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Vasily Dokuchaev (to the 175-th anniversary)

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Abstract: The idea of this paper is to highlight the scale of Dokuchaev's personality through the prism of readers' perception and comparison of the scientist's achievements, timed to certain milestones in his life, with their own successes. Dokuchaev's biography, filtered through his own life experience, provides a better understanding of the magnitude of the first soil scientist, and a respect for his significant scientific heritage. The work will give an insight into the extensive and varied activities of the pioneer in the comprehensive study of soils and the environment.

VASILY VASILYEVICH DOKUCHAEV

(01.03.1846 – 08.11.1903)

**Great Russian scholar, natural scientist, Professor of Mineralogy
and Geology of St. Petersburg University:**



- created the science of soil – Soil Science;
- he was the first to establish that the soil is an independent natural body, qualitatively different from all other bodies of nature;
- proved that living organisms form an integral part of the soil;
- discovered the basic laws of the origin and geographical distribution of soils;
- developed the doctrine of natural and soil zones, discovered the law of horizontal zoning and high-altitude zoning of soils;
- formulated the law about factors of soil formation;
- established the principles of the structure of the soil profile;
- developed new methods of soil research and the basics of soil classification and cartography;
- laid the foundations of ecology;
- laid the foundations of the doctrine of the biosphere;
- pioneered and put into practice a sustainable system of farming;

- the author of 281 printed works, 4 maps; editor of 57 books and 7 maps from 1869 to 1900;
- founded the scientific school. His outstanding students made major contributions to various branches of natural science.

Dokuchaev natural science paradigm evolutionarily changed the methodologies of almost all sciences of the XX century. Many of Dokuchaev's ideas are still relevant and they have not lost their significance in the modern world.

Vasily Dokuchaev was born on 1 March (February 17 by the Julian calendar) 1846 in the village of Milyukovo, Smolensk region into the family of the priest Vasily Sergeyevich and Pelageya Trofimovna Dokuchaevs. Vasily was the youngest of seven children.

The house where the family lived and the church where the father served and the children were baptised were not saved up to now.



Fig. 1. On the site of this house in the village of Milyukovo, Novoduginsky district, Smolensk region, stood the house where Vasily Dokuchaev was born. Archive of Central Soil Museum (CSM) (Ф. 2. Оп. 39. Д. 4. Л. 28).



Fig. 2. Church of St. Nicholas the Wonderworker in the village of Milyukovo, Smolensk region, where V. Dokuchaev was baptised in 1846. It was destroyed during the Great Patriotic War. Archive CSM (Ф. 2. Оп. 39. Д. 4. Л. 14).

Dokuchaev family



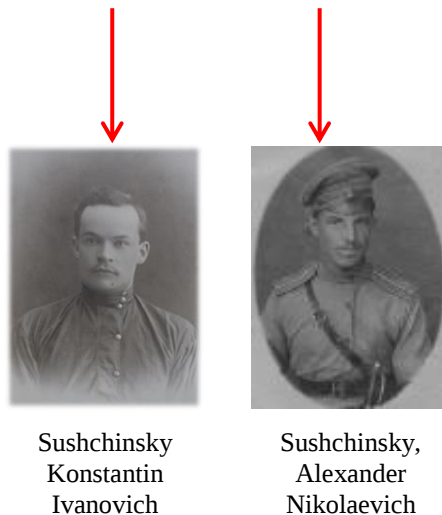


Fig. 3. V. Dokuchaev family. Archive CSM (Ф. 2. Оп. 39. Д. 15. Л.1). Archive CSM (Ф. 2. Оп. 39. Д. 12. Л.12). N. Voron's family archive.

After attending a parochial school in Milyukovo, at the age of 11 Dokuchaev enrolled at the Vyazma Religious School at the Smolensk Seminary.



Fig. 4. Vyazma Religious School at Smolensk Seminary. (Source <https://humus.livejournal.com/3145976.html?view=comments>).



Fig. 5. The view of the city of Vyazma. (Source <https://humus.livejournal.com/3145976.html?view=comments>).

In 1867 Dokuchaev graduated with honours from the Smolensk Theological Seminary and was sent to the St. Petersburg Theological Academy.

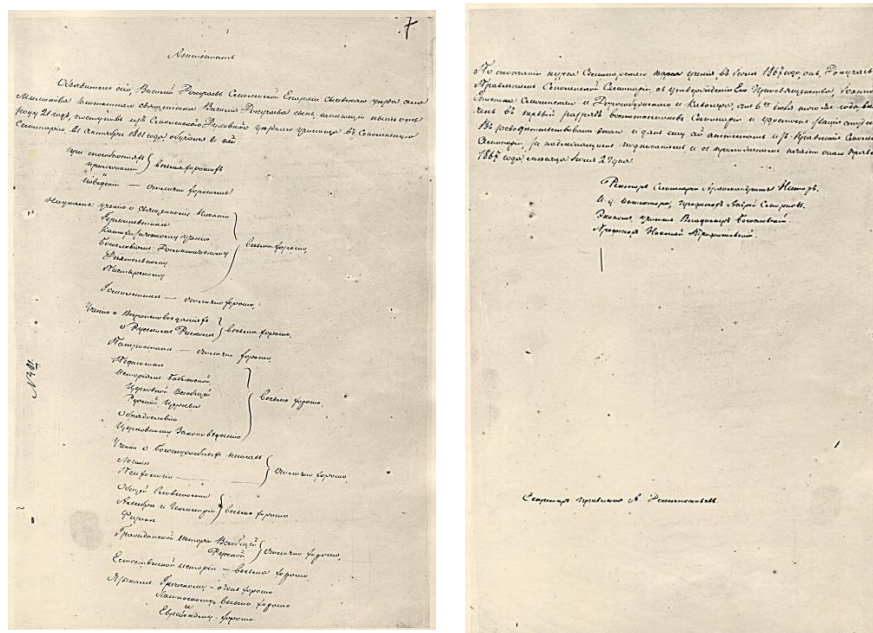


Fig. 6. Certificate of graduation from the Theological Seminary in Smolensk issued to V. Dokuchayev on 27 July 1867. Archive CSM, RSHA (Ф. 14. Оп. 5. Д. 3550.).



Fig. 7. Smolensk Theological Seminary
(Source: <https://drevo-info.ru/pictures/19181.html>).

After enrolling in the St. Petersburg Theological Academy, he left it and almost immediately joined the Faculty of Physics and Mathematics of the Imperial St. Petersburg University.

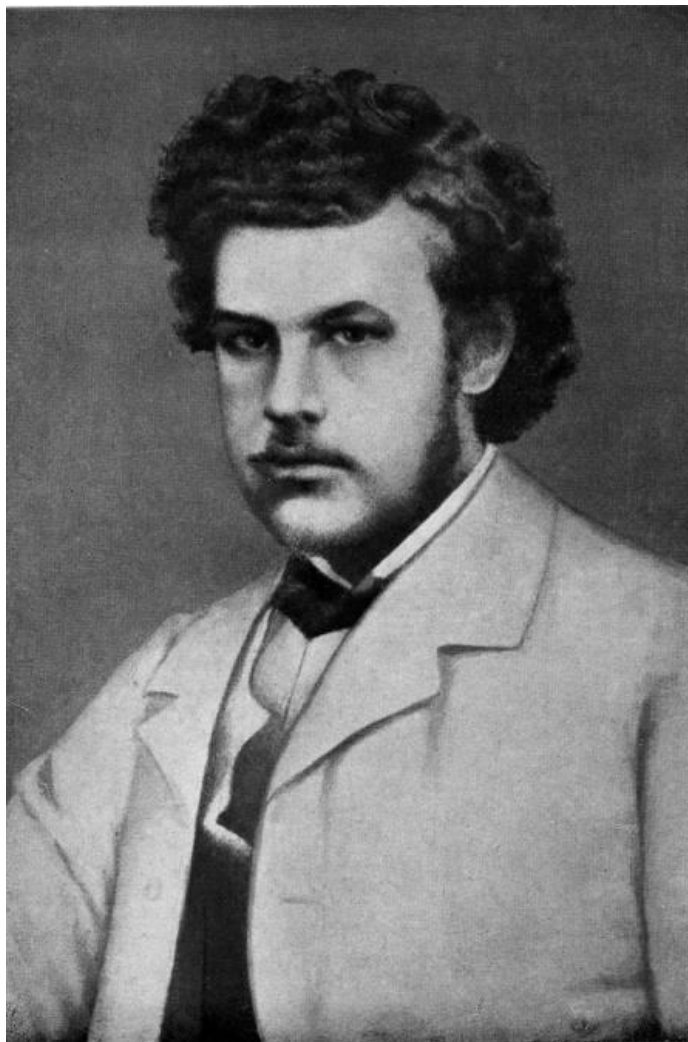


Fig. 8. V. Dokuchaev as a seminary student. Archive CSM
(Ф. 2. Оп. 39. Д. 1. Л. 5).



Fig. 9. Imperial St. Petersburg University.
(Source: <https://museums.kpfu.ru/blog/news/lingvist-professor-buntovshhik-chast-1/?template=popup>).

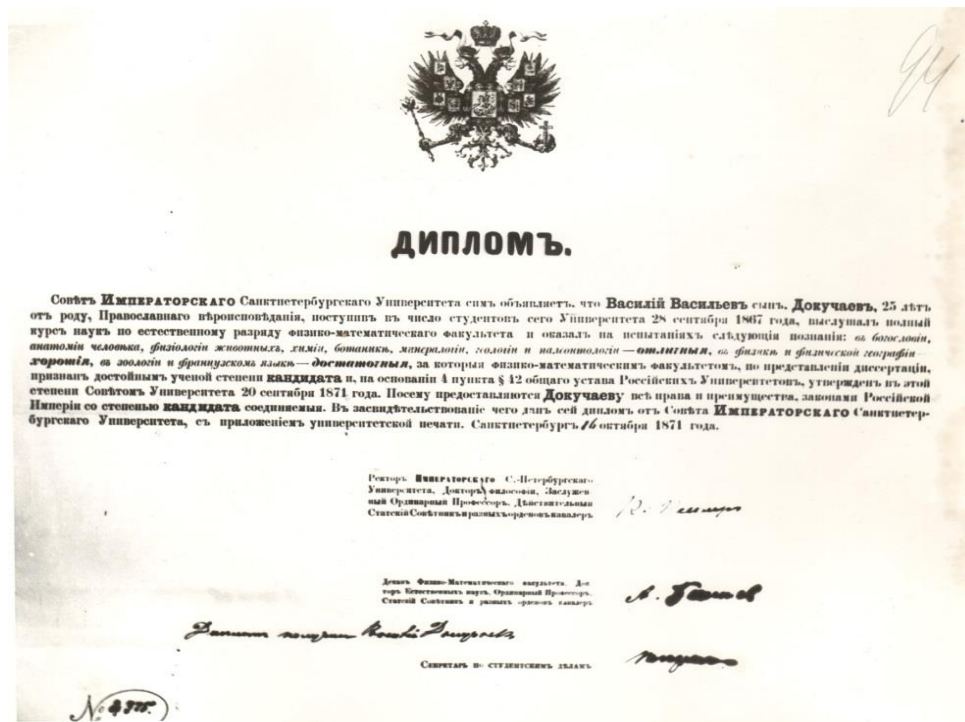


Fig. 10. Diploma of the Imperial St. Petersburg University with the defense of a thesis and the awarding of the Candidate's degree. October 16, 1871. Archive CSM, RSHA (Ф. 14. Оп. 5. Д. 3550. Л. 39).

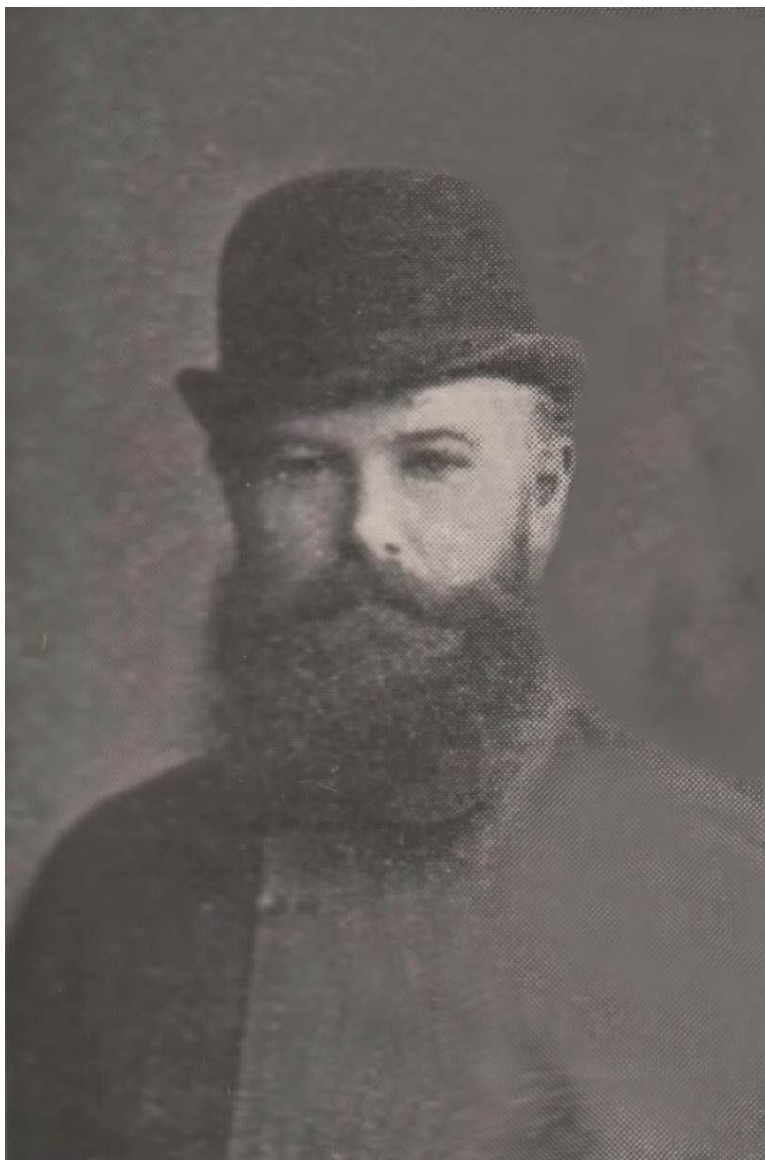


Fig. 12. V.V. Dokuchaev as the Guardian of the Geological Cabinet.
(Source: Article by P.V. Ototsky “The Life of Dokuchaev” in “Eurasian Soil Science” journal, 1904).

From 1870 Vasily Dokuchaev was lecturing in dynamic geology and petrography at the Imperial University in St. Petersburg.

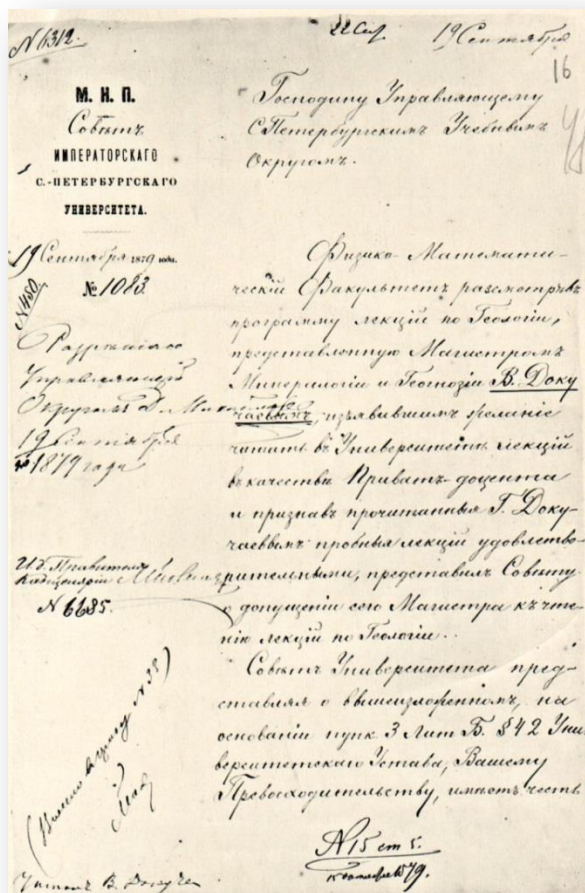


Fig. 13. Submission from the Council of St. Petersburg University for the appointment of Master of Mineralogy and Geology Vasily Dokuchaev as privat-docent to give lectures in Geology. September 19, 1879. Archive CSM, RSHA (Ф. 14. Оп. 1. Д. 7192. Л. 16).



Fig. 14. The Geological Cabinet of St. Petersburg University. (Source: <http://nlr.ru/petersburg/spbpcards/vo/3.htm>).

In 1879 Vasily Dokuchaev was appointed a privat-docent of mineralogy and became the Head of the Department of mineralogy and crystallography at St. Petersburg University.



Fig. 15. View from the window of V.V. Dokuchaev's office on the Neva River and St. Isaac's Cathedral. Archive CSM.



Fig. 16. St. Petersburg University. Mineralogical Museum. Archive CSM.



Fig. 17. St. Petersburg University. Mineralogical classroom. Archive CSM. (Source: <http://nlr.ru/petersburg/spbpcards/vo/3.htm>).

From 1875, Dokuchaev takes part in the creating of the first soil map of European Russia. After the death of Vasily Chaslavsky in 1878, Dokuchaev had to complete the work himself and write an explanatory note for the Cartography of Russian Soils map, which was published in 1879.

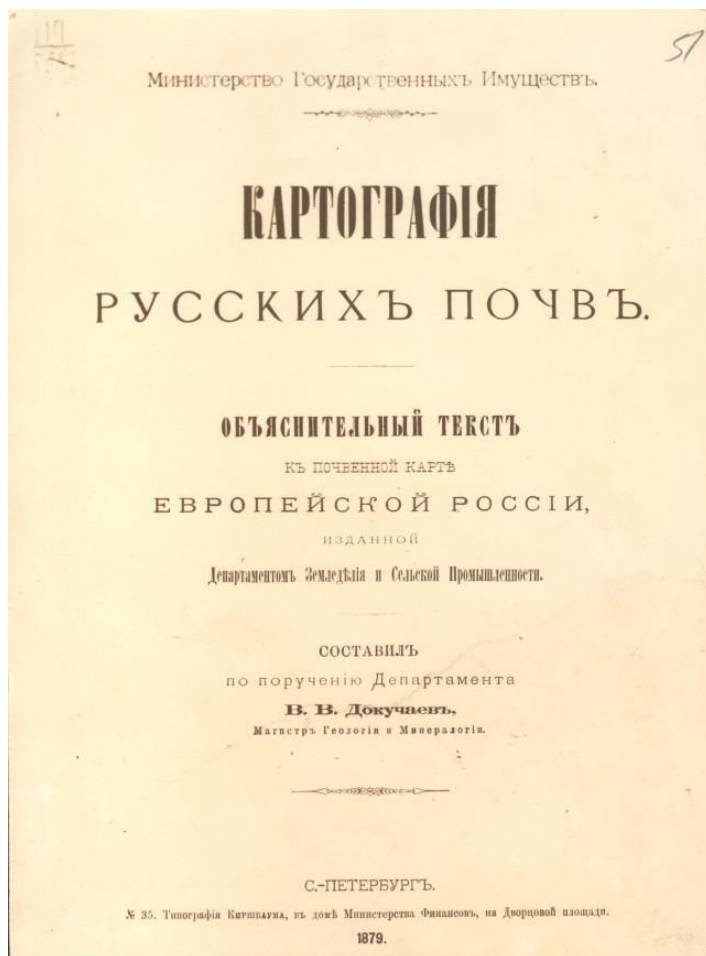


Fig. 18. Explanatory text, written by V.V. Dokuchaev to a soil map of European Russia. Archive CSM.

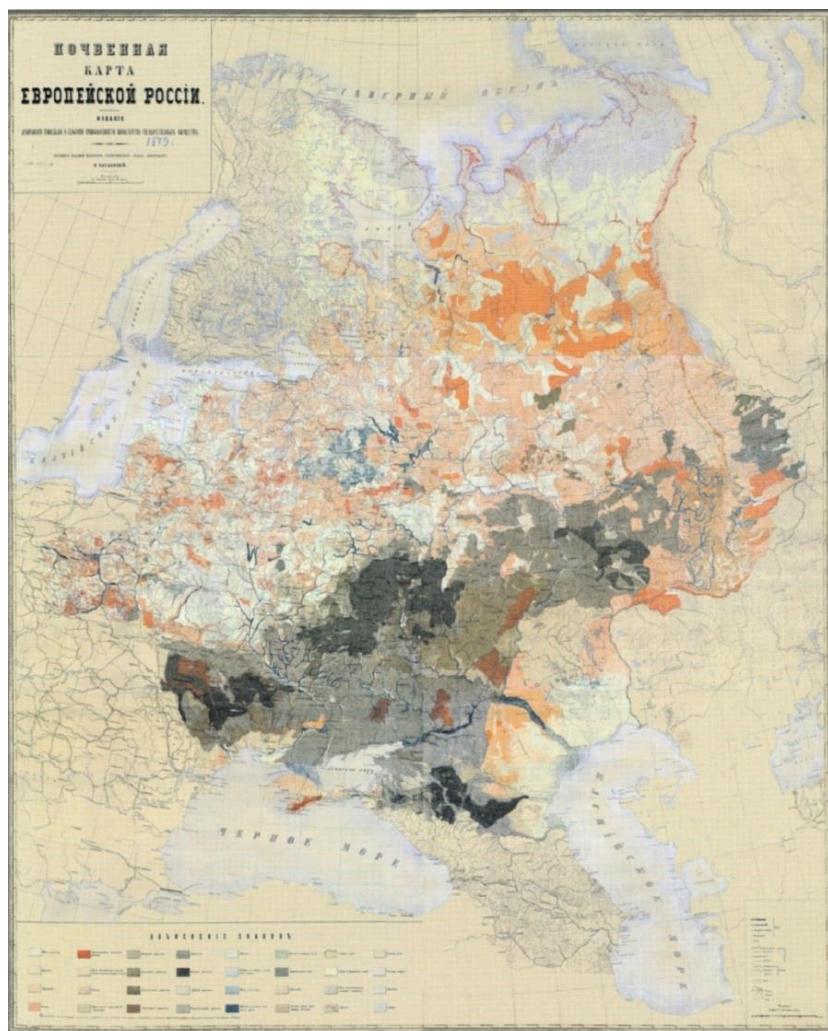


Fig. 19. The first soil map of European Russia by Vasily Chaslavsky. 1879. (From the National Atlas of Soils of the Russian Federation).

In 1876, at the suggestion of Aleksey Khodnev and Alexander Sovetov, a special commission was organized at the First Department of the Imperial Free Economic Society to develop the new research programs for Russian chernozem. Vasily Dokuchaev was entrusted with drafting the working program of research and later its execution.

During the summer months from 1877 to 1881, Vasily Dokuchaev was travelling over the chernozem zone of European Russia (the total length of the route was over 10 thousand kilometers).



Fig. 20. Soil sample collected by Vasily Dokuchaev. Saratov region, Volsky district, 5 miles West of the town of Volsk. A pasture field. Archive CSM GIK No. 1-132.



Fig. 21. Schematic map of the chernozem zone of European Russia, compiled by Vasily Dokuchaev. Archive CSM.

Since 1879, Vasily Dokuchaev regularly raised the issue of the need for a soil science museum in Russia. This dream came true only after his death through the efforts of his close student Pavel Ototsky.



Fig. 22. Showcase of the Pedological Museum of the Imperial Free Economic Society named after V.V. Dokuchaev. Archive CSM (Ф. 5. Оп. 1. Д. 4. Л. 3).

The official opening of the Pedagogical Museum was held on 6 of November 1904 at the Imperial Free Economic Society. Already at the time of its foundation the Museum was named after Vasily Dokuchaev. The exhibition was based on the collection of soil samples and monoliths taken by Vasily Dokuchaev and his students during expeditions, which had been displayed at various exhibitions since the 70s of the 19th century.



Fig. 23. The halls of V.V. Dokuchaev Pedological Museum of the Imperial Free Economic Society. Archive CSM (Ф. 5. Оп. 1. Д. 4. Л. 4).

Vasily Dokuchaev married Anna Sinclair in 1880.

By the time she met Vasily Dokuchaev, Anna Egorovna had the experience of teaching and was the Head of her own first-class boarding school for girls.



Fig. 24. A.E. Sinclair. Archive CSM (Ф. 2. Оп. 39. Д. 1. Л. 4).



Fig. 25. V.V. Dokuchaev. Archive CSM (Ф. 2. Оп. 39. Д. 2. Л. 8).

The work on the study of the chernozem zone of European Russia evolved into Dokyuchaev's doctoral thesis entitled "The Russian Chernozem", which he defended at the Imperial Saint Petersburg University on 19 December, 1883.

One of the official opponents for the thesis was Dmitry Mendeleev, who highly appreciated this work.



Fig. 25. Diploma, awarding the degree of Doctor of Mineralogy and Geognosy to Vasily Dokuchaev on the basis of his thesis "The Russian Chernozem", which he defended on the 19th of December. Archive CSM, RSHA (Ф. 14. Оп. 1. Д. 3550. Л. 40).

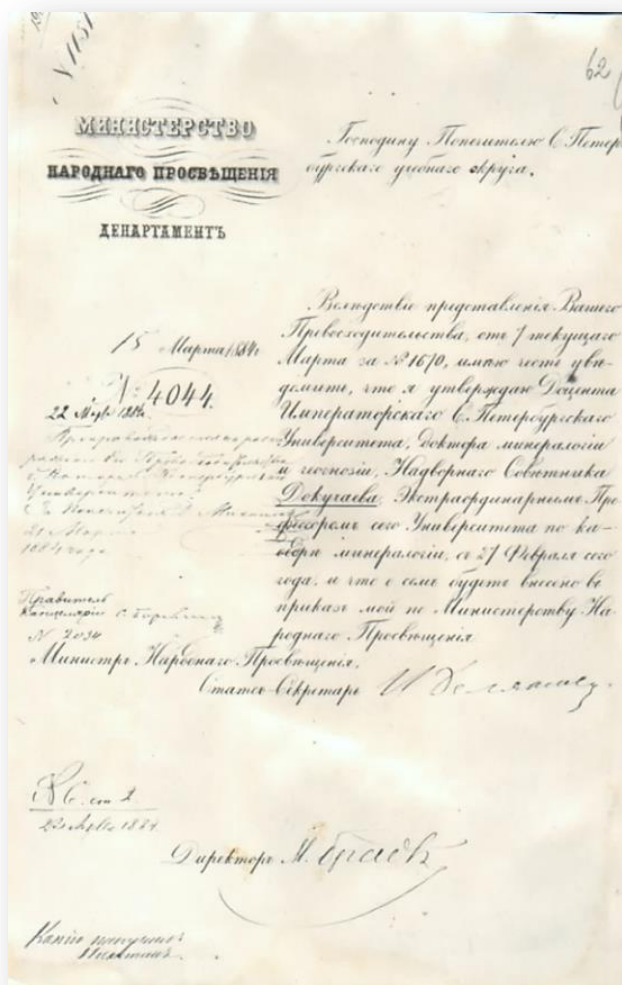


Fig. 26. Approval of the Associate Professor of the St. Petersburg University, Doctor of Mineralogy and Geology, Privy Councillor V.V. Dokuchaev as the Extraordinary Professor of this University. March 15, 1884 Archive CSM, RSHA (Ф. 14. Оп. 1. Д. 7192. Л. 62).



Fig. 27. Assembly Hall of the Imperial St. Petersburg University. Vasily Dokuchaev defended his doctoral thesis “Russian Chernozem” on December 19, 1883. (Source: <http://nlr.ru/petersburg/spbpcards/vo/3.htm>).



Fig. 28. Vasily Dokuchaev as a professor. Archive CSM (Ф. 2. Оп. 39. Д. 1. Л. 5).

In 1882, the Nizhny Novgorod provincial Zemstvo approached Vasily Dokuchaev with a proposal to determine the qualities of the provincial soils with a precise marking of their boundaries. Under the leadership of Dokuchaev, specialists trained by him completed the work in six years. The results were 14 issues of “Materials on land assessment of the Nizhny Novgorod Province” (one for each county of the province), with a soil and geological map.

In this expedition, the methodology of soil mapping was created and developed, together with the genetic classification of soils with four major classes of land-vegetation, land-swamp, swamp and floodplain soils. The method of land appraisal was improved and the Dokuchaev concept of genetic soil science was tested and extended to the northern soils.

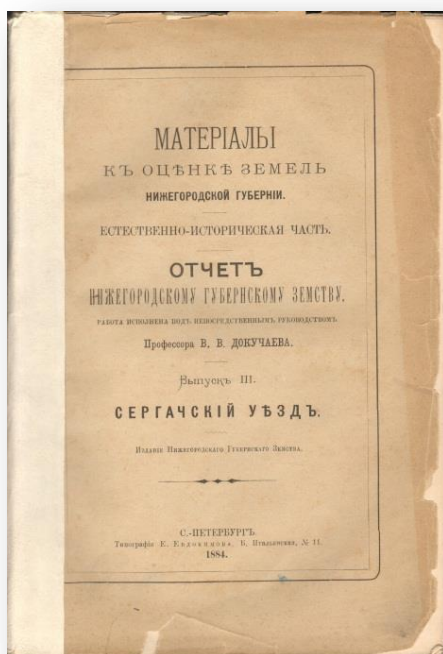




Fig. 29. Materials on the land assessment in Nizhny Novgorod province. Archive CSM.

The general appreciation of the research in the Nizhny Novgorod province was confirmed by the proposal to carry out a similar study of the lands of the Poltava province. Dokuchaev was in charge of the expedition's research during 1888–1890. The staff of this expedition included N.M. Sibirtsev, P.A. Zemiatchensky, A.R. Ferkhmin, who had already been on the Nizhny Novgorod expedition, as well as younger students of Dokuchaev: V.I. Vernadsky, K.D. Glinka, P.V. Ototsky, B.B. Polynov, F.Yu. Levinson-Lessing and others.



Fig. 30. Professors Vasily Dokuchaev and Alexander Sovetov with their students and colleagues of Vasily Dokuchaev. From left to right: top row: N.P. Adamov, D.I. Ivanovskij, S.K. Bogushevskij, P.V. Ototsky, O.O. Silant'ev, V.K. Agafonov, V.A. Transhel'. Middle row: K.D. Glinka, G.I. Tanfil'ev, A.V. Sovetov, V.V. Dokuchaev, P.A. Zemyatchenskij, A.R. Ferhmin, M.I. Sheshukov. Bottom row: V.D. Batyushkov, P.A. Kryukov, I.P. Vydrin, M.K. Savich. Archive CSM (Ф. 2. Оп. 39. Д. 11. Л. 22).

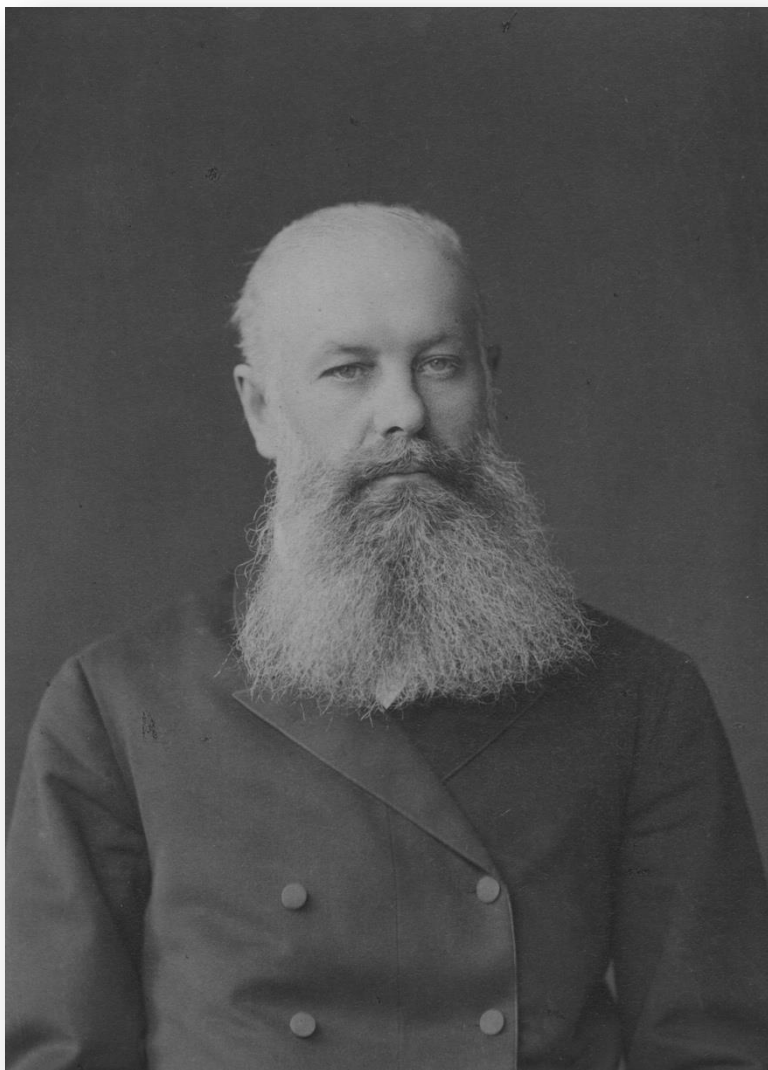


Fig. 31. V.V. Dokuchaev. Archive CSM (Ф. 2. Оп. 39. Д. 1. Л. 2).



Fig. 32. Order of St. Stanislaus, 3-rd class. (Source: <http://www.cabinet-auction.com/auction/9287/085>).



Fig. 33. Order of St. Stanislaus, 2-nd class. (Source: <http://medalirus.ru/rus-ordena/orden-stanislava-2.php>).



Fig. 34. Order of St. Anne, 2-nd class. The cross is worn around the neck with the uniform. (Source: <http://medalirus.ru/rus-ordena/orden-stanislava-3-kapitulnyy.php>).

Vasily Dokuchaev was engaged in the development of agricultural education in Russia under the Ministry of Public Education and the Department of Agriculture. In 1892 he was appointed the Director of New Alexandria Institute of Agriculture and Forestry and proceeds to radical reorganization of teaching and curricula of the Institute. In 1894 the first Department of genetic soil science was established at the New Alexandria Institute. Higher agricultural education in Russia was reorganized according to this model.



Fig. 35. The main building of the New Alexandria Institute. Photo from the album. CSM GIK No. 2–9.



Fig. 36. The album presented to Vasily Dokuchaev by the first graduating class of the New Alexandria Institute in 1892–1896. CSM GIK No. 2–9.

Vasily Dokuchaev organized the Department of Soil Science at the All-Russian Exhibition in Nizhny Novgorod in 1896.



Fig. 37. All-Russian Industrial and Art Exhibition in Nizhny Novgorod in 1896. (Source: <https://alumni.mgimo.ru/page/adaptive/id31258/blog/4819502/?ssoRedirect=true&ssoRedirect=true&ssoRedirect=true>).

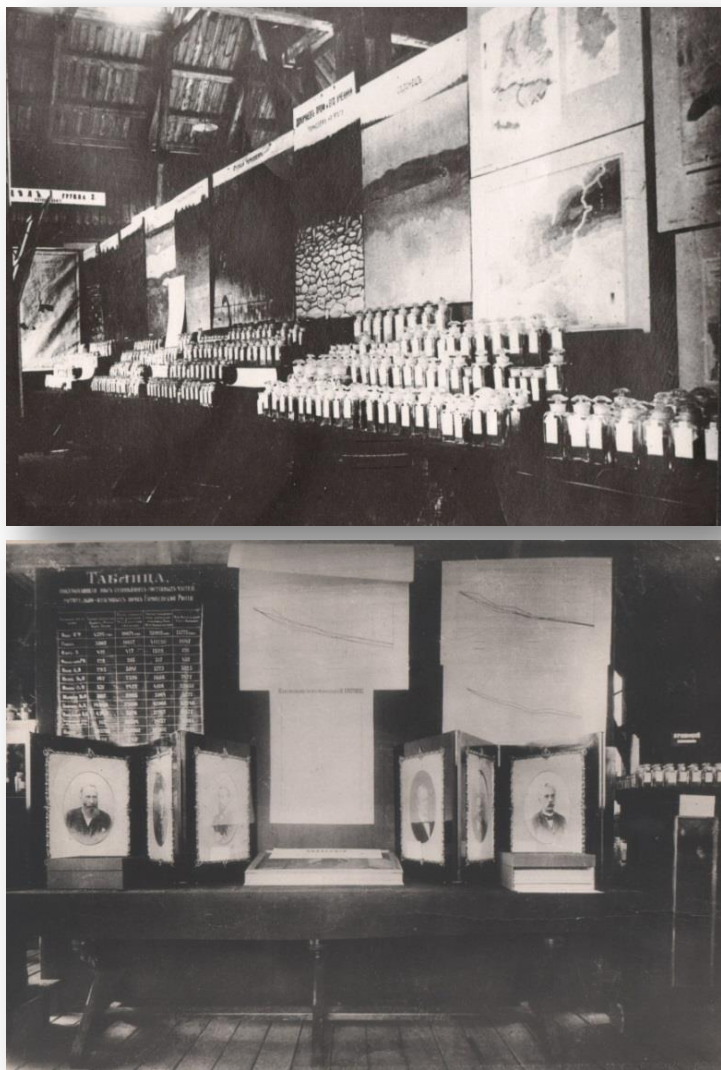


Fig. 38. Soil exposition at the All-Russian Industrial and Art Exhibition of 1896 in Nizhny Novgorod. Archive CSM (Ф. 2. Ор. 39. Д. 11. Л. 1-2).



Fig. 39. Soil sample No. 131 presented at the exhibition. Archive CSM GIK No. 2-100.

The soil collections were particularly successful at the World Exhibitions in Paris. In 1889 Vasily Dokuchaev was awarded a gold medal and the “Chevalier du mérite agricole” (Order of Merit for Farming). In 1900 Vasily Dokuchaev and his pupils Vladimir Vernadsky, Nikolay Sibirtsev, Pavel Ototsky and others were awarded the highest honour – the Grand Prix.

Visitors particularly remembered a monster sample of chernozem from the Voronezh Province (Paninskiy district) in 1900. It was about 9.7 m³ in size and was mounted on a high pedestal. After the exhibition it was decided not to cut the monolith. It was given by lot to the Sorbonne, where it was kept until 1968, when the sample and its display case were destroyed as a result of student riots. Today, the remains of the monolith are preserved in the National Agronomic Institute.



Fig. 40. Russian pavilion. The World Fair in Paris, 1900.
(Source: <https://foto-history.livejournal.com/5163604.html>).



Fig. 41. Cavalier Order “Chevalier du mérite agricole”.

(Source: <https://www.monnaiedepartis.fr/en/shop/national-orders/order-of-the-agricultural-merit-knight-miniature-0>).

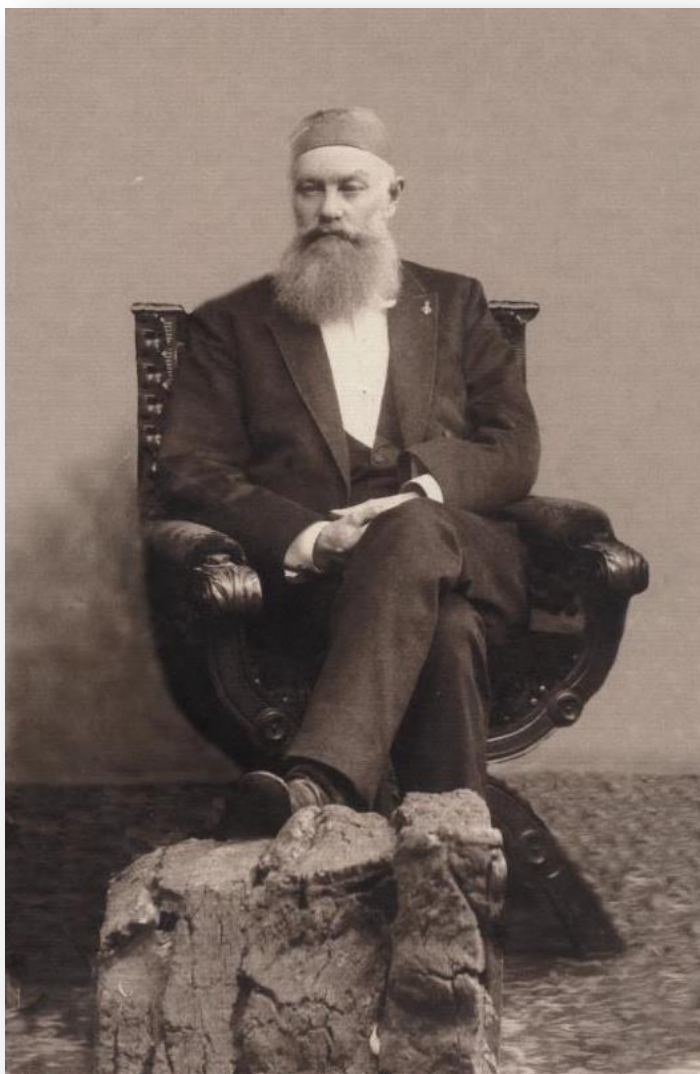


Fig. 42. Vasily Dokuchaev. Fragment of the photo. Archive CSM.

In the autumn of 1900, Vasily Dokuchaev practically ceases all communication with the outside world.

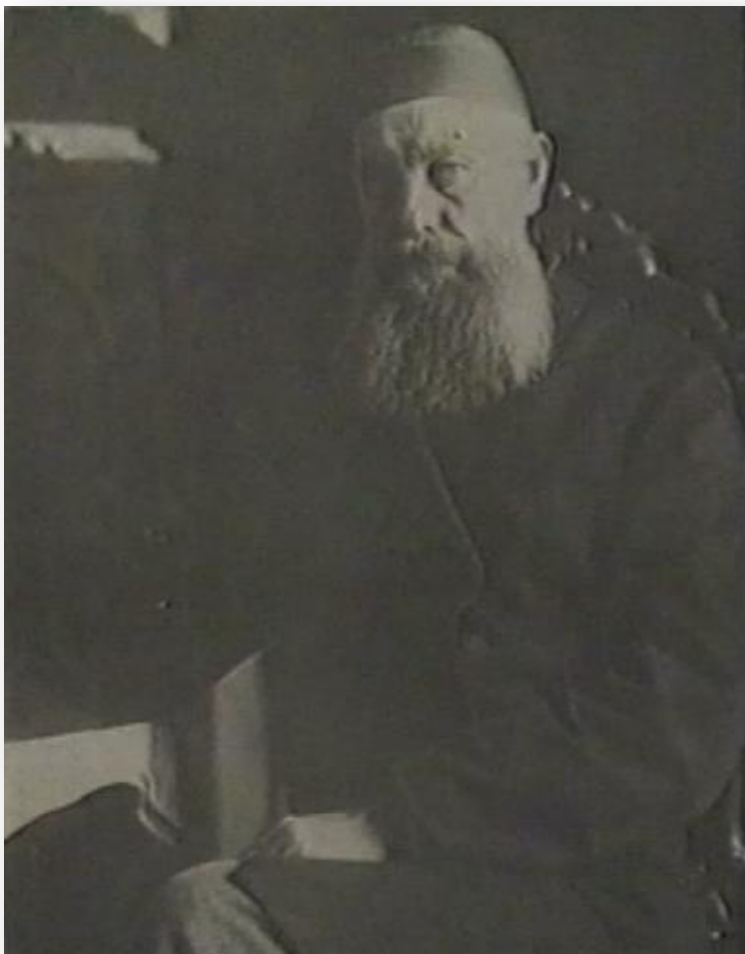


Fig. 43. V.V. Dokuchaev in the last years of his life. Archive CSM.

Vasily Vasilyevich Dokuchaev died on November 8, 1903 after a long illness.

The funeral was attended by Alexander Karpinsky, Dmitry Mendeleev, Alexander Inostrantsev, numerous friends and pupils of Dokuchaev, students, and delegates from many educational institutions.

He was buried next to his wife Anna Egorovna Dokuchaeva at the Smolensky Lutheran Cemetery in St. Petersburg.

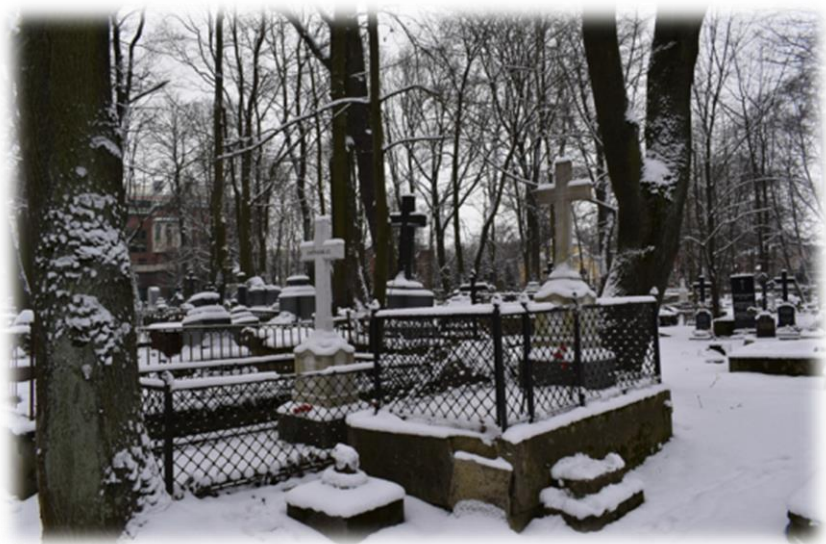


Fig. 44. Smolenskoe Lutheran cemetery in Saint Petersburg. The graves of Vasily Vasilyevich and Anna Egorovna Dokuchaevs. Archive CSM.