

Haidinger

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BIOGRAPHICAL SKETCH

OF

WILHELM VON HAIDINGER,

BY

DR. GUSTAVUS HINRICHS.







W. H. Laidinger

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With Portrait.

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"Nie ermüdet stille stehn."

WILHELM HAIDINGER was born at Vienna, on the 5th of February, 1795. He lost his father, Carl Haidinger, in 1797; but the works on mineralogy and the collections left by his father must have early drawn the attention of the boy to the individuals of inorganic nature,—the crystals. The splendid collection of minerals of his uncle, the rich banker, Van der Nuell, must also have exerted a decided influence on the young Wilhelm, for we know that when the distinguished mineralogist Mohs came from Freiberg to Vienna to arrange this collection, Mohs was so favorably impressed with young Haidinger as to offer to take him in his service, 1811, to Gratz, where Mohs was to arrange the collection of a mineralogical institute. Haidinger, at the age of sixteen, having successfully completed the course of study of the academic gymnasium of Vienna, was by his mother permitted to accept this great offer. From this early age, he gave himself entirely to the study of mineralogy, under the guidance of the then greatest mineralogist Mohs. Thus it appears that Wilhelm Haidinger, the son of a noted mineralogist, grew up surrounded by these crystallized beings of the earth, and entered as an apprentice in the service of a true master. Need we, then, wonder that he proved a diligent, painstaking apprentice, a successful and honored fellowcraft in his "Wanderjahre," and a renowned, true master at the head of the science of mineralogy, especially in the essential relation of crystal form and properties? From the cradle

to the grave, Haidinger was surrounded by these highest types of inorganized matter, the crystals. By faithful and diligent labor his powerful mind unravelled many a mystery of these dwarfs of the ancient Teutons* during his long life. Having, as it were, explored every part of the earth's crust, he in the last years of his life searched for the same beings in those bodies which, as meteorites, reach us from the remotest realms of space.

If we now follow Haidinger in his journey through life, we shall recognize in the above the grand purpose of his entire existence. It will, however, be readily admitted that his great scientific capacities were associated with a most thoroughly humane heart. While studying the mysteries of molecular science, he was ever anxious to contribute thereby to the material well-being of the race; thus he was led to the creation of the true Haidinger monument,—the grand geological institute of the Austrian empire. Conscious of the ardor and burden of scientific labor, he was ever ready to recognize its results in any quarter, and thus exerted a controlling influence on the organization of scientific associations in Austria, and contributed much to the efficiency of scientific investigations throughout the world.

Haidinger remained eleven years with Mohs, six years at Gratz, and five years at Freiberg. During all this time Haidinger was constantly at work, studying the minutiae of specimens in the cabinets, determining the characteristic properties† of mineral species. The great work of Mohs on mineralogy (1822) contains the results of Haidinger's labors, which have proved of fundamental importance to systematic mineralogy.

In 1822 Haidinger left the mineralogical laboratory of Freiberg to accompany Count Breuner on a voyage

* Dwarf=quartz=crystal; they thought that the glittering crystals in caves were living beings, merely petrified at the appearance of light in the hands of man.

† Crystal forms, cleavage, specific gravity, optical properties, etc.

through Germany, France, and England. On this trip he received an invitation (1823) from the banker, Thomas Allan, of Edinburg, to stay at his house to study and arrange his great collection of minerals.* During three years he remained with Allan, translated Mohs' treatise on mineralogy into English, improving this edition by many original observations (1825). Besides, he published some of the results of his labors in separate papers, in the *Memoirs of Wernerian Society*, in the *Philosophical Transactions of the Royal Society*, and in *Brewster's Journal of Science*. One of the most important of these papers demonstrated the true form of chalcopyrite to be quadratic, instead of tesseral, as assumed by Haüy.† This publication (1821) fairly proved Haidinger's high position as crystallographer: for the crystals of chalcopyrite are not only rather imperfect, and complicated, by twin formations, but the difference between tesseral and quadratic form determined by him was but very small. He found the vertical axis to be 0.98556, instead of 1.00000, or only 0.01444 shorter than that of the tesseral form. His investigations on the peculiar kind of hexagonal hemihedry of apatite and scheelite was also published during his sojourn in Edinburg. To these papers have to be added his careful discrimination of five species of manganese minerals (manganite, pyrolusite, hausmannite, braunite, and psilomelane); his papers on pseudomorphs, on twin crystals, and many others. The debut of Haidinger as an independent investigator was indeed most successful.

From July, 1825, until December, 1826, Haidinger accompanied Robert Allan, the son of the munificent banker, Thomas Allan, above referred to, on a scientific tour through Norway, Sweden, Denmark, Germany,

* Afterwards acquired by the British Museum.

† See Hinrichs' *Elements of Chemistry*, p. 127; *Principles of Crystallography*, p. 35.

Austria, Italy, France, and southern England. On this tour he visited mines, the great collections of minerals to be found in the capitals of the different countries, and formed numerous acquaintances with eminent scientists. During the winter of 1826–27 he stayed at Berlin, where his life-long friendship with the Roses and Mitscherlich commenced.

In 1827 Haidinger returned to his native country, and settled in Elbogen, Bohemia, where he remained for thirteen years at the head of a porcelain factory owned by himself and his brothers Eugene and Rudolphe. The products of this factory were repeatedly rewarded with gold and silver medals at different exhibitions, indicating that Haidinger understood well to apply some of his mineralogical knowledge to practical purposes.

But during this long sojourn at Elbogen, Haidinger continued his original investigations. The transactions of the Bohemian Society of Sciences, at Prague, the *Annalen* of Poggendorff, of Berlin, the *Zeitschrift für Physik* of Ettingshausen and Baumgartner, of Vienna, contain valuable contributions from Haidinger during this time. A very important contribution which mineralogical literature owes to Haidinger at Elbogen, is his “*Anfangsgründe der Mineralogie*” (1829), which was originally published in England, by request of the editors of the *Library of Useful Knowledge*. This book (312 pp. 8vo, with 15 plates) seems, so far, to have been rather overlooked by Haidinger’s biographers, probably because it contains no new contributions to the science of mineralogy; but its method is so excellent that it must have exerted a powerful influence on the study of mineralogy both in England and in Germany. The book consists essentially of three parts: a concise treatise of physical mineralogy, a compact exposition of the characteristics of all the mineral species, and a more full description of the most important minerals. In short,

it is a work which it would pay every teacher of mineralogy carefully to study, even at the present day.

Thus, we have traced the scientific development of Haidinger from 1811, when he entered the mineralogical cabinet of Mohs at Gratz, as apprentice, until 1840, when he was known to every mineralogist of Europe by his masterly researches on special subjects, and by his admirable treatises* on mineralogy in general. Twenty-nine years of earnest study and labor in the field of science had achieved this degree of distinction—more than enough to satisfy the ambition of the majority of working scientists. But what was all this in the eyes of Haidinger himself? He simply considered this successful life-work as his preparatory studies† which, by a high sense of duty, he felt himself impelled to use to the advantage of his fatherland when, by the death of Mohs (September 29, 1839), Austria had lost the man to whom was entrusted the great task of properly arranging the best mineralogical treasures collected at the capital in the Hofkammer im Münz-und Bergwesen. Haidinger was appointed as successor to Mohs at this cabinet (April, 1840), and from that year until 1871, we have thirty-one years of ardent and wonderfully successful labor of the master, interrupted but once by severe sickness, in 1866.

Fully two years Haidinger was occupied in the arrangement‡ of the great collection placed in his hands by the above appointment. In 1843 the catalogue was published.

* Mohs' Treatise on Mineralogy, Edinburg, 1825; translated by Haidinger. 3 volumes, in octavo. Anfangsgründe, German edition, 1829. See above. The same, English edition, in the Library of Useful Knowledge.

† Vorbereitungs studien. See Verhandl. Geol. Reichsanst. 1864, p. 153.

‡ This arrangement met not only the scientific requirements, but also the practical demands, of the mining engineer. It is still preserved in its essential features at the Geological Institute of Vienna.

In the beginning of this year Haidinger began the series of lectures on mineralogy to the young mining engineers who, from all parts of the empire were ordered to Vienna to perfect their technical education, in order to prove of greater service to the state. Also many other persons not in the service attended these lectures. This course of lectures was repeated every year until 1849, when the institution was enlarged to the Reichsanstalt. In his admirable *Handbuch der bestimmenden Mineralogie* (1845) he has given an exposition of the subjects treated of in these lectures. This handbook contains already many of the discoveries of Haidinger; especially, also, the principal facts of pleochroism, as observed by means of his dichroscope. In the crystallographic portion of this work we find numerous observations on form and structure, which at once are simple and highly characteristic; thus the monoclinic form of barytocalcite is at once related to the rhombohedral form of calcite, by the observation of correspondent cleavage faces in the compound crystal represented in Figures 453 and 454, on page 279. In regard to these lectures, von Hauer has remarked that Haidinger considered the lectures themselves of less weight than the work in the actual study of minerals, to which these lectures gave rise.

The other great publication which marks this period in the labors of Haidinger is the Preliminary Geological Map* of the Austrian Empire. This map, comprising nine large sheets, was finished in March, 1844, printed under date of 1845, from ninety-six stones, in nineteen colors, in 1846. In the actual preparation of this map, Haidinger was of course aided by several of his auditors, and especially by F. von Hauer.

*The more complete and much larger geological map of Austria, resulting from more than twenty years' work of the members of the Geological Institute of Austria, is in the course of publication by F. von Hauer.

In connection with his course of lectures, Haidinger arranged weekly meetings of his most advanced students. At these meetings the students reported on the work they had accomplished in the special studies they had undertaken in connection with those lectures. Out of these informal meetings grew (November 8, 1845,) the society of the "Friends of Natural Science" (*Freunde der Naturwissenschaften*), a body which, led by Haidinger, exerted a most lasting and beneficent effect on the scientific organizations in Austria. Until the active operations of the Imperial Academy of Sciences commenced (1847), the Friends of Natural Science formed the representative body of science in Austria. Haidinger's eminent talent of organization, as well as his great popularity, was strikingly demonstrated in connection with this association. To secure means for defraying the expenses of publication of the contributions of the *Freunde der Naturwissenschaften*, Haidinger invited to an annual subscription of twenty florins (\$10.00). During the five years that these publications were kept up, he received not less than 22,344 florins (about \$11,170). These means were used to publish seven volumes (8vo) of "*Berichte*," and four volumes (large quarto, with numerous plates,) of "*Abhandlungen*." The scientific publications received from learned societies and men, in exchange for these publications, composed quite an important library, which, in 1849, was transferred to the geological institute, together with the remaining volumes of both the *Berichte* and *Abhandlungen*. The results of the labors of Haidinger in behalf of the association of the Friends of Science are surprisingly great. Not less than one hundred and fifty scientists, mostly Austrians, contributed more or less extensively to the contents of these publications; a state which, hitherto, had produced hardly any continuous contributions to the advancement of science, unfolded at once a great activity in all branches of physical

and natural science. No wonder, that at a distance from this new centre of scientific activity Haidinger was considered the soul of this organization. The foundation of the Geologische Reichsanstalt, with Haidinger at its head, and the rapid development of the Imperial Academy of Sciences, at Vienna,—the highest center of all scientific work in Austria,—made the distinct organization of the Friends of Science superfluous. Accordingly, in 1850, they dissolved this organization, by the transfer of the library above spoken of. How active a part Haidinger took in the scientific work of the Imperial Academy of Vienna, the publications of the academy bear witness.

The publication of Haidinger's preliminary geological map (*Geologische Uebersichts-Karte*) of Austria, above-named, gave him an opportunity to represent to the authorities the need of great and persistent thorough geological explorations of all the provinces of the empire. Notwithstanding the unfortunate political troubles, the enlightened government of Austria liberally furnished the means to carry out the plans of Haidinger to the fullest extent. The Geologische Reichsanstalt (Geological Institution of the Empire) was created, and Haidinger appointed Director of the same (November, 1849). As such, he had a considerable number of scientific and other officers under his direction. It is a fact of no slight significance in regard to the high, truly humane, and noble character of Haidinger, that during the seventeen years of his administration, every officer of this institution constantly found in him an enlightened advisor and a fatherly friend. In the Haidinger *Feier*, on the 5th of February, 1865, the numerous friends of Haidinger—from the Emperor on the throne, to the servant at the gate—from his colleagues in Vienna, to the scientists in the most distant quarters of the globe—united to celebrate the seventieth anniversary of his

birthday, in the great hall of the Reichsanstalt. His scientific friends throughout the world presented a splendid marble bust of Haidinger, now to be seen at the Reichsanstalt. The Emperor created Haidinger a Ritter, and ennobled his descendants, Von Schmerling, the Prime Minister of the Empire, delivering the diploma in person. This latter honor may appear an empty one to us in a free republic, but it was given to Haidinger as evidence of the highest approval in the power of the chief of the government to bestow, in addition to the real support given by providing the means necessary to carry the scientific work forward with energy and success.

The Geologische Reichsanstalt, founded by Haidinger, and liberally supported by the state, will forever remain the noblest and truest Haidinger monument.

The Reichsanstalt has its headquarters at Vienna, in the palace of Prince Liechtenstein. The two wings in actual use by the Reichsanstalt measure more than five hundred feet in length. The state gives a fixed amount (40,000 florins) every year, to defray the current expenses of the institution. At the head of this institution stands the Director. He is aided by three chief geologists, six or more section geologists, a chemist, several draughtsmen, a secretary, and a number of subalterns. Besides, the state appoints mining engineers to aid in the field work of the Reichsanstalt, in order to perfect themselves in the profession by the advice and example of the regular officers of the institution.

During the summer months the geologists are nearly constantly in the field for exploration; during the winter months they work up the results attained, which are presented at the regular meetings (twice a month), and published by the Reichsanstalt. These publications are (now) of four kinds; namely: the *Verhandlungen*, or transactions of the bi-weekly meetings; the *Jahr-*

buch,* or Yearbook, containing full papers, with plates and maps, published quarterly; the *Abhandlungen*, embracing greater monographies, especially on paleontology; and Special Maps, which are copied at the institute upon order only. The publications are liberally distributed throughout the scientific world, and in return, the Reichsanstalt has accumulated a library which, in 1868, contained 16,000 volumes and 4,000 maps. The best specimens obtained on the explorations in the field are arranged in the Museum of the Reichsanstalt, occupying ten large halls in the palace. In 1868 this museum contained 30,000 specimens of rocks, arranged according to the geological formations, 13,000 minerals, arranged in the same manner, 40,000 fossils of animal, and 12,000 fossils of vegetable, origin; also, 230 splendid artificial crystals, prepared by Carl von Hauer. Besides, the institution contains many unarranged specimens, and also has liberally distributed collections to the educational institutions of Austria. During the administration of the Reichsanstalt, Haidinger superintended the publication of the three volumes, large quarto, of "*Abhandlungen*," and the sixteen volumes, octavo, of the "*Jahrbuch*" of this institution, forming a very valuable library of itself. Numerous maps and plates accompany each of these large volumes, while more than one hundred special maps, representing the geological and mineralogical features of limited districts of the realm, were published besides.

The energy of Haidinger is well indicated by the fact that the direction of the work of the numerous geologists in the field, the superintendence of the work at home in the Reichsanstalt, the publication of the *Jahrbuch* and *Abhandlungen*, left him yet time for original inves-

*Now perfected by the addition of Tschermak's *Mineralogische Mittheilungen*.

tigations, and for keeping up a correspondence with eminent scientists in different quarters of the world. The original investigations of Haidinger during the years from 1840 to 1850 relate mainly to mineralogy, especially in reference to crystal form and optical properties.* In later years, he made the study of cosmical mineralogy a specialty, as is demonstrated by his numerous papers on meteorites in the *Sitzungsberichte* of the Academy of Sciences of Vienna.

The Haidinger-Feier was the culminating point of Haidinger's official life. Near the close of the same year his exceeding and protracted labors laid him low by a cerebral form of typhus; although he recovered from it, he was unable to continue in his position. The government rewarded its faithful servant by relieving him from all his duties, without diminishing his salary. Franz von Hauer, who, from the organization of the *Reichsanstalt*, was the first geologist of the institution, was appointed Haidinger's successor, October, 1866.

Although his physical strength was shaken, Haidinger retained, according to the testimony of Von Hauer, a wonderful freshness of mind, which not only manifested itself by the vivid interest wherewith he followed the progress of science, but also in the continuation of his own individual researches, especially into the nature of meteorites.

Numerous letters received from Haidinger enable me to corroborate the above expressions. Judging from the tone of these letters, one might think they had been written by a man in the prime of life, except for the casually expressed regret of the failing of physical

* How expert he was in this branch became apparent, even to the general public, in 1858, when he, by merely looking at the great diamond of Dupoisat through his dichroscope, proved the so-called diamond to be simply a topaz. Dupoisat had valued the gem at 139,000,000 florins. Haidinger's observation through the dichroscope proved the stone to be worth, at most, the millionth part of that sum.

strength required for the performance of continued work. Until the very last, he followed the progress of investigations in every branch, but especially in molecular science, where he had won his laurels. "The science of nature," he wrote me, as late as September 29, 1870, "always conduces to a lucid life, and to civilizing progress." At the close of his letter to E. Döll, "Der 8 November, 1845," he says (October, 1870): "Peaceful progress is, undoubtedly, the highest and most worthy aim of human endeavor." Peaceful progress in the exploration of natural phenomena! While the shadow of death was already upon him, he communicated a notice on the artificial formation of crystals of pyrite, to the *Journal "Die Realschule,"* a formation which his friend Woehler had just succeeded to effect. He spoke to the editor, Dr. Döll, his son-in-law, about this and other scientific subjects, while confined to his chair on account of a cold, Saturday evening, March 18, 1871. Eight hours later, Doell was summoned to the bedside of Haidinger, whose strength was rapidly sinking, until at three o'clock in the afternoon of the next day (Sunday, March 19, 1871), he died.

Haidinger was noble and humane in his intercourse with all men. Unflinching, ever active* in the service of science, where his untiring energy and his great mind achieved so splendid results. Full of peace and honor was the evening of his life, every pulsation of which had been consecrated to the search for truth and the well-being of his fellow men. Serene was his dying.

His memory is sacred to every person who enjoyed his acquaintance. His memory is sacred to his country, because he contributed largely to the organization of sci-

* "Nie ermüdet stille stehn" was his motto, inscribed on the Haidinger medal, of 1865.

ence at its capital, and because he built up the Geologische Reichsanstalt, to which Austria points with just pride. His memory is sacred to science, for he conquered many of the most inaccessible provinces of the unknown, and prepared the way for further conquests by training forces, many of which already have proved themselves worthy pupils of the master.

May this short and exceedingly imperfect sketch of the life of a true representative scientist inspire some of the young readers to high aims in the service of science—then this feeble tribute will be worthy of him to whose memory it is dedicated.

The following publications have been consulted in the preparation of the preceding sketch : —

1. W. Braumüller. Eine Skizze aus den Leben Wilhelm Haidinger's. See Jubelausgabe (1865) of Haidinger's Handbuch.
2. Bericht über die Haidinger-Feier am 5 Februar, 1865. Wien 1865.
3. Ansprache gehalten am Schlusse des ersten Decenniums der k. k. Geologischen Reichsanstalt in Wien am 22 November 1859. Von W. Haidinger. Wien 1859. (Jahrbuch 1859, p. 137.) With map of Austria, and ground plan of the building of the Reichsanstalt.
4. Ansprache gehalten am Schlusse des dritten Quinquenniums der k. k. Geologischen Reichsanstalt in Wien am 8 November, 1864. Von W. Haidinger. (Jahrbuch, 1864.)
5. Wilhelm von Haidinger. Der 8 November, 1845. Jubel-Erinnerungstage. Rückblick auf die Jahre 1845 bis 1870. (Realschule, Wien, 1870, pp. 65-74.)
6. E. Döll. Wilhelm Ritter v. Haidinger. (Realschule, I. pp. 263-277; 1871.)
7. F. von Hauer. Zur Erinnerung an Wilhelm Haidinger. Wien 1871. (Jahrbuch, 1871, pp. 31-40.)
8. M. A. Becker. Wilhelm Haidinger. Wien 1871. (Mittheil. der geogr. Gessellsch. Wien.)
9. Fouqué. Vie et travaux de Haidinger. Revue Scientifique, Paris, 1871-2. pp. 410-416.

Dr. E. Döll is preparing a more complete biography of Haidinger.

The portrait of Haidinger, which forms the frontispiece to this biographical sketch, was lithographed expressly for us, at Vienna, under the superintendence of E. Döll, from a photograph of Haidinger, taken in 1871.