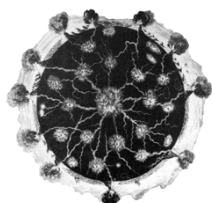


**THEODOR POSEWITZ AND HIS *BORNEO* (1889) –  
THE FIRST GEOLOGICAL MONOGRAPH OF THE ISLAND**

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**ABSTRACT**



*Earth Sciences History*  
Vol. 42, No. 2, 2023  
p. 460–475

Theodor Posewitz (1850–1917), a Hungarian medical doctor and geologist, spent five years in the Dutch East Indies between 1880 and 1885, serving the colonial Dutch army. He spent time on Java, Borneo, Bangka and Billiton islands. He dedicated his spare time to geological exploration. About eighty of his geological studies appeared in geological and geographical journals. His chief work, the first monograph on the geology of Borneo, including geological and mineral resources maps, was published in German in 1889 and in English in 1892. Early years of his studies and the results of his five-year stay in Asia are discussed, based on archival records. The background for the book, *Borneo*, and its significance for contemporary and modern science is outlined.

**Keywords:** History of geology, Indonesia, Malaysia, 19<sup>th</sup> century, geological mapping  
doi: 10.17704/1944-6187-42.2.460

**1. INTRODUCTION**

Hungary has never been a colonizing country, rather, it has been a colony itself. Being an independent, middle-sized power of Europe for five centuries in the Middle Ages, much or all of it was colonized by various empires during the subsequent 500 years. First Ottoman Turkey held two thirds of the country (1541–1699), then Habsburg Austria ruled all of Hungary (1699–1867), followed by autonomy within the Austrian-Hungarian Monarchy (1867–1918). After brief independence from 1918 to 1944, Hungary was occupied first by Nazi Germany, followed by the Soviet Union a year later, its army to stay until 1991 (Kontler 2002). Being subjugated politically, economically and financially, there were few sources remaining to conquer foreign lands, and no finances were dedicated to discover faraway corners of the world. However, personal curiosity and a sense for adventure called various individuals to leave the homeland and use any available means to reach faraway and exotic destinations, their number filling the pages of a dedicated lexicon (Balázs 1993).

Medicine and science have been intimately intertwined throughout the centuries. Medical doctors often received professional education in botany, zoology and mineralogy. Contributions made by medical practitioners to geology was the topic of a recent edited volume (Duffin *et al.* 2013). In the following paper, the achievements of a unique scientific personality from Hungary are described to illustrate the ways a curious person, dedicated to geology, chose to achieve his ambitions. Theodor Posewitz (1851–1917) was a medical doctor who is remembered for his geological monograph *Borneo*, partly based on personal experience gained during his five-year sojourn in the Dutch East Indies. As so often happens, while he is well remembered in the international arena of science, the homeland is woefully ignorant about his value and worth.

**2. SOURCES**

The life of Posewitz is succinctly outlined in a one-and-a-half page obituary by his brother-in-law, Károly Papp, then secretary-general of the Hungarian Geological Society (Papp 1918). His intimate knowledge of Posewitz—the latter married Papp's older sister—helped him to add a

personal touch to the intentions and aims of Posewitz, which would not otherwise have been recorded. However, in his haste to compile the obituary for inclusion in an annual report for the society, caused Papp to make errors and omissions, which have persisted in successive publications.

The sources used here are primarily the printed publications, which—more often than not—included strictly scientific content only. Posewitz was a prolific writer, sending publishable writings both to scientific journals and to popular magazines in Europe during his stay, especially from Borneo and Bangka. These, published in Hungary, Austria, Germany, and the Netherlands (Kázmér 2022a), are valuable and authentic records of his research and ideas regarding geological processes. Archives of the Hungarian Mining and Geological Survey hold a boxload of his manuscripts and diplomas of his degrees, as well as manuscript material from his relatives, all of which were put at my disposal.

### 3. EARLY LIFE

Theodor Posewitz (in Hungarian texts he used as his name Posewitz Tivadar), was born on 2 December 1851 in Igló, Hungary. The German name for this town is *Zipser Neudorf*, and in Slovakian it is referred to as *Spišská Nová Ves*. The town is today in Slovakia. He was born to a German-speaking, Saxonian family. This population of ‘Zipser Germans’ immigrated to Hungary in the Middle Ages, and received special rights and autonomy from successive rulers of Hungary. The father, Samuel Posewitz (1800–1871) was a medical doctor. His marriage with Emeline Karafiáth (1815–1896) in 1843 yielded six children: two daughters, Bertha (1844), Ottilia (1855) and four sons. (The manuscript family history by Korompay (1997b, p. 10) mentions seven children, but the family tree (also by Korompay 1977a) shows only six.) The eldest son, Julius Alfred (1847), studied at a mining academy (probably Schemnitz in Hungary), and completed his career by becoming director of the Posewitz family-owned iron smelting company. The next son, Emil Arthur (1849), was a pharmacist at Igló. Theodor (1850), the subject of this paper, studied both medicine and geology, served in Java, Borneo and Bangka as a military doctor, and then worked as a geologist in the Geological Institute of Budapest for twenty-nine years. The youngest son, Kornel (1852), was a director of the Kőbánya Soap Factory near Budapest (Korompay 1997b).

Theodor graduated from the Lutheran high school in Igló in 1868. His interest in natural history was initiated by his close familiarity with the nearby Hohe Tatra Mountains, where he went frequently to hike. His father owned a then-fashionable hydro-medicinal institution there. He came to the conclusion that his desire to explore unknown lands—lacking appropriate funds—could be accomplished by becoming a medical doctor and working there (Papp 1918, p. 33). He followed this course of action by studying both medicine and geology, one after the other. Fortunately, medical studies at that time included the basics of natural sciences. He spent the 1868–1869 academic year in Budapest, studying various science subjects in preparation for medicine: mineralogy, chemistry, anatomy, zoology, botany. He then moved to the University of Vienna to engage in similar subjects, accompanied by physiology and pharmacognosy. In October 1872, as a student in his ninth semester, he completed within ten days his three basic medical exams on botany, zoology and mineralogy. In the meantime, he was already enrolled as a student at Leipzig, fulfilling his duties towards clinical practice between April and August 1872. This detour was followed by another stay in Vienna during the 1872–1873 academic year. Surprisingly, a doctoral degree in chirurgy and obstetrics was conferred on him on 21 June 1873 in Würzburg, Germany. His application (written in flawless Hungarian) to register (nationalize) his German degree in Budapest was rejected. (It is usual in medicine and other corporate professions to protect their market from foreigners. However, Posewitz was a citizen of Hungary.) He did take the final exam again one year later, and became a full-fledged doctor of medicine on 28 March 1874.

After successfully completing his medical education in six years—medicine would be his bread-and-butter occupation while abroad—we see Posewitz return to his passion. A month after

the title of medical doctor was conferred on him, we see him registered at the *Bergakademie* in Freiberg, in Saxony, Germany, at the world's top-ranked mining academy. (One must note that there was also an active mining academy in Schemnitz, Hungary, a mere 120 km from his hometown). He studied in Freiberg for three academic years from 1874 until 1877. His basic knowledge of mineralogy gained in Budapest six years earlier served as a solid foundation for his studies on various subjects in geology and mining. We don't have record of whether or not he completed his studies at Freiberg by diploma or a doctoral degree.

Studies completed in two distinct fields, seemingly very far apart, did not earn him a paid position. Posewitz thus spent three years as volunteer geologist in Vienna. From 4 May 1876 (during his last academic year in Freiberg!) to 3 July 1879, he was an unpaid researcher in the Imperial Geological Institute (whether part or full time, we don't know), as documented by a certificate signed by Franz Hauer (1822–1899), director of the Imperial Geological Institute. (It is the *Geologische Reichsanstalt* of Austria, funded by the Austrian emperor, as opposed to the Royal Geological Institute in Budapest, Hungary, funded by the Hungarian king, who happened to be the same person: Franz Joseph II.) As to what he did in Vienna during those years, we cannot tell at the moment. Most probably he undertook microscopical analyses of rocks, the same activity he volunteered for in Budapest after his return from service in Asia.

Posewitz always made sure to keep close ties with his homeland. He did field work around Igló, describing a Pleistocene lake there. The talk he delivered to the Hungarian Geological Society on 9 January 1878 in Budapest was published the same year (Posewitz 1878a). Five months later he talked about 'greenstone', the host rock of the cobalt and nickel ores in Dobsina, another location close to Igló (Posewitz 1878). A further petrographical work was published on sites in the Banat, 400 km to the south in Hungary (Posewitz 1879). Microscope studies were carried out under the auspices of the Hungarian Geological Institute, where he was volunteer from October 1877 until June 1879, partly overlapping with his volunteer time in Vienna. Chief geologist of the Institute, Károly Hoffmann, certified his diligence there with the following words:

Mr. Posewitz(!), in his free time remaining besides his professional activities, worked in our institute, being active with microscopical petrographical examinations with great diligence and good results, witnessed by his publications during this time. Dr. Posewitz(!) proved to be excellent geologist, offering the greatest hopes for the future. (13 June 1879, Károly Hoffmann, chief geologist) (Archives MBFSz, Posewitz papers).

During these eleven years (1868 to 1879) he was financially independent. His father, a medical doctor, was health officer of the sixteen autonomous Zips towns, and established a hydropathic sanatorium of the Priessnitz method in the Tatra Mountains. Later he dedicated himself to his ironworks at Bauschendorf, having successful trade relations locally and abroad (Chalupecký 1981). His allowance and the inheritance he received after the death of the father in 1871, allowed young Theodor to pursue his passion for geology and travel. His itinerant lifestyle—manifested already during his studies for two degrees in two very different fields at five universities in four countries, plus professional volunteer work in two countries—needed family backing. Studying medicine simultaneously in Vienna and Leipzig (with a side trip for an M.D. to Würzburg), while studying geology in Freiberg and volunteering in Vienna, and being attached at the same time to geological institutes in Vienna and Budapest, certainly generated expenses which he must have covered from his private means.

Before he left for Asia, he joined the family company as a silent partner with a 4500 forint share, worth more than two years income of a university professor at that time (*Központi Értesítő* 1881, p. 204). These are all elements of a restless, but hard-working character. He was ready to study medicine for five years to accomplish his aim to make discoveries in faraway lands, to live there and describe them for the benefit of mankind. His writing for publication started immediately after his arrival in Batavia. Paid by the Dutch colonial government for a five-year term as a medical doctor of the colonial army allowed him to live and work in the East Indies, to visit regions which would be otherwise inaccessible to him, even with his substantial means. This

opportunity—also available to other Hungarians, who spent time in engineering or medicine in the East Indies—allowed him to pursue his passion: geology.

#### 4. IN THE DUTCH EAST INDIES, 1879-1885

When he had gained all the qualifications needed to fulfil his ambitions, Posewitz patiently waited for a good opportunity to arrive. Finally, he took a position with the KNIL (*Koninklijk Nederlands Indisch Leger*), the Royal Dutch East Indies Army, as a military doctor (Korompay 1997b, p. 10). A very basic, German-language diary among the Posewitz papers in the archive in Budapest gives us the details of his journey from Europe to Asia. The steamer *Prinses Marie* left from Amsterdam on 27 September 1879. The boat called at ports in Southampton, Gibraltar, Naples, and Port Said, passed the Suez Canal, and crossed the equator on 3 November, to arrive in Batavia (modern Jakarta), the capital of the Dutch East Indies (Figure 1), on 6 November 1879. This was a 40-day trip, the usual sailing duration for passenger boats of the day.

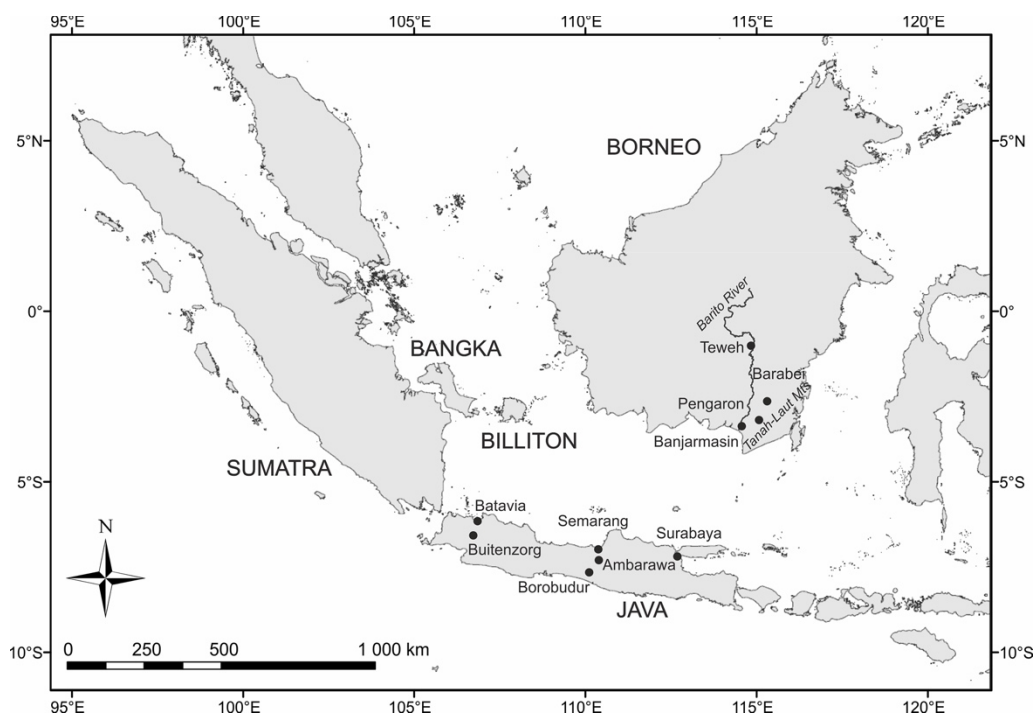
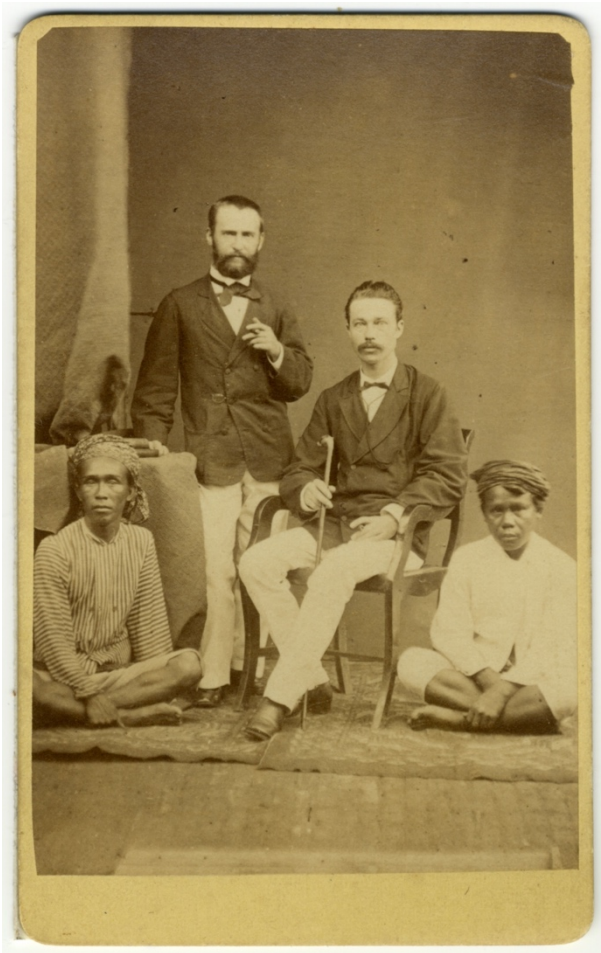


Figure 1: Western part of the Dutch East Indies. Places visited by Posewitz are marked.

Further discontinuous records in the diary allow us to decipher the name of the city of Semarang, where he arrived on 17 November 1879. During his almost one year in Java, Posewitz worked at the KNIL army hospital at Fort Willem I in Ambarawa (Figure 2), and visited various places in Java. He went to Buitenzorg (today Bogor), to visit the geological museum there. He recorded his name in the visitors' book right under the names of the geologist Louis Lóczy and Count Béla Széchenyi, two notable Hungarians, who were there a few weeks before him during a three-week stopover on their way to China. Lóczy also visited Ambarawa, corroborating Posewitz's opinion on the origin of the plains there, that it is not a crater floor (Lóczy 1881). Lóczy, his sponsor Széchenyi and two other people, were on their way towards a three-year-long research trip in China. Furthermore, Semarang, Surabaya, Sumbawa, Ambarawa and Borobudur were some of the destinations Posewitz visited in Java (Figure 1). 'Between rice paddies', 'A wedding in Java', 'The Indian life', 'Excursion to the burial temples in Buddhagam', 'An East Indian military....', 'On an Indian .... Railway', and '.... Illnesses' are some of the titles of what

## THE FIRST GEOLOGICAL MONOGRAPH OF BORNEO

look like chapters of an unfinished travelogue. These letters or rather, chapters for a planned book, written in his hard-to-read German handwriting are dated between 18 February and 23 July 1880, while he was under the strongest impressions of the new lands where he worked (MBFSz Archives, Posewitz papers). Right after his arrival in the East Indies, he sent correspondence to European journals. He had some problems finding the proper outlets for publication. While geographical and geological periodicals (*Das Ausland*, *Petermann's Geographische Mitteilungen*) welcomed his reports over many years, others were not necessarily welcoming. A rejection letter, written on 3 January 1880 by the editor of *Allgemeine Zeitung*, the leading daily newspaper in Germany, less than two months after his arrival in Batavia, accompanied a returned manuscript (MBFSz Archives, Posewitz papers).



*Figure 2: Theodor Posewitz (left, standing) in Ambarawa, Java, soon after his arrival, circa 1879–1880. Note that the arrangement of persons shows Posewitz—standing and of short stature—in a dominant position. The person sitting in the center—probably of higher social status—is unknown, as are two Javanese assistants who are seated cross-legged on the floor (Szakács 1989). Photo: C. Dietrich. Courtesy of Historical Photography Archive, Hungarian National Museum, Budapest. Photo nr. 72.161.*

There are no detailed accounts about his time of residence in the East Indies, but local newspaper announcements of government transfers and ships passengers listings accurately recorded Posewitz' main moves during his five years there ([www.delpher.nl](http://www.delpher.nl)). In September 1880, after almost one year in Central Java, newspapers announced the transfer of Dr. Posewitz to the Military Health Service of the South and East Borneo district, now as 'Health Officer 2<sup>nd</sup> class'. Here he replaced the well-known German Dr. H. Breitenstein, who later wrote some interesting memoirs of his 20 years as Army Health Officer in the Netherlands Indies (1899, 1900).

Initially, Posewitz was probably based in the regional capital, Banjarmasin (Figure 1), in the swamp region of the Barito River delta, but he soon moved upstream towards the central part

of Borneo, where he was assigned to KNIL military outposts at Boentok and Muara Teweh. In Teweh he married a local (Chinese?) lady, who gave birth to Posewitz' son, Theodor Hendrik (Tivadar Henrik), in 1882. Teweh, in central Borneo, is more than 300 km upstream from Banjarmasin (Figure 1), and was the administrative, trading, and military centre of the uplands of Central Borneo. Posewitz was still stationed in Teweh in May 1883, after his transfer to Bangka had been announced in local newspapers in April 1883.

His supposed visit to Flores Island among the Lesser Sunda Islands far to the east is a misunderstanding, coming from his report on a Dutch expedition there (Posewitz 1891b). Nor did a planned trip to Sumatra materialize.

Dr. Posewitz' final assignment in the Netherlands Indies was with the Military Health Service of Bangka Island, from around June 1883 through October 1884. He was stationed in the town of Pankal Pinang for most of his time there. In October 1884, local newspapers announced the transfer of Dr. Posewitz to the Military Hospital in Weltevreden (now part of Jakarta, Java), and he arrived in Batavia by ship from Muntok via Palembang on 1 November 1884. By this time, however, Posewitz had completed his five-year contract, and elected not to extend it. On 6 November 1884 he was therefore 'honorably discharged from Her Majesty's Military Service' (Bataviaasch Nieuwsblad, 6 November 1884).

Posewitz apparently did not immediately return to Europe. By 1 February 1885 he wrote two papers on Bangka geology (Posewitz 1886a, b). He departed Batavia three months after his discharge, on 11 February 1885 on the mailboat steamer *Sumatra*, with the destination of Marseille and Amsterdam. One newspaper clipping from 19 March 1885 suggested that Posewitz and his colleague, Army medical officer B. C. Stort, were on the *S.S. Sumatra*, but had disembarked at Suez, prior to its arrival in Marseille on 14 March 1885. This suggests some possible travel in Egypt, before returning home. Posewitz reportedly returned to Hungary by the summer of 1885.

Interestingly, all the ship passenger listings of Posewitz' return voyage to Europe, as well as his transfer travels by ship to and from Bangka in 1883 and 1884, suggest that he was traveling solo, *i.e.*, without his son. One potentially relevant newspaper announcement from 10 May 1886, listed "passengers arrived in Marseille with *S.S. Ava* from Batavia", which included a certain 'Posewitz en bed.', (presumably short for 'Posewitz en bediende', and meaning 'Posewitz and servant'). This is more than one year after Dr. T. Posewitz himself traveled home. Is this perhaps Posewitz' young son Theodor Henrik, now 4 or 5 years old, and traveling to Europe with a chaperone?

Posewitz maintained his close connections with Hungary throughout his stay in the East Indies. He maintained his membership in the Hungarian Geological Society, which he had joined in 1877. Posewitz sent maps to the library of the Hungarian Geographical Society, possibly during his Dutch service, and certainly afterward.

Posewitz considered his tour to Asia—as he planned—to be a form of exploration, to satisfy his personal curiosity and sense of adventure. He did not follow the example of other Hungarians, *e.g.*, the medical doctor Julius Mácsik, who spent 9 to 10 years there gathering respect and a fortune, or Eugen Hegedüs, topographic engineer of the East Indies government for 16 years (as reported in 1885).<sup>1</sup>

## 5. RETURN TO EUROPE

Upon his return from Asia, no secure job awaited him. As a consequence, Posewitz likely completed his medical qualifications by taking exams and getting diplomas. He obtained a magister degree in obstetrics in Budapest on 5 October 1885, and a doctor's diploma of chirurgy (surgery) in Cluj on 28 November 1885. Whether he continued practising as a doctor in Hungary, we don't know. Probably he made efforts to work as a geologist instead. An official letter, dated 30 December 1886, one-and-a half years after his return from Asia and signed by Johann Böckh,

<sup>1</sup> Magyarok Kelet-Indiában. [Hungarians in the East Indies.] *Politikai Újdonságok* 31(46), p. 638.

director of the Hungarian Geological Institute, was addressed to Tivadar Posewitz, private geologist, announcing his appointment to the position of assistant geologist (MBFSz Archives, Posewitz papers). He spent the next twenty-nine years working for the Institute in Budapest.

Posewitz remained well remembered in the Dutch East Indies, probably maintaining correspondence with friends and colleagues there. He was elected foreign member of the *Koninklijk Instituut voor Taal-land en Volkenkunde in Nederlandsch-Indie* in The Hague,<sup>2</sup> certainly to honour the publication of his *Borneo* monograph in 1889 (and English translation in 1892). Listed between two giants of contemporary learning, Ignaz Goldziher, a Hungarian philologist and leading authority of Islamic studies, and Ferdinand von Richthofen, a German traveller and geographer, who coined the term ‘Seidenstrasse’ (Silk Road), Posewitz was obviously held in high esteem in learned circles.

Posewitz continued to bring forward his East Indies experience both to professional and public audiences. During a lecture presented to the Hungarian Geographical Society on 27 March 1890, he talked about the European lifestyle in the Dutch East Indies, and introduced the audience to the public administration there, which made possible the governance of 26 million people by a mere 50,000 thousand Europeans. He denied claims about the horrible climate of the Indies, which—he said—is quite bearable if certain precautions are followed. This is a particularly interesting remark, as the climate of tropical colonies was usually considered unfavourable, even often deadly to the European settlers. This opinion prevailed among British and French doctors. However, Dutch medical theory—developed in their East Indies colony—stated that prudent behaviour and morality improved acclimatization (Pols 2011). Posewitz—upon acquainting himself with the local medical community—accepted their opinion. This likely led to the lack of any remark on lazy or otherwise reproachable behaviour of natives; despite being a European he took instead the approach of the locals, coping with the hot but not unbearable climate and mosquitoes with their methods.<sup>3</sup>

## 6. FAMILY

Theodor Posewitz married three times. His first wife was Mina Sinai, a native of Borneo, as reported by Papp (1918) in the short biography. However, these words mean ‘Chinese concubine’ in Melayu. Unfortunately, we are not aware of her real name. She was maintained in high respect by Posewitz, and after she died at an early age (she lived from 1860 to 1883), their son, Theodor Ernest Hendrik, born in 1881 in Teweh was duly raised as a member of the Posewitz family in Hungary (Figure 3). The second wife was Adéle Papp (1867–1903), sister of the Hungarian geologist Károly Papp, who wrote the obituary in his capacity as Secretary of the Hungarian Geological Society (Papp 1918). Daughter Melitta was born to them in 1896. Upon Adéle’s death he married Margit Schulek (1874–1945) by whom sons Elek (1905) and Guido Arthur (1908) were born. Elek died at the age of eight. Guido (1908–1981) followed in his father’s footsteps and studied geology and civil engineering, ultimately working in official positions. After the communist takeover in Hungary Guido emigrated to South America, and worked on dam construction in Venezuela and Mexico (Korompay 1997b).

In the Netherlands Indies, marrying a local woman was supported by government policy for the rank-and-file, while having a concubine was preferred for foot soldiers (Ming 1983). Taking temporary wives was an ancient habit in Southeast Asia among foreign merchants, well before the arrival of Europeans (Andaya 1998). If children were born from these relationships, they were generally left behind—mostly without any financial help—by the soldiers upon return to Europe. We are not aware of the customs in the case of higher officials. Posewitz brought his son home to Hungary from the East Indies, although perhaps not until 1886, one year after Posewitz returned to Hungary, and when the boy was around four years old. Theodor junior

<sup>2</sup> Személyi hírek. [Personal notices.] *Nemzet* 1890, p. 199.

<sup>3</sup> A földrajzi társaság. [The Geographical Society.] *Vasárnapi Újság* 37(13), p. 212.

attended schools in Hungary, and worked for a railway company in various managerial positions, and passed away in Budapest in 1944.



*Figure 3: Photo of a reunion of the Posewitz family in the late 1880s. Standing, left: Theodor Posewitz, resting his hands on the shoulders of son Theodor Hendrik, born from his Chinese partner in Borneo. Clearly, the young man is treated as a full member of the family. Sitting in the center is Theodor's mother, Emeline Posewitz, née Karafiath. Taken in 1893. Photo in the collection of the Hungarian National Museum. Photo nr, 72.158.*

## 7. WORK IN THE DUTCH EAST INDIES

We have no primary information on Posewitz's work as Army Health Officer, for which he was employed in the East Indies, beyond occasional remarks in brief newspaper articles and obituaries. These certainly go back to original, written or oral communication of Posewitz to friends, colleagues and journalists. A short listing of places where he lived in Borneo in 1880–1883 is given in the foreword of the *Borneo* volume: almost three years on the island, including some time (his words) in the southern marshlands of Banjermasin, further some months in the dry alluvial plans near the central mountain chains in Barabei. During most of this period, he lived in the Army fort at Muara Teweh, in the hilly region of Tertiary rocks along the enormous Barito River in the heart of Borneo, only 4 km from the equator.

One cannot avoid noting that even in listing the places of his habitation, he followed the system of geological subdivision of Borneo. Before leaving the island in mid-1883, he had a chance to visit the workings of the Pengaron coal mines and to take an excursion to the Tanah-Laut chain in the southeast, where the geological structure of Borneo could be experienced in miniature (Posewitz 1884c). His personal observations were put in context while working in the library of the *Genootschap van Kunsten en Wetenschappen* in Batavia. Here he could study the older, hard-to-find Dutch literature, while he informed himself with newer publications upon his return to Europe (Posewitz 1889a, p. V).



## THE FIRST GEOLOGICAL MONOGRAPH OF BORNEO

The dedication of the *Borneo* monograph indicates that the highest scientific authorities were aware of his activities, and probably supported him in some way (Figure 4). The book starts with a dedication to P. van Dijk, head of the Bureau of Mines in Batavia, “an eager supporter of scientific efforts, with thankful memories for the years lived in the Dutch Indies”.

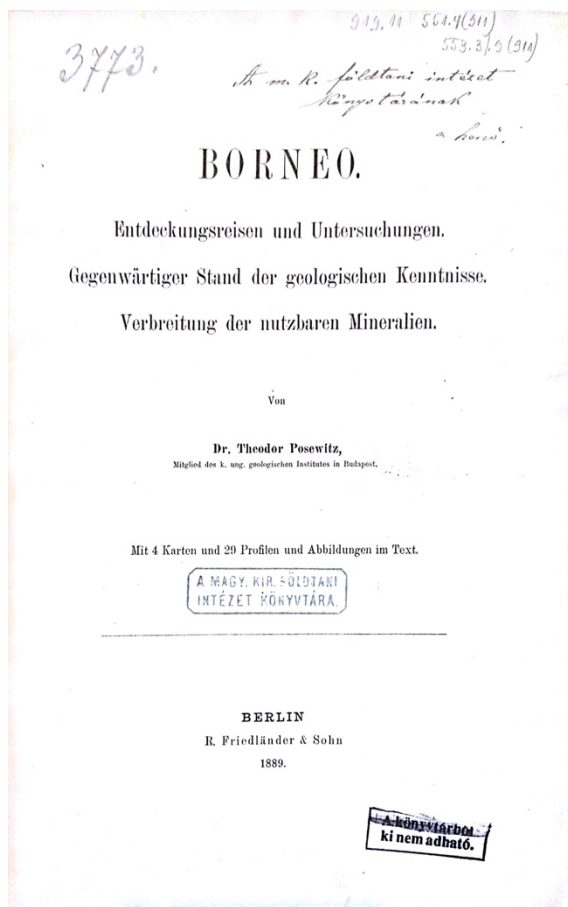


Figure 4: Title page of the German edition of the Borneo monograph (Posewitz, 1889a).

### 7.1. The Borneo geological monograph and map

Posewitz—as a professional medical doctor of the Royal Netherlands East Indies Army (*Koninklijk Nederlands Indisch Leger*, widely known as KNIL)—presumably had limited time for non-medical activities. But, to satisfy his enthusiastic interest for geology and to support his prolific writing with first-hand information, he both travelled extensively and used every chance to read scientific publications.

The main work resulting from his Indies stay is the *Borneo* monograph. Subtitled *Discovery Voyages and Investigations. State of the Art of Geological Knowledge* (published in German in 1889) (Figure 4), it was an “exhaustive study of the literature of the subject, much of the best information being in Dutch and but little known outside Holland” (Anonymous 1892). The list of references extends to 12 pages, listing 259 items, 158 published in Dutch, 51 in German, 50 in English, and the few remaining in French, Italian, and Hungarian. Certainly he learned Dutch either before or during his stay. Also, in order to function in his position as a doctor/physician in the Dutch- and Malay-speaking colony, Posewitz must have mastered both languages fairly rapidly. His brother-in-law, Károly Papp stated that “his language skills deserved

the appreciation of his peers”. Additionally, there is one table and fourteen figures in the text, as well as four additional foldout maps (e.g., Figure 5) enriching the content.

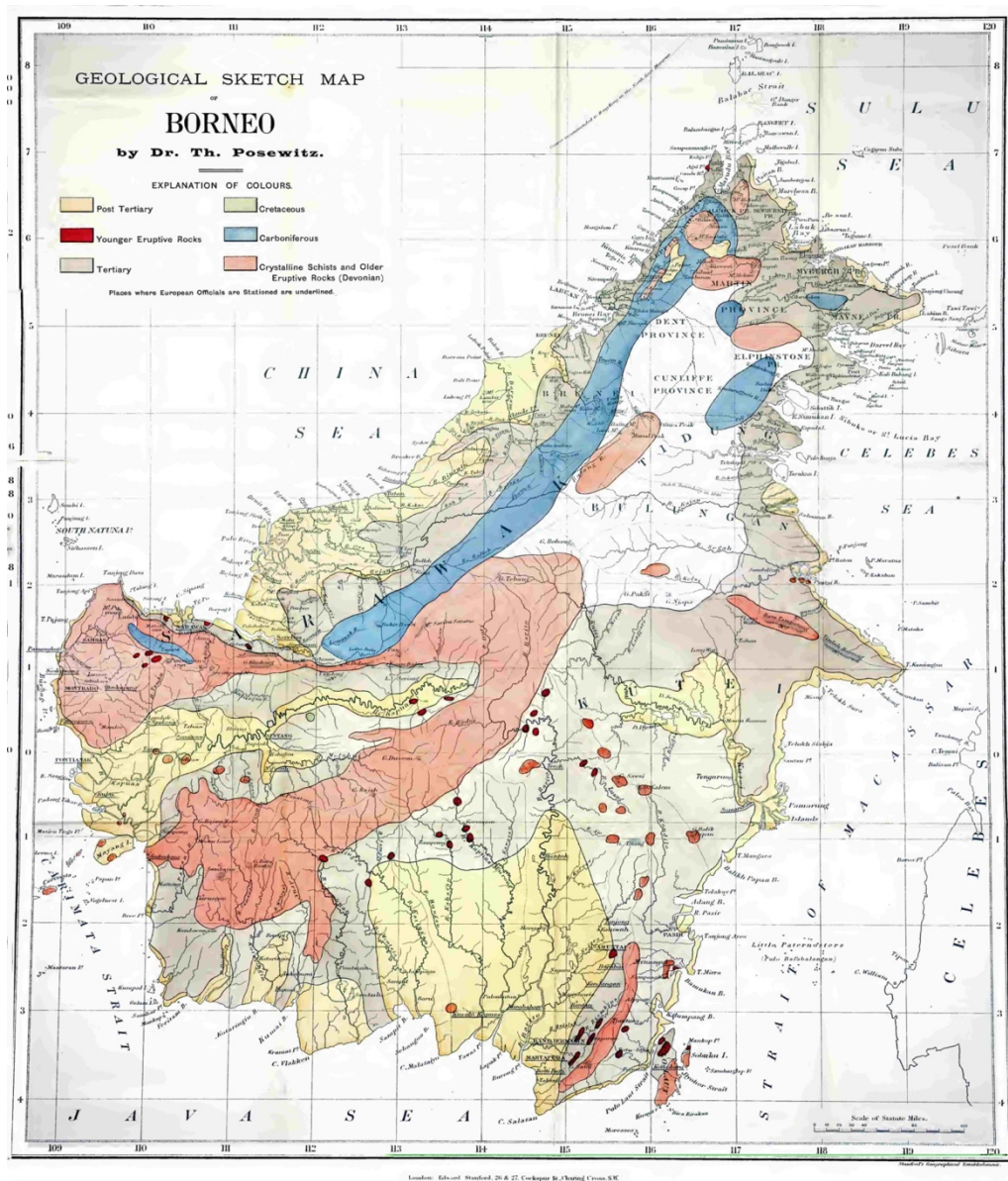


Figure 5: Geological map of Borneo from the second edition of the Borneo monograph, published in English (Posewitz 1892; Wannier 2017).

At the beginning of the ‘Borneo’ volume of 1892, there is a detailed history of exploration and studies, starting with the times of the Dutch East Indies Trading Company (VOC), through the adventures of various gentleman travellers, treasure hunters, mining engineers and soldiers of fortune, describing their geographical exploration and always emphasizing any geological observation they made, e.g., on coal and oil occurrences.

Then follows a chapter on geology, starting with physical geography including physiography of the mountain chains (because these tended to hold the mineral resources), hydrography of rivers (as these provided practically the only long-distance transportation routes),

and ports and embayments (for transfer between water and land). Geology is subdivided on the basis of relief. There were 27 pages on the mountainous region, of which really very little was known at that time. The Tertiary hilly country got the most detailed treatment. A rough stratigraphy was treated separately for each physiographic region, noting similarities which provided means for correlation, volcanic rocks and a brief record of useful minerals. Having forty pages this is a chapter with substantial information. The diluvial (Pleistocene) flatlands—although the largest in area—were treated in nine pages. Alluvial marshlands, hard to study at that time in any meaningful way, resulted in a mere five pages. The geological chapter was completed by mentioning recent coral reefs. The author mentioned reports on potential volcanic eruptions, and the very few earthquakes. Alteration of rocks by weathering into laterite and high-temperature contact metamorphism were given two pages each. Uplift and subsidence of Borneo—very difficult to determine even by modern methods—had a separate, short chapter. It was deemed worthwhile to mention changes in coastal relief within a human lifetime, such as uplifted and subsided islands, and those which simply disappeared without a trace due to erosion. Posewitz was also interested in caves, so he dedicated a short chapter to karst exploration. No modern treatment would include additional major items beyond these.

The longest major chapter was on useful minerals in both Dutch and British Borneo, and it was 150 pages in length. The description of coal occurrences included tables on their technical worth and chemical composition. There were fifty-three pages of description of gold occurrences containing extensive discussion on pre-European Chinese gold mining. These were followed by descriptions of diamonds (23 pages!), platinum, ores of antimony, mercury, iron, copper, silver, lead and zinc, tin, salt, arsenic, cobalt, nickel, corundum, molybdenum, manganese, alunite, salpetre, petroleum (only 2 pages at that time), and—unusually, but in a very modern aspect—hot springs. The book concluded with a 26-page chapter on mining ventures in Borneo, discussed in temporal order of the establishment of European-owned mines, and a short chapter on native coal mining. There were four foldout maps at the end of the volume: one on the route of major travellers, including those by Posewitz, one topographical map, one on geology (Figure 5) and one on mineral resources.

Assessing Posewitz's original contribution to the geology of Borneo would need detailed knowledge of the contemporary literature. Certainly he personally studied and surveyed profiles of coal-measures, both on the surface and underground in mine adits, and he collected samples for biostratigraphic dating. Additional original contributions were, for example, from fellow scientists, who examined the rock samples that Posewitz gathered. Maximilian Hantken (Anonymous 1959) (1821–1893), a world-renowned micropalaeontologist, founder of the science of stratigraphic micropalaeontology, former director of the Hungarian Geological Institute, and at that time professor of palaeontology at the University of Budapest, determined a Late Eocene age for the limestone from Batu Bangka from thin sections, and associated microfossils washed from the marl there (Posewitz 1889a, pp. 383–384 in the German edition).

Posewitz's book was not written in high literary style. Rather, it was a seemingly dry, objective text, containing data arranged in tabular form which abounded in numbers. There were lists of territorial units, comparative stratigraphic tables of various authors, several-pages-long lists of mountain elevations, chemical analyses of rocks, fossil lists, systematic visual descriptions of outcropping rocks and minewall successions, coal reserve calculations, production volumes, and cost calculations. A plan of the small Pengaron coal mine, at that time the largest in Borneo, was a technical rather than a geological illustration, reflecting his education for a few years at the Freiberg Mining Academy.

There are very few items in the Borneo monograph which did not relate directly to geology or mining. The reviewer of *Borneo* in *Földrajzi Közlemények* (Bulletin of the Hungarian Geographical Society), justly complained that while briefly discussing topography and administration, Posewitz omitted any mention of flora, fauna and climate, while “the names of those highly interesting dayak tribes are also barely mentioned” (Gy. A. 1889).

Posewitz's view was concentrated on those factors which he was familiar with by education and personal interests. Possibly the only remark outside geology and economic

minerals was a detailed description of Chinese mining tools and equipment. Here drawings and descriptions were given of the complex water management system built and maintained by the Chinese, serving their gold mining operations. He even illustrated the stone tools used there, having been in use since the Stone Age.

The Borneo monograph, although the most voluminous, was not the only achievement of his geological activity in the Dutch East Indies. He also published geological review papers on various other economically important locations, including a geological map of Bangka, the main island of tin mining, and on various mineral resources of the region (for a detailed bibliography see Kázmér 2022a).

### 7. 2. *Impressions of the East Indies*

Writings by Posewitz of his travels in Java, where he certainly observed many native customs which influenced him, still remain in his hard-to-read handwriting in the archives of Budapest (MBFSz Archives, Posewitz papers). His numerous publications on the East Indies, both short and long, were meticulously written, and lacked any remarks which could be considered personal. A translation of his brief travelogue in Hungarian (Posewitz 1887), described the voyage from Java to Banjarmasin in 1880 and his experiences there, was provided in a companion paper (Kázmér 2022b). Even in this article he strictly kept himself to scientific style observations, mostly without any personal comment. In his discussion on the theoretical background of travel and its literary reflection, Thompson (2011) says:

Travelling and travelogue-writing is naturally a very personal affair, an interaction of the Self and the Other, the observer and the surroundings. Travel writing provides a distilled version of this encounter, emphasizing similarities and differences with the traveller's previous experiences, often regarding the homeland, as these are found during the journey (Thompson 2011).

Posewitz's style was very much different from that of a casual visitor. While he was curious about the Borneo town of Banjarmasin at large, and described details like the behaviour of locals when seeing a foreign visitor, he explained also those features which needed a longer stay to understand. For example, in order to recognize natural sanitation provided by the ebbing river flushing all harmful pollution from the town, required the knowledge of a trained doctor. Furthermore, the ways people responded to subsidence of roads and houses, reflected the interest of a scientist who had spent an extended time in the region.

Posewitz did not make any subjective, laudatory or insulting remark on the varied elements of the local populations he met in Java, Borneo or Bangka. His appreciation of native, Chinese and Arab populations of Banjarmasin (seen the Appendix to his *Borneo* monograph) is also an objective description of their looks, customs, accommodation, and lifestyle, without attributing any inferiority to any of them as colonial subjects. He also refrained from giving any information on the lifestyle of the Dutch or other members of the Caucasian population there. He was a Dutch government employee, and was certainly expected to refrain from critical remarks on governance of the colony. The only remark he wrote—that could be understood as criticism—was to point out the failure of the Dutch army to subjugate the essentially independent Chinese mining settlements in eastern Borneo (Posewitz 1892, p. 315): their dispersal and killing hastened the cessation of the gold-washing, already in decline. This analysis was cited repeatedly by Harrison (1949, p. 43) and by Leng (1971, p. 251) in a modern book review of a monograph on the Chinese in the West Borneo goldfields.

### 7.3. *Man of learning*

Posewitz was clearly a hard-working, diligent man, with a strong personal vision and ambition. His family provided him with substantial means to study both medicine and geology in various European universities, and to maintain himself and do research as a volunteer to geological surveys. This seems to be the lifestyle of what the British call a 'gentleman geologist' (Porter

1978). He was an outdoors man, seeking and enjoying field work, as his description of a geological field trip to Pararawen Mountain exemplified (Posewitz 1884b, 1885b). His younger years have seen him hiking in the Tatra Mountains of the Carpathians. Later, his love for the region led him to accept positions in the *Ungarische Karpathenverein*, an association working for tourism development in the Tatras, and he wrote a highly successful tourist guide, which saw several editions, both in Hungarian and German. His fascination for nature never let him miss the value of laboratory work. He was one of the pioneers of microscopic petrography in Hungary, well before his East Indies trip (Posewitz 1878).

Being fully aware of the value of microscopic studies, he collected samples in the field in Borneo and brought them home to Hungary, to be examined for microfossils by Professor Hantken. He typically amassed published literature, reading for countless hours in libraries and archives of Batavia. The large amount of precise, reliable data—written mostly in Dutch—that he diligently amassed in this way, and published in his *Borneo* monograph, were the main reasons for the lasting appreciation of his *magnum opus*. His passion for details was illustrated by his Tatra guidebook; there were unusual, tabulated data in the volume including the temperatures of lakes in the High Tatras (Posewitz 1909, pp. 10–11).

Money was not an end, but a means for him. He mostly spent it on his passion. He studied medicine to be able to go to faraway lands as doctor, and he spent his own money on travel and field work while in Hungary. His travels within the East Indies exceeded those that a doctor would undertake in his official capacity (Posewitz 1884c, 1885b). It is noteworthy that his publications and other known writings barely contained any information on medical problems of people and on public health, rather geological information overwhelms.

## 8. LEGACY

Posewitz was the first, and for long time the only, one who published a monograph on the whole of the island of Borneo (Hutchison 2007). Considering the great British interest in Borneo, an English translation of the monograph followed in short time, in 1892. This edition was more than a simple translation. Frederick Henry Hatch (1864–1932), the American translator, added a number of references and notes and new maps. Hatch is considered to be the father of petrology in South Africa.

Hatch's interest towards the Witwatersrand goldfields was raised most probably while translating Posewitz's book on the mineral resources, mainly gold, of Borneo (Posewitz 1892, pp. 312–379). (Howarth 2012, p. 190).

Both the German and English versions of his *Borneo* monograph, plus his lengthy studies on coal (Posewitz 1884a) and gold (Posewitz 1883a) of Borneo, the geology (Posewitz 1885a) and tin mining of Bangka (Posewitz 1886a), are kept in libraries worldwide

As often happens, the importance of his work in the East Indies did not translate into major influence in his homeland. While many years of unpaid volunteer work and numerous publications finally earned him a permanent paid position at the Hungarian Geological Institute, his overseas studies went into oblivion. A measure of this is that the History of Science Section of the Hungarian Geological Society held a meeting (27 March 2018) dedicated to Posewitz's 30-page article *Unsere geologische Kenntnisse von Borneo*, published in the Geological Institute Yearbook, not to the book-length *Borneo* monograph.

His geological maps and especially his book-length *Petroleum und Asphalt in Ungarn* (Posewitz 1907), gained him well-deserved appreciation and fame. Fortunately, his work on Borneo has been appropriately respected and used by those for whom it was primarily written. He was elected an external member of the *Genootschap van Kunsten en Wetenschappen*, honouring his accomplishments in Borneo. While geological observations and the pioneering, but very simple, structural image he conveyed concerning the geology of the island were gradually superseded, the parts of the book on mineral resources have been held in high esteem ever since.

Geologists generally do not express their opinion about each others' work in heated debates unlike historians (*Historikerstreit*, Augstein 1993), or archaeologists (Binford 2009). Most often there are no emotionally loaded comments on a colleague's activity, neither positive nor negative. It is all the more surprising that Miklós Mészáros, a fellow Hungarian, and head professor of geology at the University of Cluj in Romania, expressed his opinion on Posewitz in 1998:

I used his Maramures coloured geological map sheet, drawn 1:75,000 scale and the adjoint explanatory booklet (Hoffmann and Posewitz 1893, 1894). It is one of the most perfect geological maps ... I was requested to translate his scientific articles on Borneo to English for exploration geologists of Shell company [for whom I was a consultant in 1995]. These contain many useful data they were unaware of, which proved useful during exploration. Here I remembered a geologist, who did not publish a lot, but those he did, are of lasting value even after a century. (Mészáros 1998).

### ACKNOWLEDGEMENTS

The author is grateful to Jan Mrázek (National University of Singapore) for his invitation to attend and lecture at the workshop *Escaping Kakania: Eastern European Travels in Colonial Southeast Asia* (Singapore, 2021). Professional contacts established at this meeting inspired parts of this paper. Tamás Fancsik, director of the Hungarian Mining and Geological Service kindly permitted me to work in the archives there. Ildikó Török, archivist, provided essential help. Historical Photography Archive of the Hungarian National Museum permitted me to publish photos in their holdings. Mario Wannier (Petronas, Kuala Lumpur, Malaysia) sent scanned versions of Posewitz's maps published in the English version of *Borneo*. Krzysztof Gaidzik (University of Silesia, Sosnowiec, Poland) helped in identifying and plotting Posewitz's route stations. Anto Mohsin (Northwestern University, Doha, Katar) explained the meaning of critical Malay expressions. J. T. van Gorsel (Houston, Texas) went to extremes in his exceptionally careful review. He added multiple interesting data on the movements of Posewitz and his son in the Dutch East Indies and on their journey homeward. Prof. John Diemer was an exceptionally helpful and understanding editor. Sincere thanks are due to all of them,

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The History of Science Archive of the Hungarian Mining and Geological Service in Budapest holds a large box of the Posewitz papers, including certificates of university studies, graduation diplomas and personal notices. Those used most often are referred to here as:

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