arts (now Philosophy) at the University of Prague[7,8]. He was born around 1555 in Mnichovo Hradiště into a knightly Utraquist family. He studied at the universities of Wittenberg (1581, Bachelor of Arts), Prague (1584, Master of Liberal Arts), and then medicine at the University of Helmstedt in Germany, where he was graduated Doctor of Medicine in 1587. In the same year, he returned to Prague and became a professor at the University of Prague, where he lectured on classical languages, especially Greek – he could not teach medicine because there was no medical faculty in Prague at that time. In addition, he devoted himself to the study of natural sciences, and in 1592 he published book *Metodi herbariae libri tres*, in which he was the first in the world to deal with the sexuality of plants[9]. The work was based on Zalužanský's own botanical experiments carried out in greenhouses that Petr Vok of Rožmberk had built for him at Kratochvíle Castle. In 1593 Zalužanský also accepted the office of rector of the university. A year later, however, he married and, as celibacy was still in force for university professors at that time, he left the academic career, although he remained in contact with the university and tried to reform it, including the restoration of the medical faculty. Zalužanský settled in the Old Town of Prague as a doctor and opened a pharmacy, which was located directly in the Karolinum[10]. In 1613, a plague epidemic struck Prague, in which he was active as a doctor, and he paid for his service to his fellow citizens with his own life. He died on 8th December 1613 and was buried in Bethlehem Chapel. From the chemistry point of view, Zalužanský's writing from 1592, *The Order of Apothecaries, which should be kept and preserved in the sale of all kinds of medicine in these famous cities of Prague as well as in other cities in the Czech Kingdom*, is significant (Fig. 1), which he wrote on the initiative of the city council of the Old Town of Prague. The dossier listed the duties of pharmacists in ensuring the quality and availability

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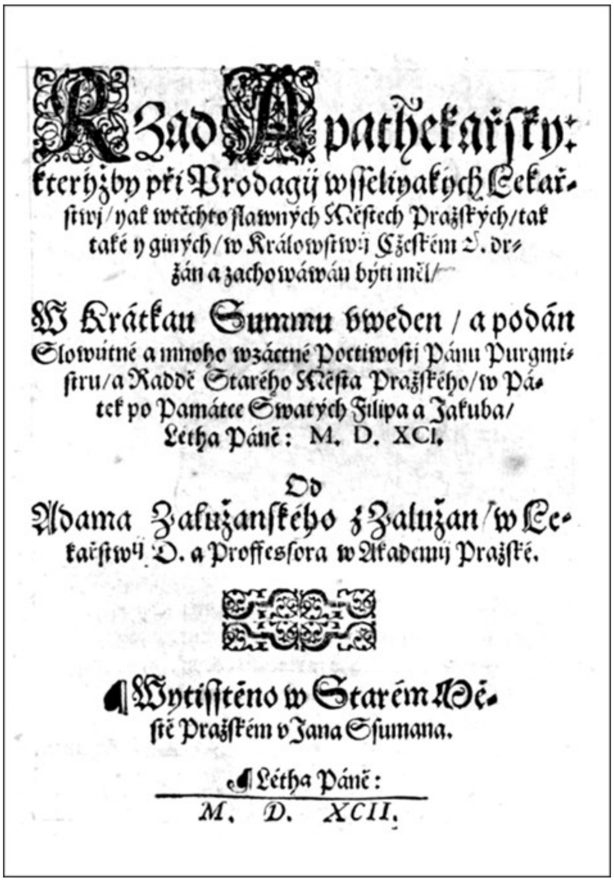

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Fig. 1. **Title page of the book *Řád apathekařský* by Adam Zalužanský of Zalužany from 1592**

of medicines and, due to its usefulness, it was published in many other editions[10,11]. It also lists numerous inorganic medicines, regulates the storage and dispensing of poisons, and describes the chemical operations carried out in pharmacies at the time.

In 2023, we will also commemorate the four hundredth anniversary of the birth of an **important chemical experimenter, Jan Jakub Václav Dobřenský of Černý Most**, a Czech physician and professor at the Faculty of Medicine of Charles-Ferdinand University[12–14]. The Prague native, whose exact date of birth is unknown, studied philosophy and medicine at our university. He spent many years in Italy, especially in Ferrara, where he met Prince Poli e Guadagnolo, in whose palace he devoted himself to natural science experiments, on the basis of which he published his first work on hydraulics (*Nova et amoenior de admirando fontium genio philosophia*, 1657). It was only after his return to Prague that he graduated as Doctor of Medicine on 11th January 1663. The following year he was appointed professor of the Faculty of Medicine, serving several times as dean of the faculty and twice as rector of the university. In addition to medicine, he took a keen interest in chemistry, including conducting experiments. Several of manuscripts have survived from these works (*Annotationes chymicae*, the eight-volume *Miscellanea chymica tam conceptus quam varias experientias*), in which, in a varied mixture of languages (Latin, Czech, German, Italian), in addition to extracts from the alchemical literature, he describes in detail his own chemical experiments. His interest in natural science was also reflected in his calendars (*The New Calendar, with a stargazing prophecy*) published between 1665 and 1685, which were among the few writings on natural science available to the general public at the time. He died in Prague on 3rd March 1697.

Another significant anniversary in 2023 is the 375th anniversary of the publication of **the pioneering work *Thaumantias, liber de arcu coelesti deque colorum apparentium natura ortu et causis*** (The Miracle Book of the Celestial Arc and the Nature, Origin, and Causes of its Visible Colours; Fig. 2), published in 1648 by the Czech physician and polymath Jan Marek Marci of Kronland (1595–1667), professor at the Faculty of Medicine of Charles-Ferdinand University[12,13]. In this work, he was the first in the world to describe the decomposition of light on a glass prism, which became the basis of spectral analysis in the 19th century[15,16] (traditionally, this discovery is attributed to Isaac Newton, who, however, did not describe it until 1666). However, in connection with the topic he

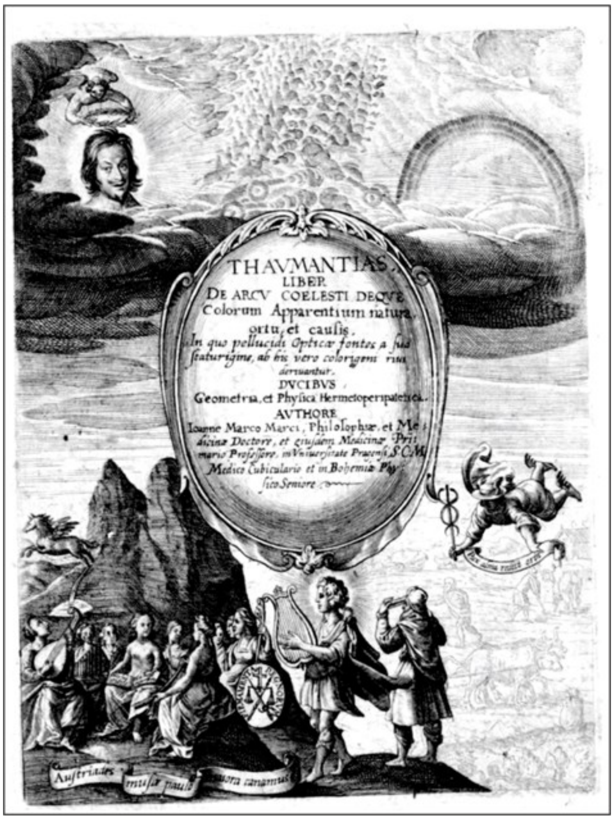


Fig. 2. **Title page of the book *Thaumantias, liber de arcu coelesti* by Jan Marek Marci of Kronland from 1648**

Fig. 3. **Jan František Löw of Erlsfeld at the age of 76**

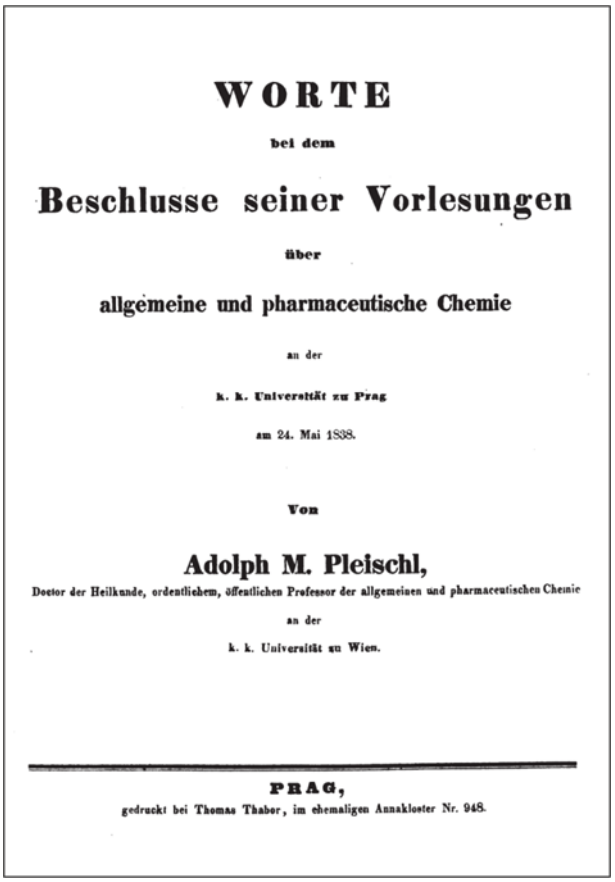
set out, that is, light, Marci also deals with other phenomena, such as the nature and properties of fire, distillation, the preparation and properties of gunpowder, and fulminating gold[17].

In the same year, 1648, again 375 years ago, another professor of the Faculty of Medicine of the University of Prague was born, whose **interest in chemistry helped to root the chemical perception of the world at our university: Jan František Löw of Erlsfeld** (Fig. 3)[12,13]. He was born on 26th March 1648 in town Planá. He completed his medical studies in Prague in 1672 and subsequently obtained a doctorate in law in Rome. For several years he worked as a physician in aristocratic families until he was appointed professor of medicine at the Charles-Ferdinand University in 1682. He was several times dean of the faculty and six times rector. Löw's interest in chemistry is evidenced, above all, by a number of alchemical and chemical works preserved in his library, which is now part of the National Library in Prague[18]. Therefore, they are an important record of the genesis of chemical thinking at the oldest Czech university. This is all the more so because in this still transitional period between alchemy and chemistry, references to chemistry also appear in Löw's own publications. First, in the form of allusions in the popular 1721 treatise on the mineral water in Úšovice (today's Mary's Spring in Mariánské Lázně) entitled *Hydriatria Nova, a brief account of newly discovered Deep bath, from ancient times called Stinky Water*. He also used antimony and mercury compounds in some of the medicines he designed[19]. He died on 25th March 1725 in Prague.

Löw's younger colleague at the Faculty of Medicine, **Professor Johann Jakob Geelhausen, an important witness of the transformation of alchemy into chemistry,** whose 285th anniversary of death is commemorated this year (his life and work were discussed in detail in a previous communication[20]), was also very interested in chemistry. Born on 25 August 1692 in Altenkirchen in Rhineland-Palatinate, Geelhausen was educated at the University of Prague, but spent part of his studies abroad, including at the University of Leyden under the renowned Dutch physician and chemist Herman Boerhaave, also known as *communis Europae praeceptor*, the common teacher of Europe[21]. Geelhausen thus helped to connect the nascent Czech chemistry with this source of current chemical developments through his unceasing diligence and curiosity. Under the supervision of František Löw of Erlsfeld, he graduated as Doctor of Medicine in 1719. The following year he became professor at the Faculty of Medicine of the Charles-Ferdinand University, where he held the office of dean four times. In 1736 he was even appointed rector of the university, but died while in office on 16th February 1738. Geelhausen's interest in chemistry was wide-ranging and it was reflected in the dissertations defended by medical students under his tutelage. Moreover, he was one of the first professors of our university to publish through the then new medium – the journal, helping to put Czech science in an international context. His participation as a chemist in the last Prague transmutation in 1728 (ref.[22]) or in the preparation of the first pharmacopoeia valid in our territory[23] is also notable.

Another professor of the Faculty of Medicine, whose 280th birthday will be commemorated in 2023, is **Josef Bohumír Mikan**[12,13]. He can undoubtedly be considered **the father of modern chemistry at Charles University**. He was born on 3rd September 1743 in Česká Lípa and studied in Prague and Vienna. In 1775, he was appointed professor of the Faculty of Medicine, where he was responsible for teaching botany and chemistry (and was several times dean of the faculty and once rector of the university). In 1785, he built the first chemical laboratory at the University of Prague in the Karolinum (at the site of the present-day cloakroom in front of the stairs to the great assembly hall). During his academic career, an independent professorship of chemistry was established at the university in 1810. In the field of chemistry, Mikan published in 1784 an analysis of mineral water from a spring near the village of Zaječice near Bečov. He died in Prague on 7th August 1814.

The year 2023 will also mark the 250th anniversary of the death of **Jan Antonín Scrinci, the first professor** to lecture on physics and chemistry at Charles-Ferdinand University[12,13]. He was born in Prague on 16th October 1697. After completing his medical studies, he was appointed professor of the Faculty of Medicine in 1738, and



WORTE

bei dem

Beschlusse seiner Vorlesungen

über

allgemeine und pharmaceutische Chemie

an der

k. k. Universität zu Prag

am 24. Mai 1838.

Von

Adolph M. Pleischl,

Doctor der Heilkunde, ordentlichem, öffentlichen Professor der allgemeinen und pharmaceutischen Chemie

an der

k. k. Universität zu Wien.

PRAG,

gedruckt bei Thomas Thabor, im ehemaligen Annakloster Nr. 948.

Fig. 4. **Title page of the book *Worte bei dem Beschlusse seiner Vorlesungen über allgemeine und pharmaceutische Chemie* by Martin Adolph Pleichl from 1838**

during his academic career he was several times dean of the faculty and three times rector of the university. In 1738 he began regular, up to today uninterrupted, teaching of chemistry at our university (then still in conjunction with physics and botany; a separate professorship of chemistry was not established until 1810). He died in Prague on 28th April 1773 and was buried in the Church of St. Michael the Archangel in Old Town of Prague[24]. The fate of his remains after the sale of the church in the 1990s and its subsequent use for entertainment purposes is unclear. Scrinci's scientific focus has been discussed in detail in our previous works[12,13].

Another precisely undateable anniversary is the 185 years that will pass in 2023 since Professor **Adolf Martin Pleischl** (1787–1867) **moved from Charles-Ferdinand University to Vienna**. In 1819 he became the fourth professor of chemistry at the university, where he significantly elevated the teaching of chemistry (see details on this in[12,13]). It was for this reason that, as was customary at the time and to the detriment of Czech chemistry, he was transferred from Prague to Vienna in 1838. Professor Pleischl was immensely popular among his Prague students, and when he said goodbye to them, they gave him a gala concert in the great assembly hall of the Karolinum[25]. Pleischl responded to this with a memorial speech (Fig. 4), in which, among other things, he exhorted[26]: *"I have so wished you to study chemistry and so I hope you have studied this wonderful science so far and will continue to study it in this spirit."*

Five years later, in 1843, that is, 180 years ago, a groundbreaking and innovative venture in the teaching of chemistry took place[27]. Professor Josef Redtenbacher (1810–1870) **introduced lectures and exercises in analytical chemistry** at the Charles-Ferdinand University, the first in the entire Austrian Empire.

The other anniversaries we will mention do not exceed one century and are connected with the Faculty of Science of Charles University. They begin on 1st January 2023 with the commemoration of eighty-five years since the death of Professor **Jan Stanislav Štěrba-Böhm**[28] (Fig. 5). He came from Sezemice, where he was born on 9th November 1874. He studied at the University of Prague, where he graduated in 1894 as Master of Pharmacy. Further studies in chemistry, part of which he completed in Paris under the renowned Nobel Prize winner Henri Moissan (1852–1907), culminated in his graduation as Doctor of Philosophy in 1903. Subsequently, from 1908 he taught chemistry at the Charles University, where he was also the dean of Faculty of Science. He was one of the editors of *Chemické listy*[29]. He was scientifically interested in compounds of scandium and cerium and was one of the authors of the *Czechoslovak Pharmacopoeia*[30]. He died on 1st January 1938 in Prague.

In October 2023, we will commemorate 70 years since the death of **Oldřich Tomíček**, Professor of Analytical Chemistry at the Faculty of Science of Charles University[28]. He was born on 10th October 1891 in Prague. At the

Fig. 5. **Jan Stanislav Štěrba-Böhm**

Fig. 6. **Karel Štulík**

Charles-Ferdinand University, he studied first pharmacy (he graduated with a Master of Pharmacy in 1914) and, with a break forced by the First World War, then chemistry (Doctor of Philosophy in 1920). He began his academic career at the Charles University, and in addition to pharmaceutical analysis, he prudently focused his scientific work on the then emerging electroanalytical methods. From 1925 until his death, he headed the Department of Analytical Chemistry at the Faculty of Science of Charles University, where he was also Dean of the Faculty. As a pharmacist, he participated in the creation of the first *Czechoslovak Pharmacopoeia*[30]. From 1942 to 1952 he was President of the Czech Chemical Society[31] and at the same time of the Czech Pharmaceutical Society. Professor Tomíček died in Prague on 21st October 1953.

Another professor of the Faculty of Science of Charles University, whose death anniversary will be commemorated this year, is Professor **Stanislav Škramovský**[28]. He was born on 24th November 1901 in Kolín. In 1921–1929 he studied first pharmacy and then chemistry at the Faculty of Science of Charles University. From 1923 he was an assistant at the faculty, and later he connected his entire professional career with it. He dealt with inorganic chemistry and was one of the founders of thermal analysis in our country[32]. For years he worked in the Czechoslovak Pharmacopoeia Commission and actively participated in three editions of the *Czechoslovak Pharmacopoeia*. He died forty years ago, on 18th August 1983 in Prague.

On 27th May, we will commemorate the tenth anniversary of the death of **Karel Štulík** (Fig. 6), professor at the Faculty of Science of Charles University and one of the leading Czech analytical chemists[33,34]. He was born on 13th February 1941 in Kolín into a family of teachers. In 1963 he graduated from the Faculty of Technical and Nuclear Physics of the Czech Technical University, followed by a postgraduate degree in analytical chemistry at the Polarographic Institute of the Czechoslovak Academy of Sciences. An interesting formative moment was his study stay in Great Britain in 1968–1969. He sealed his closeness to the British environment by marrying his colleague Madeleine Hyman, who later became a prominent translator of scientific chemical literature. From 1967 he worked at the Department of Analytical Chemistry, Faculty of Science, Charles University, both as Head of the Department and as Dean of the Faculty from 1997–2003. His scientific interests were mainly in electroanalytical chemistry and separation methods, and he published over 300 original papers and a number of monographs in these fields. He served on a number of scientific and editorial boards and represented the Czech chemical community in many international organizations. He passed away in Prague on 27th May 2013.

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