German naturalist G. Fischer von Waldheim in Russia: To the 250th anniversary of his birthday

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Abstract. The present paper commemorates the 250th anniversary of G. Fischer von Waldheim, a German naturalist who was invited in 1803 to the Moscow University and contributed greatly to the progress of natural history education and research in Russia. The paper deals in brief with his life and works before his move to Moscow and primarily focuses on his activity in Russia as a professor of the Moscow University and Moscow Medical and Surgical Academy and the author of the first Russian textbooks in zoology and mineralogy; as a naturalist who above all was one of the founders of paleontological research in the country and the author of one of the first Russian entomofaunas; and as a scientific manager who founded the Moscow Society of Naturalists and for more than forty years defined its scientific policy.

1. Introduction
In October, 2021 we are celebrating the 250th anniversary of Johann Gotthelf Fischer who became known in Russia as Grigorii Ivanovich Fischer von Waldheim. This German-born naturalist was invited in 1803 to take a chair in natural history at the Moscow University and to head the University Museum of Natural History. During his fifty-year-long stay in Moscow he significantly contributed to Russian natural science and education. According to B. Raikov, “he was one of those personalities who lay the foundation for science and education in our country in the beginning of the last [nineteenth – GK] century” [1]. Nevertheless Fischer’s role in the progress of natural science in Russia still remains widely underestimated. The present paper pays a tribute to his diverse activities as university professor, research scientist, and organizer of natural history research in Russia.

2. Materials and methods
The present paper is based on comparative historical analysis of published and archival sources, which were used to sketch in the life and activities of Fischer von Waldheim and to estimate his contribution to Russian science and education. The sources fall into five groups: biographies of Fischer von Waldheim and his contemporaries; general works on the history of natural science in Russia; histories of the Moscow University and Moscow Medical and Surgical Academy where Fischer occupied a chair in natural history; works on the history of the Moscow Society of Naturalists, founded by Fischer; histories of various learned societies, such as the Moscow Society of Agriculture or Society for Competition of Medical and Physical Sciences in organization of which Fischer played a major role.
3. Ancestry, education, and the first steps in science

Johann Gotthelf Fischer [2] was born on October 15, 1771 in a small town of Waldheim lying between Leipzig and Freiberg. His father was a linen weaver and Fischer would follow in his wake if it were not for a chance meeting with J.C. Kessel, an arch-chantor from Freiberg. Kessel travelled through Waldheim and heard twelve-years-old Fischer sing. He was enchanted with the boy’s voice and persuaded his parents to let him go to Freiberg to sing in his choir.

In Freiberg Fischer finished a local gymnasium and entered the famous Bergakademie Freiberg, where he studied under an eminent geologist A.G. Werner, “the father of German geology”. In the Academy he made friends with students who later gained iconic status in science, such as geographer, explorer, and naturalist A. von Humboldt, geologist L. von Buch, mineralologist J.C. Freiesleben.

In 1792 Fischer moved to Leipzig to study medicine. In 1794 he got a bachelor degree in the Leipzig University and a year later his first treatise on fish air-bladder (Versuch über die Schimmblase der Fische) was published. His doctoral thesis on animal respiration (De respiratione animalium) he defended in 1797 and soon set off on a journey to Italy together with the Humboldt brothers, Alexander and Wilhelm. Unfortunately the political situation was not too favourable, so the plans were changed and Fischer preferred to go to Paris, where he attended lectures of G. Cuvier and with his guidance continued his research in comparative anatomy. He also made acquaintance with leading zoologists and geologists of the time: É. Geoffroy Saint-Hilaire, B.G. de Lacépède, A. Brongniart, R.J. Haüy and others [2, 3]. In 1798 he was invited to take a chair in natural history at the Medical Department of the Mainz University and stayed in Mainz until 1804.

4. Invitation to Russia

In Mainz conditions for natural history research work were not too favourable [3], so Fischer was considering moving to some other place. In 1803 he received several invitations from the University of Jena, University of Würzburg, and Moscow University.

At that time in Russia the educational reform of Alexander I was gaining momentum. M.N. Muraviov, curator of the Moscow University and one of the prominent figures of the Russian Enlightenment immediately upon taking the office in 1803 undertook serious efforts to improve and update the quality of education and to develop technical facilities of the University. Among other things he equipped an observatory for training in practical astronomy, reconstructed the university teaching hospital, chemical and physical cabinets, restocked the University library with many valuable editions, supported organization of several learned societies by the University, and so on.

Muraviov’s concern was sparked above all by the state of the professorial body, given the forthcoming reorganisation of the University in accordance with the new University Statute. The University needed new professors and the only possible solution was to invite them from abroad. So he asked two German professors – Ch. Meiners from Göttingen and Ch.G. Schütz from Jena – for assistance in staffing the University. After lengthy and thorough discussions candidates for professorship were selected and invited to the Moscow University, among them mathematician J. Ide (1775-1806), physician and chemist F.F. von Reuss (1778-1852), botanist G.F. Hoffmann (1760-1826) and some other [4].

The chair in natural history together with the post of director of the University Museum of Natural History was offered to the alumnus of the Göttingen University M.Ch.G. Lehman (1775-1856), who was awarded a doctoral degree for his work on insect reproduction. But Lehmann did not accept the invitation and preferred civil service in Denmark to academic career in Russia. It was at this time that Fischer’s name was put forward. It is not clear why Muraviov’s recruiters had not considered his candidature earlier. He had already made a name for himself in scientific circles and, as compared to Lehman, was an experienced researcher and museum worker. It is highly likely that both Meiners and Schütz were looking for professors to be only in German universities and Mainz, where Fischer was staying, at that time was under French governance. Nevertheless the choice was excellent and Fischer started to make preparations for his journey to Russia.
5. The first years in Moscow
Fischer came to Moscow in the early autumn of 1804 and already in November he began his popular readings in natural history [4]. But he postponed his university courses till the 1806/07 academic year as a lot of preparatory work was needed to start the courses. While his predecessors at the Moscow University abided by speculative and didactic methods of presenting natural history [5], Fischer was sure that to train good professionals in natural science university courses though heavily based on fundamental knowledge should practice certain skills of field research and self-guided work with natural objects in museum collections. So, firstly, he needed a working natural history museum with systematized collections accessible to students. And, secondly, means to enrich these collections. The latter could be realized with the help of a voluntary association of naturalists, both professional and amateur, which would support and coordinate natural history research. That were the objectives Fischer tried to accomplish during his first years in Moscow.

Fischer got under his authority two University gatherings (Cabinets) – the Natural History (formerly – Mineral) Cabinet, which included various mineralogical, botanical, and zoological collections bequeathed or donated to the University by different persons, and Demidov Museum – a series of natural history collections presented to the University in 1803 by a traveller, naturalist, and patron of scientific education P.G. Demidov (1738-1821) [4]. For a start Fischer concerned himself with systematization and description of the museums’ collections. At the formal meeting on the occasion of the semicentenary of the Moscow University on June 30, 1805 he spoke on the usefulness of natural history museums for public education and the first results of his museum work. In 1806 he compiled and published the first volume of his catalogue of the Natural History Museum of the University devoted to mammals and the first two volumes of the Demidov Museum catalogue (the third volume appeared in 1807). Besides, he was busy arranging museums’ exposition, so that in 1805 both museums could open their doors to students (though only once a week on Wednesdays), and a year later – to general public (also once a week) [5].

At the same time as he was arranging and cataloging museums Fischer went into the other question, i.e. organization of a voluntary scientific association of naturalists [6, 7]. As he later remembered the idea of this association had occurred to him even before he came to Russia. He set forth his project in a letter written on his way to Moscow and addressed to the University curator M.N. Muraviov. Though at that time in the University organization of another natural history society – the Society for Competition of Medical and Physical Sciences – was well under way Muraviov returned Fischer’s lead and authorized him to draw up a draft regulation of a new society. In early June, 1805 the draft was completed and on July 25 discussed at the first founding meeting of the society, which was named the Moscow Society of Naturalists (MOIP in Russian initials). On July 27 the regulation was approved by the Ministry of Education and on September 18 the first scientific meeting of MOIP was held. Fischer was elected Director of the society and opened this meeting with an address explaining why the University and Russian science as a whole would benefit from the society.

6. Teaching
Having arranged the museums and accomplished organizational work on MOIP, Fischer focused on his university courses [4]. In the 1806/07 academic year he started lecturing on zoology and in 1807/08 – on mineralogy. The course of zoology lasted three years and consisted of two parts that were read in parallel: zoognosy (i.e. natural history of animals) in French and comparative anatomy in Latin. The first year was devoted to mammals, the second – to invertebrates (mollusks, insects etc.), and the third – to the history of polyps. Additionally Fischer read special courses on different groups of animals. As a teaching guide he used his synoptic sheets published in French and in Latin in 1808. The course of mineralogy, which Fischer following his teacher A.G. Werner preferred to name “oryctognosy”, he based on his own system, which combined ideas of the German (Werner) and French (Hâtey) geological schools. He was reading these two courses until 1837, when he left the University because of a conflict with the University curator count S.G. Stroganov [6].
Besides, since 1809 Fischer also occupied a chair in natural history at the Moscow affiliation of the Medical and Surgical Academy [6]. In 1837 after reorganization of this affiliation into the Moscow Medical and Surgical Academy he was appointed the president of the Academy and contributed greatly to its organization and management. It was mainly due to his effort that an experimental teaching hospital and natural history museum were established by the Academy. He also authored two textbooks in zoology and mineralogy, which are considered to be the first ones written in Russia for Russian students using Russian material [1, 5].

7. Scientific research and management
Fischer’s Scientific interests were wide enough: from comparative anatomy and physiology to zoology, mineralogy and even, while in Maintz, the early history of printing. His first works, as it was mentioned above, were in comparative anatomy. He continued this line of research when he moved to Russia but his main focus turned to paleontology and entomology. He is credited to be one of the founders of systematic paleontological exploration of the territory of Russia [7, 8]. From 1808 till 1852 he published in the Bulletin and Mémoires of the Moscow society of Naturalists more than a hundred papers dealing with description of various fossil organisms from giant Siberian Elasmotherium and Lophiodon to smaller invertebrates (fossil sponges, sea lilies et c.) and Permian plants [5]. His most renowned paleontological work was the Oryctographie du Gouvernement de Moscou, published in Moscow in 1837. The book contained the results of paleontological research carried out by Fischer and his students in the Moscow Governorate in a span of twenty years (1807-1837) but it was more than that. Though the paleontological part with fifty one excellent tables held pride of place, actually the book as a whole represented a comprehensive treatise of the territory of the Moscow Governorate, its geography, climate, hydrology, economy et c. Fischer’s main entomological work that brought him world fame was the five-volume Entomographie de la Russie, which appeared in1820-1851 and was the first since P.S. Pallas’s Icones Insectorum entomofauna of the Russian Empire. It contained more than 1300 pages in total and was supplied with about 130 magnificent hand-colored tables.

The activity of Fischer as a manager was no less important for the progress of Russian science than his scientific research. He was the founder and director (later – vice-president) of one of the oldest Russian natural history societies – MOIP and for more than forty years, till his death in 1853, determined its scientific policy [6]. Actually he created an exemplary scientific body which coordinated natural science research and during Fischer’s life time was the center of attraction for Russian naturalists. Besides, for fifteen years (1820-1835) Fischer was a director of the Moscow Society of Agriculture, one of the most influential and authoritative agricultural society in the country.

8. Conclusion
During the first half of the 19th century natural science in Russia was undergoing dramatic conceptual and methodological changes turning away from speculative contemplations towards scientific research and Fischer von Waldheim was an active participant or even a driving force of these changes. His efforts to revamp the principles of scientific education, to create institutions supporting and coordinating scientific research and developing public science were only the first steps on this way but very important ones. The question remains why they were (and still are) underestimated. The reasons for that are mostly extra scientific, e.g. common to the 19th century Russian popular culture antipathy to people of German origin, the fact that Fischer could not learn Russian well enough and wrote his papers in French, German, and even in Latin or something else. This question, as well as Fischer’s contribution to Russian science needs to be further investigated.

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