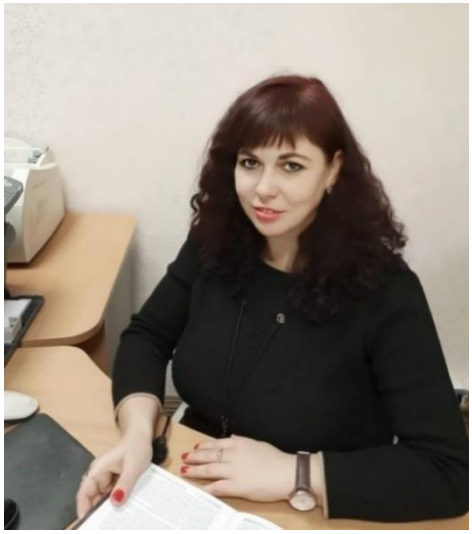
UDC 001.92: 378.25:061:377(477-25):654.071.7:631.5/.9(091)



DEMUZ Inna,
Doctor of History, Professor, Chief Researcher of the Sector of Scientific Bibliography and Biography, National Scientific Agricultural Library of the National Academy of Agricultural Sciences of Ukraine (Kyiv, Ukraine)
demuz_inna@ukr.net
ORCID: https://orcid.org/0000-0002-5936-2386
Researcher ID:
https://publons.com/researcher/1780609/inna-id-demuz/

PROFESSOR I. A. FESHCHENKO-CHOPIVSKY (1884–1952) AND THE KYIV POLYTECHNIC SOCIETY OF ENGINEERS AND AGRONOMISTS: POINTS OF CONTACT

The article analyzes the scientific and popularization activities of the prominent public figure, educator, metallurgist, professor I. A. Feshchenko-Chopivsky (1884–1952) within the Kyiv Polytechnic Society of Engineers and Agronomists, which functioned at the Kyiv Polytechnic Institute of Emperor Alexander II during 1911–1916. The main attention is paid to the scientist's participation in the opening of this scientific center, his work in the chemical section of the society and the First All-Russian Congress of Engineers (1913).

The main scientific works of Professor I. A. Feshchenko-Chopivsky, his contribution to the development of metallurgy, chemistry, economics and natural science is outlined. It has been established that the scientist developed the issue of metal cementation, which was poorly studied in the technical literature of the time. The main work in this area was «On the Surface Cementation of Metal» (1913), which became a reference book for engineers. It has been proved that Professor I. A. Feshchenko-Chopivsky is considered the founder of metallurgy in Western Ukraine and Poland. He made a significant contribution to the formation of engineering and scientific culture in metallurgy and steelmaking, developed a methodology for constructing double and triple state diagrams and the principles of a systematic approach to the theoretical analysis of chemical thermodynamic equations. The scientist's research on the geographical location and peculiarities of the climatic conditions of the province of Halicia (modern Halychyna) was also interesting.

***Keywords**: I. A. Feshchenko-Chopivsky, Kyiv Polytechnic Society of Engineers and Agronomists, Emperor Alexander II Kyiv Polytechnic Institute, chemistry, metallurgy, cementation, Halychyna.*

ПРОФЕСОР І. А. ФЕЩЕНКО-ЧОПІВСЬКИЙ (1884−1952) ТА КИЇВСЬКЕ ПОЛІТЕХНІЧНЕ ТОВАРИСТВО ІНЖЕНЕРІВ І АГРОНОМІВ: ТОЧКИ ДОТИКУ

У статті проаналізовано науково-популяризаційну діяльність видатного громадського діяча, педагога, вченого-металурга, професора І. А. Фещенка-Чопівського (1884−1952) у межах Київського політехнічного товариства інженерів і агрономів, що функціонувало при Київському політехнічному інституті Імператора Олександра ІІ упродовж 1911−1916 рр. Основну увагу приділено участі вченого у відкритті зазначеного наукового осередку, його праці в хімічній секції товариства та І Всеросійському з'їзді інженерів (1913 р.).

Охарактеризовано головні наукові праці професора І. А. Фещенка-Чопівського, окреслено його внесок у розвиток металургії, хімії, економіки та природознавства. Встановлено, що вчений розробляв питання цементації заліза, яке до нього було малодослідженим у тогочасній технічній літературі. Головною у цьому напрямку стала праця «Про поверхневу цементацію заліза» (1913 р.), яка перетворилася на настільну книгу інженерів. Доведено, що професор І. А. Фещенко-Чопівський вважається основоположником металознавства в Західній Україні та Польщі. Він зробив вагомий внесок у становлення інженерно-наукової культури в металознавстві й металургії, розробив методологію побудови подвійних і потрійних діаграм стану та принципи системного підходу до теоретичного аналізу хімічних термодинамічних рівнянь. Цікавими були дослідження вченого про географічне положення і особливості кліматичних умов провінції Галіції (сучасної Галичини).

Ключові слова: *І. А. Фещенко-Чопівський, Київське політехнічне товариство інженерів і агрономів, Київський політехнічний інститут Імператора Олександра ІІ, хімія, металознавство, цементація, Галіція*

Statement of the problem. The beginning of the 20th century for the Ukrainian lands of the former Russian Empire was marked by rapid scientific and educational activity. Scientific activity grew rapidly, and many domestic scientists received international recognition. The development of industry and various sectors of the national economy led to an increase in public demand for specialists in chemistry, physics, and metallurgy. To engage teachers and students in scientific and educational activities, scientific and technical societies were created at leading higher education institutions, bringing together representatives of various fields of technical sciences. The creation of such associations became one of the forms of organization of scientific

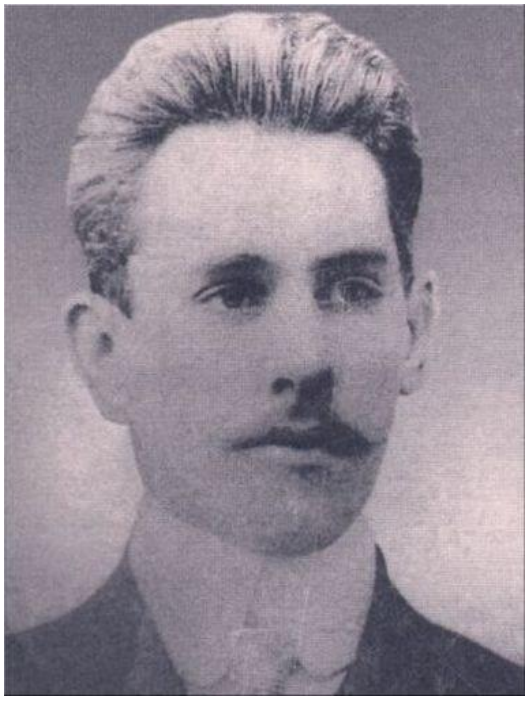
activity in the country, which, in turn, contributed to strengthening the connections between science and industry.

A powerful scientific and technical center was the Kyiv Polytechnic Society of Engineers and Agronomists, established at the Kyiv Polytechnic Institute of Emperor Alexander II (KPI) on February 8, 1911, on the initiative of engineers P. E. Butenko, I. F. Ponomarev, B. G. Sakhnovsky and I. A. Feshchenko-Chopivsky. The purpose of the Society was, first of all, to popularize scientific and technical knowledge relevant to the time, in particular in the fields of engineering, mechanics, chemistry, agronomy, as well as to attract talented young scientists (KPI graduates) to scientific activities and provide the necessary theoretical and practical support to recognized scientists. The professional activities of many scientists were directly related to the work of the Kyiv Polytechnic Society of Engineers and Agronomists. Its members were well-known KPI professors and lecturers, practitioners and theorists in the fields of engineering, mechanical engineering, chemistry, and agriculture: I. M. Hanytsky, H. H. De-Metz, V. L. Kyrpychov, Y. V. Lange, I. F. Ponomarev, P. R. Slyozkin, I. A. Feshchenko-Chopivsky, O. O. Khokhriakov, M. P. Chyrvynsky, L. V. Tsyslinsky, P.O. Shyrokykh, and others. Among these names, we highlight the figure of the Society's founder, Doctor of Technical Sciences, metallurgist, researcher of the economy of natural resources of Ukraine, supporter of the Ukrainian cultural and national revival and state-building of 1917−1921, Professor Ivan Adrianovych Feshchenko-Chopivsky (1884−1952). The scientist made a significant contribution to the development of technical science in Ukraine in the early 20th century, having authored more than 200 scientific works on metallurgy, economic geography, and agriculture, which have not lost their relevance today.

Analysis of recent research and publications. A number of works are devoted to the life and creative activity of Professor I. A. Feshchenko-Chopivsky. The most detailed is V. P. Shumanskyi's dissertation «I. A. Feshchenko-Chopivskyi's Activity in the Context of Development of Science and Technology (First Half of the 20th

Century)» (2003) [1]. Biographical information about the scientist is contained in a number of encyclopedic articles in the «Ukrainian Small Encyclopedia» (1967) [2], «Encyclopedia of Ukrainian Studies» (1980) [3], and «Encyclopedia of the History of Ukraine» (2013) [4]. Separately, we highlight the biographical work «Ivan Feshchenko-Chopivsky: Scientist and Teacher» by B. S. Rylnikov and H. V. Ponedilok (2009) [5], as well as the study by V. A. Shenderovsky «An Outstanding Scientist and Statesman − Ivan Feshchenko-Chopivsky» (2002) [6].

However, the points of contact of Professor I. A. Feshchenko-Chopivsky and the Kyiv Polytechnic Society of Engineers and Agronomists were generally ignored in these works. Only, for example, in the article by L. V. Hordienko [7], we find references to the scientist's participation in the functioning of the chemical section of the Society. Directly the issues of creation, structure and initial stage of functioning of the Kyiv Polytechnic Society of Engineers and Agronomists were considered in other works of the mentioned L. V. Hordienko. Gordienko [8], A. S. Bilotserkivska [9], as well as our research [10−11].



Professor I. A. Feshchenko-Chopivsky (1884−1952)

Summary of the main material. Ivan Adrianovych Feshchenko-Chopivsky was born on January 20, 1884, in Chudniv, Volyn, in the family of postal worker Adrian Feshchenko-Chopivsky and the daughter of a local priest, Maria Yanchynska. It was the place where the future scientist spent the first years of his life. After completing his education in 1893 at the Chudniv two-grade school, Ivan Feshchenko-Chopivsky continued his studies at the preparatory class of the First Zhytomyr Classical Gymnasium. In 1903, he successfully passed the exams for admission to the Faculty of Chemistry of the Kyiv Polytechnic

Institute of Emperor Alexander II. During his years of study at the KPI (1903−1908), the young man's teachers were well-known chemists and professors: I. D. Zhukov, V. P. Izhevsky, M. I. Konovalov, L. V. Pysarzhevsky, V. O. Plotnykov, M. M. Tykhvynsky, V. G. Shaposhnykov.

During the closure of the institute in connection with the revolutionary events of 1905, I. A. Feshchenko-Chopivsky did an internship at the Andrushivka Sugar Factory, which belonged to the Ukrainian family of industrialists and philanthropists Tereshchenko. It was the place, where the student became interested in political activism. During the revolutionary events, namely in 1905, he became active in public life, participated in the organized Ukrainian movement, was a member of the lecture committee of the Enlightenment, and regularly gave lectures in Ukrainian at the Trinity People's House until the Russian government recognized the activities of the Kyiv Enlightenment as extremely harmful. In the spring of 1906, I. A. Feshchenko-Chopivsky returned to his studies, focusing his research interests on metallurgy, namely, on the peculiarities of the steelmaking process. In this matter, he had special support from the scientist-inventor, metallurgist, professor V. P. Izhevsky [7, p. 71].

On May 12, 1907, the constituent assembly of the Kyiv branch of the Ukrainian Scientific Society was held. It was at this time that I. A. Feshchenko-Chopivsky began to write his first scientific articles, incidentally in Ukrainian, and published them in the «Notes of the Ukrainian Scientific Society». As a member of this Society, I. A. Feshchenko-Chopivsky contributed to the formation of Ukrainian scientific terminology and the preparation of the «Natural and Technical Dictionary».

In the summer of 1908, he defended his diploma project «Martenivska Factory» and received a degree in process engineering. Since December 1908, he worked as a laboratory assistant at the Department of Metallurgy and was a free professor's scholar. As you know, the scholarship holders were elected by the department's meeting on the recommendations of professors and approved by the Institute's council for a period of 1 to 3 years. Scholarship holders were obliged to prepare themselves for teaching in

their chosen specialty [12, p. 119]. In 1909−1912, I. A. Feshchenko-Chopivsky, working as a laboratory assistant at the Department of Metallurgy of Professor V. P. Izhevsky, managed the economic part of the metallurgical laboratory and supervised research [12, p. 132]. Every summer he conducted experiments necessary for laboratory tests at metallurgical and mechanical plants.

After successfully completing the test for the title of associate professor of chemical technology, he was awarded a two-year scholarship to work in the research center of one of the world's leading metallurgists, Professor Oberhoffer. He has repeatedly been on business trips abroad to familiarize himself with the experience of the best scientists and improve his own knowledge.

However, after the outbreak of the First World War, the scientist was forced to return to work as a teacher of practical classes in mountain and factory control. At the Kyiv Polytechnic Institute of Emperor Alexander II, I. A. Feshchenko-Chopivsky taught inorganic chemistry and led an elective in metallurgy. At that time, he attended all meetings of the Ukrainian Club, formed by M. Lysenko after the ban of Enlightenment [1, p. 8]. Traveling around Ukraine, the scientist collected a large amount of materials, including important statistics on the state of Ukrainian industry and natural resources in the early 20th century, which remain a valuable source for studying the history of the national economy and natural history. The collected materials formed the basis for the works «Economic Geography for Secondary Schools», «Natural Resources of Ukraine», and «Sugar Industry of Ukraine».

It was Professor I. A. Feshchenko-Chopivsky who stood at the origins of the Kyiv Polytechnic Society of Engineers and Agronomists, when in 1911, together with other engineers (P. A. Butenko, B. G. Sakhnovsky, I. F. Ponomarev), a request was prepared to the Kyiv governor to open a cell [8, p. 140]. The scientist became one of the developers of the «Statute of the Kyiv Polytechnic Society of Engineers and Agronomists» [9, p. 24], was a member of the Audit Commission [13, p. 3], as well as the chemical section.

On December 4, 1913, at a regular meeting of the said section, it was decided to delegate I. A. Feshchenko-Chopivsky to participate in the First All-Russian Congress of Engineers [14, p. 11]. The young scientist prepared a report on experiments on metal cementation, which interested many scientists and specialists, bringing I. A. Feshchenko-Chopivsky world recognition.

The issue of metal cementation, which was unexplored in the technical literature of the time, received wide scientific coverage in the scientist's works, the main of which was the work «On the Surface Cementation of Metal» (1913). It was considered a reference book for engineers. According to I. A. Feshchenko-Chopivsky's research, the main purpose of the cementation process was to harden metal and at the same time not to make it brittle, increasing its resistance to surface wear. According to the scientist, the process of cementation originated in the East in ancient times. He found that the cementation process was successful only if coal came into contact with iron with a modification that existed at a temperature of 800-900 degrees C. The cementation rate increased with increasing temperature without any dependence [15, p. 20].

Professor I. A. Feshchenko-Chopivsky had a brilliant talent for popularizing new achievements in metal science in engineering scientific and technical journals. He made a significant contribution to the formation of engineering and scientific culture in metallurgy and steelmaking. Interested in metallurgy, the scientist dreamed of Ukraine's economic prosperity. He developed the methodology for constructing double and triple state diagrams and the principles of a systematic approach to the theoretical analysis of chemical thermodynamic equations. Professor I. A. Feshchenko-Chopivsky is considered the founder of metallurgy in Western Ukraine and Poland.

As a member of the Society, the scientist repeatedly made presentations on issues relevant to the time: «On the Micrographic Consequences of Two Cases of Rail Fracture» (1911), «Research on Roofing Iron» (1911), «How Should Specialization in

Higher Technical Schools Be Understood?» (1911), «On the Surface Cementation of Iron» (1913), «On Additives in Iron Cementation» (1914), «Natural Resources of Halychyna» (1914), and others. Thus, his studies of the geographical location and climatic conditions of the province of Halicia (modern Halychyna) were quite interesting. I. A. Feshchenko-Chopivsky emphasized that the territory under study had fertile soils, diverse flora and fauna, and rich mineral resources. In 1772, after the collapse of Poland, this territory was ceded to Austria. Its final borders were established in 1848 after the fall of the Krakow Republic and the separation of Bukovyna into a separate province. Lviv became the capital of Halicia. The area covered 78,497 square kilometers. The population was predominantly rural, and there were few cities. It was an agricultural region, where the main branches of agriculture were cattle raising, poultry farming, fishing, and beekeeping.

Halicia had large deposits of salt, which were monopolistically owned by the state and brought a fairly significant amount of revenue to the government. It is known that near the city of Kalush there were significant reserves of potassium salt, which was used to make mineral fertilizers. The oil industry also played an important role for Halicia, which in 1913 accounted for 2% of world oil production. The development of the oil industry began in 1846, when rich oil deposits were discovered near the city of Drohobych. Halician oil produced 3-6% of gasoline, 55-65% of kerosene, 30-40% of oil residues, and up to 11% of paraffin. In 1911, 356 oil companies were operating in Halicia. In 1810, significant deposits of ozokerite were discovered near the town of Boryslav, as well as deposits of black coal and lignite. The iron ore deposits were insignificant and not of great industrial importance. The sugar industry was poorly developed in this area, while the brewing and distilling industries and woodworking factories worked well. The metal, weaving, and spinning industries were almost completely absent. Scholars have concluded that the Austrian government viewed Halicia as a market for German factories. Handicrafts played an important role in the life of the Halician population. I. A. Feshchenko-Chopivsky emphasized that the

intelligentsia cared about the economic development of their land. Entire villages were engaged in certain crafts: pottery, basket weaving, carpet weaving, woodworking, etc. According to the scientist's observations, Halicia had a large number of mineral springs: alkaline, carbon dioxide, iron-boron, and radioactive [16, p. 28].

It has also been found that during his work in the Society I. A. Feshchenko-Chopivsky took an active part in the preparation of the «Essay on the Development and Current State of the Chemical Department of the Kyiv Polytechnic Institute» (1913), was a member of the commission for its writing along with other compilers: D. K. Dobroserdov, V. P. Izhevsky, P. P. Kondratsky, M. G. Korsunsky, V. I. Minaev, M. M. Orlov, V. G. Shaposhnykov.

It is shown that in the later years of his life the scientist had an active civil position, as evidenced by his participation in the activities of the Ukrainian Party of Socialist-Federalists, the Central Rada, and the Minor Rada (1917). He was Minister of Trade and Industry in the government of V. Holubovych (1918), Deputy Chairman and Minister of National Economy in the government of S. Ostapenko (1919). From 1922 he worked at the Mountain and Mining Academy in Krakow [2], and from 1928 he was a scientific consultant at the Beldon plant in Katowice. In 1945 he was arrested by the Soviet authorities [3, p. 3496; 5, p. 9]. Professor I. A. Feshchenko-Chopivsky died on September 2, 1952, in the camp of the village of Abez, Komi Republic, where he was buried [4]. Only in 1996 did a public delegation from the Lviv region manage to install and consecrate a cross on his grave.

Conclusions. We note the significant role of Professor I. A. Feshchenko-Chopivsky (1884−1952) in the creation and functioning of the Kyiv Polytechnic Society of Engineers and Agronomists, which operated during 1911−1916 at the Kyiv Polytechnic Institute of Emperor Alexander II, in particular, the chemical section of the Society, which included the scientist. The article analyzes the scientific and popularization activities of the prominent public figure, educator, and metallurgist and examines his main works and scientific reports prepared during the period under

consideration («On the Micrographic Consequences of Two Cases of Rail Fracture», «Research on Roof Iron», «How Should Specialization in Higher Technical Schools Be Understood?», «On Surface Iron Cementation», «On Additives in Iron Cementation», «Natural Resources of Halicia», etc.), showed that his achievements were innovative not only in the context of the development of Ukrainian but also world science in general. Professor I. A. Feshchenko-Chopivsky made a significant contribution to the development of metallurgy, chemistry, economics, and natural science; he is considered the founder of metallurgy in Western Ukraine and Poland. His activities in the context of the development of the Kyiv Polytechnic Society of Engineers and Agronomists undoubtedly require further detail and study.

List of used sources and literature

1. Шуманський В. П. Діяльність І. А. Фещенка-Чопівського в контексті розвитку науки і техніки (перша половина XX ст.) : автореф. дис. … канд. іст. наук. : 07.00.07 / Київ. нац. ун-т ім. Тараса Шевченка. Київ, 2003. 13 с.

2. Фещенко-Чопівський Іван. *Українська мала енциклопедія*. Буенос-Айрес, 1967. Т. 8, кн. 16 : Уш − Я. С. 1979.

3. Фещенко-Чопівський Іван. *Енциклопедія українознавства :* словникова частина / Наук. т-во імені Шевченка ; гол. ред. В. Кубійович, Париж−Нью-Йорк : Молоде життя, 1980. Т. 9. С. 3495−3496.

4. Осташко Т. С. Фещенко-Чопівський Іван Адріанович. *Енциклопедія історії України* / редкол. : В. А. Смолій (голова) та ін. ; Інститут історії України НАН України. К. : Наукова думка, 2013. Т. 10 : Т−Я. С. 293.

5. Рильніков Б. С., Понеділок Г. В. Іван Фещенко-Чопівський : вчений та педагог. Львів : «Львівська політехніка», 2009. 76 с.

6. Шендеровський В. Видатний вчений і державотворець − Іван Фещенко-Чопівський. *І. Фещенко-Чопівський – видатна постать в історії науки та українського державотворення :* матеріали Міжнар. конф. (до 50-річчя від дня загибелі), м. Львів, 27–28 верес. 2002 р. Львів. С. 20.

7. Гордієнко Л. В. Діяльність членів Київського політехнічного товариства інженерів і агрономів у межах розвитку інженерної, механічної, хімічної та агрономічної наук у період 1911−1916 рр. *Літопис Волині*. 2023. № 28. С. 68−73. URL : http://litopys.volyn.ua/index.php/litopys/article/view/411

8. Гордієнко Л. В. Київське політехнічне товариство інженерів та агрономів при Київському політехнічному інституті Імператора Олександра II (1911–1916 рр.) : основні організаційні аспекти діяльності. *Історія науки і біографістика.* 2019. № 2. С. 138–152. URL : http://inb.dnsgb.com.ua/2019-2/09.pdf

9. Білоцерківська А. С. Київське політехнічне товариство інженерів та агрономів : історія створення. *Історія освіти, науки і техніки в Україні :* матеріали XII Міжнар. конф. молодих учених та спеціалістів, присвяч. 100-річчю від дня створення ННСГБ НААН, Київ, 19 трав. 2017 р. / Нац. акад. аграр. наук України ; Нац. наук. с.-г. б-ка НААН ; Рада молодих вчених НААН [та ін.] ; уклад. В. А. Вергунов, А. С. Білоцерківська, М. М. Давиденко ; редкол. : В. А. Вергунов (голова). Київ : ТОВ «Центр поліграфії «КОМПРИНТ», 2017. С. 24–28.

10. Демуз І. О. Науково-технічні товариства України кінця XIX – початку XX ст. : історіографія дореволюційного періоду. *Вісник Харківського університету імені В. Н. Каразіна*. 2013. № 1055 : Сер. : Історія України. Українознавство : історичні та філософські науки ; вип. 16. С. 23–28.

11. Демуз І. О. Наукові товариства на теренах України XIX – початку XX ст. : полілог учених і епох : монографія. Переяслав-Хмельницький : ФОП Лукашевич О. М., 2014. 681с.

12. Очерк развития и современного состояния химического отделения / Киев. политех. ин-т Императора Александра II. Киев : тип. Т-ва И. Н. Кушнеров и Ко, 1913. 212 с.

13. Протокол 1-го Общего Собрания. *Бюллетени Киевского политехнического общества инженеров и агрономов*. 1911. № 1. С. 3.

14. Деятельность секций. Химическая секция. *Бюллетени Киевского политехнического общества инженеров и агрономов*. 1914. № 1. С. 10−12.

15. Выдержки из докладов. *Бюллетени Киевского политехнического общества инженеров и агрономов*. 1913. № 4. С. 20−23.

16. Промышленность и природные богатства Галиции. *Бюллетени Киевского политехнического общества инженеров и агрономов*. 1915. № 1. С. 28−37.

References

1. Shumanskyi, V. P. (2003). Diialnist I. A. Feshchenka-Chopivskoho v konteksti rozvytku nauky i tekhniky (persha polovyna XX st.) [The activity of I. A. Feschenko-Chopivskyi in the context of the development of science and technology (first half of the 20th century)]: autoref. thesis ... candidate history of science : 07.00.07 / Kyiv. national University named after Taras Shevchenko. Kyiv [In Ukrainian].

2. (1967). Feshchenko-Chopivskyi Ivan. *Ukrainska mala entsyklopediia* – Ukrainian small encyclopedia. Buenos-Aires, Vol. 8, book. 16 : Ush−Ya, p. 1979 [In Ukrainian].

3. (1980). Feshchenko-Chopivskyi Ivan. *Entsyklopediia ukrainoznavstva : slovnykova chastyna* − Encyclopedia of Ukrainian studies : dictionary part / Science Shevchenko Society ; ed. V. Kubiyovych, Paris-New York : Young Life. Vol. 9, pp. 3495−3496 [In Ukrainian].

4. Ostashko, T. S. (2013). Feshchenko-Chopivskyi Ivan Adrianovych. *Entsyklopediia istorii Ukrainy* − Encyclopedia of the history of Ukraine / edts. : V. A. Smoliy (head) and others ; Institute of History of Ukraine, National Academy of Sciences of Ukraine. Kyiv : Scientific opinion, Vol. 10 : T−Ya, p. 293 [In Ukrainian].

5. (2009). Rylnikov, B. S. & Ponedilok, H. V. Ivan Feshchenko-Chopivskyi : vchenyi ta pedahoh [Ivan Feshchenko-Chopivskyi : scientist and teacher]. Lviv [In Ukrainian].

6. Shenderovskyi, V. (2002). Vydatnyi vchenyi i derzhavotvorets − Ivan Feshchenko-Chopivskyi [Ivan Feshchenko-Chopivskyi, an outstanding scientist and statesman]. *I. Feshchenko-Chopivskyi – vydatna postat v istorii nauky ta ukrainskoho derzhavotvorennia : materialy Mizhnar. konf. (do 50-richchia vid dnia zahybeli), m. Lviv, 27–28 veres. 2002 r.* − Ivan Feshchenko-Chopivskyi, an outstanding scientist and statesman. I. Feshchenko-Chopivskyi − an outstanding figure in the history of science and Ukrainian state-building : materials of the International. conf. (for the 50th anniversary of the death), Lviv, September 27–28. Lviv, p. 20 [In Ukrainian].

7. Hordiienko, L. V. (2023). Diialnist chleniv Kyivskoho politekhnichnoho tovarystva inzheneriv i ahronomiv u mezhakh rozvytku inzhenernoi, mekhanichnoi, khimichnoi ta ahronomichnoi nauk u period 1911−1916 rr. [Activities of members of the Kyiv Polytechnic Society of Engineers and Agronomists within the framework of the development of engineering, mechanical, chemical and agronomic sciences in the period 1911−1916]. *Litopys Volyni* − Chronicle of Volyn, no. 28, pp. 68−73. URL : http://litopys.volyn.ua/index.php/litopys/article/view/411 [In Ukrainian].

8. Hordiienko, L. V. (2019). Kyivske politekhnichne tovarystvo inzheneriv ta ahronomiv pry Kyivskomu politekhnichnomu instytuti Imperatora Oleksandra II (1911–1916 rr.) : osnovni orhanizatsiini aspekty diialnosti [Kyiv Polytechnic Society of Engineers and Agronomists at the Kyiv Polytechnic Institute of Emperor Alexander II (1911–1916) : main organizational aspects of activity]. *Istoriya nauky i biohrafistyka* − History of science and biography, no. 2, pp. 138–152. URL : http://inb.dnsgb.com.ua/2019-2/09.pdf [In Ukrainian].

9. Bilotserkivska, A. S. (2013). Kyivske politekhnichne tovarystvo inzheneriv ta ahronomiv : istoriia stvorennia [Kiev Polytechnic Society of Engineers and Agronomists : history of creation]. *Istoriia osvity, nauky i tekhniky v Ukraini : materialy XII Mizhnar. konf. molodykh uchenykh ta spetsialistiv, prysviach. 100-richchiu vid dnia stvorennia NNSHB NAAN, Kyiv, 19 trav. 2017 r.* − History of education, science and technology in Ukraine : materials 12 International conf. young scientists and specialists, devoted 100th anniversary of the foundation of the National Academy of Sciences of the NAS of Ukraine, Kiev, May 19. 2017 year / National Academy of Agrarian Sciences of Ukraine ; National Agricultural Agricultural Library

of NAAS ; The Council of Young Scientists of NAAS [and others]] ; compls. Verhunov, V. A., Bilotserkivska, A. S. and Davydenko, M. M. ; editorial board : Verhunov, V. A. (heard). Kyiv : TOV «Tsentr polihrafii «KOMPRYNT», pp. 24–28 [In Ukrainian].

10. Demuz, I. O. (2013). Naukovo-tekhnichni tovarystva Ukrainy kintsia XIX – pochatku XX st. : istoriohrafiia dorevoliutsiinoho periodu [Scientific and technical societies of Ukraine of the late 19th and early 20th centuries : historiography of the pre-revolutionary period]. *Visnyk Kharkivskoho universytetu imeni V. N. Karazina* − Bulletin of Kharkiv University named after V. N. Karazin, no. 1055 : Ser. : History of Ukraine. Ukrainian studies : historical and philosophical sciences ; issue 16, pp. 23−28 [In Ukrainian].

11. Demuz, I. O. (2014). Naukovi tovarystva na terenakh Ukrainy XIX – pochatku XX st. : poliloh uchenykh i epokh : monohrafiia [Scientific societies in Ukraine in the 19th and early 20th centuries : polylogue of scientists and epochs : monograph]. Pereiaslav-Khmelnytskyi [In Ukrainian].

12. (1913). Ocherk razvytyia y sovremennoho sostoianyia khymycheskoho otdelenyia [Outline of the development and modern state of the chemical department] / Kyiv. polytechnic Institute of Emperor Alexander II. Kyiv : type. T-va I. N. Kushnerov and Co [In Russian].

13. (1911). Protokol 1-ho Obshcheho Sobranyia [Minutes of the 1st General Meeting]. *Biulleteny Kyevskoho polytekhnycheskoho obshchestva ynzhenerov y ahronomov* − Bulletins of the Kyiv Polytechnic Society of Engineers and Agronomists, no. 1, p. 3 [In Russian].

14. (1914). Deyatelnost sektsii. Khimicheskaya sektsiya [Activity of sections. Chemical section]. *Byulleteni Kievskogo politekhnicheskogo obshchestva inzhenerov i agronomov* − Bulletins of the Kyiv Polytechnic Society of Engineers and Agronomists, no. 1, pp. 10−12 [In Russian].

15. (1913). Viderzhki iz dokladov [Excerpts from reports]. *Byulleteni Kievskogo politekhnicheskogo obshchestva inzhenerov i agronomov* − Bulletins of the Kyiv Polytechnic Society of Engineers and Agronomists, no. 4, pp. 20−23 [In Russian].

16. (1915). Promishlennost i prirodnie bagatstva Galitsii [Industry and natural resources of Galicia]. *Byulleteni Kievskogo politekhnicheskogo obshchestva inzhenerov i agronomov* − Bulletins of the Kyiv Polytechnic Society of Engineers and Agronomists, no. 1, pp. 28−37 [In Russian].

Рецензенти:
Г. В. Салата, д. і. н., доц.;
О. Я. Пилипчук, д. біол. н., проф. ***Надійшла до редакції: 14.11.2023 р.***