

---

<https://doi.org/10.15407/ujpe69.2.124>

M.V. STRIKHA<sup>1,2</sup>

<sup>1</sup> Taras Shevchenko National University of Kyiv,  
Faculty of Radiophysics, Electronics, and Computer Systems  
(4g, Akademika Glushkova Ave., Kyiv 03022, Ukraine)

<sup>2</sup> V.E. Lashkaryov Institute of Semiconductor Physics, Nat. Acad. of Sci. of Ukraine  
(41, Nauky Ave., Kyiv 03028, Ukraine; e-mail: maksym\_strikha@hotmail.com)

## UKRAINIAN LANGUAGE AND PHYSICS: A BRIEF HISTORICAL RETROSPECTIVE (TO THE 150th ANNIVERSARY OF THE SHEVCHENKO SCIENTIFIC SOCIETY)

---

*The history of Ukrainian language as a tool for publishing results of physical research and popularizing physics has been considered. Most important articles on physics that appeared in Ukrainian in 1877–1940 have been analyzed. Special impact was made on the publications of the non-governmental Shevchenko Scientific Society, which acted in Lviv in 1892–1939 as the first Ukrainian national academy of sciences. It is demonstrated that the main goal of the authors of those articles was not to disseminate the obtained results within the international community of physicists but to raise the status of the Ukrainian language, which was officially prohibited in the Russian empire by the acts dated 1863 and 1876, up to the status of the well developed European language by enabling its functioning in the hitherto closed spheres. The prospects of applying the Ukrainian language for publishing the results of physical research and popularizing physics nowadays have been discussed.*

*Keywords:* physics, Ukrainian language, Shevchenko Scientific Society, Ukrainian Academy of Sciences.

### 1. Introduction. Languages in Physics

For many centuries, Latin had been the universal language of science. Such classic books as *On the Revolutions of Heavenly Spheres* by Nicolaus Copernicus (1543) or *Mathematical Principles of Natural Philosophy* by Isaac Newton (1687) were written in Latin. National languages slowly began to acquire

rights in science only in the 17th and 18th centuries. The most important works by Galileo Galilei, including *The Discourses and Mathematical Demonstrations Relating to Two New Sciences* (1638) where he described his physical discoveries, were already published in Italian. The world's first scientific journal on natural sciences founded by the Royal Society of London, *Philosophical Transactions*, has been published in English since 1665. Ultimately, national languages become firmly established in science at the beginning of the 19th century. In 1820–1830s, when Sadi Carnot, Georg Ohm, and Michael Faraday wrote and published their fundamental works in French, German, and English, respectively, this was already a common practice (see, e.g., [1]).

---

Citation: Strikha M.V. Ukrainian language and physics: a brief historical retrospective (to the 150th anniversary of the Shevchenko scientific society). *Ukr. J. Phys.* **69**, No. 2, 124 (2024). <https://doi.org/10.15407/ujpe69.2.124>.

Цитування: Стріха М.В. Українська мова й фізика: коротка історична ретроспектива (до 150-річчя наукового товариства імені Шевченка). *Укр. фіз. журн.* **69**, № 2, 124 (2024).

After abandoning Latin in the 19th century, there was no single international language in physics (the English language began to play this role after World War II). This circumstance had its drawbacks. For example, clear and understandable Ohm's works on the dependence of the current-to-voltage ratio on the resistance were recognized by the European physicists with a great delay, only after the appearance of their English and French translations. Main scientific production during the era of constructing the fundamentals of classical thermodynamics and electrodynamics was more or less equally divided among the German, French, and English languages. Those languages were used by representatives of "small" nations as well. For example, in 1892, the Dutchman Hendrik Lorentz published in French his paper "Maxwell's theory of electromagnetism and its application to moving bodies", where the formulas for the force acting on a moving charge in an electromagnetic field (in the coordinate representation) were written out for the first time.

In the 19th century, the very intention of writing natural science articles in Ukrainian had to be considered as an incredible impudence. Within the Russian empire, the application of our language was banned by government circulars dated 1863 and 1876. The latter allowed original writings on peasant themes to be written "in the Little Russian dialect" (through a very complicated censorship procedure and with the usage of the Russian alphabet), but all scientific and educational literature and translations into Ukrainian were prohibited with no exceptions (see, e.g., [2]). Censorship did not allow not only the Gospel in Ukrainian (although its publications in other languages of the vast empire were favored by the authorities) but also innocent booklets with advice on better farming or following the rules of personal hygiene (at that time, Ukrainian peasants simply did not understand such advice made in Russian). The Romanov empire was well aware of the danger, if Ukrainian would become a "language of higher education" and tried to prevent this in every possible way.

Thus, Ukrainian-born scientists had no chance to present any of their results using their native language. The glorious mathematician Mykhailo Ostrogradskyi (1801–1862) – not only a disciple of Augustin Louis Cauchy, Pierre-Simon Laplace, and Simeon-Denis Poisson, but also a close friend of Taras Shevchenko – was aware of his belonging to the "Cos-

sack nation"; he could repay the empire only by publishing all his scientific works in French and ignoring Russian-language scientific editions, which had already appeared at that time. However, this fact does not prevent Putin's Russia from qualifying him (together with the German Leonard Euler, whose works Ostrogradskyi republished at his own expense) as "the great Russian mathematician" (the Russian-language Wikipedia unequivocally calls M. Ostrogradskyi only "Russian", whereas the English-language Wikipedia uses the term "Russian-Ukrainian", thus emphasizing his Ukrainian origin).

Physicists from the universities of Kharkiv, Kyiv, and Odesa could not write scientific texts in Ukrainian, even in the case where they clearly demonstrated their Ukrainian identity. Here is an example: the founder of teleradiomechanics Mykola Pylchykov (1857–1908). His father Dmytro Pylchykov belonged to the secret society of Saints Cyril and Methodius defeated by the authorities in 1847, and himself was one of the initiators of the creation of the Shevchenko Society in Lviv in 1873. Another example is Mykhailo Kosach (1869–1903), a researcher of electrolytes in the magnetic field and, simultaneously, a writer, an interpreter, and the brother of Lesya Ukrainka.

## 2. Ivan Pulyui and the First Papers in Ukrainian on Physics

Fortunately, some portion of Ukrainians lived at that times in another, Habsburg empire, where the living conditions for them were much better than in the neighboring Romanov empire, although not very favorable. In particular, since 1865, the Ukrainian language was allowed to use here at the gymnasium educational level, which stimulated the need for Ukrainian-language textbooks and the creation of Ukrainian terminology in mathematics and natural sciences. As early as in 1864, an 18-page booklet *Fundamentals of the Creation of the Nomenclature and Terminology for Describing Nature. Part I* was published in Lviv under the authorship of Ivan Verkhratskyi. The other five parts of this dictionary were published in 1869–1879 (see, e.g., [3]).

In 1873, on the initiative and with the financial assistance of the people from central Ukraine – first of all, the writer Oleksandr Konyskyi and the landowner from the Poltava region Yelyzaveta Myloradovych (from the Skoropadskyi family), supported by a group

## ПЕРЕГЛЯД НАУКОВИЙ.

### Про радіометр або світляний млинок.\*)

Сучасні видання академічні і наукові журнали подають багату літературу радіометра, котрий звернув на себе громадну увагу.

Вже давно догледілись експериментатори, що проміне світла начеб одпихає легкі тіла, коли вони у просторі, в котрому нема воздуха. Англичанин Крукс первий построїв такий апарат, в котрому видно, як крильця од світла ворочаються, назвавши ёго радіометром. Досі построєно багацько радіометрів і зроблено чимало досвідів, щоб дослідити, які сили, і як вони діють у тому чудному апараті. Радіометр Крукса дуже поєдично построєний. У невеличкій шклянній баньці подовговатой форми, із котрої випорожнено воздух, почыває на шпильці шклянній маленький напесточок. До напесточка причеплені крильця, дві дуже тоненькі алюмінієві пластинки, завбільшки одного квадратного сантиметра, кожда з них одним боком почорнена а другим чиста. Ди-

The first ever text on physics in Ukrainian

of influential Galicia citizens headed by the Galician Seim deputy Father Stepan Kachala, the Shevchenko Literary Society was founded in Lviv, which launched an extensive educational and publishing activity. After the reform in 1892, this society (already under the title Shevchenko Scientific Society, ShSS) acquired the status of the first national academy of sciences in Ukraine, which was still stateless at that time and divided between two empires [4]. On May 11, 1893, the Mathematical-Naturalistic-Medical Section (MNMS) was organized as a part of the ShSS. The Section united, in particular, physicists and functioned until the forced liquidation of the ShSS in early 1940 (a review of the activity and scientific products of the ShSS is given in [5]).

Also in 1892, *Zapysky NTSh (Notes of the ShSS, NShSS)* began to be published. It is clear that humanitarian papers on history, philology, and folkloristics written by the authors from both the Galicia (Mykhailo Hrushevsky, Ivan Franko, Oleksandr Kolesa, and others) and central Ukraine (first of all, Tadei Rytskyi, the father of the future great poet, and Oleksandr Konyskyi, who de facto was the editor of the first volumes of the *NShSS* [4]) dominated in the first issues. But the first article on medical topics appeared already in volume II (1893). This paper was authored by Oleksandr Chernyakhivskyi (1869–1939), who was a graduate of Kyiv University at that time. Later he became an outstanding medical scientist and the creator of modern Ukrainian medical terminology. In 1930, the Soviet secret services made him one of the main figures in the fabricated “Process of the Ukraine Liberation Union”, which took place on the stage of the

Kharkiv Opera. Being exiled, he organized the Medical Institute in Stalino (now Donetsk), and then returned to scientific work in Kyiv. In 1938, his daughter, a talented interpreter Veronika Chernyakhivska, was arrested and shot. Her father, Oleksandr Chernyakhivskyi, and mother, Lyudmyla Starytska-Chernyakhivska (the daughter of a prominent Ukrainian poet Mykhailo Starytskyi), never learned about her true fate and continued to write letters to various authorities with requests for her release.

In the next volume of *NShSS* (III, 1894), Dr. Ivan Pulyui (1845–1918) – at that time he already was the venerable professor at the German Polytechnic in Prague – included a paper on electrical engineering entitled “Apparatus for measuring the phase difference between alternating currents and some measurements made with its help” [6]. The subject of the article should not surprise us because Dr. Pulyui gained the status of the State Councilor for Bohemia and Moravia precisely for his achievements in this field, so he belonged to the circle of persons who determined the electrotechnical policy of the Austrian Monarchy. Further articles of Prof. Pulyui, the discoverer (independently of Wilhelm Conrad Röntgen) of X-rays and the co-author of the first complete Ukrainian translation of the Bible, which were published in the ShSS editions, dealt with electrical engineering issues. Currently, the life and scientific masterpiece of I. Pulyui has been enlightened in a large body of literature. In particular, they were systematically described in [7]. The activity of the scientist in the ShSS was briefly described in [8]. By the efforts of Prof. V.A. Shenderovskiy, his main works were collected and published in [9].

The first scientific text on physics in Ukrainian belongs to I. Pulyui [10]. It was published in the *Lviv Pravda (Truth)*, a “monthly for literature, science, and politics”, in 1877, long before the establishment of the ShSS as a scientific society. The paper dealt with the radiometer (the “sun mill”) discovered by the Englishman William Crooks in 1874. If the radiometer is placed into a flask with rarefied air, its “wings” painted black and white rotate under illumination from the white side.

When considering a discussion about the physical causes of the radiometer rotation (the discussion was rather eager at that time; W. Crooks himself mistakenly explained the discovered effect by the light pressure), I. Pulyui wrote, “the motion of the wings arises

due to the kinetic energy excess, which can arise again through the following ways:

1) either the molecular velocity of the substance in the apparatus increases (the kinetic theory of gases);

2) or the air mass increases due to molecules that fly out of the wings but do not change their molecular velocity (the evaporation theory);

3) or both the air mass and the velocity of the molecules increase.

If the movable and immovable parts of the apparatus do not emit molecules at all, then the first explanation has to be accepted; or the second one if the molecules fly out of the wings as molecules fly out of water.

In our opinion, the third explanation is closest to the truth".

At that time, the 32-year-old I. Pulyui was an assistant at the University of Vienna. A year before he defended his thesis "Dependence of internal gas friction on temperature" in Strasbourg. I. Pulyui turned out wrong in his consideration. Very quickly the "evaporation theory" was disproved experimentally. Instead, the molecular-kinetic theory of the mill rotation was confirmed in the work of great Maxwell, the last work that was published during his lifetime, where the difference between the pressures of rarefied gases arising due to the temperature difference was considered [11]. But one should remember that Ivan Pulyui did not write about an ascertained scientific idea, but about a problem that was a matter of sharp discussions among physicists at that time.

The original language of the quoted passage may seem clumsy, and the terminology unusual, to the modern reader. However, do not forget that this text appeared only four decades after the publication of the almanac *Rusalka Dnistrova* (*Dniester Mermaid*, 1837), which marked the beginning of the Ukrainian national revival in Galicia. It was the time when heated discussions continued between the supporters of the national language and the so-called "muscophiles" with their concept of "yazychie" (the local Ukrainian vernacular was treated as a mere dialect of the Russian language) [2]. Under those conditions, the usage of his native Ukrainian language by a bright young scientist, who, by the will of circumstances, was forced to publish all his scientific works in German, had the character of a distinct patriotic manifestation. And this is so, which is confirmed by a letter that Ivan Pulyui wrote much later, on August



Young Ivan Pulyui

6, 1893, to Oleksandr Barvinskyi, then the head of the ShSS, "It is not an easy job to cut a path where no human foot has ever touched before. Natural sciences must have their own language formed on the basis of the national language. (...) The nation without the science that stays over the nations is similar to an ignorant person among scientists" (see [7, 8]).

One more large scientific text, "About heat and work", was published by Ivan Pulyui in two issues of the same *Pravda* edition a little later, in 1879 (see [12]). This work dealt with the mutual convertibility of heat and mechanical work (one should bear in mind that the most important scientific and engineering achievements of I. Pulyui include one of the best, at that time, devices for measuring the mechanical equivalent of heat [7]). Therefore, the scientist developed this topic, which was close to him, in the 25-page popular scientific booklet *Unfailing Power* published by the *Prosvita* (*Enlightenment*) society in the same year of 1879 and republished in 1901 in the supplemented edition [13]. In this brochure, the scientist touched again on the issue of Crooks' radiometer. Here he did not mention the "evaporation theory" and explained the origin of the radiometer rotation from purely molecular-kinetic positions.

In the same year of 1901, Ivan Pulyui republished another popular scientific book *New and Variable Stars* [14], which was first published in Lviv in 1881 at the expense of the editors of the *Svit* (*World*) mag-



Crookes' radiometer in the book "Unfading Power" (1901)

azine (the third edition appeared in Vienna in 1905; see, for example, [12]). This story about unusual astronomical objects is interspersed with philosophical reflections and sometimes includes poetic fragments: "Our experience, which embraces only a small period of eternity, does not notice a change that can be the embryo of the end of our world. And yet it is absolutely certain that, despite our sine and cosine series, which can be used to represent the elements of the planetary paths, the formerly large distance of the planets and hence the time of their revolution will decrease owing to the stopping ether action, and that finally they will all fall into that womb from which they emerged countless ages ago. In all-cremating funerals, the old world will be restored to a new life..." [12, p. 38].

In those lines, we hear the voice of a scientist and, at the same time, an interpreter of the Holy Scripture, who dedicated his book about new and variable stars to Panteleimon Kulish, his colleague with whom they made the first complete translation of the Bible into Ukrainian (see, e.g., [15]).

### 3. First Physical Articles in the Transactions of the Mathematical, Naturalistic, and Medical Section of the Shevchenko Scientific Society and Their Authors

In the 4th volume of *NShSS* (1894), there appeared the first article in Ukrainian on higher mathematics entitled "On symmetric expressions from the mod-m function". Its author Volodymyr Levytskyi (1872–1956) only finished the course at Lviv University at that time. In 1901, he defended his doctorate and obtained a scholarship for an internship in Germany. Here he listened to lectures by the famous Felix Klein and David Hilbert (the both were later elected foreign members of the ShSS or, more precisely, "the members of other nationalities" because the Society did not associate itself with the Ukrainian state due to the lack of the latter). But at home, under the conditions of Polish political domination in Galicia, he remained an ordinary gymnasium teacher of physics and mathematics.

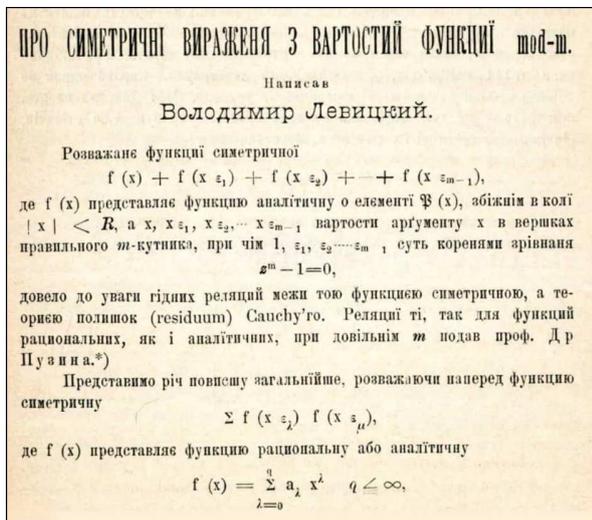
In mathematics and physics, V. Levytskyi actually burdened himself with a task comparable with that fulfilled in humanities by M. Hrushevsky and I. Franko: to demonstrate to the world (and to themselves) that the Ukrainians do exist, and their language can be a tool for scientific research in all domains of knowledge. Today, we can only wonder at the courage of a student who dared to write an article on higher mathematics in Ukrainian. After all, the *NShSS* editors did not submit it for publication for about a year because they were not sure whether this article would have at least one reader. However, as subsequent events showed, this article became an important breakthrough for the Ukrainian language into a realm that earlier had been forcibly closed to it.

Simultaneously the young mathematician began a huge terminological work. Already in issue 3 of volume 11 of *NShSS* (1896), he published "Materials for physical terminology. Part 1. Mechanics". Actually, this was the first Ukrainian-German terminological dictionary on 12 pages. No less important contribution was made by V. Levytskyi to the creation of the Ukrainian mathematical, astronomical, and chemical terminology.

In 1897, the growth in the number of non-humanitarian articles prompted the leadership of the ShSS to start publishing the separate *Zbirnyk Matematychno-*



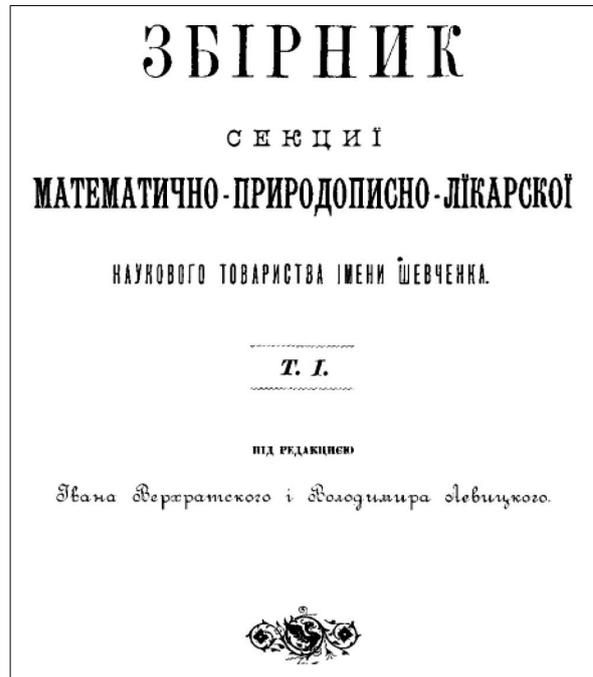
Volodymyr Levytskyi in his youth



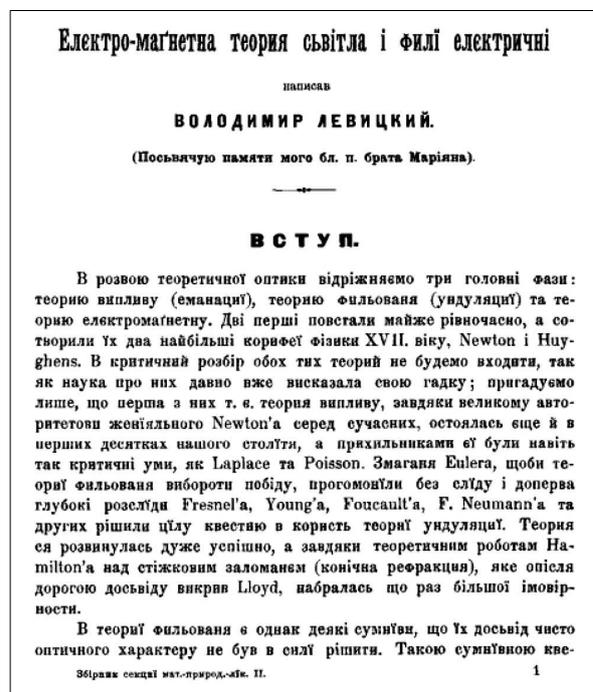
The first article on higher mathematics in Ukrainian (1894)

*Pryrodopysno-Likarskoi Sektii ShSS (Transactions of the Mathematical, Naturalistic, and Medical Section (MNMS) of the Shevchenko Scientific Society)*, whereas the *NShSS* became a purely humanitarian publication since then. The formal co-editors of the first volume of *Transactions* were Ivan Verkhratskyi (the first head of the MNMS, naturalist, and folklorist) and Volodymyr Levytskyi. However, in fact, for more than 40 years this edition was the brainchild of V. Levytskyi, who had been the head of the MNMS since 1909, and also the head of the entire ShSS in 1932–1935 [4, 5].

Already in volume II of *Transactions* (1897), there appeared the first article in Ukrainian on physics [16] (strictly speaking, the first article was the already mentioned work of I. Pulyui [10]). Its author



The first volume of the *Transactions of the Mathematical, Naturalistic, and Medical Section of the Shevchenko Scientific Society* (1897)



The first article on physics in Ukrainian published by the ShSS (1897)

## МАТЕРІАЛИ ДО ФІЗИЧНОЇ ТЕРМІНОЛОГІЇ

ЧАСТЬ ДРУГА.

(Механіка течій, газів, тепло і метеорологія).

Зладив Володимир Левицький.\*)

Абсорбція Absorption	батометр Bathometer
алькогольметр (мір) Alkoholo-meter	бароскоп Baroscop
анемометр (вітромір) Anemometer	бальон воздушний Luftballon
анемограф Anemograph	б'яна Герона Heronsball
ареометр Areometer	бігуна земляна Kältepol
обометр Volumeter	болона Membrane
гуетомір Densimeter	б'янка воздушна Luftblase
адсорбція adsorption	бура Gewitter
аеростат Aërostat	" доокружна Wirbelsturm
аліаж Legirung	Вага гідростатична hydrostatische Wage
анероїд Aneroid	відбиване Reflexion
атмосфера Atmosphäre	вихровиця Sturm
атмосферний atmosphärisch	вітер Wind
Барометр Barometer	вітряка Windbüchse
" баньчастий (баньковий) Gefäßbarometer	водотріск Springbrunnen
барометр ліваровий Heberbarometer	водопровід Wasserleitung
барометр грушковий Phiolenbarometer	волосність Capillarität
барометр пишучий Zeigerbarometer	волосна рурка Capillarrohr
барограф Barograph	" стала Capillarconstante
	перства Schichte
	взгін Auftrieb
	відосередник (при машині паровій) Centrifugalregulator
	випускане Emission

\*) Пор. Завісая Наук. Тов. ім. Шевченка т. XI.

Ukrainian-German terminological dictionary of physics (1898)

## ТЕОРИЯ ПЕРСТЕНЯ САТУРНА.

НАПИСАВ

Володимир Левицький.

—\*—\*—

1. Одною з найцікавіших пров в нашій системі сонячній є безперечно планета Сатурн. Величезна ся планета, віддалена від сонця в перигелію 1345 мільонів, а в афелію 1504 мільонів кілометрів, є по Юпітері найбільшим тілом нашої системи; її промір рівняковий вносить 119.300, а промір, що лучить оба бігуна 106.000 кілометрів. Поверхня Сатурна є проте яквх 80, а об'єм яквх 730 разів більший, як відповідні елементи Землі. Її маса є 92 рази більша від маси Землі, а се густина є ледяя  $\frac{1}{8}$ -ою густоти земскої, або 0,7, наколи гуетоту води положимо = 1. Її обіг сидеричний докола сонця триває 29 днів 16 год 23 години 40 минут, а се оборот докола оїх триває лиш 10<sup>h</sup> 29<sup>m</sup> 17<sup>s</sup>. — Докола него кружить аж вісім місяців; з них найбільший Тітан, відкритий ще в р. 1655 через Huyghens'a, найменший Гіперіон, відкритий доперва в р. 1848 через Bond'a і Lassell'a.

Но найважнішою та найбільше інтересною прикметою Сатурна, якої ніяке друге зі знавих тіл небесних не має, є великий перстень, а зглядно систем перстенів, який уносить ся зовсім свободно в площі рівняковій планети. Вже Galilei постеріг в р. 1612 через лювету, яку що йно винайдено, що Сатурн має вид еліптичний або овалний і думав, що ся планета складає ся з трох злучених з собою тіл<sup>1)</sup>; два з них після его гадки були місяцями.

1) Пор. пр. Littrow: Wunder des Himmels, ст. 484.

The first article in Ukrainian on astronomy (1901)

was V. Levytskyi himself, and it was a comprehensive (more than 70 pages) review of the development of electrodynamics during the last decades of the 19th century. It was written so completely and qualitatively that it can still serve as a good textbook on classical Maxwell's electrodynamics. Everybody can verify this because now this text was digitized and placed, together with most of other articles in *Transactions*, on the website of the Vasyl Stefanyk National Scientific Library of Ukraine in Lviv [17].

It is interesting that, in the Ukrainian text, Levytskyi gave all names of foreign scientists in Latin alphabet, as they are written in the original languages (Newton, Laplace, Poisson, Maxwell, and so forth). Perhaps such a spelling should be followed even today; this would allow avoiding confusion with the pronunciation of foreign names. For example, not all our colleagues know that the last letters "t" in the name and surname of the French Nobel laureate Albert Fert are "mute", and in Ukrainian they write Альберт Ферт instead of the phonetically correct Альбер Фер. Another example is the application of the Russian spelling of the surnames such as Einstein, Euler, Heisenberg, and others.

In issue 2 of volume 3 of *Transactions* (1898), V. Levytskyi continued to publish his terminological materials; this case, concerning the mechanics of liquids and gases, and the kinetic theory of heat [18]. As one can see from figure, most of the terms proposed by him are in use until now. Some of the non-accepted variants (for example, *волосна рурка* (volosna rurka – hair tube), i.e., *capillary*) had the right to live because they adequately reproduced in Ukrainian the Latin root of the international term.

In issue 2 of volume 7 of *Transactions* (1901), V. Levytskyi also published the first article in Ukrainian on astronomy (more precisely, on celestial mechanics) [19]. It was a review of works on the theory of the stability of Saturn's rings. Thus, the scientist occupies an absolutely unique place in the history of our science. He is the creator of Ukrainian-language higher mathematics, physics, and astronomy simultaneously. The enthusiasm with which the scientist worked to create the Ukrainian-language science is amazing. When there was a lack of other workers, he, like Hrushevsky and Franko, carried out the work of a whole institution. In particular, issue 2 of volume 4 of *Transactions* (1899) included only four articles of V. Levytskyi himself. At the same time, the scientist

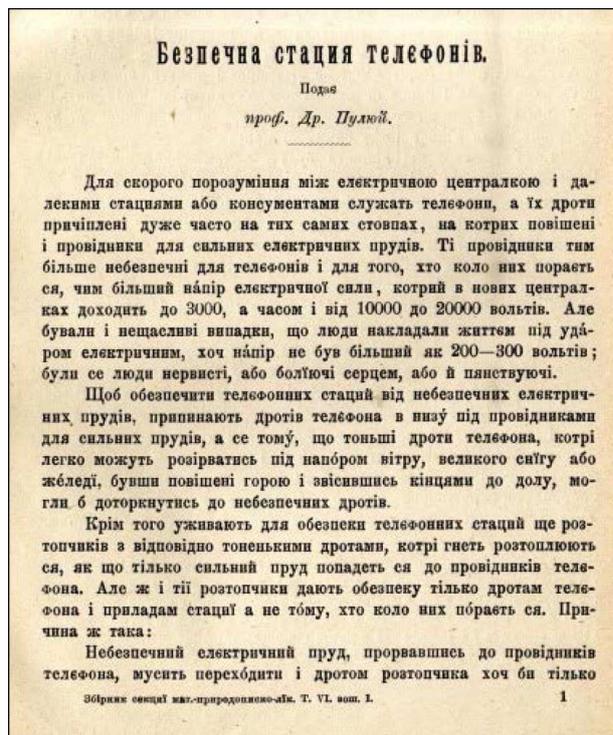
cannot be accused of “provincial arrogance”; he also published his works in Polish, German, French, English, and Spanish. At least in the international mathematic community, he was recognized as a specialist [3]. It is worth mentioning that V. Levytskyi was also the author of the first physics textbook for senior gymnasium classes [20]. Basing on the thoroughness of the material presentation, modern researchers of the history of physics classify it as closer to a university textbook (see, e.g., [21]).

As time went by, the number of authors who wrote articles on physics and other related fields of science and engineering in Ukrainian to *Transactions* increased. In particular, Ivan Pulyui continued to publish here the series of papers on electrical engineering. In issue 1 of volume 6 of *Transactions* (1900), he published an article about a telephone station that is safe from the viewpoint of the electric shock possibility [22]. Five years later, in volume 10, he published two more papers about the then advanced power plant in Krumlov (now Czech Republic) and the circular diagram of generators for alternating currents [23, 24]. At the time of their publication, those articles were extremely relevant. Today we can only regret that the scientist did not prepare and publish a detailed chronological description of the events related to the discovery of X-rays, which he himself called “Röntgen rays” for the first time (see [7]).

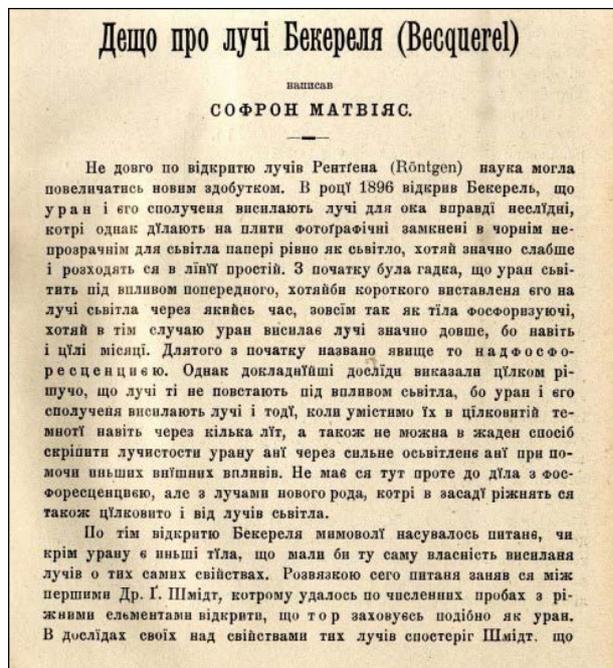
*Transactions* did not bypass other challenging physical problems of that time as well. In issue 1 of volume 7 (1900) and issue 2 of volume 8 (1902), the Ternopil gymnasium teacher (in then Galicia, they were called “professor”) Sofron Matvias published two articles where he reviewed the works of Antoine Becquerel, Pierre Curie, and Maria Sklodowska-Curie dealing with the newly discovered radioactivity. It is of interest that S. Matvias was not listed among the full members of the MNMS of the ShSS. Therefore, a wider “circle” of people interested in physics began to form around the “core”.

#### 4. *Transactions of MNMS as a Place for Publishing Original Works on Physics*

Attention is attracted by the fact that all the above-mentioned articles (except for the works by V. Levytskyi on mathematics and I. Pulyui on electrical engineering) were the reviews of the results obtained by other people, although relevant to the state of science at that time. The reasons are clear: the ShSS



Article by I. Pulyui on electrical engineering (1900)



The first article in Ukrainian on radioactivity (1900)



Roman Tsegelskyi

received minimal support from the imperial government in Vienna and from the regional government of Galicia controlled by the Poles. The Society did not have its own scientific institutions, and the then authors of *Transactions* worked mostly as gymnasium teachers. But the situation slowly changed, and there appeared articles with the results of original studies (a detailed review of the masterpiece of their authors and the bibliography of those articles can be found in [25]).

In particular, after the publication of an extremely thorough review “Fundamentals of electronics” devoted to gas-discharge phenomena and radioactivity in volume 13 of *Transactions* (1909) [26], its author Volodymyr Kucher (1885–1959) published an article (a small monograph according to today’s standards) “Dynamics of electron” [27], which contained a noticeable original component as well. The author of those articles was one of the first Ukrainians who began seriously work in the domains of theoretical electrodynamics and quantum mechanics. After graduating from Lviv University, he was also forced to teach in a gymnasium under both Austria and interwar Poland authorities. Similarly to V. Levytskyi, he combined this teaching with lecturing at the Secret Ukrainian University until this unique and heroic educational institution was ultimately destroyed by Polish authorities in 1925.

V. Kucher is also the author of a number of important original and review articles in *Transactions*, namely, “Electromagnetic theory of radiation pres-

sure” (Vol. 17, 1916), where the theory of light pressure was discussed in detail; “Reasons of the theory of ether structure” (Vols. 18–19, 1919) dealing with electromagnetic waves, which were conventionally considered as disturbances of a hypothetical “light ether”; “Theory of relativity” (Vol. 21, 1922), the first Ukrainian-language review of the special theory of relativity on 64 pages; “Thermoelectric issues in currents” (Vols. 23–24, 1925), the first Ukrainian-language work on thermoelectricity; and “Oscillations in gases from the viewpoint of the latest quantum theories” and “Main directions in quantum statistical theories” (Vols. 28–29, 1930), in those works, the fundamentals of quantum statistics were expounded in Ukrainian for the first time (see [25] for details).

In 1916, Roman Tsegelskyi (1882–1956), perhaps our most brilliant popularizer of physics during the period between two world wars, made his debut in *Transactions* with the article “From modern experiments on magnetism” [28]. In this 58-page work, not only a review of all then-known dia-, para-, and ferromagnets and their properties was made, but also the then-new theories of paramagnetism by Langevin and ferromagnetism by Weiss were presented in detail.

R. Tsegelskyi belonged to a family that gave Ukraine several famous figures in various fields. After entering Lviv University, he abandoned his education as a protest against the Polish domination. That is why he graduated from Chernivtsi University and, in 1911, received a doctorate there. After the occupation of Bukovyna by the Romanians, he returned to Lviv, also lectured at the Secret Ukrainian University, and was the secretary of the ShSS for 12 years. During the Soviet times, he was exiled to Kazakhstan, but in 1954 he was rehabilitated and returned to the position of professor at the Lviv Pedagogical Institute. Unfortunately, he worked there for a very short time.

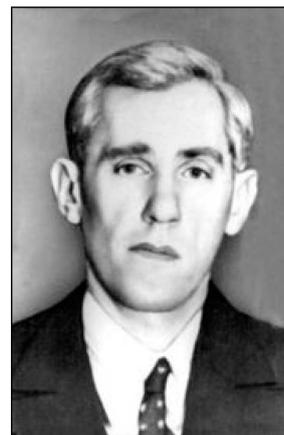
In his next article “On the experiments of Dr. Irena Parankevych concerning the elementary electricity quantum and photophoresis” (Vol. 21, 1922), the scientist described the works that the researcher, a native Ukrainian, carried out at the University of Vienna simultaneously with Robert Milliken’s experiments, which are well-known today in the history of science and where the value of the electron charge was determined for the first time. R. Tsegelskyi is also the author of a large and important review article “Dr. Ivan Pulyui as a scientific researcher” [29], which was published on the tenth anniversary of the

death of the prominent Ukrainian. This work became a prologue to a large body of literature devoted to I. Pulyui's place in science.

Roman Tsegelsky was endowed with a rare gift of telling interesting stories about physics to non-physicists. In Volume 31 (1937), he published an extensive article "Physical problems of today" [30], where a review was made of both experimental results from the discovery of radioactivity to the detection of cosmic rays and the most important stages of constructing a new quantum theory. He also willingly published similar articles in *Literaturno-Naukovyi Vistnyk* (*Literary-Scientific Bulletin*), the most influential magazine among the intellectual and patriotic Galicians at the time (where, therefore, physical terms and formulas also appeared occasionally; see [25]).

It is important that before the early 1930s, when the national revival in Soviet Ukraine became "shot", scientists from the "mainland", especially those who obtained the status of full/foreign members of the ShSS, readily published their works in the Lviv *Transactions*. Among them were the mathematicians Mykola Krylov, Mykhailo Kravchuk, and Dmytro Grave. The latter published the article "Electromagnetic forces in the solar system" in Ukrainian in volume 23–24 (1925). The article descriptively, without formulas, described the problem dealing with the resistance of space permeated by electromagnetic fields to the motion of celestial bodies and the sunspots as sources of those fields. Twelve years later, as is known, the realities of Stalin's USSR separated Dmytro Grave and his student Mykhailo Kravchuk on different sides of the tragic rift between the survivors and the repressed...

Another interesting regular author of *Transactions* in those years was Ivan Feshchenko-Chopivskyi (1884–1952). In Vols. 25 and 26 (1926, 1927), he published a large article "Cementing of iron and steel with boron and beryllium", where the most important ideas of his doctoral dissertation defended during this time period at the Mining Academy in Krakow were expounded. The scientist was born in Chudniv (the Zhytomyr Region) in a noble family. He graduated from the Kyiv Polytechnic University, did an internship abroad, and the prospects of an excellent professional career opened up before him. But the year 1917 came, and the successful metallurgist plunged into the maelstrom of the Ukrainian liberation struggle. He worked as a minister and vice-prime minister in several governments of the Ukrainian People's Re-



Ivan Feshchenko-Chopivskyi

public, and already being in exile in Tarnów, on behalf of Simon Petlyura, he headed the Republic Council.

In the interwar Poland, the scientist returned to his professional career. He creates a department of metallurgy in Krakow, published articles in the best European editions, but did not forget about the Lviv *Transactions*, where his works written in Ukrainian—"What should be understood as controlled metallurgy?" (Vol. 32, issue 1, 1938), as well as "Modern steel hardening and two-verst bath" and "Novel magnets" (Vol. 32, issue 2, 1939). In the spring of 1945, the scientist was arrested in Katowice by the NKVD, and he was sent to Kyiv, where he was sentenced to exile in the northern Republic of Komi. Here he died in the Abex concentration camp...

In *Transactions* of the interwar period, there also appeared articles based on the results of original studies carried out directly in Lviv. Among them, we should mention the work by Mykhailo Pavliv from the Lviv Polytechnic "On the absorption of gases during electric discharges" (Vol. 26, 1927)<sup>1</sup>; the article by Zenon Khraplyvyi (1904–1983), the full member of the ShSS, "Basic concepts of electrodynamics and the unitary field theory" (vol. 31, 1937), where it was shown how the Born–Infeld theory correlates with

<sup>1</sup> According to available data (see [31, p. 117]), on April 13, 1929, M. Pavliv was elected a full member of the ShSS. But already in 1939, Kharkiv was indicated as a place of his residence. So he may probably belong to the people of Galicia who had believed in Soviet propaganda and moved to the UkrSSR. Almost all of them became victims of repression. Nevertheless, M. Pavliv is not mentioned in [25] among 21 physicists-full members of the ShSS.

the Maxwell–Lorentz theory<sup>2</sup>; and the astronomical work by O. Montsibovych “Elements of the star SU Cygni” devoted to the behavior of this variable star (Vol. 31, 1937)<sup>3</sup>.

The Galicians who worked at the leading scientific centers of Europe at that time also published their articles in *Transactions*. Attention is attracted by a Ukrainian-language article written by Oleksandr Smakula (1900–1983) [32]. Its author, after graduating the Ternopil gymnasium (by that time, he already had experience of fighting in the ranks of the Ukrainian Galician Army during the War for National Liberation in 1918–1921), graduated from the famous Göttingen University, where he worked as Robert Paul’s assistant at the time of writing the indicated article. In 1934, the scientist became the head of the research laboratory of the Carl Zeiss company in Jena, where he became famous for inventing the method of blooming optical systems. Since 1945, he worked in the USA in the field of materials science and solid-state electronics, where he also made a very important masterpiece.

The article by Ostap Stasiv (1903–1985) “Mechanism of electricity transfer in non-conductors” [33] also deserves attention. When writing it (in 1937), he also was in Göttingen. This article dealt with ionic and impurity conductivity in insulators and semiconductors, in particular, in “then-popular” cuprous oxide. In the future, O. Stasiv became a world-famous scientist, the founder and director of the Institute of Crystal Physics in Berlin, the founder of the international journal “Physica Status Solidi” (many of physicists from the UkrSSR, who are contemporaries of the author of this essay, began their foreign publications from this journal). But in “People’s Germany”, where he remained after the war, the authoritative scientist was persecuted after his daughter fled to the West to her lover.

The initial purpose of *Transactions* was to publish only articles written in Ukrainian. Some later, the German-language *Reports from the Meetings of the Mathematical-Naturalistic-Medical Section* began to be published in parallel, and 26 volumes of them ap-

<sup>2</sup> After World War II, Z. Khraplyvyi worked in Germany and the USA, where he died [25].

<sup>3</sup> At the beginning of 1939, O. Montsibovych was not indicated in [31] among the full and ordinary members of the ShSS. But the program of the VI meeting of Ukrainian naturalists and physicians (1937) included his report with the same title [5].

peared in total. In the last decade, *Transactions* began to publish articles by scientists, the members of the ShSS, written in other foreign languages (in German and French; the bibliography of all physical and physics-related articles in *Transactions* is given in [25]).

In particular, in volume 30 (1934), Vasyly Milyanchuk (1905–1958), perhaps the brightest theoretician from Lviv within the period “between Smoluchowski and Yukhnovskiyi” and who was an intern of Werner Heisenberg at the Institute of Physics in Leipzig at that time, published in German an article devoted to the sum rule in multi-diplets (although, according to [25], it was he who translated O. Stasiv’s article [33] for the latter to be published in *Transactions* in Ukrainian). Unlike his colleagues, V. Milyanchuk succeeded in making the scientific career in the Soviet Lviv, but his ascension was prevented by an untimely death.

Who knows which language trend would prevail in *Transactions* in the future, but after the release of issue 2 of Volume 32 in 1939, its publication ceased: the “golden September” came and the ShSS together with all other Ukrainian institutions in Galicia was abolished. Instead, the regular authors of *Transactions* V. Levytskyi, V. Kucher, and R. Tsegelskyi, who mostly taught in gymnasiums during the inter-war Poland, got jobs in the “Ukrainized” Lviv universities. But in the post-war years, all of them actually existed in the status of “supervised persons”, similarly to the majority of Lviv intelligentsia, which was then “thinned out” by repressions.

## 5. Kyiv Takes Over the Baton

Since 1918, the Ukrainian Academy of Sciences (UAS) in Kyiv took over the status of the main center of creation of Ukrainian-language science from the ShSS<sup>4</sup>. As is known, among 12 academicians approved by Hetman Pavlo Skoropadskiyi on November

<sup>4</sup> Note that Ukrainian emigrant scientific-educational institutions in Czechoslovakia became important centers of Ukrainian-language scientific publications in the 1920s. They were supported by the Czechoslovakia president Tomáš Garrigue Masaryk (1850–1937), who was a foreign member of the ShSS in the philological section. Periodicals, textbooks, and monographs were published in Ukrainian; for example, see [34], where an attempt was made to review the most recent ideas in physics and chemistry concerning the structure of the matter. But the analysis of those publications is a separate interesting topic and goes beyond the scope of this paper.

14, 1918, and who were the first members of the UAS, there was not a single physicist. Only at the meeting of the UAS in March 1922, Yosyp Kosonogov (1866–1922), an ordinary professor of Kyiv University, was elected a full academician to the physics department by secret ballot. However, he died soon afterward, without starting to implement his plans to create a physics institute. Therefore, physics as a science was almost absent from the first volumes of *Notes of the Physical-Mathematical Department of the UAS* (they were published in Kyiv since 1923), and most of the included articles were published... in French (see [35, p. 116]).

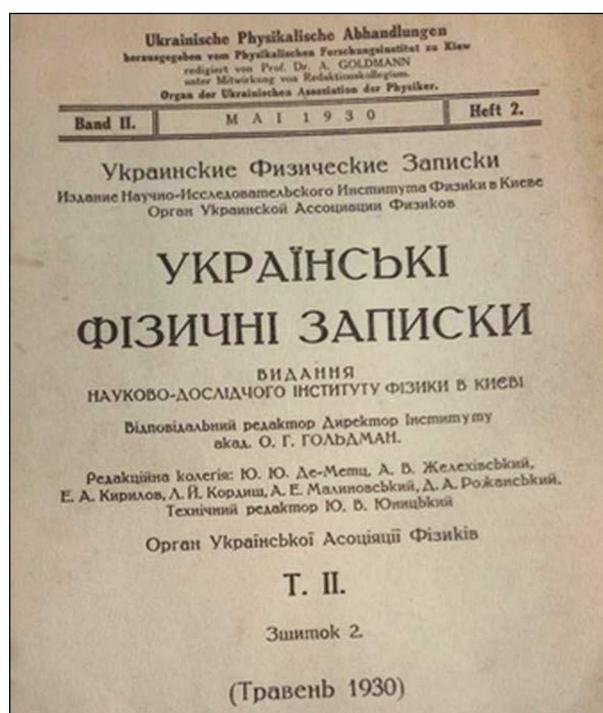
The situation changed when Professor Oleksandr Goldman (1884–1971), who headed the Scientific Research Department of Physics at the Kyiv Polytechnic Institute, managed to establish (in December 1926) the first-in-Ukraine specialized physical journal *Fizychni Zapysky* (*Physical Notes*) (since 1929, *Ukrain-ski Fizychni Zapysky* (*Ukrainian Physical Notes*)), which became a kind of “prologue” to the appearance of the Scientific-Research Institute of Physics of the People’s Commissariat of Education (now the Institute of Physics of the National Academy of Sciences of Ukraine) on January 1, 1929. O. Goldman personally and alone edited the first three issues of Vol. 1 of *Physical Notes* (December 1926, June 1927, and June 1928). But starting from volume 2 (issue 1, December 1928), the journal was published under the supervision of the editor-in-chief (O. Goldman), the editorial board (Y.Yu. De-Metz, A.V. Zhele-hivskiy, E.A. Kyrylov, L.Y. Kordysh, A.E. Maly-novskiy, and D.A. Rozhanskyi), and the technical editor Yu.V. Yumytskyi.

As one can see from the cover, the journal was published as a press organ of the Ukrainian Association of Physicists, the predecessor of the Ukrainian Physical Society revived in 1990. Unfortunately, almost no documents have survived about the activities carried out by the UAP, and even the Google search does not provide any reference to this name.

The history of *Physical Notes* is also little known today. Even on the website of the Institute of Physics of the NASU, in the “History” section, it is said [36], “*The institute had its own printed publication, Ukrainian Physical Notes, which were published from 1929 to 1936*”. Actually, as we have already seen, the journal started to be published in 1926 under the title *Physical Notes*. Under this “neu-



Oleksandr Goldman



Ukrainian Physical Notes (1930)

tral” title, it was also published after 1936<sup>5</sup>. In 1939, the journal published a devastating assessment of the work of the Institute of Physics, which was pre-

<sup>5</sup> In 1936, the All-Ukrainian Academy of Sciences was also renamed. During the days of the “Ukrainization” collapse, this change had to testify to the change of the national status of the academy to the purely territorial one.

pared by a commission headed by the “father of semiconductor science in the USSR” Abram Ioffe (also elected as a foreign member of the ShSS in 1929!) after the arrest of the director of the institute O. Goldman [37].

At that time, O. Goldman, a Jewish by nationality and a Lutheran by faith, had already been in exile as a “Ukrainian bourgeois nationalist”. Because of his arrest, *Physical Notes* had irretrievably lost the opportunity to publish a Nobel-level article. As B. Kyyak and O. Proskura found out when studying the investigative case of O. Goldman [38], before his arrest, the scientist made a report at the seminar of the institute, where the physical principles of the metal-semiconductor contact as a current rectifier were presented. This report was a year in advance of the classic works by Walter Schottky [39] and Neville Mott [40] on the same issue. The article had already been prepared for publication but had not been published: in the USSR, the arrested people were subjected to “civil death” even before the court’s verdict, and their very names could be mentioned only in an abusive context.

*Physical Notes* ultimately ceased to be published during the German-Soviet war. After the war, irregular Russian-language *Proceedings of the Institute of Physics of the Academy of Sciences of the Ukrainian SSR* appeared, which reflected the social trends of that time. But even in those years, the Ukrainian language did not disappear completely from physics. In 1949, the Kyiv University published the classic Mykola Bogolyubov’s *Lectures on Quantum Statistics* in Ukrainian [41], and those *Lectures* had been read in Ukrainian for many years far beyond Ukraine. Transactions of some universities and *Dopovidni Akademii Nauk URSS (Reports of the Academy of Sciences of the UkrSSR)* were also published in Ukrainian.

In 1956, on the initiative of academician Vadym Lashkaryov, a disciple of O. Goldman (in the 1930s, he also was in exile in the North; and in 1941, he published a Nobel-level paper, where the  $p$ - $n$  transition on cuprous oxide found using the thermoprobe method was described for the first time), *Physical Notes* were revived as *Ukrainskyi Fizychnyi Zhurnal (Ukrainian Journal of Physics, UJP)*; see [42] for details. Hence, in 2026, we will have every reason to celebrate the centenary of the foundation and the 70th anniversary of the restoration of *UJP*.

Until 1965, *UJP* was published only in Ukrainian (with extended summaries in English and Russian). Then, “for the convenience of readers from other republics,” a parallel Russian version was launched. At the end of 1976, the Ukrainian version was eliminated “as unnecessary”<sup>6</sup>.

In the 1980s, Ukrainian-language physics seemed to come to an end. Almost no monographs and university textbooks in Ukrainian were published. A restricted number of papers on physics could be found only in the Ukrainian version of the *Reports of the Academy of Sciences of the UkrSSR* [3], which was also on the verge of closing “as unnecessary”, and in the broad-scope journal *Visnyk AN URSS (Bulletin of the Academy of Sciences of the UkrSSR)*<sup>7</sup>.

In his resonant work “Do we realize national culture as a whole?”, which was written in 1988, the prominent Ukrainian culturologist Ivan Dzyuba, a political prisoner in the past and academician of the NASU and Minister of Culture of independent Ukraine in the future, stated: “*Not so long ago, the Ukrainian Academy of Sciences, which was born on the wave of a powerful cultural rise of the nation, was a brain center and the general headquarters of the national Ukrainian culture, and its leaders – from Vernadskyi to Bogomolets – not only felt their personal involvement in Ukrainian culture, but were also generators of ideas concerning its development; they personified national cultural self-awareness. Nowadays, the Academy has lost this rightful role and has not even noticed it. Today, we are happy at least when some non-humanitarian scientists, so to speak, at their own risk demonstrate interest to the destiny of national Ukrainian culture and Ukrainian language, as it was done, for example, by the famous biochemist*

<sup>6</sup> Something similar happened then to all other scientific and technical journals of the Academy of Sciences of the Ukrainian SSR. Only *Ukrainian Botanical Journal* somehow avoided russification.

<sup>7</sup> In 1986, the author published his first professional article in Ukrainian in this journal, and he feared that it might turn out to be his last one because just at that time, the editor-in-chief of the journal, Borys Paton, sent letters to academicians where he asked them to express their opinion on whether it would be advantageous to make this edition Russian-language “in order to increase its efficiency”. Such a letter was also received by my grandfather, biochemist and academician, Maksym Gulyi.

*M.F. Gulyi when taking part in the discussion held by the magazine “Prapor” about the national and international” [43]<sup>8</sup>.*

But the situation was changed owing to rapid processes of national revival on the wave of the announced “perestroika”. Already in the fall of 1988, the editorial board of the Academy of Sciences of the Ukrainian SSR allowed all the journals of the academy to accept articles in the Ukrainian language as well and publish them also in Ukrainian. The first such articles appeared in *UJP* in the following year (1989). At first, they were sole against the Russian-language background. But in the mid-1990s, on the initiative of the then editor-in-chief academician Oleksiy Sytenko and the executive secretary Ivan Ukrainskiy (1943–1997; the author had the opportunity to work side by side with him in the Kyiv City Council of the first democratic convocation), the journal again became Ukrainian-language.

## 6. Ukrainian Language in Modern Physics; What’s Next?

But Ukrainian science has already rapidly integrated into world science, so life itself dictated the necessity of the appearance of the English-language version of *UJP* in 2004. As a result, the existence of the Ukrainian version was endangered again. The utilitarian benefit of the latter seemed non-obvious to many, and the publication funds were always strictly limited.

Therefore, let us try to think: Why do we need physics articles in Ukrainian today? The answer is simple: first of all, in order for this language to remain fully structured, for the new Ukrainian terminology to appear in time, and for the Ukrainian language to be a reliable tool both when obtaining specialized higher education at a high-quality level and when carrying out effective scientific research (it is difficult to imagine a time when exclusively the English language will be heard in our auditoriums and laboratories, as

<sup>8</sup> The matter concerns a conversation between the author M. Strikha and his grandfather academician M. Gulyi. It was published under the neutral title “To the sources of spirituality” in the Kharkiv “thick” literary magazine *Prapor* (1987, No. 9, pp. 158–168). Perhaps, it was the first publication in the period of early “perestroika”, where the issue of the Ukrainian language functioning in natural sciences was raised (very cautiously). Afterward, there appeared other articles on this topic; see, e.g., [3].

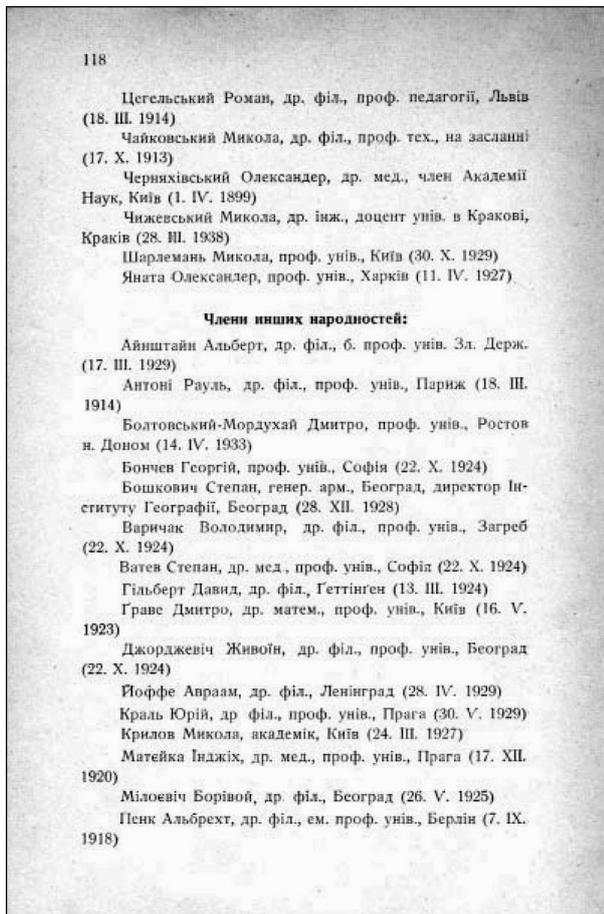
almost exclusively the Russian language did not so long ago).

Many specialized textbooks are published in the Ukrainian language today. Among them, there are impeccable ones, not only by their content, but also by scientific language. For instance, this is the fundamental *Quantum Mechanics* by Ivan Vakarchuk, the 4th edition of which was published in 2012 [44]. Some more examples of high-level publications can also be pointed to.

But the terminology used in most of our other textbooks is far from being always perfect. For example, as an equivalent of the English term “quantum dot”, the calque *квантова точка* (*kvantova tochka*, i.e., quantum point) from the Russian term *квантовая точка* (*kvantovaya tochka*) is still mostly used. But such a term immediately misleads about the very essence of the subject because a “dot” is not a “point”, and the matter concerns an object that has small but finite dimensions and includes thousands of atoms. It is not for nothing that the fundamental dictionary of the scientific language [45], which is recommended for application by the Bureau of the Physics and Astronomy Department of the NASU, offers the Ukrainian counterpart *квантова цятка* (*kvantova tsiatka* – quantum spot). But its introduction into active circulation would be possible, first of all, through professional journals (in addition, their editors should monitor the language of the accepted articles).

However, there is a critical lack of such journals. There still exists the possibility of publishing works on physics in Ukrainian (in *UJP*, *Reports*, and *Bulletin*, as well as in a number of specialized university editions, although their number permanently decreases: even the Lviv *Zhurnal Fizychnykh Doslidzhen* (*Journal of Physical Studies*) de facto became English-language, with a very small number of Ukrainian inclusions). However, the careful work of the editorial staff on correcting the scientific language is practically absent everywhere. And if today’s trend continues, the areal of Ukrainian-language physics may collapse in the foreseeable future.

Meanwhile, our more prosperous western neighbors, the Poles, publish in English series A and B of their main physical journal *Acta Physica Polonica*; simultaneously they publish (through the Polish Physical Society) the Polish language quarterly *Postępy fizyki*, which contains articles on current topics in gen-



The list of foreign members of the ShSS in the last (74) volume of the *Chronicles of the ShSS* published in 1939 before the liquidation of the Society. The first in the list is A. Einstein

eral physics that are aimed at a wide audience and whose purpose is, in particular, “the stabilization and unification of Polish physical terminology” [46].

A similar attempt was made in Ukraine. In 2004, it was decided to publish in parallel the English-language *UJP* and the Ukrainian-language quarterly *UJP Reviews*. However, despite the absolute necessity of such a general-physics review journal (and its popularity among students and university lecturers), due to a number of reasons (among them should be mentioned unsuccessful management and the absence of a clearly defined separate legal status; the latter remained an inexplicable appendage for the editorial office of *UJP*), the quarterly almost immediately turned into an annual, and was stopped at volume 13 in 2018.

138

Surely, writing articles in Ukrainian today is in a certain aspect even more difficult than when Volodymyr Levytskyi, Oleksandr Goldman, or Mykola Bogolyubov did it under politically much less favorable circumstances. It is so because at that time scientists were not supervised by scientometrics with its pragmatic slogan “Every publication must have the maximum citation index.”

Nevertheless, it is necessary to write scientific articles in Ukrainian, at least sometimes, because it is illogical to destroy today what the authors of *Transactions* and *Physical Notes* laid down decades ago. Perhaps, this argument was shared by the editorial board of *UJP* headed by the current editor-in-chief, President of the NASU, Anatolii Zagorodnii when, at the beginning of the military year 2023, they decided to continue publishing the parallel Ukrainian version of the journal.

Unfortunately, there is another practice that is unfavorable for the future of the Ukrainian language in *UJP*. About half of the Ukrainian authors whose English-language articles were rejected by Western journals submit them to *UJP*, but they are too lazy to add also their Ukrainian translation. As a result, the article is published only in English in both versions of the journal, which discredits the very idea of preserving a separate Ukrainian-language edition. The situation is similar in other physical editions that publish two parallel versions, for example, the journal *Fizyka i Khimiya Tverdogo Tila (Physics and Chemistry of Solid State)* of Vasyl Stefanyk Precarpathian National University.

Therefore, in view of the objective need for English-language publications and the inevitable further washing out of the Ukrainian language from those journals that cannot afford two parallel versions (as happened with the above-mentioned *Journal of Physical Studies*), it is time to develop a flexible nationwide strategy of preserving at least a network of high-quality basic broad-profile editions that would publish Ukrainian-language articles (oriented, in particular, at students and lecturers of higher education institutions) in all basic branches of natural sciences. Such a strategy could be developed by the NASU in cooperation with leading universities and public scientific organizations. The coordination of terminological work remains to be a separate important task. The absence of its solution will make impossible, in particular, the emergence

of high-quality university textbooks in modern fields of knowledge.

Finally, for objective reasons, the ShSS editions did not publish original articles on physics of the Nobel or near-Nobel level. But the Mathematical-Naturalistic-Medical Section of the ShSS fulfilled an extremely important mission and laid the groundwork for the appearance of the results of this level and affiliated just with Ukraine. So, when Albert Einstein and Max von Planck gratefully accepted their election as foreign members of the ShSS, this also reminded the scientific world community that Ukraine, which was absent from political maps at that time, did exist, at least as a latent possibility [25].

Therefore, under more favorable circumstances, it would be good in the future to publish some of those physical articles from *Transactions* that still retain their cognitive and methodological value. It is worth starting from the very first of such articles, with a review of classical electrodynamics made by Volodymyr Levytskyi 126 years ago. In so doing, for the convenience of readers, the language of the articles should be edited according to modern lexicology and rules, for example, by replacing the Polonisms *фалля* (*falya*) and *пруд* (*prud*) by *хвиля* (*khvylya*, i.e. wave) and *струм* (*strum*, i.e., current), respectively. Those who are interested in the history of our scientific language can also find digitized originals.

When speaking on December 9, 2023 at the Session of the General meeting of the NASU, which was dedicated to the 150th anniversary of the NASU, academician I. Mryglod reasonably remarked [47], “*The words of the famous Louis Pasteur ‘Science has no homeland’, which are often cited to prove that it is enough to restrict physics to English, actually have the continuation ‘Science has to be the highest personification of the motherland.’*” So, let us remember that the authors of the *Transactions of the MNMS of the ShSS* in Lviv and *Ukrainian Physical Notes* in Kyiv really did a scientific and civil feat, which must not be forgotten by descendants. Our contemporaries also must not avoid the started-by-them practice of printing physical works in Ukrainian.

1. *The Oxford Handbook of the History of Physics*. Edited by J.Z. Buchwald, R. Fox (Oxford University Press, 2013).
2. M. Strihka. *Ukrainian Translation and Interpreters: Between Literature and Nation Building* (Dukh i Litera, 2020) (in Ukrainian).

3. P. Hobzei. Ukrainian mathematical terminology: history of its creation and current state. *Nauka i Kultura* **22**, 268 (1988) (in Ukrainian).
4. *History of the Shevchenko Scientific Society* (Shevchenko Scientific Society, 1949).
5. O. Petruk. Mathematical-naturalistic-medical section of the Shevchenko Scientific Society. *Svitoglyad* No. 5, 34 (2023) (in Ukrainian).
6. I. Pulyui. Apparatus for measuring the phase difference between alternating currents and some measurements made with its help. *Zapysky Naukovogo Tovarystva im. Shevchenka* **3**, 1 (1894) (in Ukrainian).
7. R. Gaida, R. Plyatsko. *Ivan Pulyui. Life and Creation. 2nd edition* (NTSh, 2019) (in Ukrainian).
8. R. Plyatsko. Ivan Pulyui in the Shevchenko Scientific Society. *Svitoglyad* No. 5, 27 (2023) (in Ukrainian).
9. I. Pulyui. *Collection of Works*. Edited by V. Shenderovskiy (Rada, 1996) (in Ukrainian).
10. I. Pulyui. About a radiometer or a light mill. *Pravda* No. 20, 772 (1877) (in Ukrainian).
11. J.C. Maxwell. On stresses in rarefied gases arising from inequalities of temperature. *Phil. Trans. Roy. Soc. London* **170**, 231 (1879).
12. I. Pulyui: *Life in the Name of Science and Ukraine. Bibliographic index. Compiled by L. Olenych* (Ivan Pulyui National Technical University of Ternopil, 2010) (in Ukrainian).
13. I. Pulyui. *Unfailing Power* (Shevchenko Scientific Society, 1901) (in Ukrainian).
14. I. Pulyui. *New and Variable Stars* (Shevchenko Scientific Society, 1901) (in Ukrainian).
15. I. Pulyui. *Collection of Works. Vol III. Prayer Book. Psalter. Edited by Prof. V. Shenderovskiy* (Rada, 1997) (in Ukrainian).
16. V. Levytskyi. Electromagnetic theory of light and electric waves. *Zapysky MPLS* **2**, 1 (1897) (in Ukrainian).
17. <https://www.lsl.lviv.ua/index.php/uk/resursi-i-fondi/elektronni-materialy/>.
18. V. Levytskyi. Materials for physical terminology. *Zapysky MPLS* **3**, issue 2, 1 (1898) (in Ukrainian).
19. V. Levytskyi. Theory of Saturn’s ring. *Zapysky MPLS* **7**, issue 2, 1 (1901) (in Ukrainian).
20. V. Levytskyi. *Physics for Senior Classes of Secondary Schools* (Lviv, 1912) (in Ukrainian).
21. Yu.V. Golovach. Physicists, full members of the Shevchenko Scientific Society in Lviv. *Ukr. J. Phys.* No. 3, 468 (1992) (in Ukrainian).
22. I. Pulyui. Safe telephone station. *Zapysky MPLS* **6**, 1 (1900) (in Ukrainian).
23. I. Pulyui. Circular diagram of generators for alternating currents. *Zapysky MPLS* **10**, 1 (1905) (in Ukrainian).
24. I. Pulyui. Hohenfurt electric power station of the G. Spiro company in Krumlov. *Zapysky MPLS* **10**, 1 (1905) (in Ukrainian).

25. Yu. Golovach, Yu. Gonchar, M. Krasnytska. Physics and physicists in the ShSS in Lviv. *J. Phys. Stud.* **22**, 4003 (2018) (in Ukrainian).
26. V. Kucher. Fundamentals of electronics. *Zapysky MPLS* **13**, 1 (1909) (in Ukrainian).
27. V. Kucher. Dynamics of electron. *Zapysky MPLS* **15**, issue 1, 1 (1912) (in Ukrainian).
28. R. Tsegelskyi. From modern experiments on magnetism. *Zapysky MPLS* **17**, 1 (1916) (in Ukrainian).
29. R. Tsegelskyi. Dr. Ivan Pulyuy as a scientific researcher. *Zapysky MPLS* **27**, 1 (1928) (in Ukrainian).
30. R. Tsegelskyi. Physical problems of the last time. *Zapysky MPLS* **31**, 99 (1937) (in Ukrainian).
31. *Chronicle of the Shevchenko Scientific Society in Lviv. Part 74* (Lviv, 1939) (in Ukrainian).
32. O. Smakula. Measurement of the specific resistance of liquid air. *Zapysky MPLS* **26**, 77 (1927) (in Ukrainian).
33. O. Stasiv. The mechanism of electricity transfer in non-conductors. *Zapysky MPLS* **31**, 68 (1937) (in Ukrainian).
34. M. Galagan. *Atomistic-Molecular Theory. Essay on the Evolution of Scientific Views Concerning the Fine Structure of Matter* (Ukrainian Public Publishing Fund, 1925) (in Ukrainian).
35. *Systematic Catalog of Publications of All-Ukrainian Academy of Sciences. 1918–1929* (Kyiv, 1930) (in Ukrainian).
36. <http://www.iop.kiev.ua/ua/history/>.
37. Chronicle. Resolution of the session and physical group of the Academy of Sciences of the USSR on the work of the Institute of Physics of the Academy of Sciences of the Ukrainian SSR. *Fiz. Zapys.* **7**, 337 (1939) (in Ukrainian).
38. B. Kyyak, O. Proskura. The fate of academician Oleksandr Goldman. *Z Arkhiv. VChK-GPU-NKVD-KGB* No. 1–2, 253 (1997) (in Ukrainian);
39. W. Schottky. Halbleitertheorie der Sperrschicht. *Naturwissenschaften* **26**, 843 (1938).
40. N.F.Mott. Note on the contact between a metal and an insulator or semiconductor. *Proc. Camb. Philos. Soc.* **34**, 568 (1938).
41. M.M. Bogolyubov. *Lectures on Quantum Statistics* (Radyanska Shkola, 1949) (in Ukrainian).
42. M.V. Strikha. Vadym Yevhenovych Lashkaryov, the outstanding Ukrainian physicist of the 20th century, the discoverer of the  $p-n$  junction in semiconductors (dedicated to the 120th anniversary of his birthday). *Ukr. J. Phys.* **68**, 707 (2023).
43. I. Dzyuba. Do we apprehend the national culture as a whole? *Nauka i Kultura* **22**, 309 (1988) (in Ukrainian).
44. I.O. Vakarchuk. *Quantum mechanics. Textbook. 4th edition* (Ivan Franko National University of Lviv, 2012) (in Ukrainian).
45. O. Kocherga, Ye. Meinarovych. *English-Ukrainian-English Dictionary of Scientific Language (Physics and Related Sciences). Part I. English-Ukrainian* (Nova Knyga, 2010); *Part II. Ukrainian-English* (Nova Knyga, 2010).
46. [https://www.ptf.net.pl/postepy\\_fizyki](https://www.ptf.net.pl/postepy_fizyki).
47. L. Ostrolutska. Science has a homeland. Shevchenko Scientific Society is 150 years old. *Svit* No. 47–48, 4 (2023) (in Ukrainian).

Received 27.12.23.

Translated from Ukrainian by O.I. Voitenko

M.B. Стрїха

#### УКРАЇНСЬКА МОВА Й ФІЗИКА: КОРОТКА ІСТОРИЧНА РЕТРОСПЕКТИВА (ДО 150-РІЧЧЯ НАУКОВОГО ТОВАРИСТВА ІМЕНІ ШЕВЧЕНКА)

Розглянуто історію використання української мови для публікації результатів фізичних досліджень та популяризації фізики. Проаналізовано основні статті з фізики, надруковані українською мовою у 1877–1940 рр. Особливий наголос зроблено на виданнях недержавного Наукового товариства імені Шевченка, яке діяло у Львові в статусі першої національної української академії наук у 1892–1939 рр. Показано, що автори статей у цих виданнях головною своєю метою ставили не так донесення результату до міжнародної спільноти фізиків, як піднесення статусу української мови, офіційно забороненої у 1863 та 1876 рр. у російській імперії, до статусу розвинених європейських мов, забезпечуючи її функціонування в закритих доти для неї царинах. Обговорено перспективи використання української мови для публікації результатів фізичних досліджень та популяризації фізики сьогодні.

*Ключові слова:* фізика, українська мова, Наукове товариство імені Шевченка, Українська Академія наук.