

The History of Teaching Zoology at the Moscow Higher Women's Courses in the early XX Century

ROMAN A. FANDO

Sergey I. Vavilov Institute for the History of Science and Technology, Russian Academy of Sciences, Moscow, Russia; fando@mail.ru

Based on new archival materials, this paper reconstructs the pre-revolutionary system of women's training in zoology at the Moscow Higher Women's Courses. The history of teaching zoology at the Women's Courses is the first experience of a large-scale training in life sciences for female students based on the university-level curricula. The zoological laboratory opened at the Courses in 1904 to train the auditors in histology, embryology, and evolutionism. The academic quality of education was provided by Moscow University professors, M.A. Menzbir, N.K. Kol'tsov, and P.P. Sushkin, who were invited to teach at the Courses. The training, which lasted from September through May included lectures, the female students attended practicums; many attended scientific seminars and circles, and also conducted research under the guidance of eminent scientists. The laboratory was fitted with the necessary equipment, collections, and professional literature: all of this was regularly updated and replenished, which was paid with the Courses' own funds and charity donations. The experience of organizing the teaching and learning process at the Zoological Laboratory was shared with the participants in 12th Congress of Natural Scientists and Physicians in Moscow to demonstrate different forms and methods of zoological teaching. In 1918, the Courses were reorganized into the Second Moscow University. Nevertheless, the traditions of pre-revolutionary education were adopted by the teachers of the nascent soviet higher school and implemented in teaching practices. Among those who received training in zoology at the Moscow Higher Women's Courses were S.L. Frolova, N.N. Ladygina-Kohts, M.P. Sadovnikova-Kol'tsova, V.N. Shreder, and others who became renowned scientists in the fields of zoology, cytology and genetics, the teachers and organizers of Russian science.

Keywords: Moscow Higher Women's Courses; pre-revolutionary higher education for women; teaching zoology; female natural scientists; professionalization of women scientists.

The history of women's higher education in Russia traces its roots to the second half of the XIX century, when the struggle for equal educational opportunities for women was going on among the Russian society. The theme of the Russian government's persistent reluctance to address the so-called "women's issue" has been covered in a number of works by the Russian and international authors (Sheremetevskaya, 1896; Tishkin, 1982, 1983; Pushkareva, 2002; Yukina, 2003; Dudgeon, 1982; Johanson, 1987; Engel, 1999). T.N. Shilina believes that the changes in women's status and position at home and in society were influenced by political upheavals and economic crisis during the reign of Alexander II. By the mid-XIX century, mass impoverishment of landed gentry led to many gentlewomen finding themselves outside their traditional framework of women's life and forced into earning their own living (Shilina, 2015), which necessitated education.

In 1859, women were, as an experiment, allowed to attend lectures at St. Petersburg University as free auditors together with male students. By 1861, there were as many as 30 female auditors at the University. When the Ministry of Public Education polled the universities' councils about the possibility of admitting women to universities, there were only 2 "yays" at Moscow University vs 23 "nays". Dorpat University also voted against higher education for women while Kazan, Kiev, St. Petersburg, and Kharkov Universities conceded this possibility (Valkova, 2006). Male scientists were concerned that admission of women would mean lowering the bar of Russian science (Agamova and Allakhverdyan, 2000). Despite rather liberal attitude of most professors towards the issue of university education for women, the doors to the universities were closed for women due to the eruption of student riots.

The society except for its most progressive representatives has not yet gotten used to the idea of the necessity of higher education for women; the government did not see it as a public necessity and was suspicious and even wary of it. (Oldenburg, 1904, p. 27–28)

In parallel with the universities' councils, the issue of higher education for women was discussed by the Commission for Preparation of the New University Regulation, headed by E.F. Bradke, the Trustee of the Dorpat Educational Precinct. The majority of the Commission members voted against women's admission to universities. In 1863, after the adoption of the new University Regulation, women were banned from attending lectures, which caused quite a stir. In 1867, the editor of the "Nedelya" (Week) magazine E.I. Konradi addressed the participants of the First Congress of Russian Naturalists, held in St. Petersburg, with a call to support women in their struggle for the right to university education (Ponomareva, Khoroshilova, 2009). In March and May 1868, the Rector of St. Petersburg University received a petition from 400 women to open women's courses or organize lectures for women (Vremenko, 2004). The same year the Ministry of Public Education received a similar petition signed by 63 women from Smolensk. Similar petitions soon came from Moscow, Tiflis, and Kiev (signed by the total of about 500 women) (*ibid*).

The Minister of Public Education D.A. Tolstoy strongly opposed the opening of higher education institutions for women. Receiving a delegation of women from Khar'kov, who were petitioning for making university education accessible for women, he told them sternly that he would never allow women at the universities as they would corrupt all the students (Fedosova, 1980). However, the public pressure was so strong that the government was forced to make concessions and allow to open the first private courses for women. The first of such courses were opened in Moscow in 1869.

So much ado, so much joyful excitement was caused by the first publication announcing Mr. Minister of Public Education's permission to open women's courses! It was the first women's celebration in Moscow, the first joyful welcoming of the new dawn, the new life! (Nekrasova, 1886, p. 11).

A number of works in the Russian historiography are devoted to the first women's courses: the Lubyanka Courses (Nekrasova, 1880, 1886) and the Bestuzhev Courses (Evtseva, 1966; Kovalevskii, 1971; Fedosova, 1980; Vakhromeeva, 2003). It should be mentioned here that V.I. Guerrier's Higher Women's Courses in Moscow, founded in 1872, have been also covered in several publications that described the history of creation of the new higher education institution and V.I. Guerrier's efforts in this undertaking (e.g. Bobrova, 1961; Evenchik, 1972;

Aksenov, 1997; Ivanova, 2009a, 2009b; Tsygankov, 2010; Zotova, 2010; Bortashevich, 2016). However, no coherent, integrated picture of how the teaching and learning process was organized, and what was the system for teaching science and humanities at the courses has been reconstructed yet in the Russian and international literature. The documents from the Fonds 363 of the Moscow Higher Women's Courses (MHWC) in the Central State Archive of the City of Moscow (TsGAM) made it possible to fill this gap.

The Courses were opened by virtue of the ordinance issued by the Minister of Public Education D.A. Tolstoy on the 6th of May, 1872 and with the active participation of the founder of the Courses, Vladimir Ivanovich Guerrier, who was professor of universal history at Moscow University. According to the institution's charter, the Courses provided two years of instruction. However, due to a surge of interest among women in an almost university-level education, the charter had to be amended and, as a result, starting from 1879, the curriculum was extended to three years, which allowed more in-depth studies of many curriculum disciplines.

To be eligible for admission, women had to have successfully completed a full eight-year course of studies at a gymnasium, parochial secondary school for girls, or any other school vested with the rights of gymnasium, and meet the passing grades. To enroll, the applicants were required to provide a certificate of completion of studies in a gymnasium and the written permission of the applicant's father (for unmarried auditors) or husband. Apart from these documents, the applicants were obliged to provide a certificate of political loyalty¹.

The Higher Women's Courses were closed in 1886²: officially, because of the creation of a Government Commission for reviewing the issue of higher education for women, and unofficially, because of the auditors' involvement in the anti-government riots and numerous police reports on the auditors' political disloyalty.

After the Courses were closed, the collective lessons were organized for women on the initiative of the Society for Providing Means of Support for the Higher Women's Courses (*Obshchestvo pomoshchi Vysshim zhenskim kursam*), with the leading university professors asked to conduct the lessons. The auditors ("coursists", or *kursistski* after the Russian word for "courses") paid token fees for attending classes; moreover, financial support was often provided by rich people. Sometimes classes were held in the houses of the renowned philanthropists: merchant N.P. Lanin (14 Tverskaya) or book publishers — brothers M.V. and S.V. Sabashnikov's (26 Arbat).

The Courses were reopened in 1900. They comprised two faculties, historical/philosophical and physical/mathematical. The Faculty of Physics and Mathematics had two divisions, mathematics and natural sciences. Beginning with 1900, the curriculum was extended to four years. At the insistence of the public and the academe, the medical faculty was opened at the Moscow Higher Women's Courses in 1906.

At the division of natural sciences, the students were taught geology, chemistry, zoology, and botany in detail — although, of course, they also studied physics and mathematical disciplines. The subjects were taught in the following order: during the first year, the auditors studied theology, algebra, geometry, trigonometry, physics, chemistry, and general plant morphology and anatomy; during the second year — physics, analytical chemistry, organic chemis-

¹ Central State Archive of the City of Moscow (TsGAM). Fonds 363. Series 1.

² All of the Higher Women's Courses were closed except for the Bestuzhev Courses in St. Petersburg. In 1886, the Bestuzhev Courses were only closed for new enrollments but those who had enrolled earlier were allowed to complete their studies. It was only in 1890 that, after persistent petitioning by the *intelligentsia*, the courses resumed their operations.

try, crystallography, mineralogy, general zoology, plant taxonomy, and plant morphology and anatomy; during the third year — physics, organic chemistry, invertebrate zoology, vertebrate zoology, human physiology, geology, paleontology, petrography, special plant morphology and taxonomy; and during the fourth year — physical chemistry, invertebrate zoology, vertebrate zoology, geology, paleontology, petrography, plant physiology, and special plant morphology³.

In 1903, on the initiative of V.I. Vernadsky, N.D. Zelinsky, and B.K. Mlodzievskii, a new option was made available to the third and fourth year students: to choose additional subjects to study so as to better prepare the paper⁴ on a chosen topic that had to be defended upon the completion of their studies⁵.

Zoology classes were particularly popular among the students for a number of reasons: a large amount and vast content of practical classes; the course of zoology covered the then-new biological disciplines such as Mendelism and cytology; an opportunity was provided to learn the skills for conducting laboratory and field studies. Moreover, zoological disciplines were taught at the Courses by the prominent scientists who were driven by their sense of duty towards society and their desire to better educate Russian women.

Later on the experience of teaching zoology at the Moscow Higher Women's Courses was shared with other higher education institutions and educational public associations in Moscow. In November 1909, in view of the pending 12th Congress of Russian Naturalists and Physicians in Moscow, the Congress' Committee asked the Council of the Higher Women's Courses to organize excursions for the Congress participants in order to demonstrate them the new approaches to the teaching of life sciences. The Council decided that learning how zoology is taught at the Moscow Higher Women's Courses would be the most interesting and helpful for the conventioners.

Despite the fact that zoological classes were housed in a rented flat and could not compete with the university chairs in regard to the level of equipment and abundance of collections, this experience was nevertheless valuable for the provincial organizers of science who set up new laboratories in different higher education institutions and also suffered from the shortage of funding and premises.

The conventioners were shown a zoological laboratory located in Titova's house in Merzlyakovskii Pereulok, practical classes and an exhibition of specimens and collections prepared by the coursisits. The visitors were also shown the evolutionary biology collections arranged by the topics: geographic variation, adaptations to environment, zoogeography, protective coloration, mimicry, Mendelism, Lamarckism and orthogenesis, and the descent of man (Fig. 1).

The ideologist and organizer of the zoology training at the Higher Women's Courses was N.K. Kol'tsov who gathered around himself a team of like-minded teachers who conducted research, possessed organizing skills, and were good at presenting instructional material (Fig. 2).

From 1900 to 1904, teaching had mostly consisted of lecturing. The coursisits were obliged to audit the two-year courses including the introduction into zoology, invertebrate zoology, vertebrate zoology, and a year of embryology. The practicums organized for the students initially included working with a microscope and dissecting crustaceans, molluscans, and amphibians to study the internal organs of the animals belonging to different taxonomic groups. In the absence of a zoological laboratory, practical classes had to be held right in the lecture rooms: for this purpose, the tables and benches were moved to the window and the necessary equipment and materials were distributed. The students had 18 minor microscopes at their disposal.

³TsGAM. Fonds 363. Series 1. File 6. Item 80.

⁴This qualification paper was called 'composition' at the time.

⁵TsGAM. Fonds 363. Ser. 1. File 8. Item 126.



Fig. 1. The building of the Courses in Merzlyakovskii Pereulok. Source: Russian State Archive of Economics. Fonds 3. Series 1. File 489. Item 38



Fig. 2. Nikolai Konstantinovich Koltsov. Source: Archive of the Russian Academy of Sciences. Fonds 450. Series 2. File 27. Item 37

At the Faculty meeting on the 27th of May 1903, M.A. Menzbir raised a concern about the need in a venue expressly intended for teaching biological disciplines. The practicums had to be provided with cold and hot water, gas, and specialised laboratory equipment⁶. By the autumn of 1904, the Faculty managed to obtain a large lab room and purchase 17 new microscopes; several magnifying devices were loaned by the Society of Tutores and Teachers (*Obshchestvo vospitatelnits i uchitel'nits*). Due to the scarcity of space, this laboratory hosted both the zoology and botany classes.

This broadening of the scope of zoological training was associated with new teachers becoming involved in the training process. At the Faculty Meeting on 15 April 1903, M.A. Menzbir announced his partial resignation from lecturing and teaching practicums. He hence recommended to invite privatdozent V.G. Rudnev from the University to teach embryology, and N.K. Kol'tsov — to teach general zoology and histology. P.P. Sushkin, who had already worked at the Courses for one academic

⁶ TsGAM. Fonds 363. Ser. 1. File 8. Item 167.

year, took on some hours of zoology. In the end, Menzbir was left only with lecturing in vertebrate zoology and human anatomy⁷.

A purely zoological laboratory was set up in the spring of 1906. A spacious flat was rented for this purpose in the same building where the Courses' main classrooms were located. The laboratory had a big room for microscope work that could host 50 students, two classrooms for senior students' studies, a room for storing collections, the assistants' room, and a chemicals room. In the absence of a suitable room for practical lessons in animal dissection, the desks in the lecture room were moved in order to instantly turn the room into a specialized laboratory for 70 auditors. The laboratory worked from 9 AM to 9 PM on weekdays, from 9 AM to 7 PM on Saturdays and from 11 AM to 7 PM on Sundays.

Sometimes the laboratory was overcrowded. As outsider women often found their way to the classes to illegally study the topics of their particular interest, the issue of the need in a more careful checking of the tickets to classes was raised at the Faculty Council's meeting on 5 October 1906⁸. The students had to be divided into "full auditors" who received systematic education and passed the exams, and "free auditors" who were allowed to attend lectures and practical classes of their choice. The coursisits were allowed to switch from one category of students to another upon their personal application and with the dean's permission.

A commission comprising the teachers and assistants was put in charge of the laboratory. The Commission elected the head for administrative matters for a term of one year, and for a few years this function was performed by N.K. Kol'tsov.

By the autumn of 1909, two rooms with four windows were added to the zoological laboratory. According to the 1909 inventory book, the laboratory's equipment was worth 5,558 rubles and included 49 Leitz microscopes⁹, two Hartnack microscopes with oil immersion¹⁰, different types of magnifying lenses, two large Becker-Sartorius microtomes, one large Jung microtome, three medium-sized Leitz microtomes, five thermostats, a Sartorius incubator¹¹, and an aeration apparatus for maintaining living cultures (Kol'tsov, 1909).

The laboratory had an abundant zoological collection assembled from different sources: a unique collection of marine animals was purchased from the zoological station at Villafranca¹², and a collection of parasite animals was bought in Prague. A.F. Kohts donated his own collection to the Courses to make teaching evolutionism more illustrative.

Due to the teachers' efforts and contributions, an abundant library was assembled at the laboratory. The literature was grouped into two main areas: the textbooks and general works in zoology bought for teaching and learning, and the journals and books by renowned biologists to encourage the students to do research on their own. A complete set of issues of *Zeitschrift für wissenschaftliche Zoologie* (Journal of Scientific Zoology), *Archiv für Protistenkunde* (Archive

⁷ Ibid. Item 151.

⁸ TsGAM. Fonds 363. Ser. 1. File 25. Item 17.

⁹ Ernst Leitz GmbH was a corporation that manufactured microscopes and other optics.

¹⁰ Edmund Hartnack of Paris manufactured microscopes with immersion lenses, in which special immersion liquid was placed between the lens and the specimen to enhance brightness resolution.

¹¹ It was a German company founded by Florenz Sartorius in 1870.

¹² Moscow Higher Women's Courses allocated 100 rubles for purchasing marine animals from Villafranca. In 1904, N.K. Kol'tsov convinced the Director of the Courses, V.I. Guerrier, to make this purchase. (TsGAM. Fonds 363. Ser. 1. File 10. Item 243) At the same time, Kol'tsov managed to talk the Administration of the Zoological Station at Villafranca into selling this collection for the token sum of 45 francs, and spend the rest of money on buying necessary materials for practical classes with the students. (TsGAM. Fonds 363. Ser. 1. File 12. Item 34).

for Protist Science), *Biologisches Centralblatt* (Biological Central Journal), *Zoologische Jahresberichte* (Zoological Annual Reports), *Archiv für Rassen- und Gesellschafts-Biologie* (Archive for Race and Society Biology), *Anatomischer Anzeiger* (Anatomical Gazette), and *Dr. H.G. Bronn's Klassen und Ordnungen des Tierreichs* (Dr. H.G. Bronn's Classes and Orders of the Animal Kingdom) that were available for the coursisits could hardly be found anywhere else in Moscow. In total, 3,500 rubles worth of the books and journals were bought for the library.

In addition to that, the library (founded in 1911) of the Faculty of Physics and Mathematics was available to the students. Not only 600 rubles were annually allocated by the Director for buying books for the library but there was also a steady flow of money from the philanthropists¹³. Thus, a number of journals were bought with the money from the interest on bank deposits bequeathed by Countess N.S. Sheremetievskaya¹⁴. During the first year of the library's operation, its stock amounted to more than a thousand books, including 192 volumes devoted to anatomy, zoology and animal physiology, 154 volumes on botany and plant physiology, and 27 volumes on geography and anthropology¹⁵. The library was also replenished with contributions from benefactors. Thus, A.M. Minina donated 164 books on the life sciences teaching methodology, and V.A. Sechenova donated two copies of the complete works by I.M. Sechenov. The patrons of the library included P.P. Aleksandrov, E.A. Bogdanov, N.D. Zelinskii, I.A. Kablukov, N.A. Morozov, S.S. Nametkin, I.F. Ognev, A.N. Reformatskii, S.N. Reformatskii, K.A. Timiryazev, and O.A. Fedchenko. The library had classified and alphabetical catalogs compiled by two resident workers¹⁶.

Zoological disciplines were taught at the Courses by the renowned scientists: M.A. Menz'bir, N.K. Kol'tsov, V.G. Rudnev, and P.P. Sushkin. N.A. Kasianov, A.F. Kohts, L.P. Kravets, M.P. Sadovnikova, S.S. Chetverikov, V.N. Lebedev, and N.G. Logvinovich worked as assistants.

The minor macroscopic practicum was conducted by L.P. Kravets and A.F. Kohts. During these classes, the students used wet preparations to acquaint themselves with the morphology of various animals, and learned about organ systems of different taxonomic groups. The minor microscopy practicum was conducted by N.K. Kol'tsov who was assisted by V.N. Lebedev and M.P. Sadovnikova. This practicum set students a task of developing the skills of working with microscope and preparing slides. In the course of this practicum, the students studied different kinds of animal cells and tissues. Particular attention was given to the internal structure of different protozoans: amoebas (*Amoeba proteus*, *Arcella*, and *Diffugia*), flagellates (*Euglena*), and ciliates (*Paramecium*, *Stentor coeruleus*, *Stentor polymorphus*, *Spirostomum*, *Stylonychia*, *Vorticella*, *Opalina*, *Balantidium*, and *Nyctotherus*) and their life cycles, studied using different stains. The mitotic division of eukaryotic cells as well as the characteristic features of spermatozoids and egg cells, the process of their fusion, and the development of fertilized eggs were reviewed in great detail.

The histological practicum to study microscopic anatomy and embryology of the vertebrates was conducted by V.G. Rudnev and N.G. Logvinovich. The two-hour practical classes were preceded by a one-hour lecture that covered the fundamentals of histology. Rudnev together with his assistant¹⁷ also taught the embryological practicum where the students were offered to study different animals' development stages and prepare microscopic slides on their own. In 1914, due to Rudnev's illness, the responsibility for teaching classes in histology and

¹³ TsGAM. Fonds 363. Ser. 1. File 88. Item 61.

¹⁴ Ibid. File 12. Item 65.

¹⁵ Ibid. File 88. Item 61.

¹⁶ Ibid. Item 61–62.

¹⁷ Natalia Georgievna Logvinovich herself was an alumna of Guerriers' Higher Women's Courses.

embryology fell completely on the shoulders of Ms. Logvinovich who was the very same year introduced into the Council of the Faculty of Physics and Mathematics¹⁸.

Parasitology practicum appeared in the Courses' curriculum in 1909. V.N. Lebedev, who until then worked at the Courses' medical division, was invited to teach this practicum. The same year, entomology practicum taught by S.S. Chetverikov was opened for the students. On Chetverikov's initiative, the meetings of the Moscow Entomological Society were held at the Courses' zoological laboratory since 1913¹⁹. We know from the recollections of contemporaries that Chetverikov's lectures were carefully designed. Practical classes in entomology consisted of very detailed studies of the representatives of different insect orders, preparing and drawing insect specimens and slides. Sergey Sergeevich Chetverikov set very high standards for the drawings' quality so that by the end of the practicum all participants in his practicum learned to draw fairly well²⁰.

To teach the students to draw, the art classes were included in the Courses' curriculum²¹ in 1903 on the initiative of P.P. Sushkin and A.N. Stroganov²². Art classes at the Courses were taught by a well-known animal artist Nikolai Avenirovich Martynov²³. A special room was allotted for drawing lessons, both group and individual. Any student could go there to work on their pencil drawings or watercolors when they were free from classes. The studio was open on workdays from 9AM to 4PM and, on the insistence of N.A. Martynov, on Sundays and holidays too. His classes were overwhelmingly popular. In the very first year when drawing lessons began to be taught at the Courses, 170 auditors enrolled for these classes and, as the studio could only host 35 or 40 persons, many students who wanted to develop their drawing skills had to get a rejection for this reason²⁴.

The major practicum in invertebrate zoology was preparing the students for scientific research. Only those students who had completed two years of training at the Courses, including minor practicums, could be admitted to the major practicum. Before each lesson, the auditors were to study the relevant specialist literature and prepare the necessary equipment and their study plan. During the major practicum, the students were to carry out all their observations and experiments on their own. When they need a consultation, they could consult with a supervisor in the time specially assigned for this purpose. The major practicum in invertebrate zoology was taught by N.K. Kol'tsov, N.A. Kasianov, and M.P. Sadovnikova²⁵. It was on the latter's initiative that an additional demonstration course in invertebrate zoology was introduced in 1910²⁶. In 1912, Abram Lvovich Brodskii²⁷, an alumnus of Moscow and Geneva Universities and Kol'tsov's assistant at the Shanyavsky University, was invited as an assistant for this course.

The major practicum in vertebrate zoology was initially taught by P.P. Sushkin (Fig. 3). In April 1906, he forwarded a letter to the Director of the Courses to inform him that, because of his work at the Zoological station at Villafranca, he was no longer able to teach, and asked to find him a replacement²⁸, and a temporary one was selected. However, after his illness, Sushkin

¹⁸ TsGAM. Fonds 363. Ser. 1. File 114. Item 27.

¹⁹ Ibid. File 1. Item 201.

²⁰ V.I. Vernadsky National Library of Ukraine. Fonds 287. Ser. 1. File 38. Item 53.

²¹ TsGAM. Fonds 363. Ser. 1. File 1. Item 135.

²² Ibid. File 10. Item 531.

²³ Ibid. File 67. Item 44.

²⁴ Ibid. File 88. Item 64.

²⁵ TsGAM. Fonds 363. Ser. 1. File 67. Item 17.

²⁶ Ibid. Item 22.

²⁷ Ibid. File 19. Item 47.

²⁸ Ibid. Item 47.



Fig. 3. At the zoological laboratory of the Higher Women's Courses in Merzlyakovskii Pereulok. 8 April 1910. From left to right: P.P. Sushkin, N.N. Popova (Sushkina), S.S. Chetverikova, V.G. Shablovskaya. Source: Archive of the Russian Academy of Sciences. Fonds 319. Series 2. File 14. Item 1

quit teaching altogether in September 1907, as he was forced to leave Moscow for a lengthy treatment²⁹. The Council generously paid him the fee for the entire period of his forced absence³⁰. The major practicum in vertebrate zoology (four teaching hours per week) began to be taught by L.P. Kravets. Eventually Sushkin resumed teaching this practicum and began to teach an original course in comparative anatomy of the vertebrates as well. He only stopped teaching this course in 1910, when he took a job with Khar'kov University³¹. It took quite a long time for the Faculty to find a suitable replacement for him.

In November 1910 A.N. Severtsov was elected by Moscow University's Council as professor at the chair of comparative anatomy and, in December 1910, he was asked to teach comparative anatomy³². However, after the 1911 events and the subsequent resignation of M.A. Menzbir from the Imperial University, Menzbir, who had quit teaching at the Moscow Higher Women's Courses in 1904, was also offered to teach this course³³. Consequently, Severtsov withdrew from

²⁹ Ibid. File 32. Item 2.

³⁰ Ibid. Item 26.

³¹ TsGAM. Fonds 363. Ser. 1. File 57. Item 259 Rev.

³² Ibid. File 67. Item 101.

³³ Ibid. Item 175.

this nomination and handed over this vacancy to his teacher. In his letter to the dean of the Faculty of Physics and Mathematics V.D. Davydkovskii, Severtsov wrote,

In view of the difficult situation in which M.A. Menzbir found himself absolutely undeserv- edly and unjustly, the Faculty should approach him with a proposal to take on teaching compara- tive anatomy. Therefore, while expressing my gratitude to the Faculty for the honour of offering me to become one of its members, I withdraw myself from consideration, believing that M.A. Menzbir is much more entitled to it than I. I repeat that this idea occurred to me absolutely independently of your letter and it gladdens me that our wishes agree³⁴.

The demonstration course in zoology taught by A.F. Kohts evoked particular interest among the auditors (Fig. 4). This course effectively comprised the fundamentals of evolutionism as it introduced the concepts of species and speciation, the theory of natural selection, and the paleontological evidence of evolution and diversity of the fauna — all of this expressed in a graphic and concise form. Kohts was a preacher of Darwinism, regarding it as the foundation for all biological disciplines:

<...> science has never before seen a grander, a more harmonious and complete picture of the world than the one that conveyed Darwin's scien- tific worldview, expressed in a few concluding lines of his immortal work — the idea of gradual origin of the organic world up to its higher forms, ending with man... (Kohts, 1915, p. 35)

In 1907, Kohts moved his personal collec- tion of taxidermied animals to the Higher Women's Courses³⁵. Over two years (1907–1909) the collection had grown so much that it barely fit in the room that had been specially allocated for it. Initially Kohts was purchasing the specimens and setting up the museum with his own money. Later on a part of this collection was bought by the Higher Women's Courses and became its property³⁶.

The night day before Kohts' lectures, dozens — and sometimes hundreds — of specimens were brought into the lecture room and arranged on extendable tables in the order dictated by the content of the lecture. These busy, time-consuming preparations often went on well past midnight (Kohts, 2014). During classes, Kohts used taxidermied animals to demonstrate



Fig. 4. Alexander Fyodorovich Kohts. 1901. Source: *A.F. Kohts. Collected works. Vol. 2. The history of the State Darwin Museum / A.I. Klyukina, Ed. Moscow: GDM, 2014. P. 57*

³⁴ TsGAM. Fonds 363. Ser. 1. File 67. Item 205.

³⁵ Later on A.F. Kohts' collections formed the core of the Darwin Museum's holdings and, therefore, 1907 — the year when A.F. Kohts' collection was moved to the Higher Women's Courses for the demon- stration course in zoology — is regarded as the year of foundation of the Museum. In 2007, the State Darwin Museum celebrated its centenary.

³⁶ In 1911, the Council of the Courses bought from A.F. Kohts the items amounting to 970 rubles. Source: TsGAM. Fonds 363. Ser. 1. File 1. Item 148.

particular phenomena, which made his lectures inimitable and attractive for the audience. As the lecturer himself recollected later on, "One may doubt that the lectures on evolutionism have ever been delivered elsewhere in Europe in such a vivid form as in a Higher Women's Courses' cozy classroom adjacent to the museum" (Ibid., p. 82–83).

The Regulation on the Museum of Evolutionary History at the Moscow Higher Women's Courses was adopted in 1913. The bulk of the collection worthy of 15,000 rubles was donated to the Courses on condition that the institution would pay the preparator's salary of 100 rubles per month as well as allocate a small amount of money for the Museum's operating costs³⁷. It was also stipulated that A.F. Kohts would be the director of the Museum and, in the event of his death, his rights would be passed on to his wife.

Kohts hired the leading specialists to work with the Museum collections. These people maintained the uniqueness of the future Darwin Museum's holdings. The Museum's preparator was F.E. Fedulov who, "with his devoted and inconspicuous work on and behind the lines, had pointedly demonstrated what a remote Russian countryside can do for creating the capital city's progressive values and the belief in a better tomorrow for the common Russian people" (Kohts, 1917, p. 8) (Fig. 5). Fedulov possessed an extraordinary power of observation and sense of form that enabled him to create specimens practically indistinguishable from the living objects. V.A. Vatagin, who together with Kohts had studied drawing under N.A. Martynov³⁸, was hired as an animal artist and, on Menzbir's instruction, prepared a series of charts for the course in zoogeography. Kohts' wife, his former student N.N. Ladygina-Kohts, was his main and most loyal assistant and source of inspiration in the matters of collecting and exhibiting specimens.

New collections were annually added to A.F. Kohts' museum. Over the period from 1913 to 1917, these collections' worth increased to 50,000 rubles. The budget of 1,000 to 1,500 rubles was annually earmarked for the Museum's development and the Director provided additional 3,000 rubles, raised from private donations. In addition to that, A.F. Kohts gave public lectures and private lessons and turned over his earnings to the Museum³⁹ (Fig. 6).

The evolution theory was initially taught by M.A. Menzbir. His resignation created a problem for the Deanery that had to find an accomplished professional to replace Menzbir. They approached K.A. Timiryazev who refused because of the lack of time, and then the evolution theory began to be taught by A.F. Kohts⁴⁰.

In February 1912, N.K. Kol'tsov petitioned the Deanery of the Faculty of Physics and Mathematics to introduce a new subject, animal biology (ethology), in the curriculum⁴¹. Until then, zoology teaching was fairly traditional in most universities. Animals were only studied in regard to their morphology, anatomy, and physiology. As N.K. Kol'tsov wrote:

Due to such one-sidedness in zoology teaching, the zoologists themselves are very often unable to answer the simplest and the most natural questions: why a fly crawls on the glass and does not slip, why it doesn't freeze in winter, why insects run on the water and do not drown,

³⁷ Although it was recorded in the Minutes of the Meeting of the Courses' Board of Trustees of 11 May 1913 that "It is resolved to authorise the Faculty of Physics and Mathematics of the Courses to buy the biological museum from Mr. Kohts on the terms that the Faculty deems acceptable but at a cost not exceeding 15,000 rubles". Source: TsGAM. Fonds 363. Ser. 1. File 1. Item 198.

³⁸ Many of the University biologists (A.N. Severtsov, P.P. Sushkin, V.N. L'vov) studied drawing with Nikolai Avenirovich Martynov.

³⁹ TsGAM. Fonds 363. Ser. 1. File 136. Item 342.

⁴⁰ Ibid. File 32. Item 94 Rev.

⁴¹ Ibid. File 80. Item 143–144.



Fig. 5. Taxidermist F.E. Fedulov and a taxidermied gorilla. 1916. Source: A.F. Kohts. Collected works. Vol. 2. The history of the State Darwin Museum / A.I. Klyukina, Ed. Moscow: GDM, 2014. P. 81



Fig. 6. At the museum of the Moscow Higher Women's Courses. Source: Russian State Archive of Economics. Fonds 3. Series 1. File 486. Item 54

why a heavy moose runs across a quagmire and does not sink down, etc.”⁴². “The said one-sidedness in teaching, this preoccupation with nothing but a stark description of the organs is historically explained by the fact that all efforts of the zoologists have been aimed at collecting as much morphological material as possible and thus further strengthening and broadening the foundation on which the evolution theory rests, particularly Darwinism. However, the theory of evolution now stands unshakable and, therefore, there’s no need in putting all their energy into the accumulation of one-sided morphological data, all the more so as the remaining controversial issues of transformism tend to be addressed nowadays in a more experimental way⁴³.

According to N.K. Kol'tsov, this side of zoology could be especially important for the auditors as many of them later became employed as teachers. To foster the students' interest in zoology, the graduates of the Courses were required to be able to not only study the animals in the laboratory conditions but also be at ease in the forest and in the field. N.A. Kasianov was charged with developing a curriculum for this course.

Beginning with 1 September 1916, psychological and pedagogical subjects were introduced at the Moscow Higher Women's Courses: thus, the methodology of biology teaching with an emphasis on demonstration and discussion sessions (seminars) was included in the curriculum for biology students⁴⁴. During the seminars, the auditors discussed the content of different secondary school textbooks on zoology, botany, and natural study, written by the Russian and

⁴² TsGAM. Fonds 363. Ser. 1. File 80. Item 146.

⁴³ Ibid. Item 146–146 Rev.

⁴⁴ Ibid. File 123. Item 341.

foreign authors. The students were asked to identify the textbooks' strengths and weaknesses, using the following criteria: comprehensibility of material for intended age groups, the size of the book, the choice and presentation of content, the number of pictures and their relevance to the text, and the presence of inaccuracies and biological mistakes⁴⁵. In addition to this, the auditors attended the lessons given by school teachers in order to learn practical teaching skills, and studied the equipment used in gymnasiums' classrooms. They also had classes at the Pedagogical Museum of the Society for Promoting Technical Knowledge and at the Moscow City Museum of Teaching Aids, in particular, at the visual aids-making shop.

As part of studying the methodology of teaching biology, the lectures on the history of biological disciplines and the history of teaching biology in Russian schools were delivered. The curriculum encompassed practically all aspects of biology teaching: the educational goals of teaching biological disciplines at school; the didactic principles of teaching (scientifically-grounded teaching, comprehensibility, visuality, and linking theory to practice); teaching methods; the role of visuality in teaching; after-school learning activities (nature exploration excursions, visits to life sciences museums); textbooks and teaching aids for schoolchildren⁴⁶.

In 1903 the students of the Moscow Higher Women's Courses began to be trained for research work. According to a unanimous resolution adopted by the Council of the Faculty of Physics and Mathematics⁴⁷, "the goal of teaching at the Higher Women's Courses ought to be not only providing the students with the information pertaining to various disciplines taught [at the Courses] but also introducing them, at least to a modest extent, to more independent research work"⁴⁸. The best means for achieving this goal was providing an opportunity to the third- and fourth-year students to familiarize themselves with research practices and methods. To this end, the students were offered to study some disciplines in greater depth and carry out an independent research project in a chosen discipline. In view of this newly-introduced variability, the disciplines were divided into obligatory and optional, chosen by the students. Such approach to teaching was more consistent with the objectives of a university-level higher education institution.

In 1907, a group of teachers led by N.K.Kol'tsov approached the Council of the Higher Women's Courses with a proposition to introduce the institution of "privatdozent" (assistant professor). However, some Council members, particularly B.K. Mlodzievskii, opposed this proposal on the grounds that Privatdozentship was not quite in line with the quintessence of teaching at the Courses. The Director of the Courses S.A. Chaplygin agreed that introducing Privatdozentship would be inconsistent with the Courses' Charter and therefore this issue was postponed for future discussion⁴⁹.

In March 1907, Kol'tsov once again raised the issue of instituting Privatdozentship. In his opinion, Privatdozents should be the individuals who agree to teach without remuneration and are known for their accomplishments in research or teaching. Privatdozents were to be approved following the same procedure as other teachers, and could participate in the Faculty meetings without voting rights. Kol'tsov's proposal was once again challenged by the Faculty members: A.K. Vlasov, B.K. Mlodzievskii, I.I. Zhegalkin, I.I. Chistyakov, V.D. Sokolov, S.A. Chaplygin, and M.N. Shaternikov. It was decided to defer this issue for further discussion at the Council meetings⁵⁰.

⁴⁵ Ibid. File 157. Item 73–74.

⁴⁶ TsGAM. Fonds 363. Ser. 1. File 157. Item 74–75.

⁴⁷ The meeting of the Faculty Council was held on March 9, 1903.

⁴⁸ TsGAM. Fonds 363. Ser. 1. File 8. Item 144.

⁴⁹ Ibid. File 32. Item 11 Rev.

⁵⁰ Ibid. Item 125.

As for the possibility for the students to sit qualification exams at the universities, it was established by the circular No. 13463 of 20 March 1912, concerned with applying the Law of 19 December 1911 to women who wished to take exams before the universities' examination boards, that the auditors who had completed their studies at the higher education institutions for women could only be admitted to examinations by special permission of the Ministry⁵¹. According to footnote 2 to this law, it was only the auditors of the Moscow (Guerrier's), St.Petersburg (Bestuzhev's), Kiev and Kazan Higher Women's Courses, as well as the auditors of the Imperial Women's Pedagogical Institute in St.Petersburg who were allowed to sit examinations without the Ministry's special permission (Fig. 7).



Fig. 7. At the zoological laboratory of the Moscow Higher Women's Courses. 1910. Source: Archive of the Russian Academy of Sciences. Fonds 450. Series 4. File 85. Item 6

After they completed their studies at the Courses, many auditors chose to continue doing research at the laboratory. Paying a token fee of 10 rubles per year, they continued with their research projects under the guidance of their teachers. Thus, Sofia Leonidovna Frolova studied the idiosome in *Ascaris megalcephala* (1910) under the guidance of N.K. Kol'tsov⁵². The result of this work was a paper published in *Archiv für Zellforschung*. She was also exploring the theme of additional chromosomes and their role in sex determination in *Adelgidae*⁵³. Nadezhda Nikolaevna Popova and Vera Grigorievna Shablovskaya studied comparative anatomy of the animals under the guidance of P.P. Sushkin⁵⁴.

⁵¹ TsGAM. Fonds 363. Ser. 1. File 114. Item 10.

⁵² Ibid. File 67. Item 71.

⁵³ The Adelgidae is a family of herbivorous insects in the order Hemiptera. Adelgids, whose body length is 0,5–1,5 mm, only live on the conifers and produce galls resembling small conifers or pineapples.

⁵⁴ TsGAM. Fonds 363. Ser. 1. File 57. Item 263 Rev.

N.K. Kol'tsov himself wrote that in 1912 he acted as a consultant for six research projects and therefore offered daily consultation hours for these women to talk about the perused literature and present the results of their experiments⁵⁵.

One of the forms of research activities was the Life Sciences Circle organized by the students of the Courses in 1911. The Circle members went on excursions into nature, collected insects, mollusk shells, plants and minerals. Apart from the taxonomic collections, the students had amassed the phyto- and zoogeographical collections characterizing different natural habitats, and a biological collection illustrating animal and plant adaptations to environmental conditions (protection from drought, defense against predators, etc.)⁵⁶. N.K. Kol'tsov provided space in his laboratory for the valuable material collected by the students⁵⁷ (Fig. 8).



Fig. 8. Major practicum in zoology at the Moscow Higher Women's Courses. 1910. Source: Archive of the Russian Academy of Sciences. Fonds 450. Series 4. File 85. Item 39

A milestone event in the life of the Higher Women's Courses in Moscow occurred in 1913. The Minister of Public Education L.A. Kasso approved the "Regulation on Keeping Women on at the Moscow Higher Women's Courses to Improve Their Scientific Knowledge" on 17.03.1913. According to this Regulation, the women who successfully completed their studies at the Courses could continue their scientific training at this institution. The candidates were nominated by the Departments and approved by the Council of the Courses. The duration of scientific training comprised two years but could be extended to three years upon the Faculty's request. A significant implication of this document was making this form of education available. The graduates of the Courses who were kept on to continue their training with the Departments could attend lectures and practical classes free of charge and use the library and scientific

⁵⁵ Ibid. File 88. Item 10.

⁵⁶ Ibid. Item 133.

⁵⁷ Ibid. Item 134.

laboratories⁵⁸. Moreover, some of the most talented girls were provided with grants amounting to 600 rubles per year⁵⁹.

World War I necessitated changes in the Courses' operations. In 1914, the military units were temporarily accommodated in the corridors of the Higher Women's Courses. The premises of the Physical Institute's laboratory were used as an infirmary for the wounded while students worked as nurses. A teacher A.A. Dyoshin and the assistants L.P. Kravets, D.K. Aleksandrov, D.I. Romashev, and V.N. Lebedev were drafted into military service. Due to the commencement of warfare, A.A. Eikhenvald (Eichenwald) was unable to return to Russia. Nevertheless, the studies at the Faculty continued in the same fashion, with the same content and amount of teaching hours⁶⁰. Moreover, it was decided that the faculty members who were fighting on the front lines would receive compensation amounting to their annual salary. Many teachers took their colleagues' teaching hours in addition to their own: thus, A.F. Kohts began to teach human anatomy instead of A.A. Dyoshin who was called up; P.G. Leiberg and A.A. Glagoleva began to teach physics instead of A.A. Eikhenvald, and M.M. Zvadovskii took on teaching zoological disciplines in place of L.P. Kravets.

Some laboratories provided direct help to the army. Chemical laboratories began to produce medications for the wounded. The Faculty of Physics and Mathematics delegated S.S. Nametkin as its representative in the Moscow Committee for Organizing the Manufacture of Medications in Russia. He had not only organized the manufacture of medications but also took part in redirecting chemicals from other Faculty's laboratories, especially those containing bromine, iodine, bismuth and mercury, for the Army's use. N.K. Ko'ltsov handed over 200 rubles for manufacturing medications⁶¹. This money was saved from the budget of his laboratory.

Year 1917 saw an outbreak of political rallies and meetings. Kohts thus wrote in 1917,

The episodic, unforeseen, crowded and noisy evening public gatherings (meetings, rallies and lectures) had effectively disrupted most of my classes despite the auditors' keen willingness to continue with these [classes] till the end of the term. <...> To an even greater extent than the teaching role of the museum in my charge, the "street"'s finding its way into the building of the Courses affects the preservation of its collections <...> The Museum is threatened by the most noxious enemy of zoological collections — tobacco smoke. <...> The majority of smokers from among the outsider visitors to our building pay absolutely no regard to either requests or signs asking to abstain from smoking in the foyer and corridors⁶².

In February 1917, the entire Faculty was actively discussing the draft new University Regulation that provided for dividing the curriculum into the core and specialized disciplines. After a thorough discussion of this draft regulation, the biologists at the Higher Women's Courses concluded that the core disciplines only were not enough for the higher education. The graduates needed to study special disciplines in order to master the research methods⁶³. The Biological Commission of the Courses proposed to introduce new subjects — ecology, genetics, experimental biology, and zoogeography — for zoology students of the 1917–1918 academic years⁶⁴.

⁵⁸ TsGAM. Fonds 363. Ser. 1. File 88. Item 299.

⁵⁹ Ibid. Item 299 Rev.

⁶⁰ Ibid. File 114. Item 1 Rev.

⁶¹ Ibid. Item 2 Rev.

⁶² TsGAM. Fonds 363. Ser. 1. File 136. Item 342 Rev.

⁶³ Ibid. Item 208.

⁶⁴ Ibid. Item 258.

After the October 1917 Revolution, the life of the Higher Women's Courses changed dramatically. At the Courses' Council meeting on the 24th of February (9th of March) 1918, the Director of the Courses S.A. Chaplygin announced that, in accordance with the Soviet Government's resolution, classes at the higher education institutions were to end by the 2nd of April. The Council, however, decided to continue teaching till April 20, begin the spring exams on April 22 with a break for the last three days of the Holy Week and the entire Easter Week, and resume the exams right after the Easter⁶⁵.

In September 1918, the Moscow Higher Women's Courses were reorganized into the Second Moscow State University (MSU) that admitted the students of both sexes. The former Director of the Courses Sergei Alekseyevich Chaplygin was held over as rector (1918–1919) of the newly established higher education institution. All of the Courses' assets and facilities were nationalized and handed over to the Second MSU; the Darwin Museum was established based on Kohts' collections, with Kohts remaining the director of the Museum from the time of its inception in 1922 till the end of his life in 1964. The standards of teaching at the new higher education institution were much lower, compared to the academic standards of the Courses. In pursuit of the democratization of the student body, the entrance exams were called off, which had a considerable impact on the composition of students.

In 1929, the Second MSU was reorganized into the Second Moscow State Medical University, the Moscow Institute of Fine Chemical Technology ("MITKhT"), and the Moscow State Pedagogical Institute.

Therefore, zoology teaching at the Higher Women's Courses in Moscow was short-lived — from 1900 till 1918 — but played a crucial role in the training of women for the teaching and scientific careers. The curriculum included not only the university-level courses on morphology, anatomy and physiology of animals, but also the special courses on zoopsychology and physico-chemical biology. N.K. Kol'tsov was the initiator of individual tuition for the students who wanted to do research. Some of the graduates of the Moscow Higher Women's Courses became renowned scientists: Sofia Leonidovna Frolova (1884–1951), in the field of zoology; Nadezhda Nikolayevna Ladygina-Kohts (1889–1963), in zoopsychology and primatology; Maria Polievktovna Sadovnikova-Kol'tsova (1882–1940), in zoopsychology; and Vera Nikolayevna Shreder (1897–1976), in hydrobiology and physiology. These women combined the traditions of the Russian pre-revolutionary education with the innovations dictated by the time and the new social system. The Russian women who had been fighting for their rights to education for so long succeeded in proving that they were able to overcome difficulties and reach the heights in the exploration of the secrets and laws of nature.

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⁶⁵ Ibid. File 157. Item 279–279 Rev.

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История преподавания зоологии на Московских высших женских курсах в начале XX века

Р.А. ФАНДО

Институт истории естествознания и техники им. С.И. Вавилова РАН, Москва, Россия;
fando@mail.ru

В статье на основе новых архивных материалов воссоздана дореволюционная подготовка женщин в области зоологии на Московских высших женских курсах. Преподавание на женских курсах являлось первым в Москве опытом массового обучения слушательниц зоологическим дисциплинам по университетским программам. Благодаря открытию на курсах лаборатории зоологии в 1904 г. была организована подготовка слушательниц по зоологии, гистологии, эмбриологии,

эволюционному учению. Академизм преподавания обеспечивали приглашённые преподаватели Московского университета: М.А. Мензбир, Н.К. Кольцов, П.П. Сушкин. Обучение проводилось с сентября по май, кроме лекционного материала слушательницы проходили практикум, многие студентки посещали научные семинары и кружки, выполняли исследования под руководством выдающихся учёных. Лаборатория была обеспечена необходимым оборудованием, коллекциями и специальной литературой, которые постоянно пополнялись за счёт собственных средств учреждения и благотворительных пожертвований. Опыт организации учебного процесса в зоологической лаборатории был представлен участникам XII Съезда естествоиспытателей и врачей в Москве, так как демонстрировал различные формы и методы обучения зоологии. В 1918 г. курсы были преобразованы во Второй Московский университет, тем не менее, традиции дореволюционного образования были взяты на вооружение педагогами зарождающейся советской высшей школы и перенесены в практику преподавания. В стенах Московских Высших женских курсов подготовку по специальности «зоология» прошли С.Л. Фролова, Н.Н. Ладыгина-Котс, М.П. Садовникова-Кольцова, В.Н. Шредер и др., которые впоследствии стали известными исследователями в области зоологии, цитологии и генетики, педагогами и организаторами отечественной науки.

Ключевые слова: Московские высшие женские курсы, дореволюционное женское высшее образование, преподавание зоологии, профессионализация женщин-учёных.