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The first Russian translations of Euclid in Russia

(*If we have a general idea of gradual development of a science,*
it is substantially easier to understand it;
the most complicated components of a science yield easier to substantive
study if we know steps that were taken to arrive at them.
H. Suter)

Abstract. This article is the first part of research devoted to the inception and formation of history of mathematics as a separate science in Russia. Its elements began intensively emerging in the epoch of Peter the Great and underwent several developmental stages. This work outlines five stages that Russian scientists went through while molding elements of studies in the history of mathematics into a science with its own subject, goals, and methods. The purpose of this article is to analyse the first stage, i.e. that of historical and scientific translations. We have chronologically analysed two types of translations in this work (translations of mathematical works of early Greeks and translations of Western European works devoted to the history of mathematics) and briefly looked at translators' personalia, which are relatively unknown in literature devoted to the history of mathematics. This part is devoted to translations and translator's personalities of Euclid's and Archimedes' works.

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Contents

1. Preface. In Russia the history of mathematics began to evolve in the 18^{th} century and, developed by numerous Russian scientists in the course of two centuries, was moulded in the 20^{th} century into a separate science, which had its own subject, goals, and methods. The following stages can be distinguished in the course of its evolution:

- accumulating information on the history of the science by translating works of ancient scientists and western classical authors;
- accumulating biographical and bibliographical materials in works of Russian scientists and teachers;
- forming a tradition in the works of Russian mathematicians to have their mathematical research studies accompanied by detailed journeys into the history of the issue at hand;
- publishing articles and works of Russian authors devoted to the history of various areas of mathematics or its individual issues;
- emerging of national seminal works of general nature in history, philosophy, and methodology of mathematics.

It should be noted that these stages of emergence and development in the history of mathematics in Russia were, for the most part, not separated in time. They went on together, mutually affecting one another. The goal of this article is to analyse the first stage in the evolution of the

history of mathematics in Russia, i.e. the **stage of translating works devoted to the history of the science.**

2. Introduction. It is generally acknowledged that in Europe, the history of mathematics began taking shape as a separate area of research in 1758, when the *History of Mathematics* by Jean-Étienne Montucla (1725–1799) appeared in two volumes. At that time Russia was only beginning to rapidly develop its sciences after the reforms of Peter the Great. Those were mostly natural sciences, closely associated with the country's real-life needs. There were no works of local scientists in the history of mathematics yet. However, interest in this science began to be felt in this particular *age of enlightenment* and consisted in translation of a large number of memoirs of Western authors devoted to the mathematics by ancient scientists, mainly to Euclid's and Archimedes' works.

In his research devoted to Russian translations of The Elements, K.A. Rybnikov wrote that *"... Euclid – "brilliant Clidos" – was first mentioned in manuscripts of the* 17^{th} *century, which date back to the early* 16^{th} *century. However, until the era of Peter the Great, one would not come across a manuscript with a translation of The Elements or any revision thereof."* [8, p. 318][1]

Rapidly growing St. Petersburg quickly became the venue for commercial, military diplomatic, confessional, and scientific contacts with representatives from other empires. There were a lot of various people, including translators, on the staff of the Main Admiralty (founded by Peter I in 1704, built during the reign of Anna Ioannovna in 1734–1738) and Academy of Sciences (founded by order of Peter I in 1724). One of Peter's orders read as follows:

"We badly need translators to translate books, especially art books,... . And art includes: Mathematical art at least to Spherical Triangles, Mechanical, Surgical, Architectural, Civilis, Anatomical, Botanical, Military, Hydraulics, and so on and so forth." (v. [1, p. 215]).

Numerous foreigners who were invited to work for the shipyard, as well as the Academy and University affiliated therewith, could not speak Russian at all or spoke it badly. Therefore, when discussing documents related to opening of the Academy (13 January 1724), Peter I wrote a note in the margin of Schumacher's and Blumentrost's project in his own hand as follows: *"Two more Slavic men must be added, so they could teach Russians more conveniently."* [12, p. 434][2]. Furthermore,

[1] v. Рыбников, К.(1941)

[2] See Островитянов, К.В.(1958)

he clearly understood the difficulties which could arise when scientific literature is translated, and suggested: *"... it should be done as follows well in advance: those who can speak foreign languages and do not know arts, should be sent to learn arts; while those who know arts and do not speak foreign languages, should be sent to learn languages."* [1, p. 215][3].

In pursuance of the country's national needs, special works with utilitarian and practical focus were translated in the first place. We would note some unofficial requirements to translations which formed at that time:

- first, translations did not have to be made from the original;
- second, translations did not have to be accurate; they could be modified (reviewed; cut down; what seemed unimportant could be omitted). Peter I, to a great extent, inspired this: *"Whereas Germans are accustomed to fill their books with a great deal of useless narration to only make believe they are great, therefore ... the treatise should be corrected to blot out everything useless. As an example, find enclosed, so the books are translated the way you will see there – without superfluous narration which only wastes time of the readers and puts them off the studies."* [16, p. 578][4];
- third, translations must be easily understandable: *"write in your own language as distinctly as possible."* [16, p. 529].

In that epoch, when no research in Russian existed and Russian scientific terms only began to appear, it was extremely difficult to translate scientific texts. The Draft Regulations of the Academy provided for one translator in each academic class and recommended that each translator, in addition to Russian, should speak Latin, German, French, or Greek, as *"numerous books circulate in these languages, and all known sciences reside in those books."* [13, p. 113]. At first, those were foreigners. E.g. captured Swedes who knew Russian were used as translators by the Order of Tsar of 23 January 1724. Subsequently, a special learning institution was established. In addition to the Swedes, the institution enrolled everyone who wished to be enrolled – all in all, 30 to 40 men per year. Peter the Great himself, his high-ranking associates and those Russian envoys who had studied abroad did not disregard translations. As for professional Russian translators, almost all of them were graduates of Slavic-Greek-Latin schools and spoke Latin and Greek perfectly.

[3] V. Дриссен-ван хет Реве, Й. (Driessen-van het Reve, Jozien J.) (2015)
[4] See Соловьев, С.М.(1989)

They were often healers, as e.g. Satarov brothers, Maxim and Ivan. Below we sketch some details we managed to find about them.

3. Maxim Petrovich Satarov a son of a physician, graduate of a school of medicine and surgery, which was established by Nicolaas Bidloo, Chief Physician of Moscow General Hospital which was opened at the same time (1707). In 1724, M. Satarov presented his translations of *Antropogenia* and *Thesaurus* by Frederik Ruysch from Latin into Russian to the Academy, having entitled it Catalogue Antropogen and Thesaurus Ruysch. For these translations he was appointed to the position of a translator at the Academy of Sciences – *"because ... he is fully conversant in Latin and Russian and has sufficiently demonstrated his translating skills."* (v. [20, p. 64]). Maxim Satarov translated the anatomic catalogue of Kunstkammer, all medical articles incorporated in the *Summary of Comments from the Academy of Sciences, Part One, for 1726* and article entitled Borealis Aurora by Meyer, Professor of Mathematics, published in the same publication. Moreover, according to E.E. Birzhakova (senior research scientist at the Department of Vocabularies of Linguistic Research Institute at the Russian Academy of Sciences), he was one of the authors of trilingual *"Weismann's Lexicon"* which was prepared in accordance with the instruction of the first President of the Academy of Sciences Lavrenty Lavrentievich Blumentrost. However, she mentioned that the translators of Lexicon *"... being fluent in Latin, did not speak German at all or spoke but poor German."* [20, p. 63–64]

It should be noted that the brothers have been often confounded with each other in bibliographic references. E.g. in an article devoted to translator Gorletsky, a reference reads as follows: *German-Latin and Russian Lexicon: Conjointly with the first elements of the Russian Language boot / Published at the Imperial Academy of Sciences;* [Translated into Russian by I.I. Ilyinsky, **I.P. Satarov**, and I.R. Gorletsky] – St. Petersburg: Gedr. in der Kayserl. Acad. der Wissenschafft en Buchdruckerey, 1731 [21, p. 246]. The same translator was indicated in the Bibliographic Database too [2]. Some authors did not write the initials at all to avoid the confusion: *"From 1726 to 1733, 38 students studied at the University, only seven of them being Russian: Vasily Adodurov, son of a nobleman; Ivan Ilyinsky, academic translator; Denis Nadorzhinsky, son of Catherine I's confessor; Peter Remezov, son of academic secretary; Andrey Gorlenko, son of regimental record clerk; Healer Satarov; and Ivan Magnitsky, son of a teacher of mathematics, who took private Latin lessons from Prof. I.-R. Beketstein"* [14, p. 6]. Maxim Petrovich

is known to have worked at the Academy as a translator for around nine years (from 1724 to 1732) [13, p. 114]. According to V.V. Bobynin, Maxim Satarov was a *"translator at the Academy of Sciences as of 9 May 1724; died on 19 May 1732."* (v. [6, p. 24]).

4. Ivan Petrovich Satarov Less information is available on his brother **Ivan Petrovich Satarov** (??–1749), who was also a physician and a translator. Judging from the fact that people described him as a *"surgeon"*, it may be suggested that he had graduated from Moscow School of Medicine and Surgery as well. In St. Petersburg, I. Satarov was appointed to the Admiralty and served in both positions (translator and surgeon). V.V. Bobynin mentioned interesting details regarding the Satarovs: *"The need to replenish the translator's own knowledge, which quite often arose when translating others, made him* [Maxim Satarov] *attend, together with his brother, public lectures in Anatomy and 'Healing Sciences' delivered by Academician and Professor Duvernois"* [27]. And further, Ivan Satarov *"applied to the Academy of Sciences on 21 June 1732 for a position of a translator to fill the position of his deceased brother Maxim."* [6, p. 24]

Ivan Petrovich might well have been more skillful in colloquial Western European languages such as German, because, in virtue of the nature of his service at the Admiralty, he had to deal with native speakers much more often than his brother Maxim, academic translator who worked basically with Latin publications. It was Ivan Petrovich Satarov who became the author of the first Russian translation of Euclid's *Elements*. However, he did not translate from the original. He had to translate Henry Farquharson's book, where the famous work was edited for length.

5. Andrey Danilovich Farwarson. It was Peter I who invited Henry Farquharson or **Andrey Danilovich Farwarson** (1674–1739) as they used to call him, a Scottish mathematician, to Russia. Russian historians often described him as a famous Scottish professor of mathematics from Aberdeen University, which, as subsequently demonstrated by A.N. Kholodolin, was not consistent with the reality: Henry Farwarson (Farquharson) *"was pretty young when Russian Tsar met him in England in 1699. At that time he was but a starting teacher of mathematics at one of Aberdeen colleges who could hardly imagine to become a professor, especially in this far-off and unknown Russia. However, Peter I, with his amazing insight and ability to assess people, invited Farwarson to work as a teacher of mathematics at Moscow School of Navigation, having offered him a contract with an annual salary of RUB 100, a good apartment free of charge, coverage of his subsistence expenses, and in addition, GBP 50 per each student who would under his leadership successfully graduate from the course of mathematical sciences."* [18]

ЭЛЕМЕНТОВЪ

ЭВКЛІДОВЫХЪ

КНІГА ПЕРВАЯ.

Въ сеи первои книгѣ издаетъ Эвклідъ о углахъ, треуголникахъ, и объ иныхъ фігурахъ прямолинѣйныхъ на паче о параллелограммахъ, и являетъ какимъ образомъ полигоны, или фігуры многоугольные и нерегулярные [то есть неправилныя] къ прямоугольникамъ, или параллелограммамъ, или такожде треуголникамъ, сиречь къ фігурамъ солшезнашнымъ и правилнымъ, переносится могутъ. На конце же книги являетъ преславную ту Пиѳагорову теорему.

ВО ВСЯКОМЪ ТРЕУГОЛНІКѢ ПРЯМОУГОЛНОМЪ, КВАДРАТЪ БОКА КОТОРОИ ПРЯМОМУ УГЛУ ПРОТІВОЛѢЖІТЪ РАВЕНЪ ЕСТЬ ПРОЧЫХЪ ДВУХЪ БОКОВЪ КВАДРАТАМЪ КУПНО.

Figure 1: The Russian translation.

As of 1701, Farwarson worked at "The school of mathematical and navigational, that is, naval cunning arts of learning". This school was housed in Sukharev Tower in Moscow. When a naval academy appeared in St. Petersburg, the school was moved there (1716). First, Farwarson thoroughly selected those foreign publications which could be used as textbooks for future naval officers; participated in editing translations of these books; and thereafter, took up the pen himself to fill gaps in Russian course books. In the year he died, two manuals he had written were published. One of them was of great importance for historians of mathematics. It was *Euclid's elements selected from twelve Newton's books and abbreviated by Professor of*

Mathematics Andrey Farwarson to form eight books translated from Latin into Russian by Surgeon Ivan Satarov" (St. Petersburg, 1739; 284 p., 13 tables).

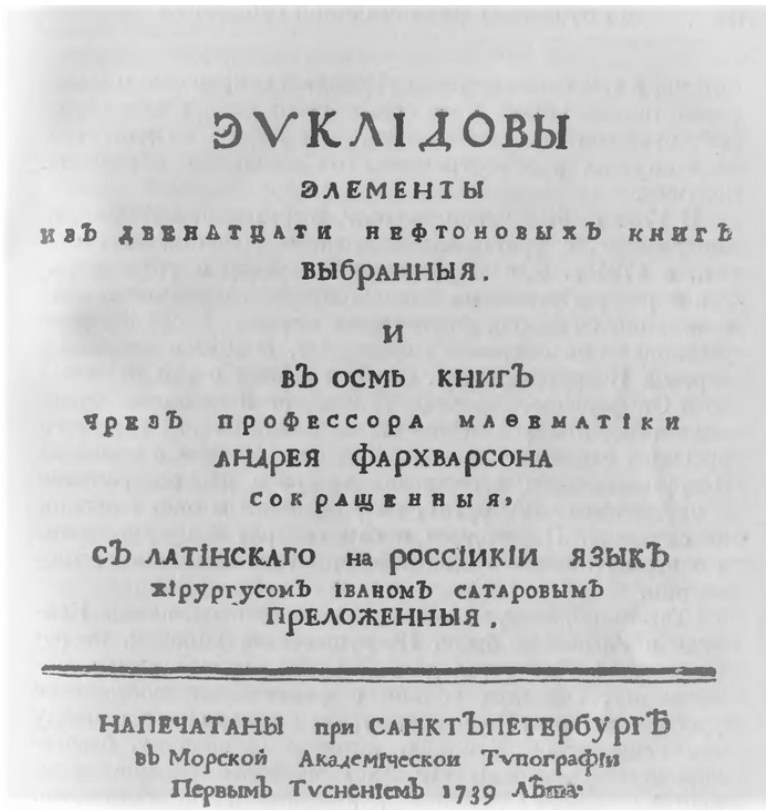

ЭВКЛІДОВЫ
ЭЛЕМЕНТЫ
ИЗЪ ДВЕНАТЦАТИ НЕФТОНОВЫХЪ КНИГЪ
ВЫБРАННЫЯ.
И
ВЪ ОСМЬ КНИГЪ
ЧРЕЗЪ ПРОФЕССОРА МАѲЕМАТІКИ
АНДРЕЯ ФАРХВАРСОНА
СОКРАЩЕННЫЯ,
СЪ ЛАТІНСКАГО НА РОССІЙКІЙ ЯЗЫКЪ
ХІРУРГУСОМЪ ІВАНОМЪ САТАРОВЫМЪ
ПРЕЛОЖЕННЫЯ.
НАПЕЧАТАНЫ при САНКТЪПЕТЕРБУРГѢ
въ Морской Академической Типографіи
Первымъ Тисненіемъ 1739 Лѣта.

Figure 2: Euclid in the translation of A. Farwarson, 1739.

There were a lot of Western publications of Euclid. However, Farwarson singled out the abbreviated French publication of Books I – VI and XI – XII of *The Elements* by **A. Tacquet** and gave an account of this publication in Latin. It should be noted that Farwarson treated this work of Euclid as a textbook in practical mathematics his naval cadets needed badly, not as a historical treasure which was of paramount importance for the development of mathematical science in Russia. [The name of Isaac Newton was taken in vain in the title of the book and had nothing to do with the contents of the book]. *Archimedes' Theorems selected by André Tacquet Jesuit and abbreviated by Georgy Peter Domkiio.* (St. Petersburg, 1745) [G.P. Domcke], translated by the same Ivan Satarov, were a sequel to this book. This way the elements of classical heritage in elementary geometry became available to Russian readers as early as in the first half of the 18^{th} century.

It was not an easy thing for the pioneers to translate into Russian because the epoch of Peter the Great was the last period of Slavic-and-Russian bilin-

gualism, when two very unlike languages – literary Slavic and 'grass-roots' Russian language – had to coexist. According to historian R.M. Soloviev, *"the learned who could speak foreign languages, i.e. translators, got used to the literary language, and colloquial, grass-roots language, seemed to be a language of evil people to them."* [16, p. 529] Translating traditions demanded that rhetorical moves which were uneasy to understand and Slavic forms of speech be consistently used. However, following the prompts of the deceased ruler (*"to avoid high-sounding Slavic words"*), translators endeavoured, as far as possible, to use *"public mediocrity language"*. Incidentally, they were also breaking new ground when they introduced Russian terminology: *"Making a sustained effort and performing the responsible mission of translating foreign scientific books, selecting Russian equivalents to hundreds and thousands scientific terms, they made a tremendous contribution in the creation of the language of Russian science."* [13, p. 114]

According to V.E. Pyrkov, the book translated by I.P. Satarov was not recognized [23] and relatively soon, a new book of Euclid's geometry appeared. That's just where historians disagree. Some of them believe that in 1748 and in 1753 the printing office of the Naval Academy published a newly translated work by Euclid, which was incorporated in the textbook entitled *A Book of Complete Edition on Navigation* (St. Petersburg, 1749–1753) by its author, Admiral R.I. Mordvinov, Academy graduate and an outstanding scientist [23, 37], as a section devoted to geometry. According to other historians, *"in November 1740, Mordvinov presented to the Board of Admiralties three parts of the Complete Edition on Navigation. The Board decided to publish 500 copies. When the book was published, it was entitled 'A Book of Complete Edition on Navigation published by Order of HER IMPERIAL MAJESTY by State Board of Admiralties, printed in the Royal City of St. Petersburg at the printing office of Naval Academy in summer 1744…"* [37]. The bibliography of Mordvinov's works reads as follows: *"Complete Edition on Navigation (4 Parts).* Published in 1744 and 1753; *An Interpretation of Geometry.* Published in 1753."

Nowadays these books are exceedingly rare and sell accordingly (RUB 1,400,000–1,500,000); they bear an indication as follows: *"Books of Complete Edition on Navigation, written in accordance with the Order of Her Imperial Majesty given from the State Board of Admiralty / Maritime Shipping Fleet by Captain Semen Mordvinov. St. Petersburg: At the printing office of Naval Academy; affiliated with the Sea Cadet Corps of Nobility, 1748–1753.*

1. Part 1 Contains geometry, plane trigonometry, and spherical trigonometry.
2. Part 2 Contains sphere, astronomy, and description of the Earth, or cosmography.
3. Part 3 Contains the science of determining distances and time spans between luminaries and main circles; determining width and length of

any place on the Earth; and various tables.

4. Part 4 Contains navigation starting with compass, and loxodromics, and dead reckoning, and ship inclination (...).

The author presented the first three parts of the book about navigation to the Maritime Board in 1740. It was not until 1750 when Captain Mordvinov presented the final Part Four. The Board delegated consideration of this part to Rear Admiral Rimsky-Korsakov and Captain Nagaev, who subsequently reported that was worth publishing. Semen Ivanovich was not rewarded for his book-writing, and shortly after the book had been published, he wrote to the Board that 'although his work on Navigation had been published, he had no copy thereof for himself'." [36]

6. Semen Ivanovich Mordvinov. In 1715, **Semen Ivanovich Mordvinov** (1701–1777), who belonged to one of the noble families, was introduced to Peter the Great, who sent him to learn *"numeral science" ("zifirnaja nauka")*, first to schools in Novgorod, and Narva. The same year, in October, he was transferred to Naval Academy. The duration of his studies there was even shorter: already in January 1716, Mordvinov was enrolled in the first set of midshipmen company on board of the ship *Mikhail Archangel* in Revel, which immediately left for Denmark with its squadron. It was in Denmark that Peter I met with the naval cadets and sent the best 20, including Semen, to France to *"improve their nautical skills"*. During his service in Brest, France, Mordvinov, among other 10 distinguished cadets, was first appointed as a midshipman of French Fleet, and thereafter (in July 1722), the King of France conferred the rank of a ship-of-the line ensign second class on him. He returned to Russia in 1722, commanded many ships, and gradually moved up the ranks. It should be noted that in February 1726, Admiral Gordon took him as a personal aide, and Semen Mordvinov served at Saint *Alexandre* as a translator.

During the Seven Years' War (1756–1763), Mordvinov commanded a sea force, participated in the siege of Kolberg Fortress, and was promoted to a Rear Admiral. Subsequently, Catherine the Great conferred the rank of Admiral on him (1764). Semen Ivanovich successfully used any coastal pauses, which happened in the fighting, to carry out literary, technical, and historical research. The diversity of his findings bespeaks his exceptional abilities and knowledge [24][7][8]. All it takes to confirm this is to list some of his works: *On Establishment of Fleet on the Sea* (1735), *The Book of Complete Edition on Evolution, or On the Exercise of Fleet of the Sea* (1736), three parts of *Complete Edition on Navigation* (1740), *Catalogue which contains articles on*

[6] cf. [17]

[7] [22, Available On-line from URL: Мордвинов Семен Иванович.] (Mordvinov Semen Ivanovich. (Mordvinov Semyon)).(in Russian): 27.03.2018.

[8] See [24].

Figure 3: Semen Ivanovich Mordvinov (1701-1777)[6](Source: *Portal Музеи Европы*).

the Sun, the Moon, and stars, as well as on complete flood in famous places, gulfs, and rivers, and other descriptions pertaining to marine navigation in various tables along the St. Petersburg meridian (1744), and other. Somewhat around 1745–1746, serving in the shore authorities in Kronstadt and St. Petersburg, Mordvinov began processing the archives of Generaladmiral F.M. Apraksin, who had been heading the sea services of Russia for quarter of a century and whose papers were dumped in a barn and forgotten for a long time. Evidently, being well aware of the value of these documents for future Russia, he thereby formed the basis for the Archives of Russian Navy [37].

Approximately at the same time, he worked on his famous navigation manual, which was more comprehensive in its contents and, in addition to

the geometry stated in accordance with Euclid, included trigonometry and navigation. Although this manual turned to be too complicated not only for naval cadets, but for teachers too [23], nonetheless, future naval officers used this book to master the sciences for around two decades, until the new adapted edition of the *Elements* was published. This was another translation of Euclid's works, which was published in 1768 (or, according to V.V. Bobynin, in 1769) and prepared for the Naval Academy (since 1752 known as Naval College) as well. These were translated by N.G. Kurganov, educator, mathematician, author and writer of textbooks in mathematics and navigation in Russian.

7. Nikolai Gavrilovich Kurganov (1725/26–1790/96) of humble origin, son of a non-commissioned officer of Semyonovsky Life Guard Regiment, after three years of studies at a School of Navigation (1738-1741) under L.F. Magnitsky, was selected for further studies at the Naval Academy. However, in two years, still being a student of the Academy, he was engaged to teach astronomy and *"enrolled in the class of 'Greater Astronomy', where the most gifted students took an extended course, getting ready to teach."* [38] Having graduated from the Academy (1746), Kurganov was retained at the Academy as an *"apprentice"* (assistant lecturer) and served there for the rest of his life, teaching *"mathematical and navigation sciences"*, and as of 1790, experimental physics as well. Although it was toilsome for him to build a career, and he was promoted slowly because he was a baseborn, in 1765, Kurganov was charged with governance of all teachers of mathematical sciences at the Sea Cadet Corps. The dates when the Academy awarded him the title of a professor vary (one can find 1773 and 1774). However, he became a professor of higher mathematics and navigation, when he was lieutenant colonel, as the author of manuals in main subjects which were taught in the Sea Corps [10].

In the late 1750s, teaching in the Corps, Kurganov successfully made astronomical calculations and observations at the observatory of the Academy of Sciences, participated in geographic expeditions to update maps of the Gulf of Finland and Baltic Sea (June 1750 – March 1751; July 1752 – July 1753). He was a close acquaintance of M.V. Lomonosov and, on his instruction, on 26 May 1761, together with A.D. Krasilnikov, was even watching Venus passing the Sun disk [10, 38].

He was an extraordinary man. For his time, he was a very well educated man. He could speak perfect French and German; he read books in his subject in Latin and English; and, what was most important, he endeavoured to simplify teaching, presenting the subject in a clear, unambiguous, and captivating manner. The manual he had written, *Multi-Purpose Arithmetic, which contains a thorough study of the easiest ways to perform various arithmetical, geometrical, and algebraic calculations, all of which pertain to mathematics and may happen in public settings: In 2 Parts. – St. Petersburg, 1757*, was published several times under different titles. It replaced Arithmetic by Mag-

nitsky and was widely used. The new method of narration promoted fast spreading of Kurganov's textbooks, which were distinguished by their thoroughness, coherence, and clarity of materials contained therein. It should be noted that N.G. Kurganov is known to be the author of several textbooks in navigation, geodesy, theory of ship, shiphandling theory, naval tactics, coastal fortification, coastal defence, and a *Manual of Letter Writing, which contains the learning of Russian language and includes lots of educational and useful and entertaining additions of whatsoever nature*, published in St. Petersburg in two parts (1777).

Kurganov translated from French almost from the very beginning of his teaching career. However, the first three books in geometry and seamanship remained unreleased. In 60–70s, some more translations appeared. Those were books in navigation and Euclid's work entitled *Elements of Geometry, i.e. first bases of the science of measuring lengths, which consist of eight Euclid's books explained in a new way, which is the most clearly comprehensible for youth. From the French original printed in the Hague in 1762, translated and published thanks to diligence and effort of Nikolai Kurganov, Captain of both Naval and Szlachta Corps, teacher of mathematical and navigational sciences. In St. Petersburg in 1769* [6, p. 33].

The reason why N. Kurganov, the successful author of a popular textbook in mathematics, decided to translate Euclid, was notable. He wrote in the translator's goals and objectives: *"Mathematical sciences have been improving for a long time, and new works devoted to Geometry have been published almost daily. We do not despise these benefits, which have their merits; however, we do hope that publishers of those works will agree with us and prefer the Euclid's Elements, which is the product of such an elevated mind that it can only be conveniently imitated, it cannot be surpassed. When no one opposes of our reassurance of Euclid's indisputable advantage, we will have to only show here the advantage of this new publication compared to the preceding ones . . . "* [6, p. 34].

The next publication was in 1784. It was a translation of *Euclid's Elements – eight books, i.e.: Books One, Two, Three, Four, Five, Six, Eleven, and Twelve; enclosed to these, were Books Thirteen and Fourteen. Translated from Greek and revised. In St. Petersburg, in the printing office of the Naval Szlachta Cadet Corps.* This work was translated by teachers of this Corps, Masters of Oxford University, V.N. Nikitin and P.I. Suvorov.

8. Vasiliy Nikitich Nikitin (1737-1809) was a Russian mathematician, active Master of Sciences, teacher of mathematics, physics, Latin, and Russian. Nikitin was born to a family of a priest; in 1748, he entered the Moscow Slavic Greek-Latin Academy and on graduation in 1761, was retained at the Academy as a teacher of the Greek and Hebrew Languages. In four years, Vasiliy Nikitin stated his willingness to go to England as a supervisor of ten Russian students which were selected from religious schools as the best

ones to study theology and Oriental languages at Oxford and Cambridge. *"On his arrival to Oxford, the "supervisor" began studying sciences together with his underlings. The subjects he studied there were higher mathematics, experimental philosophy (physics), astronomy, chemistry, history, law, theology, English, and French and Italian to some extent. ... For his commitment to studying sciences and praiseworthy diligence, in 1771, Nikitin was awarded the Master's degree honoris causa, and in 1775, before his departure from England, the same University gave him the degree of active Master of Science. This degree had hardly ever been awarded to foreigners, as it was associated with obtaining of certain rights in the University's the republic of letters and, what is more, of civil rights of a native Englishman."* [25].

However, having returned to Russia, he did not succeed in scientific matters, having taken on the task of teaching mathematics, physics, Latin, and Russian at the Sea Cadet Corps and writing textbooks. In 1783, V.N. Nikitin was elected to the newly established Russian Academy (established in 1783 by the Russian Empress Catherine II and princess Dashkova as a research center for Russian language and Russian literature. Not to be confused with the Imperial Saint-Petersburg Academy of Sciences). However, he fell short of expectations here too.

9. Prokhor Ignatievich Suvorov. The fate of his co-author, **Prokhor Ignatievich Suvorov** (1750–1815), ordinary professor of higher mathematics at Moscow University, is to a great extent similar to that of Nikitin. He was also born to a family of a churchman. Having graduated from a gymnasium in Tver in 1765, he was sent to Oxford. Having studied up Latin and mastered English there, he attended the courses of law, philosophy, history, theology, Ancient Hebrew, Greek, French, mathematics, and astronomy. Suvorov was also awarded the degree of an active Master at Oxford and, having returned to Russia (1775), taught mathematics, Latin, English, mythology, and language arts at the Sea Cadet Corps [26].

Nikitin's and Suvorov's colleagues co-wrote several learning guides for the Sea Corps. However, according to V.V. Bobynin, only two of them were published: *Plane Trigonometry and Spherical Trigonometry* (St. Petersburg, 1787) translated by the authors into English and published in London too, and *Eight Books of Euclid's Elements, i.e.: Books One, Two, Three, Four, Five, Six, Eleven, and Twelve. Translated from Greek and revised.* (St. Petersburg, 1784). Let us just mention the second publication (1879) with added *Books Thirteen and Fourteen.* According to F. Petrushevsky, who will be mentioned herein below, the *"revisions"* that were made were very bold, so ... Nikitin's and Suvorov's translations, which richly deserve to be described as a *"good book in geometry"*, may not be regarded as Euclid's *Elements*, because they contain *"so many amendments, additions, etc., that a shadow of the original can hardly be seen."* However, this book is *"notable ... for the fact that it was for the first time that translators tried to replace the Greek*

and Latin geometrical terminology with the Slavic and Russian; a small share of the thus invented terms was good, e.g. "zadanie" (task) instead of "theorem" (theorem), "tochka" (point) instead of "punkt" (point); however, most of them were clumsy and unpronounceable." [26]

Another translation of Euclid's *Elements* was published in the early 19^{th} century. According to V.V. Bobynin, this one was the best out of those published in the 18^{th} – 19^{th} centuries. This was the translation made by **Foma Ivanovich Petrushevsky** (1785-1848), a famous Russian metrologist and translator. Petrushevsky, student of St. Petersburg Teachers' Institute, hav-

Figure 4: Foma Ivanovich Petrushevsky (1785-1848).[10](Source: Portal *Academic Studies Press. BiblioRossica.*)

ing graduated from the Institute, worked as a teacher of mathematics and

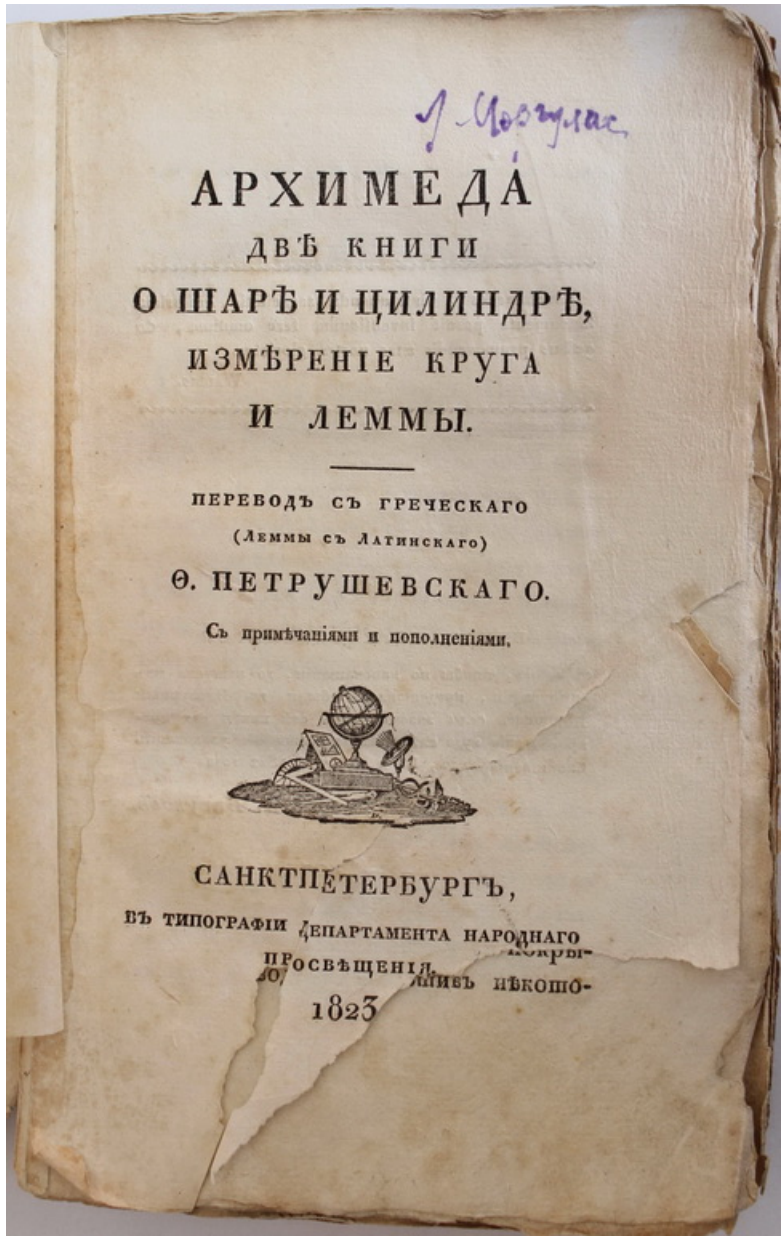
[10]See [35].

physics in one of gymnasiums in Pskov for eight years, three of which he was also the school principal. After he had been transferred to St. Petersburg (1816) *"to deal with written affairs of the Conference of the Teachers' Institute"*, he was gradually moving up the career ladder: he was head of the Department of the Main Administration of Colleges (1816); thereafter, worked at the Department of Public Education (1818) and the State Treasury (1820); worked as a principal at the poor child foundling hospital (1825–1834); and as of 1834, Director of the Institute for the Blind [7, v. 13, p. 708–709].

The *"Main Administration of Colleges"*, which formed a part of the Ministry of Public Education (MPE), was, *inter alia*, in virtue of its Charter, in charge of publishing textbooks for Russian schools. It was evidently at that time that Foma Ivanovich, based on his strong experience in teaching mathematics at gymnasiums, addressed S.F. Lacroix' arithmetic manual and translated it. This way the An *Elementary Treatise on Arithmetic* (Traité élémentaire d'arithmétique) by Lacroix translated by F.I. Petrushevsky appeared in 1817. This textbook was published in St. Petersburg and included the translator's notes and comments [34]. Interestingly, a year earlier, in 1816, another book by Lacroix was published in St. Petersburg, *Introductory reasoning about arithmetic* translated by A.P. Rastorguev. However, the Academic Senate formed in 1817 at the MPE specifically approved the Lacroix' book translated by Petrushevsky as an arithmetic learning manual.

This success as a translator prompted F.I. Petrushevsky to translate mathematical works of early Greeks, Euclid [31, 34] and Archimedes [28, 29]. In 1835, an encouraging Demidov Prize was awarded to him for these translations. In the 1830s, Petrushevsky got carried away by metrological studies and published several works devoted to both ancient and contemporary metrology. In 1849, his main creation, General Metrology, was published posthumously. This work was awarded the Demidov Prize after the author's death. According to V. Egorov, it was the *"first metrology book which was written in the Russian language and included ancient and modern measures. What is more, it was based not only on published sources, but on information the author had obtained from private correspondence."* [7, v. 13, p. 708–709] Furthermore, it should be noted that Petrushevsky was vigorously involved in creating Russia's first encyclopaedia which contained numerous original articles of Russian authors. It was Plyushar's *Encyclopedic Lexicon*, where almost all articles devoted to metrology were written by Petrushevsky.

His translation of *The Elements* was the most complete one: at first, a work [30], which comprised translated Euclid's Books One to Six and Eleven to Thirteen, was published in 1819, and in addition, in 1835, Books Seven to Nine translated into Russian were published [31]. The only Euclid's book that was not addressed was Book Ten, which was devoted to classification of incommensurable quantities. Let us take a closer look at this translation as a top achievement in translating scientific works of early Greek authors into



АРХИМЕДА
ДВѢ КНИГИ
О ШАРѢ И ЦИЛИНДРѢ,
ИЗМѢРЕНІЕ КРУГА
И ЛЕММЫ.

ПЕРЕВОДЪ СЪ ГРЕЧЕСКАГО
(Леммы съ Латинскаго)
Ѳ. ПЕТРУШЕВСКАГО.
Съ примѣчаніями и пополненіями.

САНКТПЕТЕРБУРГЪ,
ВЪ ТИПОГРАФІИ ДЕПАРТАМЕНТА НАРОДНАГО
ПРОСВѢЩЕНІЯ.
1823

Figure 5: Archimedes in translation of F. Petrushevsky, 1823.

Russian.

Having first sincerely praised Euclid and his *Elements* in the Introductory Note to the publication of 1819, Petrushevsky then addressed the reason why he had taken on the task of doing this job:

"... probably no other book has suffered so much as The Elements from publishers and translators who, to all appearances, in eager rivalry, tried to

get away from the original, modify the best places which may not be stated or expressed otherwise, supplement these places with topics which have nothing to do with The Elements, and identify errors which, in fact, only exist in their own understanding. In order to satisfy yourself, just look at three translations which we already have. Each of them, and especially the last one, may be described as a good Geometry book; however, none can be called Euclid's Elements, as there are so many amendments, additions, etc., that a shadow of the original can hardly be seen in them." [33, p. VI–VII].

The three translations mentioned by Petrushevsky are the translations from Latin made by I. Satarov (1739); from French, made by N. Kurganov (1769); and from Greek, made by Suvorov and Nikitin (1784). The source text for Petrushevsky's translation was the Oxford publication of Euclid (Euclidis, quæ supersunt omnia, Oxoniæ, 1703). Petrushevsky chose this publication as *"... English geometricians ... had more zest for Geometric accurateness than anyone else,... and Euclid has had ardent proponents among them..."*, and *"in England, this kind of writings, which make the way to the science easier, thus only weakening it, had bred in smaller numbers."* [33, p. VIII][11].

The property of a translation is that it must be as close to the original as possible, except as it concerns *"evident errors"* and *"certain additions"*. Petrushevsky believed this property to be the main achievement, as compared to the "loose" translations of the 18^{th} century: *"Everything else has been left sacred in order to let the lovers of Mathematical Sciences have the pleasure of meeting Euclid in his own, so to say, attire, especially because these Elements have still been taking precedence over everything that has been written to this end in conciseness, clarity, and accurateness, as well as in the contents of the topics and remarkable arrangement."* [33, p. IX] He espoused the views of Montucla, Leibniz, and Wolff, believing that any rearrangement of materials in the course of translating negatively affects the strength of evidence. Entering into controversy with proponents of the rearrangement, Foma Ivanovich remarked that this new arrangement of materials in geometry, which was encouraged by some geometricians, was by no means harmless, and, in a sharp riposte, he recalled Montucla saying that the proposed new arrangement *"constrains human brain and teaches to follow the path which is contrary to that through which truths are revealed."* [33, p. X]

Petrushevsky gave a detailed and convincing response to the four main claims to the renowned Euclid's work, which were associated with:

1) Postulate Eleven [There are various lists of "Elements" of Euclid with a different number and sequence of postulates and axioms. The translator retained the numbering used in the English edition *of Euclidis, Quæ supersunt omnia, Oxoniæ, 1703.*];
2) the absence of proof for some cases;

[11] Available on-line at https://ru.wikisource.org/wiki/Индекс:Начала_Евклида.djvu


ЭВКЛИДОВЫХЪ
НАЧАЛЪ
ВОСЕМЬ КНИГЪ,
А ИМЕННО:
Первыя шесть, одиннадцатая, и две-
надцатая,
Содержащія въ себѣ
ОСНОВАНІЯ ГЕОМЕТРІИ.
Переведъ съ Греческаго
Ѳ. ПЕТРУШЕВСКАГО,
съ прибавленіями и примѣчаніями.
САНКТПЕТЕРБУРГЪ.
ТИПОГРАФІЯ ДЕПАРТАМЕНТА НАРОДНАГО
ПРОСВѢЩЕНІЯ.
1819.

Figure 6: Euclid in translation of F. Petrushewski, 1819.

3) the general theory of proportions;
4) the complexity of proof in Books Eleven and Twelve.

Regarding the statement that one of the postulates is not a postulate and

must, therefore, be qualified as a theorem and proved, he noted that after it was first used to prove an assertion, it became almost evident, which is why the objection raised was not important anymore. It concerned Postulate 11 worded as follows: *"That, if a straight line falling on two straight lines makes the interior angles on the same side less than two right angles, the two straight lines, if extended indefinitely, meet on that side on which are the angles less than the two right angles."* [33, p. 6]

The absence of proof can be clearly explained by the fact that Euclid proved only general cases and believed that individual cases need not be proved. Petrushevsky provided this proof in his "additions" to the translation, *"making the reader feel free to decide whether this proof was essential or just useful."* The translator denied the charges of too complicated a theory of proportional quantities Euclid had incorporated in The Elements, proving that *"The arithmetical theory of proportions* [with which authors often try to replace the Euclid's theory] *was absolutely insufficient because it frustrated the most important and indispensable property of Mathematics, accuracy."* [33, p. XIV] Comparing the theory of Euclid to the theory of Guriev set forth in *Experience in Improving the Elements of Geometry* Petrushevsky exhibited the translator's deep familiarity with and subtle knowledge of intricacies of the materials he translated. The last objection of partisans of the *"improvement"* of the Euclid's work forced Petrushevsky to analyse Euclid's proof comprised in the books of *The Elements* mentioned above and proofs of various authors offered to replace Euclid's proof. He described Euclid's proof as clear, accurate, and *"being beyond any objections"*, while those of other authors, as based on *"vague or far from fair. Because the proof may not be called 'proof', where it is assumed that straight lines consist of points, surfaces consist of lines, and bodies consist of surfaces; that a polygon which has infinitely large or small number of sides, circumscribed about a circle equals the circle; that parallel lines meet at infinity, etc."* [33, p. XV] Petrushevsky included his clarifications regarding other objections in the Additions, which also comprised his notes to the translation. Some of these notes were made just to supplement, others – to be able to *"understand other geometers in a most convenient way, especially Archimedes and Apollonius."* [33, p. XVI]

Adhering to the chronology of events, let us note an unusual publication of the Euclid's work translated in 1877 in backcountry Russia – in Kremenchug – by two students of a local non-classical secondary school. An article written by I.Y. Depman, *Noteless Russian-language publication of Euclid's Elements* [9], was devoted to this relatively unknown publication. T.A. Tokareva also mentioned this publication: *"... in the second half of the* 18^{th} *– first half of the* 19^{th} *century, numerous attempts were made to publish translations of The Elements by N.G. Kurganov (1739), P.I. Suvorov and V.N. Nikitin (1784, 1789), F.I. Petrushevsky (1819, 1835), and E.V. Hartwig (1877)."* [19, p. 212] Whereas we are talking of translations into Russian, it should

be noted that Hartwig published Euclid's *Elements* translated into German by G.F. Lorenz. However, he did not translate this work into Russian. According to I.Y. Depman, *"The German publication of The Elements, which was translated by Lorenz and underlying the Russian translation, was very popular in the 19th century and was republished several times. The earliest Lorenz' translation we know was published in 1771. Thereafter, there were at least several more publications: in 1781, 1798, 1809, 1819, 1824, 1825, 1839, and, finally, in 1860 with E.V. Hartwig's appendices."* [9, p. 470].

Thus, another Russian translation of *The Elements (Eight Books of Euclidian Geometry)* was made from Lorenz' German translation published by Dr. Hartwig by Nemirovsky and Berger, students of Alexandre Nonclassical Secondary School in Kremenchug [32]. They translated this work under the direction of the School Principal A.A. Sokovich. Some details about the latter are provided in the work of I.Y. Depman [32]. **Alexandre Antonovich Sokovich** (1840–1886), graduate of Kharkov University who was granted the title of its active student in 1863 after the graduation. Thereafter, he taught geography, mathematics, and physics at secondary schools in Voronezh and Ekaterinoslav for around a year. However, being dissatisfied with his level of knowledge and being keen to improve his skills, in 1864 he came to attend a two-year Teachers Training Course at the same Kharkov University to focus on math and physics. While he was attending the course, he passed a special test to *"be approved in the degree of a candidate of the Faculty of Physics and Mathematics in the Department of Mathematical Sciences"* [9, p. 472] An additional point is that his writings included two manuals (in Elementary Geometry and Mathematical and Physical Geography) designed for course students. Notably, these manuals comprised a number of valuable historical notes, which was not characteristic of this kind of manuals. This characterises Sokovich as an extraordinary teacher who was able to capture the interest of his students and encourage them to engage in such uncommon activities.

In the Introduction to the Russian translation, A. Sokovich, who also edited this translation, wrote that it had been around half a century since The Elements were last published in Russian, and *"... Euclid seems to have been forgotten here, and yet, his Elements of Geometry, with their simplicity and clarity of proof, are indisputably among top course books, and we believe that they may serve as a very useful manual for students of secondary schools."* [32, p. 2]

Why did the above publication of The Elements attract the attention of the editor and the translators? Why this one? It was most likely because it was the most *"schoolwise"* one, as it comprised Euclid's Books One to Six and Eleven and Twelve, while Hartwig's additions to it pursued *"the express purpose to adapt Euclid's Elements to the needs of school"*. The volume of the work was also of importance. The point is that in the German publication, Lorenz was rather successful in applying symbols when stating

materials, which substantially reduced its volume. Russian translators used this method as well, therefore, the translation had only 172 pages, while 9 tables with perfectly written 232 figures were enclosed separately. The size and the implementation made this manual easy to use as a textbook.

The last translation of Euclid's *Elements* into Russian made in the 19^{th} century was the publication of 1880 as revised by Vashchenko-Zakharchenko [5]. **Mikhail Egorovich Vashchenko-Zakharchenko** (1825–1912) studied at the Department of Mathematics of the School of Philosophy at St. Vladimir University in Kiev; as of 1864, he was a privat-docent, and as of 1867, a professor of the same University. The range of his research interests was quite

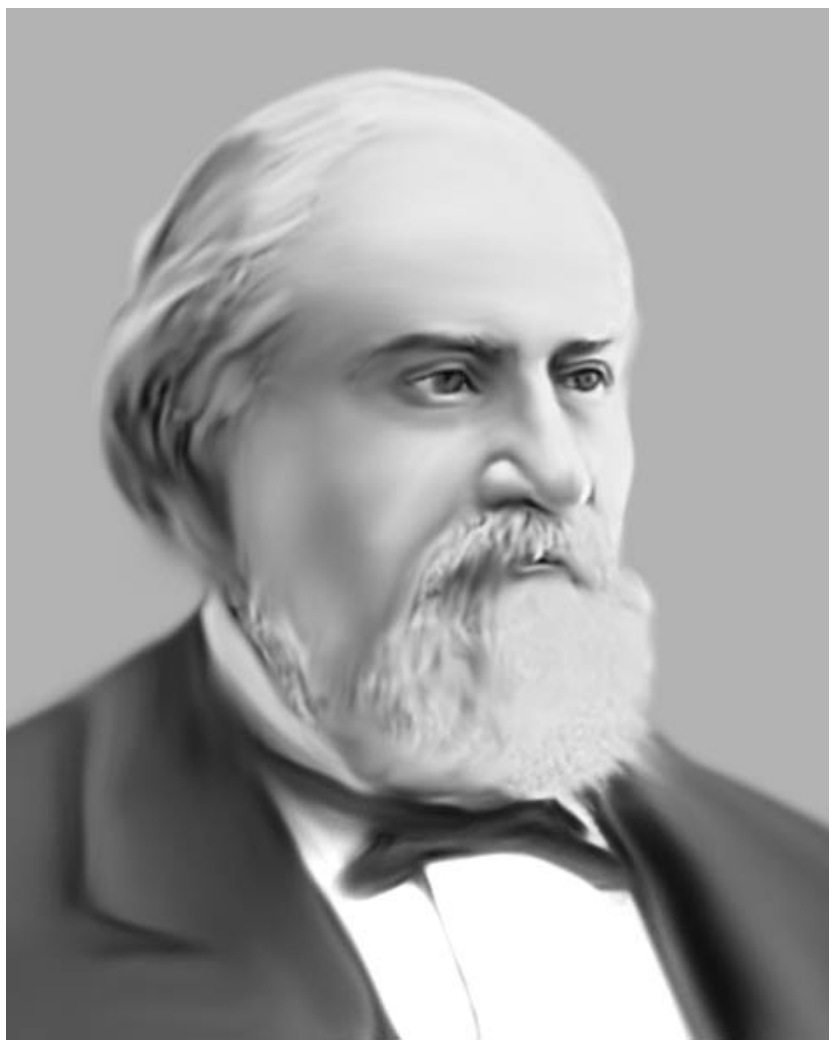


Figure 7: Mikhail Egorovich Vashchenko-Zakharchenko (1825-1912) (Source: [15]))

wide. However, history of mathematics was perhaps one of the highest on the list. Vashchenko-Zakharchenko was the author of several pretty valuable historical research studies. They were devoted both to special issues in the history of mathematics and general theory. In the late 1870s he was engrossed in issues of non-Euclidean geometry; he run a course on this subject at the University (1878–1881), incorporating all of the most recent achievements in this area [11].

In the Introduction to his translation, addressing the *"efforts that have been recently made by geometers to explain the elements of Geometry and take stock of Euclid's Elements",...* and *"endeavours taken to introduce them in schools as a manual"*, he backed up these initiatives and noted that it was very important to use *The Elements* as a manual in geometry in terms of pedagogics. *"Teaching math in gymnasiums*, he wrote, *has a two-fold purpose: first, to appropriately develop the way of thinking, which is a pedagogical goal...; second, to lay a solid foundation for further studying of mathematics as a science with all its branches."* [5, p. I] Owing to his extensive experience in teaching math at learning institutions and administering examinations of whatsoever nature, Mikhail Egorovich came to a strong conclusion that *"nothing had had such negative effect on students' appropriate mathematical development as the great variety of manuals, which does not result in the development of knowledge of Geometry as a strict logical system; instead, this results in knowledge of a mix of theorems, on frequent occasions pretty bold knowledge, however, lacking any logical order."* [5, p. II]

It should be noted that as a translator, Vashchenko-Zakharchenko felt pretty free with *The Elements*, being governed by his main goal: to make a good teaching guide for a teacher. He himself pointed at processing of the text: *"To find out the meaning of definitions, postulates, and assumptions, in the Introduction, I gave an account of Legendre's research devoted to the sum of angles in a triangle, of the relationship of this theorem with the Euclid's assumption, and of Lobachevsky's system known as non-Euclidean geometry where the Euclid's assumption is to a certain extent modified. The insight into this system casts a light upon the elements of Geometry and enables a more appropriate attitude to the assumption which used to be the subject of numerous misconceptions, disputes, and studies.*

"The Introduction is followed by the translation of Euclid's Elements with comments and additions. ... Enclosed at the end of the work, are problems to each book and a list of specific theorems from each book which must be taken into account to solve each of these problems." [5, p. V]

Consistently commenting upon each of the translated Euclid's books in the Introduction, he instantly instructed the reader what was worth special attention there; what notes were incorporated in the translation and what for; what needed to be explained by the teacher to his/her students, etc. In the end of the Introduction, the author provided interesting statistical data

НАЧАЛА ЕВКЛИДА

СЪ ПОЯСНИТЕЛЬНЫМЪ ВВЕДЕНІЕМЪ

И

ТОЛКОВАНІЯМИ.

Μηδεὶς ἀγεωμέτρητος εἰσίτω μοῦ τὴν στέγην. Platon.

Ординарнаго Профессора Императорскаго Университета Св. Владиміра

М. Е. Ващенко-Захарченко.

КІЕВЪ.

Въ типографіи Императорскаго Университета Св. Владиміра.

1880.

Figure 8: Euclid in the translation of M.Vashchenko-Zaharchenko, 1880.

on all publications of The Elements he had managed to collect: *"... all in all, there were up to 460 publications; 155 of them, in Latin and Greek; 142, in English; 48, in German; 38, in French; 27, in Italian; 14, in Dutch; 5, in Russian; 2, in Polish; and 26, in various other languages, e.g.: Swedish, Finnish, Portuguese, Spanish, Danish, Chinese, Arabic, etc. This publication is the fifth one in the Russian language."* [5, p. X] It should be noted in this connection that Mikhail Egorovich counted two translations made by F.I. Petrushevsky as one, and he was either unaware of the translation made

under the direction of A.A. Sokovich or did not want to count it).

According to D.D. Morduhai-Boltovskoi, the next translator of *The Elements*, the translation of M.E. Vashchenko-Zakharchenko was *"... very loose and occasionally inappropriate. It is reasonable to believe*, wrote Morduhai-Boltovskoi, *that the work was translated from Latin publication of R. Simpson who was quite free with Euclid's text; it was this publication where he had taken most of his comments from, having thereafter supplemented them with his own translator's comments, which were generally pretty superficial. However, it cannot be denied that this publication, regardless of its weaknesses, turned to be very useful"* [3, p. 7]

It is debatable whether the purpose of this translation justifies the means used to achieve it, but the amount of work the translator had done was really immense. There is Introduction; then 716 pages of text; then the *List of The Elements by Euclid published in the period from 1482 to 1880* in the end of the work (p. 717–730); then a wonderful, in terms of its bibliographic significance, *Index of Works devoted to Non-Euclidean geometry, which were published until 1880* (p. 731–742) [all in foreign languages, except for one Russian publication (M.E. Vashchenko-Zakharchenko. Introduction to *The Elements* by Euclid. Kiev, 1880)]; and a *List of Works the author used when preparing this work* (p. 743–746), which was equally useful and important. Apropos, the above *List of The Elements...* and *Index...* were published the same year (1880) in Kiev as individual publications.

It is fair to say that contemporaries highly appreciated the work of M.I. Vashchenko-Zakharchenko. Thus, three years after it had been published, Mikhail Semenovich Panchenko, privat-dozent of the Department of Physics and Mathematics of Novorossiysk University and Chairman of the Teachers Council of G.R. Berezina female classical school in Odessa, published a brochure, *Geometry of the Ancients*, which clearly showed that this translation of Euclid was thoroughly studied by progressive teachers of that time. It was thanks to this translation, which was adapted basically for teachers, that Russian teachers could learn of the great heritage of the ancients, admire it, and present it to their students. This was what Panchenko wrote about this translation: *"I admit that The Elements by Euclid represent a wonderful example of the depth of synthesis. What an extraordinary clarity and, at the same time, simplicity; what a strict consistency throughout the system!"* [4, p. 4]

Several responses to the new Russian publication of *The Elements* appeared abroad as well. We learned about one of them from Academician V.G. Imshenetsky, who made an announcement at a meeting of Kharkov Society of Mathematics on 29 September 1881. The text of his announcement and extracts from the review by Professor Hoüel (Bulletin des Sciences Mathématiques et Astronomiques. v. IV. Mars, 1880) of the new publication of *The Elements* by Euclid under the editorship of Prof. Vashchenko-

Zakharchenko as translated by Imshenetsky were published in *Announcements and Minutes...* of the Society [39]. Provided herein below are several extracts from the speech of the author of the announcement and the above review.

"There was no shortage of publications of the famous book, V.G. Imshenetsky began, "the publication mentioned above was at least the 461^{st} *one as of the time the book printing was invented. However, in spite of the constantly growing number of these publications, there was no publication edited in the context of the most recent discoveries which were made in the current half of the century in relation to the nature of principles of elementary geometry.*

Now we have the pleasure to announce that this deficiency has been made up for with a wonderful publication, the name whereof was provided above. Owing to the comments and additions of the learned publisher, which enriched his work, this Euclid's treatise may now serve as a text in elementary teaching and, at the same time, guide geometricians who wish to get acquainted with high-class research studies which were conducted in these recent years thanks to the detailed study of the elements of science of space." [39, p. 129]

Further, often without making distinction between his own opinion and statements of the reviewer, Imshenetsky analysed the work under review in pretty much detail, giving generous praise to the translator for the interesting introductory word, *"for Legendre's wonderful research studies"*; for the additions concerning the non-Euclidean geometry, which formed the *"indispensable addition to any treatise in elementary geometry"* stated on 60 pages and *"would be interesting and useful to read"*; for the accuracy of the translation; for the language *"filled with the spirit of rigour"*, etc. [39, p. 133–134]. Imshenetsky emphasized that *"... Mr. Zakharchenko had enriched his work with a precious supplement consisting of three bibliographical guides with a list of 460 Euclid's publications printed in almost all literary languages known since the time the book-printing was invented, provided in the first supplement. G. Hoüel, on his part, added five more items to this list, which were missing there."* [39, p. 135]

At the end of his speech, V.G. Imshenetsky quoted the final words of the reviewer: *"In his excellent translation and additions, which are altogether in harmony with the text, the learned professor from Kiev provided this classic text, which is the most recent and complete of all we have had in elementary geometry. Whilst Slavic languages have not taken the rightful place in our (French) schools, which conform with the scientific role of the nations speaking these languages, we strongly recommend the translation of this wonderful book into the language which is more widely spread in our country."* [39, p. 135]

The differences in opinions of scientists of the 19^{th} and 20^{th} centuries on this work can be explained quite easily: requirements for translating classical authors had changed. Whilst at first translations were assessed in terms

of their practical usefulness for students, later scientists began caring more about the originals, as more accurate translations enabled *"those studying the history of mathematics and interested in obtaining unimpaired Euclid"* [3, p. 5] to get a closer insight into the original.

10. Conclusion.

1. The stage of accumulation of knowledge in the history of mathematics by translating world scientists has no timeframes and runs in parallel with the development of the history of mathematics in Russia.
2. The approach to translating of creator-owned works in the course of the historical process substantially changed: from word-for-word non-specialist translations to texts processed by translators in order to adapt the contents to the goals dictated by actual practice to "careful" translating of historians of science aimed at preserving the author's structure of the work and introducing the original to the reader. These changes were not linear; they were affected by socio-economic and political conditions prevailing in the period the translation was made.
3. At first, the source to be translated was chosen *"based on the convenience"* (depending on the language the translator knew better). For example, works of the ancients were often translated from a double or even triple translation of the original. In the 19^{th} century, translators began choosing sources more thoroughly, always making sure which one was closer to the original.
4. Translators' profiles were also changing. In the first half of the 18^{th} century, translations were made by professional translators who spoke foreign languages but did not have deep expertise in mathematics. At the end of this century, natural scientists and teachers of physical and mathematical sciences who had experience in translating foreign manuals and writing manuals of their own, came to replace them. The diversity of translators community in the late 19^{th} century stemmed from the comprehensive knowledge and great amount of education of the Russia's Big League of scientists of the time.
5. The appearance of translations of works of contemporary Western authors devoted to the history of mathematics indicated the emergence of enduring interest of Russian scientists and natural scientists in the history of science and their willingness to study these problems. Furthermore, translators chose works to be translated not only with regard to the interest of researchers of the history of the science. They took into account the interests of the broad audience of readers.
6. The special series of translated Western scientific physical and mathematical literature which appeared in progressive Russian publications, as well as the publishing houses themselves which dealt with these translations and engaged high-class experts to work on these trans-

lations, like, for example, Mathesis, enables us to assert that, by the end of the 19^{th} – beginning of the 20^{th} century, owing to these purposeful publishers' activities, Russian readership had access to research findings comparable to the access the Western readers had.

7. Russian history of mathematics owes the numerous works in the history of physical and mathematical sciences which appeared in the end of the 19^{th} – beginning of the 20^{th} century to the above translations as well.

As a matter of fact, we have not considered all translations of classical ancient authors and Western European historians of mathematics in this work. However, we do hope that the works we selected have enabled us to create an accurate picture of this stage of the inception and evolution of the Russian history of mathematics.

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Pierwsze tłumaczenia Euklidesa na rosyjski (XVIII–początek XX wieku)

Natalia Vasilievna Lokot

Streszczenie. Badania, których wynikiem są dwa artykuły, są poświęcone powstawaniu w Rosji historii matematyki jako odrębnej nauki. Jej elementy zaczęły intensywnie wyłaniać się w epoce Piotra Wielkiego i przeszły kilka etapów rozwoju. Wyróżnić można pięć etapów, przez które przeszli rosyjscy naukowcy, kształtując elementy badań z historii matematyki w naukę z własnym przedmiotem, celami i metodami. Analizujemy pierwszy etap, tj. etap przekładów historycznych i naukowych. Chronologicznie przeanalizowaliśmy w tych badaniach dwa rodzaje tłumaczeń (tłumaczenia prac matematycznych wczesnych Greków i tłumaczenia dzieł zachodnioeuropejskich poświęconych historii matematyki) oraz przyjrzeliśmy się osobom tłumaczy, stosunkowo mało znanym w literaturze poświęconej historii matematyki. Niniejsza część omawia tłumaczenia i biogramy tłumaczy dzieł Euclidesa i Archimedesa.

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