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Between Moscow and Berlin: The Russian connections behind Flatau's "Law of Eccentric Location of Long Pathways in Spinal Cord"

Boleslav Lichterman^a and Piotr J. Flatau^b

^aI. M. Sechenov First Moscow State Medical University, Moscow, Russia; ^bScripps Institution of Oceanography, University of California San Diego, La Jolla, California, USA

ABSTRACT

The origins of Edward Flatau's "The Law of Eccentric Location of Long Pathways in Spinal Cord" are discussed, considering newly examined archival documents from Central State Archive of Moscow and Museum of the I. M. Sechenov University (former medical faculty of Imperial Moscow University [IMU]). These documents, together with German and Polish records, illustrate the international character of Flatau's education and shed light on the bigger question of interactions between Moscow and Berlin *fin de siècle* neurologists. Flatau's peregrinations between these two cities are documented, together with difficulties encountered due to his nationality and the changing political environment.

KEYWORDS

Alexei Kozhevnikov; Edward Flatau; history of neurology; Imperial Moscow University; Lazar Minor

Introduction

According to a review of Nerve Fibers in Man, "Our evidence, and that of all others, shows that propriospinal fibers are arranged according to Flatau's Law (1897a, 1897b), the short fibers remaining closest to the gray matter, pushing the longer fibers towards the periphery" (Nathan, Smith, and Deacon 1996, 1831). One of Edward Flatau's greatest achievements was his doctoral dissertation, "The Law of Eccentric Location of Long Pathways in Spinal Cord." Naderi, Türe, and Pait (2004) commented,

Bastian (1890) demonstrated that in complete transverse lesions of the spinal cord, reflexes below the level of the lesion are lost and muscle tone is abolished. Flatau (1894) observed the laminar nature of spinal pathways. The 20th century ushered in a new era in the evaluation of spinal cord function and localization.

Flatau's Law was published as a book (Flatau 1898) and defended at Flatau's alma mater, Imperial Moscow University, in 1899.

Edward Flatau (1868-1932) is regarded as one of the most prominent Polish neurologists (Herman 1975; Reese 1953; Triarhou 2007). His scientific contributions include an *Atlas of the Human Brain, and the Course of the Nerve Fibers*, published in five languages (German, English, French, Russian, and Polish; Flatau 1894; Triarhou 2011), a classical treatise on migraine¹ (Flatau 1912), as well as numerous books and contributions on neuroanatomy, experimental neuro-oncology, and disseminated encephalomyelitis (Flatau-Redlich's disease) (Reese 1953).

CONTACT Boleslav Lichterman ✉ likhterman_b_l@staff.sechenov.ru  Department of Humanities, the IM Sechenov First Moscow State Medical University, Bolshoy Patriarshy per., 3, str. 1, Moscow, 123001, Russia

¹He suffered from migraine attacks himself.

Eufemiusz Herman, a pupil of Flatau's who wrote a seminal book on the history of Polish neurology, discussed Flatau's contributions to neurology in considerable detail but did not write much about his studies in Moscow. He simply stated, "in Moscow [Flatau] was under the charm of two outstanding Russian scientists: the neurologist Aleksey Kozhevnikov and his student, a psychiatrist, S. S. Korsakov" (Herman 1958, 205). Similarly, in his introduction to *Recueil de travaux offert a Eduard Flatau*, a psychiatrist, Maurycy Bornsztajn, who was also Flatau's pupil, did not even mention the Russian period (Bornsztajn 1929).

The book *Recueil de travaux offert a Eduard Flatau* consisted of 68 contributions by prominent neurologists, including some outstanding Russian scientists like V. Bekhterev, L. Minor, and M. Astvatsaturov. In 2019, to commemorate the 150th anniversary of Edward Flatau's birth, a preliminary volume modeled after the 1929 *Recueil de travaux* was published, which examined his contributions to neurology and psychiatry, with a small chapter describing his Moscow period. This work was extended² (Flatau and Lichterman 2021) in 2021 to commemorate a plaque unveiled in Warsaw to celebrate Flatau's achievements.

Medical studies in Moscow

Edward Flatau was born in December 1868 into the family of a Jewish merchant in Płock, a small town in the Russian Empire close to the border with Prussia. According to his *curriculum vitae*, dated March 31, 1898, Flatau entered Płock Classic Male Gymnasium in 1878 and graduated in 1886 with honors.³ In the same year, he became a student of the medical faculty of Imperial Moscow University (IMU; see Figure 1). Information about his stay in Moscow is scarce. We know his address from university records. As a third-year medical student, he and two other Jewish medical students compiled lectures on balneotherapy, which were delivered by Dmitry Dubelir⁴ (1889; see Figure 2). In 1890, Flatau met Privatdocent of IMU, Lazar Minor, who became his first neurology teacher (Figure 3). Five years later, on October 30, 1891, he graduated (Figure 4) and obtained a medical diploma with honors.

The medical faculty of IMU was established around 1758, becoming one of the most prestigious medical schools in the Russian Empire by the end of nineteenth century. Its famous graduates include Nikolai Pirogov, Sergei Botkin, and Ivan Sechenov, among others. However, many Polish students aspiring to become medical doctors opted for Imperial Medico-Surgical (since 1881, Military Medical) Academy in St. Petersburg. There, the chair of nervous and mental diseases was their fellow countryman, Ivan Merzheevsky (Jan Mierzejewski; 1838–1908). On the other hand, in 1882, the number of Jewish students at the Academy was

²We examined files at the Archive of Moscow University (Fond 418) located at Central State Archive of Moscow (TsGA Moskvy). These files include "O prinyatii v chislo studentov Flyatau Eduarda" (acceptance of Edward Flatau as a student of IMU) (opis 300, delo 733); "Delo soveta Imperatorskogo Moskovskogo Universiteta o zastshchitenii lekarem Flyatau dissertatsii na stepen' doktora meditsyny" (File of the council of Imperial Moscow University on defense of dissertation for a degree of doctor of medicine by Dr. Flatau) (opis' 67, delo 527); "Delo meditsynskoi ispytatel'noi komissii o Flyatau Edurade" (File on medical examination commission on Edward Flatau) (opis' 78, delo 347) and "Delo meditsynskogo fakul'teta Imperatorskogo Moskovskogo Universiteta. Flyatau E. Dissertatsiya na stepen' doctora meditsyny" (File of medical faculty of Imperial Moscow University. Flatau E. Dissertation for a degree of doctor of medicine) (opis' 405, delo 139). Papers of L.S. Minor at the Museum of the IM Sechenov University were also examined.

³*Curriculum vitae lekarya Eduarda Lyudvikovicha Flyatau* (TsGA Moskvy, fond 418, opis' 67, delo 527, listy 6–9). All dates are given according to the Julian calendar, which was officially used in the Russian Empire until 1918. It was 12 days behind the Gregorian calendar (introduced by that time in most European countries) in the nineteenth century.

⁴Dmitry Petrovich Dubelir (1848–1912) was a Privatdocent of IMU who taught balneotherapy.



Figure 1. Edward Flatau in 1886 (TsGA of Moscow, F.418, op.300, delo 733, list 17).

restricted to 5% of the total number enrolled (Mindlin 2003). In 1887, in both St. Petersburg and Moscow, a *numerus clausus* was introduced that limited the number of Jewish students permitted to attend educational institutions, including universities, to 3% of the total student population. At that time, Flatau was already studying at IMU, so he was not subject to this restrictive new rule. Thus, perhaps Flatau decided on Moscow for his studies because of the 5% *numerus clausus* rule in St. Petersburg. The reason Flatau had decided to study in Russia in the first place was his perception of the poor quality of Imperial Warsaw University. Much later, together with his pupil Maurycy Bornstein and Wilhelm Knappe, he published a long chapter “Imperial Warsaw University. Doctors, Education,” in which he stated that the medical

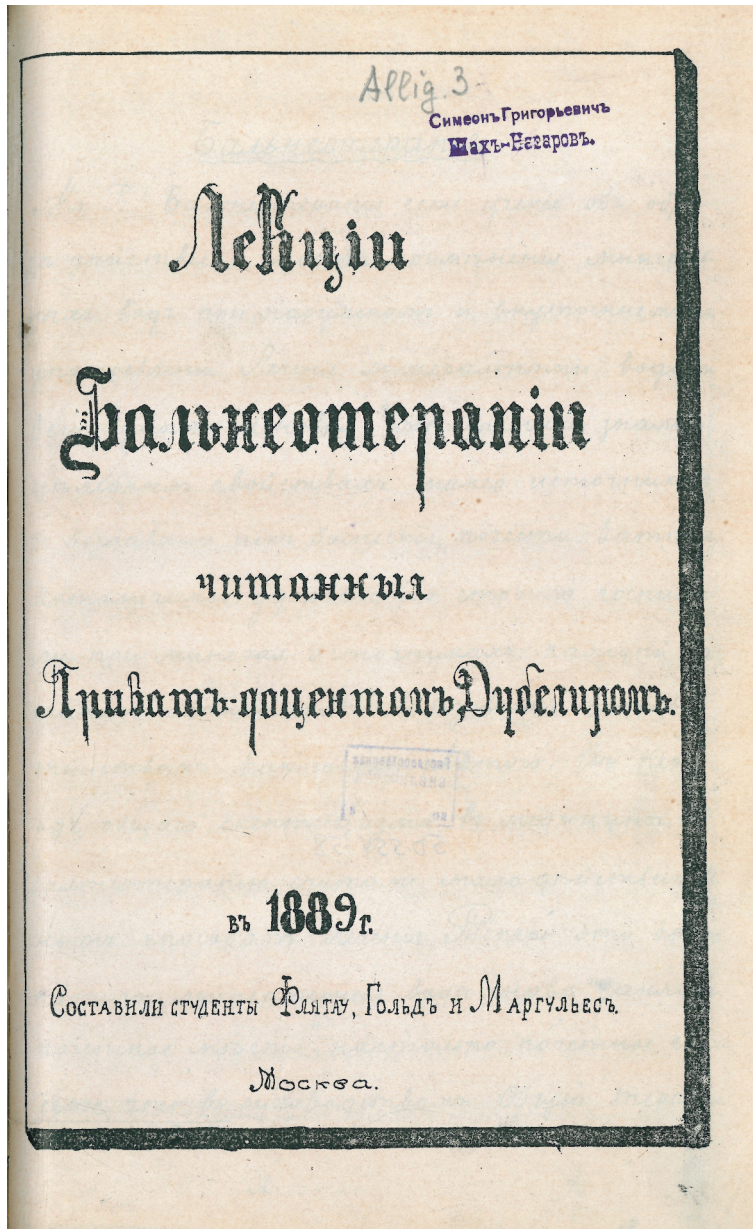


Figure 2. Title page of lithograph edition of lectures on balneotherapy by Dmitry Dubelir (from Russian State Library, Moscow).

department of Imperial Warsaw University “is considered the worst in the country, not only in the opinion of the medical establishment, but even in the opinion of [Russian] governmental circles” (Bornsztajn, Flatau, & Knappe, 1906).⁵

⁵The quality of education and research at Imperial Warsaw University has been debated by modern historians of science (Schiller 2005a, 2005b). It is beyond the scope of this article to decide on this issue. It is worth mentioning that the quality of Imperial Warsaw University was changing between 1869 and the beginning of the twentieth century.



Figure 3. Lazar Minor (in the center) with his students. Mikhail Krol (1879–1939) is on the left, the person on the right is not identified. Photo from 1900s (Museum of I. M. Sechenov University, L. S. Minor fond).

What's more, in 1886 Jews with foreign passports residing in the Russian Empire who did not comply with Passport Bylaws of 1876 (subsection 2 of paragraph 476) were being expelled abroad. Even though Płock was part of Russia, Ludwik Flatau had arranged for his sons to be Prussian citizens with residence in Toruń, most probably to avoid Russian military service. This meant that in the middle of his medical studies in Moscow, his son Edward had to change his Prussian citizenship to Russian or face the prospect of being expelled.

On January 23, 1890, a trustee (*popechitel'*) of Moscow Educational District, Count Pavel Alekseevich Kapnist, wrote a letter to the rector of IMU, Gavriil Afanas'evich Ivanov, stating that the governor of Płock had informed the governor-general of Warsaw⁶ that a foreign Jew, Ludovick (Ludwik) Flatau, was living in his governorate of Płock. Kapnist

⁶The Russian part of Poland consisted of several regions.



Figure 4. Edward Flatau as a graduate student of Imperial Moscow University (TsGA of Moscow, F.418, op.300, delo 733, list 18).

stated in his letter that Ludwik Flatau had not been expelled abroad from Płock due to his poor health.⁷ However, he explained that Ludwik had a 20-year-old son named Edward who was a student at IMU. The Warsaw governor-general asked Count Kapnist to notify him

⁷Both Ludwik Flatau and his son, Edward Flatau, were Prussian citizens.

whether the authorities at the university had been aware that Edward Flatau was a foreign Jew when they had admitted him as a student and which documents had been considered. Kapnist requested this information from the rector of IMU.⁸

On February 1, 1890, Flatau wrote to the rector of IMU that he would like to give up his Prussian citizenship.⁹ On December 12, 1890, he requested that the rector provide him the necessary documents to apply for Russian citizenship: a copy of his high school diploma (*attestat zrelosti*), a certificate confirming that he was a student at Moscow University, and a certificate of good morality.¹⁰ In May 1892, while in St. Petersburg, Flatau requested the Office of the Registrar (*kantselyarija*) of IMU to provide him, as soon as possible, with a certificate issued by the governor of Płock stating that he had taken the Oath of Russian Allegiance. He needed this to obtain a permanent Russian passport from the mayor of St. Petersburg. He asked to give the certificate or a copy of it to Bronislav Krzhimuskii,¹¹ a medical student at IMU.¹²

Moscow neurology

A chair for nervous and mental diseases was established at IMU in 1884. It was headed by Professor Aleksey Kozhevnikov (1836–1902), who initially trained in obstetrics (Figure 5). Kozhevnikov published about 40 papers on various topics, mostly case reports (Lisitsyn 1961; Vein 2007). In 1890 he founded the Society of Neurologists and Psychiatrists at IMU. That same year, a new building of the neurological clinic of IMU with 44 beds was opened (Figure 6), and Kozhevnikov became its first director, a position he held until his retirement in 1899. In 1892, he established the Neurological Museum of IMU, which was named after him.

A psychiatry clinic at IMU was opened in 1887 and run by Professor Sergei Korsakov (1854–1900). Flatau worked there in 1892. He also worked that year at the Department of Nervous Diseases headed by Privatdocent Lazar Minor at Yauzskaya Bol'nitsa (Yauza Hospital) for Menial Workers in Moscow. Professor Lazar Solomonovich Minor (1855–1942) was of one of the best known and internationally recognized neurologists in Imperial Russia (Vein 2011). In 1879, he graduated with honors from IMU and in 1882 he obtained a degree of doctor of medicine from IMU. In 1884, he became a *Privatdocent* and the chair of nervous and mental diseases at IMU and began to work as a neurologist at the Hospital for Menial Workers.¹³ Minor was trained in neurology in Paris under J.-M. Charcot and in Berlin under C. Westphal and E. Mendel (Vein 2011). He played a crucial role in the career of his pupil, Edward Flatau, and they became friends.

They met in 1890 at *Hermitage*, a famous Moscow restaurant (see Flatau's letter below). Presumably, Minor introduced Flatau to his teacher, Emanuel Mendel, and to other German neurologists and neuropathologists.

⁸TsGA Moskv, fond 418, opis' 300, delo N.733, list 21.

⁹TsGA Moskv, fond 418, opis' 300, delo N.733, list 22.

¹⁰TsGA Moskv, fond 418, opis' 300, delo N.733, list 42.

¹¹Bronislav Ippolitovich Krzhimuskii (1864–?) was a friend of E. Flatau. He graduated from IMU in 1893 and then practiced medicine in Don Region (see <http://www.gen-volga.ru/alf/k.htm>). In 1917, he lived in Moscow (<https://stevemorse.org/russian/phonebookviewer.html?db=1&page=265>).

¹²TsGA Moskv, fond 418, opis' 300, delo N.733, list 41.

¹³TsGA Moskv, fond 418, opis' 55, delo 96, listy 28–37.

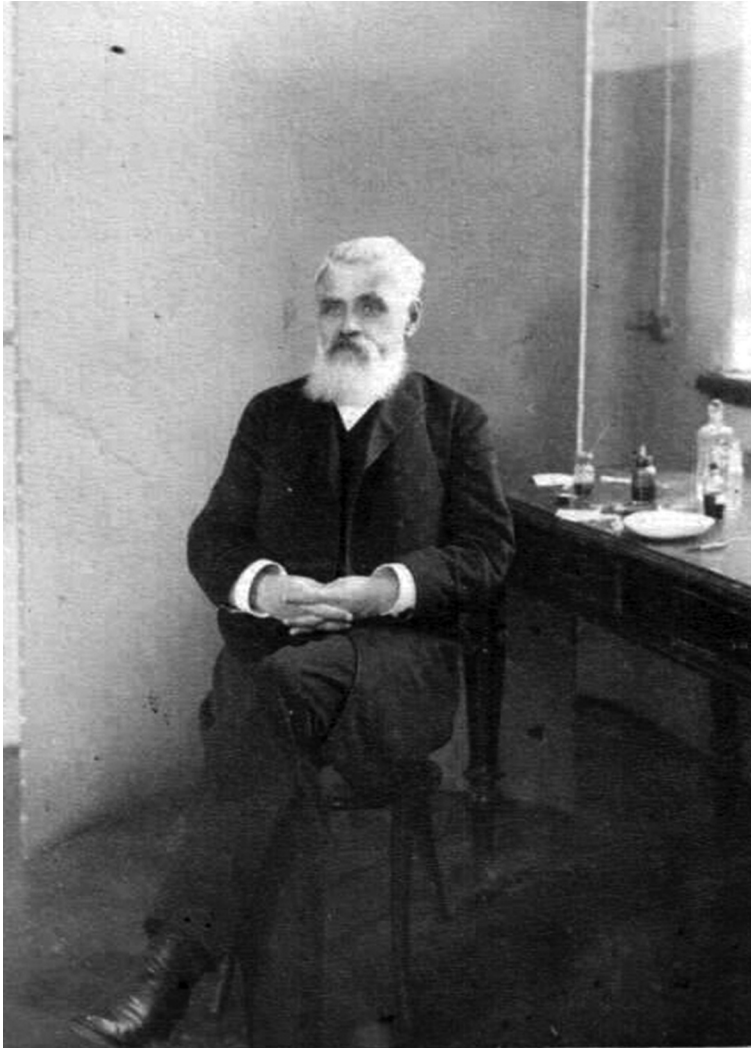


Figure 5. Aleksey Kozhevnikov. Photo Ca. 1890 (Museum of I. M. Sechenov University, L. S. Minor fond).

In September 1892, Flatau moved to Berlin and stayed there until 1898. We discovered his letter from Warsaw, dated December 30, 1898, in L. Minor's collection at the Museum of the IM Sechenov University, which was labeled by an archivist as "an obscene letter from an unknown sender" (Figure 7). It vividly illustrates the Flatau–Minor relationship:

Dear Lazar Solomonovich!

[...] As far as joint work is concerned, I have one rather big idea in my bosom, which I will have to talk to you about personally. You will probably like the idea, and then we can begin. To no purpose you scold the Berliners. They behave like pigs, but they are smart people and love science. I personally could never come to grips with their spirit of colonialist nation. They are unusually impudent in their stupid, provincial chauvinism. Of course, in Warsaw there is not the same spirit of science, but "man muss geben" [something has to give]. There are probably good people and fools here too. You just need to



Figure 6. Neurological clinic of IMU. Photo ca.1900 (photo in public domain).

choose, and it can be more difficult here than in another city, in view of the great “amicability” of people. And in the end “bin ich ein freier Mensch” [I am a free man]. Until I am conquered by Amalia or another Canaille, and I do not like the prospect of it, I will go out into the world to carry on a gypsy, nomadic way of life. I am personally sure that one of my grandfathers was a gypsy, or that it lies in the blood of Jews. If you think about this particular Jewish blood as a strange mixture of longing for something in the distance, historical melancholy and deep sarcasm, mixed with an “à vol d’oiseau” [bird’s view] attitude towards myself, then you may be able to understand me. But you yourself know about this as well as I do. In any case, I am pleased to have found you; I have very, very few people left whom I trust, and therefore I think that our friendship will last even longer than M-elle Amalie’s hatred towards me. Give her my regards and tell her that I am coming to Moscow especially for her. I believe that I will arrive in Moscow by St. Tatiana’s day [January 12th] to go on a binge with you. But do not make such an innocent face. After all, I saw you for the first time in 1890 in the Hermitage, when drunken students dragged you out from somewhere and forced you to make a speech standing on the table. I have a good memory. Heartfelt bow to Ida Osipovna [Minor’s wife]. Yours, E. Flatau. P.S. Do not send your dissertation to me, I will get it myself when I am in Moscow¹⁴

Minor contributed to a textbook on neuropathology (Flatau, Jacobsohn, and Minor 1904). Much later, in 1929, it was he who considered Flatau as one of his most eminent young collaborators (Minor 1929). In his contribution (“On the relationship between migraine and epilepsy”) to Flatau’s Jubilee book (*Recueil de travaux offert à Edouard Flatau*), Minor clearly recalls his collaboration in Russia with his then young pupil: “I

¹⁴A letter of E. Flatau to L. Minor from Warsaw, dated December 12, 1898. Museum of the IM Sechenov University, L. S. Minor fond.

In 1893, Flatau returned to Moscow for two months to pass his doctorate exams. In 1897, Flatau and his friend Louis Jacobsohn Lask (1863–1941) came to Moscow for the XIIth International Medical Congress and presented an exhibition on the comparative anatomy of mammals (Eisenberg 2018, 2021). Afterward, they published a detailed account on the discussion that took place in the nervous and mental diseases section of this congress (Flatau and Jacobsohn 1897). An experimental study on the pathology of nervous cells by Goldscheider and Flatau was also presented there. “Flatau’s Law” (of eccentric location of long pathways in spinal cord) was first presented in March of 1897 by his German mentor, Heinrich Wilhelm von Waldeyer, at the Royal Prussian Academy of Sciences (Figure 8; Flatau 1897a, 1897b). In January 1899, Flatau returned to Moscow to defend his dissertation on this topic.

Flatau used Marchi’s method published in 1886 (Nieuwenhuys, 1998, 113). Marchi’s staining had been a tool in neuroanatomy and neuropathology research for more than a century; the method was used in most European and American laboratories until the advent of the new generation of tracers in the second half of the twentieth century (Manni and Troiani 2005). Such a staining technique was itself suggested by Camillo Golgi, who had discovered in 1873 the possibility of staining an individual nerve. For this discovery, Golgi was awarded, along with Santiago Ramon y Cajal, the Nobel Prize in 1906.

In 1893, Flatau started work in the laboratory of neurologist Emanuel Mendel. There he met Louis Jacobsohn, who had worked as an assistant in Mendel’s polyclinic and laboratory since 1890. In 1894, Flatau and Jacobsohn moved to the Anatomical Institute of Berlin University to join Wilhelm Waldeyer and deepen their knowledge of neuroanatomy. Flatau not only worked at the Anatomical Institute but also conducted research at other institutes. He was particularly interested in studying changes in nerve cells. Like his teacher Waldeyer, he supported the neuron theory and was especially interested in the pathological-anatomical examination of nerve cells, as evidenced by numerous articles he published. Marchi’s staining technique was already known in Waldeyer’s laboratory, where Flatau worked. Alongside the neurophysiologist Johannes Gad, head of the Physiological Institute of the University of Berlin, Flatau undertook experiments on dogs in 1893. In the period 1894–1897, Flatau came up with his law. This work was submitted by Waldeyer to the Royal Prussian Academy of Sciences in March 1897 (Eisenberg 2018). In the same year, this work was published in the medical journal *Zeitschrift für Klinische Medizin*. In 1899, Flatau included the same text in the Supplement to his celebrated Brain Atlas (Flatau 1899).

Defense of his doctoral dissertation

On March 24, 1898, Flatau wrote a letter to the medical faculty of IMU stating that, “by submitting my dissertation entitled ‘The law of eccentric location of long pathways in spinal cord’ and my curriculum vitae, I have the honor to humbly ask you to consider this dissertation and admit me to its defense.”¹⁷ This was granted, and the dissertation was assigned to Professor Kozhevnikov.

¹⁷TsGA Moskvyy, fond 418, opis’ 405, delo 139, list 1.

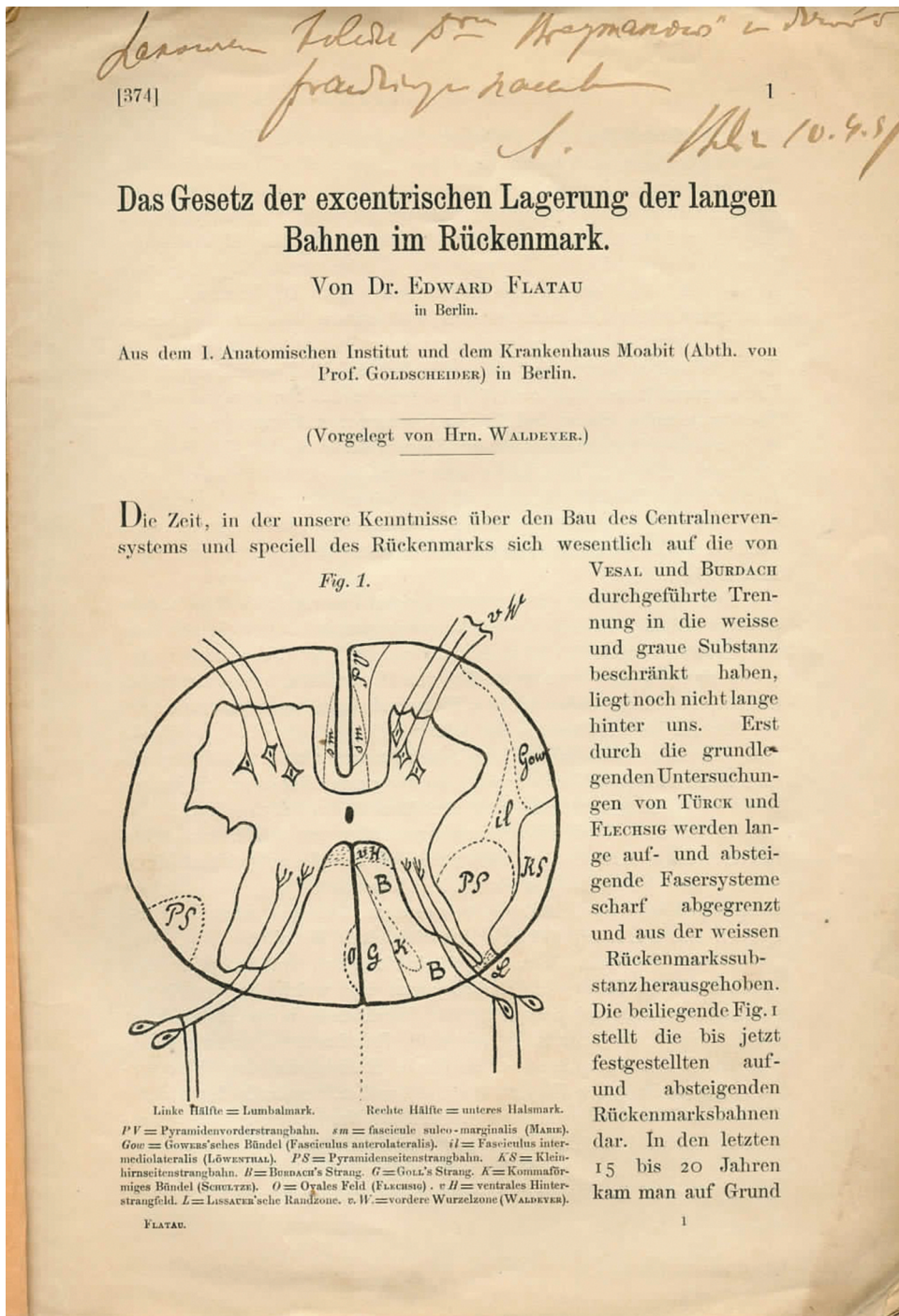


Figure 8. First page of German publication of "Law of Eccentric Location of Long Pathways in Spinal Cord" with Flatau's autograph (collection of P. J. Flatau).

In his review, dated May 23, 1898, Kozhevnikov evaluated highly “an extensive and very detailed work done by the author in Berlin at the First Anatomical Institute [headed by] Professor Waldeyer and at Moabit Hospital [headed by] Professor Goldscheider.” He continued:

Mr. Flatau’s work is in line with the modern science on the structure of the spinal cord and its functions in normal and pathological situations. This work occupies an important place in the field of the anatomy of the spinal cord, introduces a number of new important scientific facts and thus broadens our knowledge about the structure of the spinal cord, about long and short pathways, their functions and meaning, and it is presented in a clear and logical manner.

He concluded, “Flatau’s dissertation is based on very good research and fully deserves to be published and submitted as a dissertation for the degree of Doctor of Medicine.”¹⁸

Kozhevnikov’s review was also signed by Professors Dimitry Zernov and Sergei Korsakov, who fully accepted his opinion. In December of 1898, the dean of the medical faculty wrote to the rector of IMU,

On Saturday, January 16, 1899, at 2 p.m., at the Auditorium of the Clinic of Nervous Diseases, at Devich’e Pole (Virgin Field), there will be a public discussion on the work of Edward Flatau, who will defend his dissertation “The law of eccentric location of long pathways in spinal cord” which he wrote for a degree of Doctor of Medicine.¹⁹

The public defense of Flatau’s dissertation was successful. Professor Sergei Korsakov was appointed as one of the opponents (reviewers). Due to his becoming ill, he was replaced by Vladimir Karlovich Roth (1848–1916), who succeeded Kozhevnikov as the chair of nervous and mental diseases and as director of the neurological clinic of IMU. The dissertation was published in book form (Flatau 1898) and Flatau presented a copy to Kozhevnikov with the inscription, “to my deeply respected teacher Professor Aleksey Yakovlevich Kozhevnikov” (Figure 9).²⁰

After defense of his dissertation, Flatau settled in Warsaw. In his letter to IMU dated February 25, 1899, he requested a copy of his diploma, because the Warsaw Physicians Society was preventing him from using the title of doctor of medicine.²¹ At that time, Flatau was 31 years old. The sender’s address was *ul. Marszałkowska*, 150, where Flatau had moved after transferring to Warsaw and establishing a private neurobiology laboratory that later become part of the Warsaw Scientific Society located at *ul. Śniadeckich*, 8. A few years later, in 1903, when Flatau was already practicing in Warsaw, the Department of Medicine of the Ministry of Internal Affairs enquired the rector of Imperial Moscow University when and how the University awarded a doctor of medicine degree to Flatau. This is the last correspondence in the files of Imperial Moscow University regarding Edward Flatau.

¹⁸TsGA Moskvyy, fond 418, opis’ 405, delo 139, listy 14–15.

¹⁹TsGA Moskvyy, fond 418, opis’ 405, delo 139, list 2.

²⁰The full scan of the dissertation with the dedication to Kozhevnikov is available online at <https://archive.org/details/zakonekstsentr00flat/mode/2up>.

²¹TsGA Moskvyy, fond 418, opis’ 67, delo N.527, list 14.

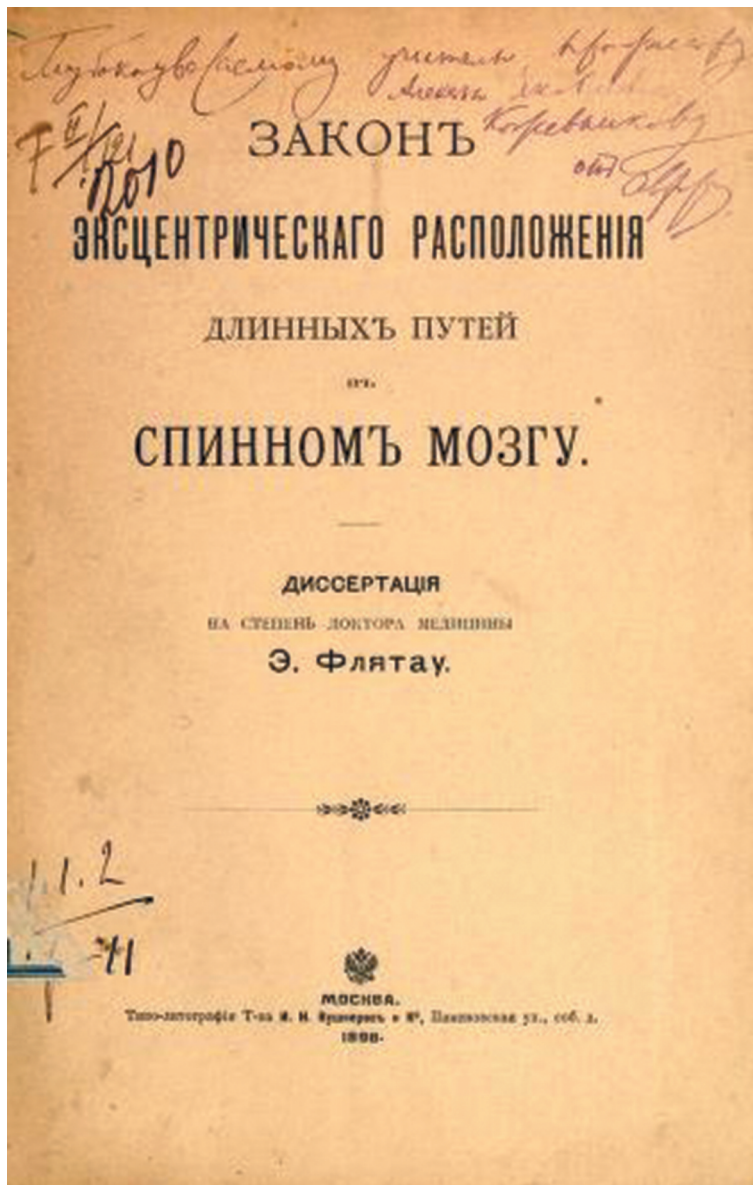


Figure 9. First page of Flatau’s dissertation published in Russian. It has the inscription, “To my deeply respected teacher Professor Aleksey Yakovlevich Kozhevnikov” (the Savine Collection in the University of North Carolina at Chapel Hill; <https://archive.org/details/zakonekstsentric00flat>).

Summary

Although Flatau was a Russian citizen (in Polish, “rosyjski poddany”) and lived most of his life in the Russian Empire (Poland gained independence in 1918), Soviet and Polish medical historians justly regarded him as a Polish neurologist (Arkhangel’sky 1965; Herman 1975). He was recently described as a pupil of S. Korsakov (Panova and Lanska 2020), but it would

make more sense to view him as a pupil of Kozhevnikov and Lazar Minor, as we have clearly demonstrated in this article.

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