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Yaroslav Zechner, Margret Hamilton. Correspondence between Eduard Suess and Vladimir A. Obruchev: with emphasis on "The Face of the Earth". *Travaux du Comité français d'Histoire de la Géologie*, 2022, 3ème série (tome 36 bis), pp.199-210. hal-04424258

HAL Id: hal-04424258

<https://hal.science/hal-04424258>

Submitted on 29 Jan 2024

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Correspondence between Eduard Suess and Vladimir A. Obruchev: with emphasis on “*The Face of the Earth*”

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Abstract. Eduard Suess was a well-known Austrian geologist, who shaped generations of geologists with his concepts, such as the supercontinent Gondwana and the Tethys Ocean. His correspondence with numerous scientists of his time and the establishment of “*The Face of the Earth*” made a foundation for modern geology. One of the scientists with whom E. Suess exchanged letters was Vladimir A. Obruchev, a Russian geologist and “the father of Siberian Geology”, who studied areas around Lake Baikal, Altai Mountains, and Central Asia. In this study the authors analysed the correspondence between V. A. Obruchev and E. Suess, which give insights not only in their scientific exchange but also in development of their personal friendship. Furthermore, their exchange of scientific data, ideas and knowledge influenced the work of “*The Face of the Earth*”, in particular chapters dealing with Lake Baikal, Altai Mountains and Central Asia. The main aim of this study was to analyse historical documents in form of letters, sketches, and maps from V. A. Obruchev from the Geological Archive in Vienna.

Keywords: Obruchev – Suess – *The Face of the Earth* – Tian-Shan – Nan-Shan – Lake Baikal – Central Asia

Introduction

Europe in the 19th century, both united and extremely divided. It was a time period of revolutions, political and social transformations, rise of the nationalism, rapid industrialization, and dissemination of science across the continent. During this period, geology was ironically a young science, with many ground-breaking inventions and theories yet to be made. The 19th century from geological perspective was dominated by the work of Charles Lyell “*Principles of Geology*”. His work made a foundation for methodology in modern geology, which requires the study of modern processes and collecting precise, quantitative data, which would be used to interpret past geological processes and environments. Interpretation of collected evidence was however dominated by major works of Leopold von Buch, who considered volcanism as a main driving factor of orogenesis. Ano-

ther major work was by Élie de Beaumont, who sought geometric symmetry in the origin of mountain ranges (Obruchev & Zotina, 2009). In this rapidly changing World, two geologists, with considerably different backgrounds contributed a remarkable amount of knowledge in order to unravel the geological *Face of the Earth*: Eduard Suess and Vladimir Afanasyevich Obruchev. In this study, we analysed Obruchev’s letters, maps, and sketches from the correspondence with E. Suess, which gives us interesting insights of not only on how they worked and were thinking but also on how their friendship developed over time.

Eduard Suess (1831-1914)

Eduard Carl Adolph Suess was a well-known and one of the most influential geologists of his time. He was born in London in 1831 in a wealthy

Austrian merchant family. Suess's biography is well known and his concepts of Supercontinent Gondwana or Tethys Ocean are deeply embedded in scientific community and every geology related schoolbook. Eduard Suess started working at the Austrian Academy of Sciences at the age of twenty-nine, followed by full membership in 1867. In 1898 he was chosen as a president of the Academy and remained its president until 1911. His professorship at the University of Vienna lasted 45 years between 1856–1901. Suess's lectures were widely acknowledged and remarkably popular between the students.



Fig. 1: Portrait of Eduard Suess published in the "Geologische Rundschau" for his 80th birthday (Steinmann, et al., 1911).

Eduard Suess could truly inspire his students with rhetorically perfect explanations and excellent colourful drawings. His lectures usually represented his ongoing research and scientific questions he was working on. In the initial years of his professorship, Suess held lectures in paleontology, followed by lectures in geology with an emphasis on stratigraphy and lithostratigraphy. Later on, his lectures were focused on tectonics. During this period E. Suess worked on his opus magnum "The Face of the Earth". In complement to lectures Eduard Suess went to fieldtrips with his students. Most of them took place around Vienna and Vie

na Basin. Later on, fieldtrips extended into the Lower Austria and the Alps and even further to Italy and Sicily. Suess did not just lecture during the fieldtrips but also took active part in students endeavours, where he would again feel young in their company. As noted by V. A. Obruchev, Eduard Suess was a humble person despite of his popularity and acknowledgement. In addition to his scientific career, he was also a public figure and a politician. Suess was member of the Austrian Landtag and thereafter member of the Austrian Reichsrat. He shared monarchist political views and criticized liberally oriented political parties supporting a unified Austria-Hungary (Obruchev & Zotina, 2009). Nevertheless, Eduard Suess saw himself in the first place as a scientist, geologist, and philosopher. He played an important role in the development of an aqueduct system to supply Vienna with drinkable water. Another Suess's important contribution to the development of Vienna was the regulation of the Danube River to stop its frequent flooding of the city. His remarkable scientific contribution manifested itself in the multi-volume work "The Face of the Earth", composed of his own philosophical views, re-worked, and summarized scientific literature and scientific exchange with numerous scientists and philosophers from around the world (Obruchev & Zotina, 2009; Şengör, 2015). One of these scientists was a young Russian geologist Vladimir Afanasyevich Obruchev.

Vladimir Afanasyevich Obruchev (1863-1956)

Vladimir A. Obruchev was born in 1863, in a small village of Klepenino located in Tver Governorate¹. His mother was of German origin and taught him German and French during his childhood. Obruchev graduated from the St. Petersburg Mining University in 1886 and in his early career he translated foreign scientific research articles for publishing in Russian journals. One of these articles, or to be more precise, a series of books, was written by the German geographer and traveller Ferdinand von Richthofen about China², which raised an immense interest in Obruchev for Asia and the origins of loess depos-

¹ Tverskaya Guberniya (English: Tver Governorate), an administrative division of the Russian Empire between 1796 and 1929. Nowadays Tverskaya Oblast (English: Tver Oblast).

² Ferdinand von Richthofen. China. Ergebnisse eigener Reisen und darauf gegründeter Studien. Verlag von Dietrich Reimer, Berlin, 1877.

its. After graduating St. Petersburg Mining University Obruchev participated between 1886–1888 in scientific expeditions to Central Asia³ under the supervision of Ivan Vasilyevich Mushketov⁴.



Fig. 2: Photograph of Vladimir Afanasyevich Obruchev in 1886 (Geological Institute RAS, 1885).

The results were published in numerous scientific journals, but Obruchev also wrote a series of expedition essays for general public. This expedition resulted in Obruchev's main scientific interests, such as the origin of loess deposits, aeolian and fluvial depositional environments and permafrost. After the expedition, I. V. Mushketov proposed Obruchev a position as an exploration geologist in Irkutsk, where he studied coal and gold deposits, and vast Siberian territories⁵.

One could keep talking about Obruchev's extraordinary biography for a long time. As a matter of fact, there are numerous publications and books dedicated to his life. However, we would like to complement at this point his biography from the

year 1891 by making use of his correspondence with Eduard Suess.

Beginning of the correspondence

V. A. Obruchev–E. Suess

The Geological Archive of Vienna has 42 Obruchev's letters and 24 maps in excellent condition stored in Cabinet 8 / Box 9. Suess's letters are on the other hand located in the archive of the Russian Academy of Sciences (RAS) in Moscow (pers. comm. RAS). There are 63 letters from Suess to Obruchev, but it was not possible for us to retrieve original scans of the letters from the RAS. The first letter from Obruchev to Suess, which is available to us, is from 1/13 May 1892 (Julian/Gregorian)⁶ and was sent from Irkutsk. However, Obruchev mentions his letter from 5/17 December 1891 and in the collected edition of Obruchev's scientific heritage (Обручев, et al., 1964), the first available letter from Suess is dated from 6 July 1891. In this letter Suess mentions one of the first Obruchev's publications on the gold deposits in Olekminsko-Vitim Mountain range, which was published in 1891. The correspondence between Suess and Obruchev, therefore must have begun in the first half of 1891.

Interestingly is that Obruchev in 1891 was a very young geologist with only two published publications. We do not know why and how Suess reached out to Obruchev, as there were other more prominent Siberian geologists such as I. D. Czerski⁷ and G. N. Potanin⁸. We speculate that Suess, in order to obtain more information on Siberian and Asian geology at first reached out to I. V. Mushketov, who might have further forwarded him to Obruchev, prior to his knowledge of German and interests in Siberian geology. Another possibility is that Suess actually reached out to Obruchev directly as he was the only permanent

³ Obruchev's first expeditions between 1886–1888 under the supervision of I. V. Mushketov to the Karakum Desert, in Transcaspien Oblast. The Transcaspien Oblast was an administrative region of the Russian Empire until 1924. Nowadays the area corresponds approximately to Turkmenistan and southwestern Kazakhstan.

⁴ Ivan Vasilyevich Mushketov (Russian: Иван Васильевич Мушкетов, 1850–1902), was a Russian geologist and geographer. He is well known for his exploration work in Russia and China, including regions of Tian Shan and Turpan Valley. Mushketov was professor and scientific supervisor of V. A. Obruchev.

⁵ V. A. Obruchev. Geological research of the Olekminsko-Vitim Mountain range and its gold-bearing placer deposits in 1890. (*В. А. Обручев. Геологические исследования Олекминско-Витимской горной страны и её золотоносных россыпей и 1890 г.* < Изв. Вост.-Сиб. отд. РГО >, 1891, т. 22, № 2–3.

⁶ Gregorian calendar was adopted on the 6th of February 1918 by the Russian Socialist Federative Soviet Republic (RSFSR).

⁷ Jan Stanislaw Franciszek Czerski (Russian: Иван Деметьевич Черский, 1845–1892), was a Polish palaeontologist, geologist, geographer, and explorer of Siberia, who was exiled to Transbaikalia for participating in the January Uprising of 1863. He was one of the first to develop tectonic structure of Lake Baikal and Central Asia.

⁸ Grigory Nikolayevich Potanin (Russian: Григорий Николаевич Потанин, 1835–1920), was a Russian ethnographer and natural historian. He is well known for his exploration of Inner Asia and as a political activist supporting the Siberian Independence movement.

geologist in the far East. In fact, even Obruchev was surprised by Suess's request on Siberian geology:

« Diese Schrift scheint Ihnen unbekannt zu sein, da ich mir sonst nicht erklären kann, weshalb Sie Ihre ehrenvolle Anfrage an einen Neuling in der Geologie von Sibirien, wie ich einer noch bin, richten, anstatt sich an die Autorität von Herrn I. Czerski zu wenden;... »

« This writing seems unfamiliar to you, as I cannot otherwise explain why you would direct your honourable request to a newcomer in Siberian geology like myself, instead of turning to the authority of Mr. I. Czerski;... » – V. A. Obruchev to E. Suess, Irkutsk 1/13 May 1892 (Letter 1, p. 1).

At the same time, Obruchev sent Czerski's publications on Siberian geology and discussed the origin of the Lake Baikal. He argued that lake Baikal is actually a graben-structure and not as proposed by Czerski of orogenic origin (Letter 1, p. 4). Obruchev also mentioned that he got a proposal (under procurance of I. V. Mushketov) to participate in Potanin's expedition to the Eastern Tibet⁹.

In the following years (1892–1894), V. A. Obruchev participated in expeditions to Mongolia and China under the supervision of Grigory Nikolayevich Potanin, where he conducted a series of topographical and geological observations. During the day he collected geological data and mapped the area and at night summarized the results, wrote reports and articles to the Russian Geographical Society and maintained correspondences with his colleagues, including Eduard Suess.

His first expedition route (German: *die Marschroute*) began on 15/27 September 1892 from Kjachta to Urga¹⁰, which he reached on 23 September / 5 October covering over 30 km per day. Obruchev shared his short but extensive results with Suess from Peking on 9 January 1893. In his letter (Letter 2, p. 4) he sketched a map of the expedition route, with geological description and orientations of the major depressions and faults. It is interesting to note, that Obruchev

thanks Suess for wishing him “*Glückauf*”, which is a traditional greeting of German and Austrian miners and in general means good luck.

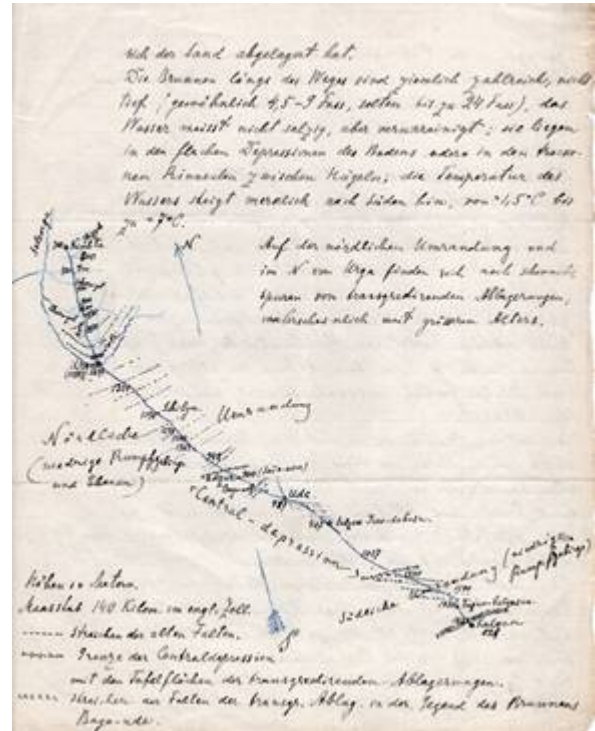


Fig. 3: Geological sketch of the Kjachta-Urga-Kalgan¹¹ route by Obruchev (Letter 2 from Obruchev to Suess, p. 4).

After months of expeditions, Obruchev sent a letter to Suess on 24 September 1893 from Su-Chow¹², with unpublished results from the Nan-Shan Mountain range. In addition, he kindly asked Suess not to publish them until they would be officially released through the Russian Geographical Society. Moreover, Obruchev let Suess to know where his further expeditions would take place and asked him for places and regions of particular interest (Letter 3, p. 1–10).

Between 1893 and 1895, the correspondence between Suess and Obruchev was mostly an exchange of geological data and ideas. Obruchev sent Suess information on geological structure of the Inner Asia, specifically Nan-Shan and Tian-Shan regions. The data consisted predominantly of lithological descriptions, tectonic structure, and measurements of the major faults.

⁹ Second Chinese–Tibetan expedition during 1892–1893 to study Eastern Tibet under the supervision of G. I. Potanin. Potanin would get seriously sick and will have to abort his expedition. However, Obruchev would continue the expedition on his own.

¹⁰ Urga, until 1924 former name of Ulaanbaatar, the capital of Mongolia.

¹¹ Kalgan, nowadays Zhangjiakou in northwestern Hebei province, northern China.

¹² Su-Chow, former name of Suzhou city in the Jiangsu province.

Paleontological material was however of exquisite interest for both scientists, as it provided information on paleogeographical environment and stratigraphy. Obruchev, in his letter to Suess from 9/21 January 1895 from St. Petersburg, asked Suess for his help with the interpretation and preparation of paleontological material from the Nan-Shan region and sent part of it to him (Letter 5, p. 4–5). We can see how the scientific exchange between the two geologists evolved during these years, from exchanging existing reports and literature to sharing ideas, unpublished data and even samples. Furthermore, Obruchev named one of the mountain ridges (Fig. 4) in Nan-Shan after Suess¹³:

« Ich habe mir erlaubt, Ihren berühmten Namen einem bis jetzt unbekanntem Gebirgszuge zu geben, welcher die Fortsetzung der Dislocationslinie der Rittergebirges bildet, von letzterem aber durch eine breite Bresche getrennt ist und deshalb ein Recht auf einen besonderen Namen hat die Huldigung eines jungen Forschers dem Autor des „Antlitz der Erde“. »

« I have taken the liberty of giving your famous name to a previously unknown mountain range, which forms the continuation of the Ritter Mountains' fault line, but is separated from the latter by a wide gap. Therefore, it deserves a special name as a tribute from a young researcher to the author of "The Face of the Earth" » – V. A. Obruchev to E. Suess, Su-Chow 30 May 1894 (Letter 4, p. 8).



Fig. 4: Western part of the Suess Mountain ridge. From (Обручев, 1901).

In 1895, Obruchev returned to Irkutsk from St. Petersburg to study for the next four years the

geology of Transbaikalia for the construction of the Trans-Siberian Railway. His observations and ideas had a major impact on the understanding of the geological structure of Siberia. Between 1895 and 1898 both scientists exchanged their ideas and literature on the Inner Asia and Transbaikalia.

Obruchev meets Suess

After seven years of correspondence, Obruchev and Suess finally met in person in Vienna:

« Ganz unverhofft werde ich in kurzer Zeit das Glück haben Ihnen persönlich meine Hochachtung darzubringen, denn in diesen Tagen, am 9/21 oder 10/22 Oktober reise ich in Familienangelegenheiten nach Zürich und nehme meinen Weg über Wien, um dort 2 Tage zu verbringen, wahrscheinlich am 13/25 oder 14/26 Oktober. »

« Unexpectedly, I will have the pleasure of personally expressing my highest respect to you in a short time. In these days, on 9/21 or 10/22 October, I will be traveling to Zurich for family matters and will make my way through Vienna to spend two days there, probably on 13/25 or 14/26 October. » – V. A. Obruchev to E. Suess, St. Petersburg 2/14 October 1898 (Letter 12, p. 1).

He kindly asked Suess to find for his family an inexpensive hotel, not far from Suess's apartment and that they would soon have an opportunity to discuss the results from Transbaikalia in person. Obruchev could not hold off his excitement to discuss Siberian geology with Suess and proceeded in his letter with short description of his thoughts and ideas (Letter 12, p. 2). We can only speculate and fantasize, what the two scientists talked and discussed about, when they first met. Did they discuss and shared ideas in Suess's little apartment over the map of Asia? Or maybe they went to one of the traditional Viennese cafés for a cup of *mé-lange*? What we know however, is that Suess organized and paid a hotel room for Obruchev and his wife¹⁴ in "Hotel Nordbahn"¹⁵, which is located a couple of minutes away from Suess's apartment at the Afrikanergasse 9. Obruchev returned to Vienna on 17 November 1898, however it is uncertain whether Suess and Obruchev actually met

¹³ Suess Ridge nowadays Da Tong Shan, located north of Qinghai Lake in the Qilian Mountain System.

¹⁴ Elizaveta Isaakovna Lurie (Russian: Елизавета Исааковна Лурье, 1863–1933) was Obruchev's wife until she passed away in 1933.

¹⁵ Hotel Nordbahn, nowadays "Austria Classic Hotel Wien" located in Praterstrasse 72, 1020 Vienna.

during these dates (letter 24). Interestingly, he deliberately mentioned that he would come incognito to Vienna, without letting Suess know the exact address. Possibly, to exclude the possibility for Suess to pay for Obruchev's room.

An unexpected finding from the Gobi Desert

In following years, Obruchev sent Suess new results of Russian geologists A. P. Gerasimov¹⁶ and A. Giedraitis¹⁷ from the Asia and Transbaikalia. In addition, he also sent maps and paleontological material from China, which consisted of gastropods, bivalves, fish remains and some fractured and disintegrated remains of unknown origin from the Gobi Desert. Suess painstakingly cleaned and reconstructed those disintegrated remains and was astonished with the finding. They represented the teeth of the herbivorous mammal *Rhinoceros*¹⁸, which put in doubt the idea of Gobi Formation formed as part of the saline, mediterranean sea. Suess immediately pointed out that *Rhinoceros* remains indicated freshwater, lacustrine environment. Obruchev however, was more cautious in making final conclusions but accepted Suess's idea later on after studying remains more in detail and gathering additional information (Letter 19, p.2).

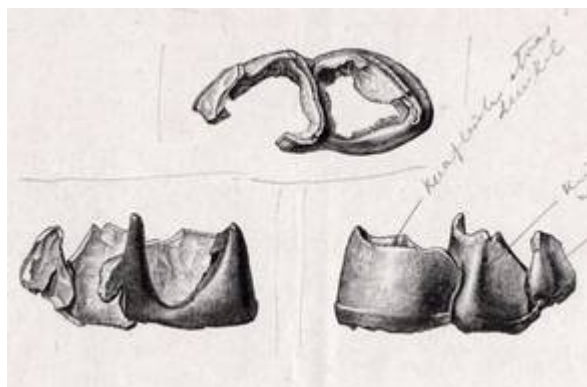


Fig. 5: A drawing of the *Rhinoceros* remains from the white marls of Gobi Desert (Letter 17 from Obruchev to Suess, p. 3).

The *Rhinoceros* finding resulted in a joint publication: „*Ueberreste von Rhinoceros sp. Aus der östlichen Mongolei*“ published in *Verhandlungen der kaiserlich-russischen Mineralogischen Gesellschaft* (Suess & Obruchev, 1899). Furthermore, their publication and findings led to additional expeditions into the Gobi Desert.

An interesting detail is that during these months of their correspondence Obruchev ended his letters with wishing all the best to Suess's family instead of regular: “*Hochachtungsvoll W. Obrutschew*”, which can be translated as “*Yours sincerely V. Obruchev*”. A minor but interesting detail in the development of their relationship.

Obruchev in Europe

On 15/27 May 1899, Obruchev travelled to a health resort in Bad Ems, Germany. From there he planned to go to Switzerland, where his intention was to learn more about Central Gneiss and eruptive rocks. For the August he planned to go to Bohemia and from there to Berlin and Vienna. In his letter from 6/18 of May 1899, Obruchev asked Suess if he could recommend him some interesting geological locations in Switzerland and if his son Franz Eduard Suess¹⁹ could show him around in Bohemia (Letter 19).

« Hochgeehrter Herr! Ihren Brief soeben erhalten, beantworte nächstens, besten Dank für Andeutungen über Litteratur. Die unnötigen Bogen 21-23 vom chines. Bericht bitte zurückzuschicken hierher Friedrichsburg 27. Mit den besten Grüßen Ihr ergebener W. Obrutschew. »

« Dear Sir! I have just received your letter and will respond shortly. Thank you very much for the hints on literature. Please return the unnecessary pages 21-23 of the Chinese report here to Friedrichsburg 27. With best regards, yours faithfully, V. Obruchev. » – V. A. Obruchev to E. Suess, Bad Ems 4 June 1899 (Letter 20).

¹⁶ Alexander Pavlovich Gerasimov (Russian: Алекса́ндр Па́влович Ге́расимов, 1869–1942), was a Russian geologist and geographer. Between 1895 and 1899 worked on the Trans-Siberian Railway and between 1897–1907 under the supervision of V. A. Obruchev on gold deposits in the Lena River region.

¹⁷ Antanas Giedraitis (Russian: Анто́н Э́дмундович Ге́дройц, 1848–1909), was a Russian-Lithuanian geologist, who worked under the supervision of V. A. Obruchev between 1895–1898 on the Trans-Siberian Railway.

¹⁸ *Rhinoceros* is a genus of one-horned rhinoceroses.

¹⁹ Franz Eduard Suess (1867–1941), was an Austrian geologist, son of Eduard Suess. His major scientific interests were Bohemian Massif and the origin of tectites, a term introduced by him.



Fig. 6: Postcard from Obruchev to Suess, sent from Bad Ems, Germany in 1899 (Letter 20).

The correspondence between the two geologists continued even during Obruchev's vacation (Fig. 6). They exchanged literature with each other, discussed some specific details but also shared their plans for the Summer. In Bad Ems, Obruchev stayed until 2 June 1899, from there he travelled to Eifel, Sieben- and Vogelgebirge (possibly meant Vogelsberg) to learn about basalts, trachytes, porphyry and melaphyrs. From Germany he and his family planned to travel to Switzerland, thereafter, visit the Brenner Railway in South Tyrol, Munich, and the Ore Mountains on the way to Berlin, where he attended the Seventh International Geographical Congress²⁰, with a talk on "Orography and Tectonics of Transbaikalia" (Letter 23). From the postcards sent by Obruchev, we found out that he changed his travel route and went from Berlin to Vienna before the congress (Letter 25). Obruchev arrived in Vienna on 19 September 1899 and probably met with Suess on the next day. He didn't stay long in Vienna and left to Pest²¹ on 21 September 1899. In Pest through mediation of Suess, Obruchev met Hungarian geologist and geographer Lajos Loczy²², who undertook expeditions to Asia. From Pest, Obruchev returned to Berlin on 27 September 1899 (Letter 26). The Seventh International Geographical Congress in Berlin took place between 27 September and 4 October 1899. We don't know how long Obruchev stayed in Berlin but the next

available for us letter from him was sent on 28 September / 10 October 1899 from St. Petersburg (Letter 27). In his letter Obruchev sent literature and maps of Transbaikalia, a resume of the geographical congress, drafts of China reports, and mediated meeting between Suess and D. A. Klementz²³ (Letter 27). At the end of 1899, Suess's wife passed away. Obruchev expressed his condolences in his letter from 4 January 1900 (Letter 29). However, he continued in his letter with discussions on Asian geology and expeditions of other geologists and geographers. In August 1900 Obruchev visited "The Exposition Universelle" in Paris and later on possibly also visited Suess in Vienna. He wrote about his experience to Suess from Paris

:

« Hier in Paris konnte ich leider keinen einzigen von meinen bekannten oesterreichischen Geologen begrüßen, weder Ihren Sohn, noch Prof. Diener²⁴ und Loczy. Auffallenderweise ist der Congress nicht sehr belebt – viele Geologen fehlen – und die Wunder der Ausstellung verursachen, dass die Sitzungen auch nicht von allen Anwesenden besucht werden. Es sind auch wenig interessante Vorträge gewesen und ich bin ziemlich enttäuscht was Inhalt und äusserliche Ausstellung des Congresses anbelangt... »

« Here in Paris, unfortunately, I could not welcome a single one of my well-known Austrian geo-

²⁰ Seventh International Geographical Congress took place in Berlin from 27th September to 4th October in 1899.

²¹ Interestingly, Obruchev uses Pest, although Pest, Buda and Obuda were unified into Budapest in 1873.

²² Lajos Loczy (1849–1920) was a Hungarian geologist and geographer, who participated in East-Asia Expedition between 1877 and 1880 under the supervision of Graf Béla Széchenyi.

²³ Dmitri Alexandrovitch Klementz (Russian: Дми́трий Алекса́ндрович Кле́менц, 1848–1914), was a Russian anthropologist and archaeologist, who participated in the expedition to Turfan (Xianjiang, China).

²⁴ Carl Diener (1862–1928) was an Austrian geologist, geographer, and paleontologist. His well known for stratigraphic and faunistic studies in the Alps, most prominently for proposing Anisian Stage in Middle Triassic.

logists, neither your son, nor Prof. Diener and Loczy. Noticeably, the congress is not very lively – many geologists are missing – and the wonders of the exhibition hamper participants to attend the sessions. There have also been few interesting lectures, and I'm rather disappointed with the content and overall organization of the congress... >> – V. A. Obruchev to E. Suess, Paris 23 August 1900 (Letter 34).

In this letter, Obruchev addressed for the first time Suess as a “friend” and “teacher”:

« *Die Rückreise geht Mitte September über München und, vielleicht, Wien, wo ich dann wieder die grosse Freude haben werde, Sie, verehrter Freund und Lehrer, zu begrüßen...* »

« The return journey will be in mid-September via Munich and, perhaps, Vienna, where I will again have the great pleasure of greeting you, dear friend and teacher... » – V. A. Obruchev to E. Suess, Paris 23 August 1900 (Letter 34).

Professor Obruchev

In the next year, Obruchev, under mediation of I. V. Mushketov, was selected as professor of geology in a newly founded Technological Institute of Emperor Nicholas II in Tomsk²⁵. He wrote regarding his professorship and change of his study area to Suess and asked for his informal approval:

« *...im Herbst bleibe ich wahrscheinlich in Tomsk stecken, wohin man mich als Professor der Geologie beim neugegründeten Technologischen Institut beruft; ich habe zugesagt und sage nach diesem Sommer Abschied der sumpfigen Taiga von Olekma-Witim, denn ich will mich Centralasien widmen und den Tien-Shan erforschen...Ich glaube, dass Sie diesen Entschluss billigen werden?* »

« ...in Autumn, I will likely get stuck in Tomsk, where I have been appointed as a professor of geology at the newly established Technological Institute. I have accepted the position and will say farewell to the marshy taiga of Olekma-Vitim after this Summer because I want to dedicate myself to Central Asia and explore the Tien-Shan mountains... I believe that you will approve this decision? » – V. A. Obruchev to E. Suess, St. Petersburg 8/21 April 1901 (Letter 39, p. 1).

In the years 1901 to 1912, Obruchev worked as dean and professor at the Technological Insti-

tute of Tomsk, where he organized and established mining faculty, held lectures on physical geology, petrography, field geology, and geology of mineral deposits. Furthermore, he organized expeditions to Dzungaria and conducted several exploration studies on gold deposits. The idea of studying Dzungaria, Altai, and Tian-Shan was already born during Obruchev's stays in Vienna and discussions with Suess. Obruchev would later call Dzungaria as “*The Gates to China*” (Обручев, et al., 1958). Despite of the responsibilities Obruchev faced, he never forgot about his old friend, mentor, and professor. Obruchev sent a postcard to Suess from a train to Siberia, congratulating him to his 70th birthday (Letter 40). The next available letter to us at the Geological Archive of Vienna is from 8/21 September 1911, sent from Tomsk. Unfortunately, letters between 1901 and 1911 from Obruchev do not exist or were lost. In his letter from 1911, Obruchev congratulated Suess with his 80th birthday and wrote about his personal situation in Russia:

« *...Sie hätten schon lange das Recht den Lebensabend im Kreise Ihrer Lieben ruhig zu geniessen ohne sich den Kopf wegen des Antlitzes unseres Erdballs zu zerbrechen, auf dem so viele Ungerechtigkeiten geschehen. Die Verhältnisse in Russland geben ihr das Recht, so zu denken, aber ein Forscher findet eben in der Betrachtung der Naturereignisse Trost und Erholung von der Aergernissen und Niederlagen im Lebenskampfe. Dieses fühlte ich besonders in diesem Sommer, als ich fern von Tomsk war, selten Zeitungen las und ganze Tag die hässliche russische Gegenwart vergessen konnte.* »

« ...for a long time have you had the right to peacefully enjoy your retirement surrounded by your loved ones without worrying about the Face of the Earth, where so many injustices occur. Current conditions in Russia give you the right to think this way but a researcher finds solace and comfort in observing natural events, escaping from the annoyances and defeats in life's struggles. I felt this particularly during this summer when I was far from Tomsk, rarely reading newspapers, and being able to forget about the ugly Russian reality throughout the whole day. » – V. A. Obruchev to E. Suess, Tomsk 8/21 September 1911 (Letter 41, p.1-2).

²⁵ Nowadays: National Research Tomsk Polytechnic University (TPU), a technical university in Tomsk, Russia.

Expulsion and retirement of Obruchev

The publicity of Obruchev and his publications in liberal-progressive newspaper “*Siberian Life*”²⁶ drew attention of the government. Obruchev’s eldest son²⁷ was expelled from the Tomsk Polytechnic University and even had to leave Tomsk. Obruchev himself was requested to leave the position as professor:

« *Mir befiehlt das Ministerium in nächster Zeit in eine andere Schule überzugehen, weil ich nicht regierungsfreundlich gesinnt bin und einen schlechten Einfluss auf meine Kollegen ausübe, speziell der Vermehrung akademischer (in russischem Sinne) Jünglinge unter den Studenten im Wege stehe.* »

« I was ordered by the ministry to change the school in the near future, as I am not supportive of the government and exert a negative influence on my colleagues, particularly hindering the proliferation of academic (in the Russian sense) youth among the students. » – V. A. Obruchev to E. Suess, Tomsk 8/21 September 1911 (Letter 41, p. 3).

Obruchev was however not the only known professor who was affected by the government policy. The series of expulsions of liberals and freethinkers during the years of 1911 and 1912 are known as “*The Kasso Case*”²⁸. Despite political and personal problems, Obruchev still maintained correspondence with Suess and sent him his results on Siberian gold deposits (Letter 41). However, expulsion from the university and Tomsk heavily undermined health condition of V. A. Obruchev. He wrote to Suess from Nervi by Genoa²⁹ on 28 April 1913, that he couldn’t answer his letters because of pneumonia and influenza. Obruchev left Russia, with his wife and youngest son³⁰ and travelled south, to the warmth of the Mediterranean Sea to complete his healing. They travelled through Vienna and Austria but did not

meet Suess, as ice-cold weather conditions could weaken Obruchev’s health (Letter 42). Letter 42 from 28 April 1913 is the last letter available to us at the Geological Archive of Vienna. It is however not the last letter in the correspondence between Obruchev and Suess. From the published letters and works of Obruchev in “*Selected Works. Volume 6*” (“*Избранные Труды. Том 6*”) published by his eldest son Vladimir Obruchev, we know that Suess sent a postcard to Obruchev on 17 January 1914. We can therefore assume that the correspondence lasted at least until the end of January 1914. Eduard Suess passed away on 26 April 1914 and with his death, ended the correspondence between the two geologists.

Obruchev, despite of forced retirement and expulsion, continued to work on his results from previous expeditions and develop new ideas and theories in active tectonics until the October Revolution in 1918. For active tectonics or tectonics of recent geological time, Obruchev introduced a new term – *neotectonics*. Moreover, during this period, he wrote one of his famous science fiction novels “*Plutonia*”. After the revolution, Obruchev was reinstated as professor at the Taurida National University³¹ in Simferopol, Crimea (Обручев, et al., 1958).

In following years, Obruchev worked as professor at the Moscow Mining Academy³², where he complemented and continued to develop the idea of the ancient vertex of Asia and importance of *disjunctive dislocations* based on the work of E. Suess “*The Face of the Earth*”. Moreover, Obruchev played an important role in establishment of the permafrost institute in the Soviet Union. The remarkable scientific contribution and popularization of Earth Sciences through science fiction novels such as “*Sannikov Land*” and “*Plutonia*”, made V. A. Obruchev one of the most influ

²⁶ *Siberian Life* was a Russian daily newspaper published in Tomsk between 1897–1919 and distributed in Siberian cities.

²⁷ Vladimir Vladimirovich Obruchev (Russian: Владимир Владимирович Обручев, 1888–1966) was an eldest son of V. A. Obruchev who studied geology at Tomsk Polytechnic University. He participated in his father’s expeditions to Dzungaria and later on to Mongolia and Altai. Moreover, he published a multi-volume work of selected publications and biography of his father V. A. Obruchev.

²⁸ The Kasso Case was a series of forced resignations of liberal professors and students from Russian universities at the hand of minister of education Lev Kasso in 1911.

²⁹ Nervi is nowadays a city district of Genoa, Italy.

³⁰ Dmitry Vladimirovich Obruchev (Russian: Дмитрий Владимирович Обручев, 1900–1970) was a Russian paleontologist and the youngest son of V. A. Obruchev.

³¹ Nowadays: Vladimir Vernadsky Taurida National University, currently located in Kyiv, Ukraine.

³² Moscow Mining Academy was renamed several times. Nowadays, it is National University of Science and Technology (MISIS) located in Moscow, Russia.

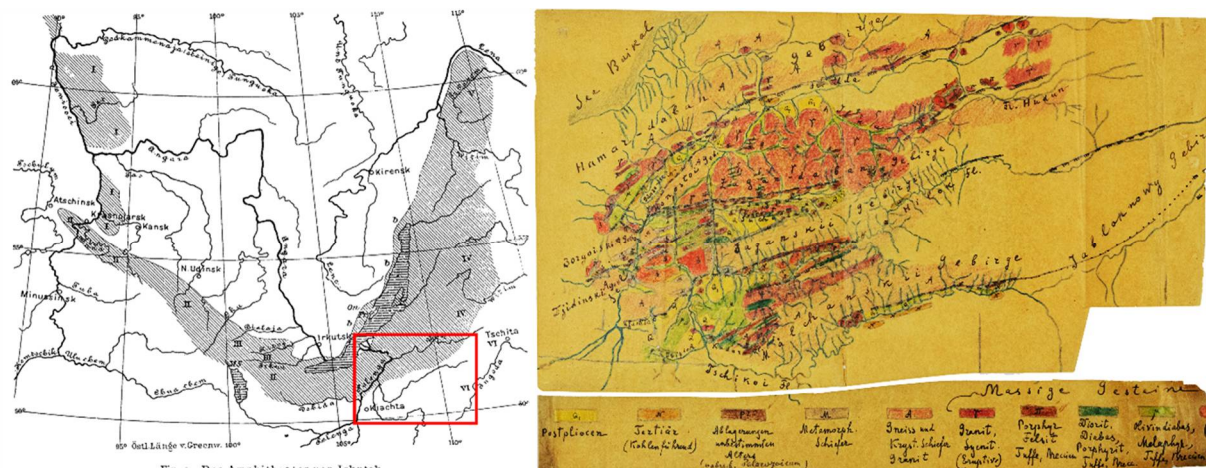
ential geologists of the 20th century (Обручев, et al., 1958). Despite of his extraordinary scientific career and tremendous amount of work, Obruchev didn't forget about his friend and mentor E. Suess and in 1937 he published his biography. In 1956, V. A. Obruchev passed away in Moscow at the age of 92.

The Face of the Earth

The Face of the Earth (German: "Das Antlitz der Erde") is the multi-volume work of Eduard Suess, his *opus magnum*, and his legacy. It is based on the theory of contraction and covers the geology of the entire Earth. *The Face of the Earth* embodies the geological knowledge of his time. Suess didn't collect the geological data outside of the Alps, instead, he corresponded with numerous scientists and geologists, who shared with him data they collected. It is divided into four volumes, in the first volume Suess discussed the formation of the continents and mountain ranges, lets the reader imagine the Earth without its atmosphere and hydrosphere. Imagination is the key element in reading his work. Suess also discussed the importance of dislocations and most importantly of

regressions and transgressions, which shaped the face of the Earth. Volume two is the synthesis of observations of the Pacific and Atlantic Oceans, followed by descriptions and analysis of Palaeozoic, Mesozoic, and Tertiary Seas. The third volume is dedicated to Eurasia and Northern Europe. In writing of this volume, an important contribution was made by Russian geologists, particularly by V. A. Obruchev, who was the main correspondent and support in unravelling the geology of northern Siberia and eastern Asia.

The main questions discussed by Obruchev and Suess were the formation of the Asia and Lake Baikal. The area around Lake Baikal was referred to as *The Amphitheatre of Irkutsk* (German: *Das Amphitheater von Irkutsk*). It is however unclear, which area exactly the *amphitheatre* covers. Based on the map from Volume III/1 (left image in Fig. 7), the area comprises regions east and south of Lake Baikal, followed by regions around Yenissei and Angara rivers in the North (shaded areas on the left image in Fig. 7). However, based on the overview map of the Vertex of Eurasia from Volume III/2 the *amphitheatre* covers only areas west / northwest of Lake Baikal.



The idea of geological evolution model of *The Ancient Vertex* (German: *Der alte Scheitel*) was firstly introduced by Czerski. Suess and Obruchev

would continue to develop and complement the idea of an *ancient vertex*. For Obruchev, it remained as one of the main scientific research

topics. The Ancient Vertex of Eurasia comprises large areas south of Lake Baikal, Gobi Desert, Turpan Depression (Fig. 8), Tian-Shan, and Nan-Shan Mountain systems. All of those regions were studied by V. A. Obruchev and other Russian geologists and geographers. The *vertex*, based on

Suess, forms the primary Precambrian basement of Eurasia, around which mountain folds gradually were formed and therefore the entire continent expanded. Since the Cambrian period it has undergone extensive fracturing through *disjunctive dislocations*³³.

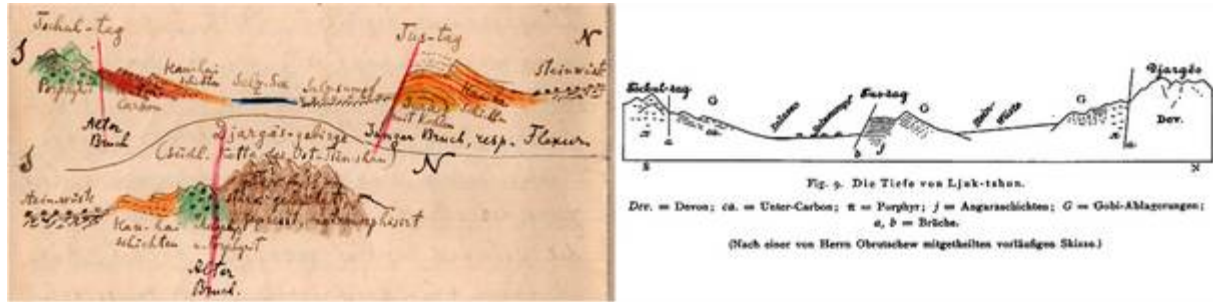


Fig. 8: Geological profile of the Turpan Depression, eastern Tian-Shan. Left image: original profile by Obruchev (Letter 6). Right image: Obruchev's profile published in "Das Antlitz der Erde", volume III/1, p. 214.

As acknowledged by Suess himself in the "The Face of the Earth" Obruchev has contributed significantly to the writing and editing of the volume III/1:

« Hier habe ich mit herzlichem Danke zu erwähnen, dass Hr. Obrutschew mich nicht nur durch viele briefliche Mittheilungen erfreut, sondern mich auch bei der Ausarbeitung der nachfolgenden Seiten bei längeren und wiederholten Besuchen mit seinem persönlichen Rathe so sehr unterstützt hat, dass Alles was hier über den Bau Sabaikalien's gesagt werden soll, so weit es überhaupt Lehrreiches enthalten mag, diesen Mittheilungen und Rathschlägen zuzuschreiben ist. »

« Here I must sincerely thank Mr. Obruchev, not only for numerous letters but also for providing me with invaluable personal advice during his prolonged and repeated visits while working on the following pages. Everything that is to be said here about the structure of Transbaikalia, as far as it may contain any informative content, is to be acknowledged to these correspondence and recommendations. » – Eduard Suess in „Das Antlitz der Erde“, Volume III/1, p. 60.

Conclusion and final remarks

The correspondence between V. A. Obruchev and E. Suess lasted for 23 years (1891–1914). Obruchev's letters from the Geological Archive in Vienna, give us extensive insights in their scientific exchange. They exchanged with each other literature, reports, collected data, maps, sketches, geological profiles, photographs, and even samples in form of rocks and fossils. Their correspondence facilitated development of new ideas and discussions, enabling them to analyse the same data from different perspectives. Moreover, it resulted in a joint publication and complemented their own works and publications.

For the young Obruchev, Suess was a mentor, professor and possibly even the "window to Europe"³⁴. For the much elder and well-established Suess, Obruchev was a guide into vast and unexplored territories of Siberia and Asia. Moreover, Obruchev would help Suess to navigate through tremendous amount of Russian literature

³³ As noted by Şengör, 2015, *disjunctive dislocations* represent faults. Suess interpreted them as normal faults, however, those are now known to be thrust faults.

³⁴ "Window to Europe" is a metaphor used for the city of Saint Petersburg, highlighting its unique position and access to the Baltic Sea. We used this term for Eduard Suess, as we think acquaintance with Suess, helped Obruchev to build his scientific career and reputation beyond the Russian Empire and USSR.

and keep him always up to date. Obruchev and Suess have also mediated new contacts to each other, such as Lajos Loczy to Obruchev and Dmitri A. Klementz to Suess.

In light of extensive scientific exchange between the two geologists, we can also see how their personal relationship developed over the time. In the first years (1891–1898) of their correspondence, Obruchev wrote to Suess in a very formal way and the content of the letters was mostly geological data and descriptions. In the following years (1898–1901), Obruchev met Suess in person. From this point of time, he shared his vacation plans and greeted Suess's family in his letters. In the last years of their correspondence (1913–1914), Obruchev addressed Suess as “*Hochgeehrter Meister und Freund*” and “*Hochverehrter und lieber Freund*”, which can be trans-

lated as “*Highly esteemed Master and Friend*” and “*Highly esteemed and dearest Friend*”. During this period, Obruchev, together with geological data, shared personal problems and struggles with Suess. Obruchev contributed considerable amount of data and knowledge to Suess's opus magnum “*The Face of the Earth*”, particularly to the chapters regarding the geology of Siberia and Asia. Interestingly, although “*The Face of the Earth*” gained considerable popularity in Europe, it has never been published in Russia or in the Russian language. Was Suess's work truly groundbreaking, despite of its major flaws, as noted by Şengör in 2015? Perhaps not, but it's unprecedented contribution to the foundation of modern geology is undoubtful, especially in terms of emphasizing the importance of scientific exchange and collaboration.

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