THE CONTRIBUTION OF PETRACHE POENARU
TO THE IMPROVEMENT OF ROMANIAN
MATHEMATICAL TERMINOLOGY

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Abstract: The paper presents historical aspects concerning the Petrache Poenaru (1799–1875) scientific activity for the improvement of Romanian mathematical terminology in: arithmetic, trigonometry and geometry.

Keywords: History of mathematics, mathematical terminology.

1. SHORT BIOGRAPHY

Petrache Poenaru was born on the 10th January 1799 in Băneşti, Vâlcea County (Fig. 1).

Fig. 1. Petrache Poenaru.

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Petrache Poenaru attended the Secondary School near the Obedeanu Church in Craiova between 1811 and 1818, then he worked as a copyist at the Office of the Bishop of Râmnicu Vâlcea. Later on, between 1820 and 1821, he taught Greek language at the Metropolitan School in Bucharest.

That time, Wallachia was under Turkish domination and was ruled by the Phanariots. In 1821, the Revolution led by Tudor Vladimirescu began. Petrache Poenaru joined the army of Oltenian soldiers and became Tudor Vladimirescu personal assistant.

Poenaru was sent in a diplomatic mission to advocate the Romanian cause to the Representatives of the great powers at Laibach. After news of Vladimirescu's death spread, he took refuge in Sibiu and remained there where he learned German language.

When the political situation improved, he was able to earn a scholarship to study in Vienna, in 1822. There, he discovered a great appetite for technical sciences, while also fervently studying Greek, Latin, French, Italian and English.

In 1824, the Wallachian ruler Grigore Ghica granted him another scholarship, which compelled Poenaru to return to the country after the studies ended and share his acquired knowledge as a teacher for a period of eight years.

In November 1825 he was at the Polytechnic Institute of Vienna, studying math, chemistry and general technology. In 1826 he went to France and attended Polytechnic Institute of Paris, where he studied Engineering, Geodesy and Topography. He worked to draw the map of France under the leadership of Puissant, making topographic maps around town Meulan sur Seine in 1827.

When he stayed in Paris he invented the fountain pen and on the 27th of May 1827 in Paris, the Manufacture Departament from the French Ministry of Interior registered Poenaru's invention with the code 3208 and the description "plume portable sans fin, qui s'alimente elle-même avec de l'ancre" (Fig. 2). This invention prevented paper scratches, ink leaks and was made of replaceable parts.

In 1831 he was in Great Britain to visit and study the industry in this country, in particular mining and metallurgical industries.

In 1832 he returned to Wallachia and he worked as Inspector of Schools. Between 1832 and 1847 he was the General Director of Schools of Wallachia.

In 1841 he was elected in the Dolj Public Assembly and in 1842 (a short period), 1850 and in 1855 he led some of the services of Foreign Ministry, as Director.

In 1847, the College of St. Sava was abolished and in instead was introduced the French Teaching. On this occasion Petrache Poenaru was fired from the education system.

After the Revolution of 1848, joined by Poenaru, taking part in the Commission for the emancipation of gypsies, he never came back in the higher education system.

Poenaru was appointed in 1857 as a member of the Commission of Documents, and later, in 1864, as a member of the Commission of State.

Petrache Poenaru received a honorary diploma from the Transylvanian Association for Romanian Literature and Romanian People Culture in Sibiu, in November 1861 (Fig. 3).

Fig. 2. Patent given to Petrache Poenaru for invention of fountain pen.

Fig. 3. Honorary diploma from the Transylvanian Association for Romanian Literature and Romanian People Culture.

In 1870 he was appointed member of the Romanian Academy, occasion on he wrote the acceptance speech: "Gheorghe Lazăr and Romanian School" (Academy Meeting of 8th September 1871). This speech because of Poenaru illness, was read by academician Al. Odobescu. Petrache Poenaru died when he was 76 years old, on the 2nd October 1875.

2. SCIENTIFIC ACTIVITY IN MATHEMATICS

The first Geometry textbook in Romanian language, in the Romanian countries, was „Elements of Geometry translated after the Légendre's textbook", published in 1837 in Bucharest, in Eliade's Publishing house, the translation being made by Petrache Poenaru.

Poenaru's full title translation (Fig. 4) was "Elements of Geometry translated after the Légendre's textbook" and was printed to the detriment of House of National Schools for the scholars who study this course at Saint Sava College. Bucharest's Eliade Publishing house, 1837.

This textbook was verified by a committee made up of professors Simion Marcovici, D. Pavlide and N. Picolo and on 8th January 1835, the committee recommended textbook printing.

Petrache Poenaru mathematical terminology used in this translation was influenced by that of his former teacher, Gheorghe Lazăr. He gave up some terms used by Gheorghe Lazăr, that he considered to be useless and used Romanian language for others.

In this translated text there are mathematical expressions which had been introduced for the first time, such as: axiom, demonstration, solving, example, explanation, expression, formulae, hypothesis, inverse (reciprocal), problem, proposition, property, symmetry, as mathematical expressions (terminology) with general character.

As a pure geometrical terminology we can identify: alternate angles, adjacent angles, opposite angles, corresponding angles, internal alternate, external alternate, circumscribed, acute angles, splayed angles (maths: reflex angles), right angles, the line which may be horizontal, vertical, slantwise (oblique), zig-zag or inflexed; the line has footbridges; between the fotbridges at the extremities of the line there is a distance (distances); the polygons as a shape made by straight lines will be classified as follows: quadrilateral, pentagon, hexagon, heptagon, octagon, decagon, dodecagon, pentadecagon, pentacontagon. In relation with the circle we encounter geometrical expressions such as: to touch, centre, concentric (but also concentrate too), circumscribed, circumference, contact (or touch), semicircle, sector, segment, semicircumference, tangent, the tangent; then for the 3D geometry there is: plane (planes), curved surface, stripe instead of edge, spindle/rod instead of axle, corner instead of 3D angles, solid truncated (frustum), tetrahedron, exahegron, octahedron, dodecahedron, icosahedron, spherical spindle (spindles), etc.

From these examples it is seen how closed was the mathematical terminology used by Petrache Poenaru mathematics in the first Geometry textbook, from the one currently used.

Also, Petrache Poenaru published the first course of Algebra for Wallachia country (second after that of the Gheorghe Asachi from 1837, Iassy), in Romanian language on 1841, with the title „Elements of Algebra translated after the Appeltauer textbook". Translated from Latin with some modifications by Poenaru P., National Schools Director, Bucharest, St. Sava College Printing, 1841. The book had 341 + 16 pages and translator's name was written only on the inside cover of the textbook (Fig. 5).

This textbook was verified by a committee made up of Mihai Ghica, Alexandru Filipescu and Barbu Ştirbei and approved the printing of 500 copies, of which 200 will be given to author, 50 for to be given as exams prizes and for selling 250 copies to recover the printing expenses. On 14th December 1842 the printing was ready and had a cost of 3,062 lei.
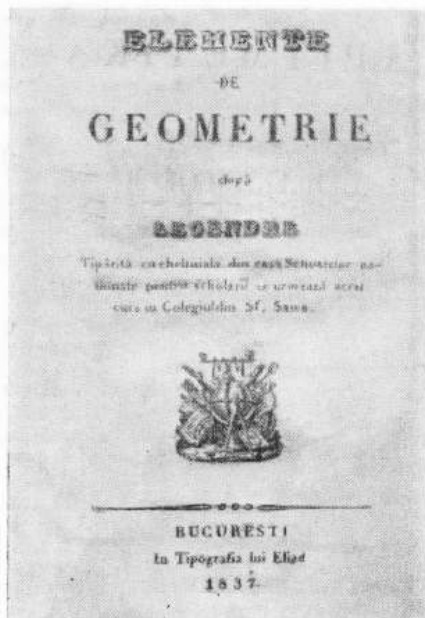
Fig. 4. Elements of Geometry
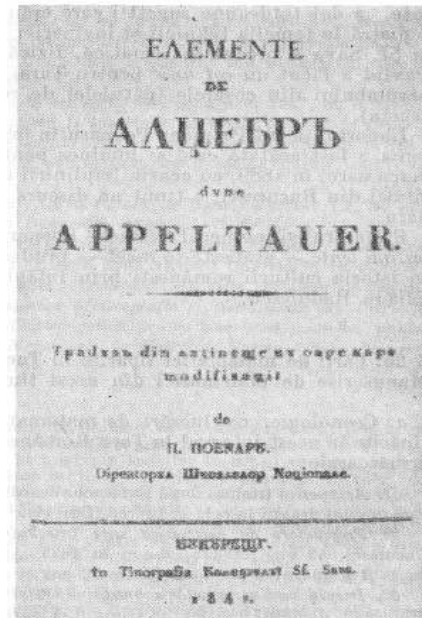translated after the Légendre's textbook.

Fig. 5. Elements of Algebra
translated after the Appeltauer textbook.

For instance we may give more examples of mathematical expressions which lasted until our times and used for this kind of algebra as: quotient, magnitude (size), algebraic term, homogeneous, product, permutation, positive, negative, dividend, divider, quotient, even, odd, periodic, surd form quotients, complex/ imaginary roots, proportions, stationary, arithmetic proportions, powers/indices, exponents, rule of three, base, system of logarithms, characterised, equation, identity, arithmetic progression.

Also, there is mathematical nomenclature/terminology less inspired which never reaches us such as: self-make up instead of coefficient, makers instead of factors, wringers instead of fractions, self-makers wringers instead of fractional coefficients, mixed wringers or the bastard (for a number with integer and decimal part), renouncement or ignoring/neglecting (for the elimination of the unknown quantity/variable), etc.

There is confusion between formulae (identity) and equation.

The algebra begins with quotients or quantities/variables, continues with algebraic manipulation, indices, surds, roots, exponents, fractions, fraction operations, quotients involving surds, ratio and proportions, rule of three, the society rule, logarithms, linear and quadratic equations, or equations which can be simplified/rearranged as linear or quadratics ones and it ends with arithmetic progressions and simple and compound interest.

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