A ROUND OF APPLAUSE FOR ANALYTICAL GEOMETRY

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ABSTRACT

The article is devoted to the well-known Russian mathematician Boleslav Mlodzeevsky (10.07.1858–18.01.1923), who from 1896 to 1913 worked at Moscow Institute of Railway Engineers, now – RUT (MIIT), and was the first head of the Institute's department of mathematics. Scientific works of the scientist refer to differential and algebraic geometry and its applications. They are of interest to future mathematicians today as well. He was the first to organize such a form of training as a mathematical seminar, read the first course on the theory of functions of real variable and set theory. He developed the Russian terminology of set theory. This year marks the 160th anniversary of a remarkable mathematician and a man who has left an excellent mark in history.

Keywords: mathematics, history, differential and algebraic geometry, engineering education, Boleslav Mlodzeevsky, mathematical seminar, set theory, scientific societies.

Background. *July 2018 marks the 160th anniversary of birth of Boleslav Kornelievich Mlodzeevsky, a Russian mathematician, prominent educator in Russia in late 19th – early 20th centuries. He was the first extraordinary professor of mathematics, enlisted in the staff of the faculty of the Engineering School, which opened in Moscow in 1896 (in 1913, it was renamed to Moscow Institute of Railway Engineers). With the efforts of Professor Mlodzeevsky, who headed the department of mathematics, the first mathematics curricula were formed, the first programs of mathematical courses for railway engineers, lithographic and then printed texts of lectures were published.*

Objective. *The objective of the authors is to consider life and work of Boleslav Kornelievich Mlodzeevsky.*

Methods. *The authors use general scientific and historical-retrospective methods.*

Results.

33 courses + 66 reports

Boleslav Mlodzeevsky can rightly be considered an innovator in teaching of mathematical disciplines in higher educational institutions. It should be noted that he was the first in Moscow to read a course on the theory of functions of a real variable and on set theory. Subsequently, the development of these areas led to the emergence in the 20s of the last century of Moscow mathematical school of the theory of functions and functional analysis – «Lusitania», created by his student and colleague at Moscow University, N. N. Luzin.

33 written and lithographed courses on various branches of mathematics have remained and been kept: on analytical geometry, higher algebra, mathematical analysis, integral calculus, partial differential equations, determinant theory, etc. Interest in these lectures has not disappeared till now. Not so long ago, in 2015, in the series «Physics and Mathematics Heritage» the books of B. K. Mlodzeevsky «Fundamentals of Higher Algebra», «Fundamentals of Analytical Geometry on the Plane», «Fundamentals of Analytical Geometry in Space» were reprinted, with publishers indicating the usefulness of studying these texts to future mathematicians, physicists and engineers.

At a time when Mlodzeevsky was a student, the university education was different from the modern one. The number of mathematical courses read was small, as were the volumes of their content. The training consisted of attending lectures and preparing for exams on lithographed theses. Practical training was not conducted. At the initiative of V. Ya. Zinger, it was not until 1876 that trial «exercises for analytical geometry» were proposed for those who wished.

Acquaintance with the mathematical literature began from the moment when the student stayed in the university for preparation for scientific studies after graduating from the main course. So in the case of Mlodzeevsky, whose talent was noticed by Zinger, he recommended his pupil for further studies at the university. He also gave him a list of necessary literature and outlined the sequence of its study, which was no small matter, since it was always extremely difficult and sometimes impossible to engage in serious mathematics for a beginner, who came across a risk to abandon a scientific career.

The support of the senior leader, his undoubted good attitude to his student, allowed him to gradually acquire the skills of independent work. The theme of the master's thesis «Studies on bending of surfaces», proposed again by Zinger, became a worthy scientific experience. The methods used by Mlodzeevsky in this work were also useful to him when writing his doctoral thesis. The scientist returned repeatedly to the question of bending in his later works: «On surfaces connected with Peterson surfaces» (1900), «On bending of Peterson surfaces» (1903), «On a transformation of infinitesimal bendings» (1905) etc.

Among scientific works there are works relating both to geometry and to algebraic analysis, to applied aspects of mathematics. In the last years of his life, the scientist began to pay more attention to algebraic geometry, in particular, studying Cremona transformations: «The theorem on decomposability of Cremona transformations on the plane» (1914), «The theory of Cremona transformations» (1916), «Cremona numbers tables of the first 21 orders». The results of scientific research were reported at various mathematical meetings, and then published in the journal «Mathematical Collection» (published since 1866). So, only at the meetings of the Moscow Mathematical Society he read 66 reports.

Pioneer without predecessors

It is possible to find out what kind of man was B. K. Mlodzeevsky, the first head of the department of mathematics of the future university of transport, from the memoirs of his contemporaries and students, among them a graduate of the Higher Women's Courses, subsequently a professor at Moscow University, who headed the department of higher mathematics – O. N. Tsuberbiller.

Olga Nikolaevna recalls: «A characteristic feature of B. K.'s teaching activities was the desire to bring students closer to professors; in this case he really can be considered a pioneer who did not have predecessors … Upon his arrival from abroad, B. K.

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took over the management of the student's mathematical library and, during his 11-year-long management, promoted its prosperity, taught students to read mathematical books and especially insisted on their acquaintance with foreign languages…». And more: «B. K. can be justly called the creator of the Mathematical Department of H.W.C. (later Second State University). For many years women did not receive any rights, but this did not bother them much; they were attracted to courses by an unselfish thirst for knowledge, an almost instinctive love of science; most of them had a hard teaching career in the province, and the years spent on the courses were the happiest, most vivid memories of their lives. This atmosphere of disinterestedness, the lack of careerism was especially close to B. K. – a deep idealist who for the whole life strove for self-improvement».

At the University named after A. L. Shanyavsky from 1911, Professor Mlodzeevsky read special courses in mathematics. And there, according to the same student: «On Saturdays, at six in the evening, there was a huge audience: there were gray-haired professors of mathematics, philosophers, university lecturers left at the University, students of various higher educational institutions, high school teachers, just amateurs mathematicians and even high school students … B. K. was extremely accessible: they came to him with serious scientific questions, came for explanations of simple doubts, and he treated everyone equally; came with personal grief, for advice, and came for material assistance and no one left without approval, without affection, without help. B. K. did not calm down until he could fulfill the request addressed to him … Any work satisfied B. K. only when he knew that when it was carried out, all the forces and skills were applied. At the same time, B. K. always said that a person should do the work that is most difficult for him, leaving an easier task for those who are weaker than him» [2].

People often heard from the professor that there is a higher rank than the title of a scientist – this is the title of «man», which determined a special style of communication with people who addressed him.

Boleslav Kornelievich was a member of several scientific societies: the Society of Naturalists, the Society of Naturalists, Umov Physical Society, the Psychological Society, where he was a member of the editorial committee of the journal «Questions of Philosophy and Psychology».

Mlodzeevsky had to endure severe trials and hardships in the post-revolutionary years, especially in 1918 and 1919. From the memoirs of Olga Tsuberbiller: «In his youth, B. K and his wife briskly and cheerfully passed through all the material difficulties, but now the matter was complicated: life in an unheated room, lack of nutrition caused great physical suffering to the sixty-year-old B.K., who was also sick. But he tried in every possible way to hide this from others, sawing wood … wore sacks of frozen potatoes … To these physical sufferings very soon joined the present grief: the only grandson was born

and a few days later died of the cold and exhaustion of the mother, and then the wife fell ill with malignant anemia…».

To support his family, the professor had to work hard, which ultimately affected his own health. On January 5, 1923 Boleslav Kornelievich was sent to the clinic for an operation to remove the carbuncle. Two operations, conducted under anesthesia, aggravated the diabetes, which the professor suffered, and led to a common poisoning of the body. On January 18, Professor Mlodzeevsky died. He was buried at the Novodevichy Cemetery in Moscow. His grave is a monument of history and architecture.

The well-known Soviet physicist Vladimir Zernov wrote about Boleslav Kornelievich in his book «Notes of the Russian Intellectual»: «Mlodzeevsky was the most popular professor among those who taught at the first year. He read analytical geometry on the plane and higher algebra, and each of his lectures ended in applause. Mlodzeevsky presented his lectures in an unusually picturesque manner and in the professors' department he was a good actor».

Conclusion. *Boleslav Mlodzeevsky left behind a whole galaxy of pupils – scientists well known to the world mathematical school: D. F. Egorov, I. I. Zhegalkin, A. V. Vlasov, A. I. Nekrasov, S. S. Byushgens, S. P. Finikov, N. N. Luzin, V. V. Golubev, G. N. Sveshnikov, O. N. Tsuberbiller … And this is only a fraction of what he would have been entitled to write down in his asset, being a lifetime on the foreground events and, as it turned out, periodically receiving for the enthusiasm and selfless work the applause of the grateful educational audience.*

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