

Mineral Collections by Siebold

Philip Franz von Siebold (1796 -1866) was born in Würzburg, Germany, into a doctor's lineage as a son of Johann Georg Siebold and Apollonia von Siebold (geb. Lotz). His grandfather, Karl Kaspar von Siebold, was one of the most notable surgeons in Germany at that time. His father was a promising professor of medical science, although he passed away when F. P. von Siebold was two years old. In 1815 Siebold began to study medical science at the University of Würzburg where his father had been a professor. In his school days, he lodged at the house of Professor Ignaz Döllinger, a famous physiologist and one of Siebold's father's friends. Many scholars in natural sciences gathered in the professor's house, such as L. Oken (biology, natural philosophy, and animal physiology), N. von Esenbeck (botany), J.W.E. d'Alton (anatomy and archeology), H.C. Pander (biology), K.F. Gärtner (medical science and botany), and S. Sömmerling (anatomy and physiology). The exposure to those scholars strongly influenced Siebold to give him a deep interest in natural history, especially botany. He studied not only medical science but also natural science, geography and ethnology at the university. He read travel books by E. Kämpfer and C. P. Thunberg who had stayed in Nagasaki, Japan. Through all these experiences, he came to draw the image of conducting natural historical and scientific research on East Asia in his future. In 1880 he graduated from the university and became a medical practitioner in Heijdingsfeld where his mother lived after his father's death. However, he did not throw away the dream. While working as a medical practitioner for two and a half years, Siebold had pursued a possibility of going to East Asia.

In 1822 Von Siebold obtained a position of Chirurgus Major of the Dutch East Indies by the recommendation of F. J. Haarbauer, who was Dutch Surgeon General and used to be a student of his father, and Siebold was sent to the Dutch East Indies. Departing from Rotterdam in September, 1822, P. F. von Siebold - arrived at Batavia in February, 1823.

After the French Revolution and the rise of Napoleon, the Netherlands were annexed to France and England, but gained independence again with the Napoleon's fall. Then the Netherlands recovered both the rights and interests of Dutch East Indies. It had been earning profit by the trade with Japan and intended to deepen the relationship with Japan to help rebuilding the central government finances. For this purpose the Dutch government felt the necessity for research on natural and cultural histories of Japan. Under these circumstances, Siebold arrived at Batavia and Baron van der Capellen, General Gouverneur, proposed that he should have stayed in Japan for general researches on the natural science of Japan. Van der Capellen intended to send him to Japan for comprehensive studies of Japanese history, social system, geography, natural products, etc. from the view point of natural history. At that time, recognition of European science had risen in Japan, especially, the latest European medicine. Taking advantage of such a convenient situation, P. F. Siebold stayed in Dejima as a Dutch medical doctor and investigated natural science of Japan; although he was an excellent doctor, he was much more interested in the natural science of Japan.

Because of the Japanese governmenta policy, Dutch people were confined in a small isolated island "Dejima" in Nagasaki and they were forbidden to go anywhere outside of Dejima. However, Siebold tried to collect specimens of natural history, mainly botanical and zoological ones. This is known from the following letter (in 1823) to his uncle, which is followed by English summaries in terms of mineralogical specimens in brackets;

Ich bin glücklich auf Japan angekommen und verleve in meiner rastlosen Tätigkeit im Fel-

de der gesammten Natur- und Heilkunde die angenehmsten Tage meines Lebens. Das merkwürdigste Land der Welt zu untersuchen ward mir demnach zu Theil. Im nächsten Jahre werde ich Ihnen eine interessante Abhandlung über den Zustand der Medicin, Chirurgie und Geburthülfe in Japan mittheilen und dieselben jährlich fortsetzen. Ich erwarte einen Zeichner aus Europa, der mir dabei von Nutzen sei wird. Ich habe eine Dissertation geschrieben. “Die Historiae naturalis in Japonia statu etc.” Ich habe 25 bis jetzt in keinem Schreiben über Japan als daselbst einheimisch bemerkten Thiere beschrieben. Ich habe mich viele zoologische Entdeckungen und bei weiterem mehr botanische (gemacht). Ich halte hier wöchentlich Vorlesung in holländischer Sprache über Natur- und Heilkunde. Unter sechs Jahren verlasse ich Japan (nicht) und auf keinem Fall eher, als ich eine ausführliche Beschreibung von Japan, ein Museum japonicum und eine Flora geliefert habe, und dann glaube ich, in Europa unserem Namen Ehre zu machen!

(Untill now I described 25 animals of Japanese special products, which had not been written in the books about Japan. I made many zoological and botanical discoveries.)

(This letter was in Siboldiana, Japan-Insitut Berlin, which was copied and stored in the Toyo Bunko, Japan)

Siebold intended to travel beyond Dejima for collecting much more specimens. There were few good doctors with modern medical knowledge in Japan. He showed Japanese people his excellent technique of surgery, which made many Japanese people want to learn the modern European knowledge of medical science. By building a good reputation as a doctor, Siebold was permitted to open a school outside of Dejima, where he gathered many Japanese pupils. He gave his pupils various assignments on Japanese natural history and encouraged them to work hard. In this way, he could collect much information and many specimens necessary for his own researches.

The captain of the Dutch settlement had a habit of paying courtesy visits to Edo (Tokyo) regularly. In 1826 a Dutch delegation went to Edo, when Siebold had a chance to accompany the captain. It was also an excellent chance to collect natural historic specimens by himself. Because Siebold showed much more interest in the botanical and zoological specimens than the mineralogical ones, he preferentially collected botanical and zoological specimens on the journey. He employed a young German pharmacist, Heinrich Bürger, from Batavia, who had better knowledge about physics, chemistry and mineralogy than Siebold. Siebold ordered Bürger to describe the Japanese geological characteristics and to collect minerals. We can see the activities of Siebold and Bürger on the physical, chemical and mineralogical collection during the journey in the Siebold's book of “Nippon, Archiv für Beschreibung von Japan und dessen Neben- und Schutzländern Jezu mit südlichen Kurilen, Sachlin, Korea und Liukiu-Inseln”. Followings are some examples from the courtesy visit to Edo in “Nippon”;

Einer ähnlichen großmütigen Entscheidung der Niederländisch-Indischen Regierung hatte ich die Bewilligung meines Gesuches um einen Gehülfen und einen Zeichner zu verdanken. Die Herren Heinrich Bürger und Karl Hubert de Villeneuve wurden nach Japan gesendet. Herrn Bürger, früher Apotheker bei unseren Hospitälern auf Java, übertrug ich nun die Fächer der Physik, Chemie und Mineralogie, die er mit besonderer Vorliebe betrieb,

(The Dutch-Indian Government accepted the request of Siebold to employ an assistant for his physical, chemical and mineralogical researches and they sent H. Bürger, a pharmacist in Java, to Japan. Bürger performed his jobs ardently.)

15. February

Eine Tannenallee führt an der Fuß des steilen Nagasakitoge, auf dessen Koppe, Sintoge, eine Herberge liegt, die wir baid erreichen. Die Gebirge der Umgegend von Nagasaki, wie überhaupt der SW.-Teil von Kiusiu, sind vulkanischer Formation. Am Fuße des genannten Berges beobachtete Herr Bürger Porphyrschiefer, auf dem Gipfel Basaltkuppen von porphyrtiger Struktur und mit Hornblende gemengt.

(The mountains in Nagasaki district are volcanos, which are similar to those in the Southwestern district of Kyusyü. Bürger observed porphyritic slate and a basaltic dome with porphyritic structure including hornblende)

17. February

Herr Bürger, der diese Quelle chemisch untersuchte, erhielt folgende Resultate: "Kalkwasser verursachte keine Trübung; essigsäures Blei machte es stark opalisieren; schwefelsäures Eisenoxydul bewirkte eine grünliche Farbe; konzentrierte Säuren brachten keine Luftblasen; Gallustinktur und eisenblausäures Kali keine Veränderung hervor; salzsauer Baryt veranlaßte einen starken weißen Niederschlag und salpetersäures Silber machte dasselbe opalisieren". Es geht daraus hervor, daß in diesem Wasser hauptsächlich schwefelsäure und etwas salzsaure Salze aufgelöst erhalten sind. Merkwürdig ist das Vorkommen natürlichen Schwefels in Gipslagern unweit der Quelle.

(Bürger performed chemical analysis of hot spring water. The results were as follows; not clouded by lime water, strongly clouded by lead acetate, green color by ferrous sulfate, no bubble by concentrated acid, no change by Death Shocco Tinki and Potassium ferrocyanide, white precipitate by barium chloride, clouded by silver nitrate.)

18. February

Bei Wukumoto besuchten wir eine Steinkohlengrube. Die Kohlen wurden durch einen Schacht zur Tage gefördert, der als eine 120 Stufen tiefe Treppe sanft abwärts führt. Es waren Blätterkohlen (Houille feuilletée), welche in dünnen Schichten mit Schieferthon abwechselten. Bis auf etwa sechzig Treppen abwärts, denn tiefer erlaubten uns unsere japanischen Begleiter nicht hinabzusteigen, war die Mächtigkeit der Schichten unbedeutend und betrug nur einige Zoll; tiefer sollen sie jedoch eine Stärke von mehreren Fuß haben, was man auch aus den gewonnenen Kohlen entlösung getrieben, welche zwar langsam, aber auf eine sehr einfache Weise vor sich geht, indem das Wasser durch einen an einem Hebel befestigten Eimer, wie bei unseren Ziehbrunnen, aus der Grube geschafft wird. Da die Kohlen von starkem bituminösen Gehalt sind, werden sie gewöhnlich zu Koks ausgebrannt, was gleich am Fundorte und in freien Meilern geschieht.

(At Wukumoto, Bürger and I visited a coal mine. We were not permitted to go to the deeper level and we observed only a thin coal layer of several inches wide. But there seems to exist a thick coal layer of several feet in the deeper level. The coal includes much bituminous content)

19. February

Von Uresino bis Usitsu bemerkte Herr Bürger Thon und Mergelschiefer, von Usitsu bis Kansaki Thonflötze mit Steinkohlenlagern in dünnen Schichten, mit Thonschiefer wechselnd; von Kansaki bis hierher und weiter bis Dasiro kommt häufig Feldspat vor, und die Porzellanerde

bildet ganze Stücke des Gebirges. Es ist dieselbe, welche auf der Insel Amakusa in Granitfelsen bricht und ihrer Güte wegen sehr geschätzt wird.

(On the way from Ushitsu to Kanzaki, Bürger found alternating layers of clay and coal. And in Tashiro, the whole mountain consists of pottery clay which is in good quality like in Amakusa)

Zu Yamaije, wo wir übernachteten, bekamen wir bald die Kuriositäten dieses Ortes zu sehen, vor allem eine abenteuerliche Mineraliensammlung, die aus verschiedenen, in den Augen der Japaner seltenen Fossilien bestand, welche in der Umgegend und auf dem benachbarten Berge Homandake gesammelt worden waren. Sie enthielt unter andern ungeheuere Stücke gemeinen Quarzes, Bergkrystalle und stalaktitische Formen von weißen ins Rötliche spielenden Kieselschiefer mit eingesprengtem Roteiseinstein und eine Großes Stück Holzstein, an welchem sich die Textur und Absonderungsflächen gut erhalten hatten.

(At Yamaka we saw several curious specimens from the area, in which there were novel mineral collections and various fossils from the outskirts and Mt. Homandake. In the collections, we could find crystals and fragments of quartz, stalactite-forming minerals including hematite and large samples of petrified wood.)

20. February

Am Fuße des Homandake wechselt Gneis mit Gips und bildet das Grundgebirge, durch welches Granit, der in mächtigen Blöcken an der Abhängen der engen Thalsolen hervorragt, emporsteigt. Der granit ist von einer sehr schönen, grobkörnigen Art.

(At the foot of Mt. Homandake, gneiss and gypsum exist alternately with forming a plateau which is intruded by a large block of coarse-grained granite.)

23. February

Kosai und meine übrigen Schüler brachten mir nach Landessite Begrüßungsgeschenke, welche in einigen ihnen merkwürdige erscheinenden Naturalien und sonstigen Erzeugnissen ihres Landes bestanden. Darunter befanden sich eine seltene wild Ente, Seekrabben, Seepferden und Seenadeln und eine neue Art Flußkrebse, nebst vielen getrockneten Pflanzen, Keulenschwämmen und Mineralien.

(Kosai and some of my other students brought me natural specimens and products from Japan as welcome presents, which they thought to be interesting.)

25. February

Wir sprachen hier bei Kosai vor, um eine Mineraliensammlung zu bestehen.

(We promised to visit Kosai and to see his mineral collections.)

1. March

Aus einem quarzigen Thonschiefer, der in dem nahen Thonschiefergebirge gebrochen wird und so stark von Eisenoxyd imprägniert ist, daß er eine braunrot Farbe hat, verfertigt man, nach Art der chinesischen Specksteinarbeiten, Tuschsteine, Reibschalen und viele andere kleine Geräte und Kunstsachen, welche allgemein in Japan beliebt

(The siliceous clay stones from the neighboring mountain are reddish brown in color by iron oxide and used as materials for carving, polishing and many other handcrafts.)

4. March

Am Strande, der mit verwitterten Granitgneis und losgerissenen Granittrümmern bedeckt war, wurde ein guterhaltenes Stück eines fossilen Elefanten- Backenzahnes gefunden. Es sollen übrigens in dieser Gegend und vorzüglich auf der im Harima nada gelegenen Insel Sjodosima häufig fossile Knochen, welche ohne Zweifel Überreste vom Mammut sind, vorkommen.

(On the beach, which was formed from the weathered granitic gneiss and broken granitic rock, we found a well preserved fossil of an elephant molar. Fossils of mammoths, without any dispute, are often found in Shodoshima located in Harima-Nada.)

5. March

Oft sind es steile, kahle, unfruchtbare Felsblöcke von grobkörnigem, rötlichem Granit, welchen Adern von glänzendweißem Quarz und glimmererndem Gneis durchziehen, oft sanfte Hügelbildungen mit üppiger Waldvegetation, oft gleichen sie zerrissenen Thalwänden, deren Fuß eine Menge loser Blöcke bedeckt.

(The steep and barren rocks are often intruded by veins of either reddish coarse-grained granite or sparkling gneiss.)

6. March

Es (Kosima) liegt wie ein Vorgebirge vor der niedern, von Flüssen durchschnittenen Küste der Fürstentümer Bizen und Bitsiu und ist ein isoliertes Granitgebirg, wie sich beim ersten Blick an den bloßgelegten Küstenwänden und Granitgeschieben, welche in größeren und kleineren Blöcken am Ufer liegen, wahrnehmen last;

(Kojima is an isolated granite mountain which can easily understood if we see the naked cliff by the shore and the large and small granite blocks on the beach.)

Herr Bürger, der sich der Gesellschaft des Colonel de Sturler anschloß, sammelte Mineralien und stellte seine anderweitigen geognotischen Untersuchungen an, während wir uns mit der kümmerlichen Felsenflora befaßten und nach den Salinen gingen, welche sich längs dem Strande zwischen Himi und Mukohimi befinden.

(Mr. Bürger, who joined the party of Colonel de Sturler, collected mineral specimens and performed other geological researches.)

9. March

Meinen Schülern Kosai und Sjogen gab ich Auftrag, sich in der Stadt nach Naturalien umzusehen. Ihre Ausbeute war übrigens unbedeutend und beschränkte sich auf einen fossilien Knochen, den man Riukots (Drachengebein) nannte und welcher bloß ein Rückenwirbel des fossilien Hirsch ist,

(I gave my students, Kosai and Syogen, a task to find natural specimens in the town. However, the specimens obtained are not important and restricted to the fossils of bones, which are called as "Ryukotu : dragon bones" but are actually the fossils of backbone of deer.)

18. March

Am Abend besuchte mich der Bruder meines unvergeßlichen Schülers Mima Zunzo, der von der Insel Sikoku nur zu dem Zwecke mich zu besuchen hierher gekommen war, und

bringt einige Gewächse und Mineralien.

(In the evening the brother of my unforgettable student, Miwa Junzo, visited me from Shikoku only to see me and to bring some plants and minerals.)

29. March

Jetzt kamen meine japanischen Freunde und früheren Schüler, unter diesen Mizutani Zukuroku, ein sehr erfahrener Botaniker, mit dem ich von Dezima aus im Briefwechsel stand, und Tokaku, ein Laie in der Heilkunst, dem ich früher zum Sammeln von Naturalien den Antrag gegeben hatte. Ich lernte hier die meinen Untersuchung spatter so nützlich gewordenen Ito Keiske und Okutsi Sonsin kenne. M. Zukuroku, dieser große Freund der Naturgeschichte, brachte Sammlung aus allen Zweigen derselben.

(Today my Japanese friends and early students, Mizutani Sukeroku who is a splendid botanist with large experience and Tokaku who is an amateur of medicine, visited me. There, I met Ito Keisuke and Okouchi Zonshin, who became very useful to my research later. M. Sukeroku, the great friend of natural history, brought collections of all kinds.)

Sie brachten daher alle Naturalien in meine Sänfte, wo ich dieselben musterte und auf Ansuchen meines Freundes M. Zukuroku die mir bekannten Objekte bestimmte. An Dr. Bürger sandte ich alle Mineralien zur genaueren Prüfung.

(I identified the specimen, which I know according to the request of my friend, M. Sukeroku. I sent all minerals to Dr. Bürger for exact testing.)

Unter den Mineralien befand sich ein äußerst seltenes Petrefakt eines sehr gut erhaltenen Käfers, auch ein schöner grüner Obsidian etc. etc.,

(Among the minerals, there were an extra rare fossil of well preserved beetle, beautiful green obsidian and so on.)

31. March

Eine starke Brandung bei eben eintretender Ebbe fand an dem spiegelglatten, mit feinem Sand bedeckten Strande statt, auf dem bei abfließenden Wogen auf der Oberfläche geschlämmter Glimmer (Eisenglimmer) im hellen Goldglanz sich zeigen. Wir sammelten davon zur Analyse, auch fanden wir desselben in Quarz eingesprengt, welcher das Muttergestein desselben zu sein scheint.

(After waves flowed away, mica (iron mica) crystals appeared shining with golden color in the sand. We collected them for analysis and we could find quartz rocks including mica, which might be a wall rock of mica on the beach.)

25. May

Gestern war der Bruder meines Zöglings Riosai zu mir gekommen; ich hatte versprochen, ihn zu Kakegawazu besuchen. Ich eilte daher frühe dem Zuge voraus und verweilte einige Zeit bei diesem Freunde, der mich mit Mineralien und anderen Naturalien beschenkt.

(Yesterday the brother of my student Riosai came to me and I promised to visit Kakegawa. I stayed with him and he gave me minerals and other natural specimens.)

11. June

Von hier aus gingen wir zu dem Kaufman, der das Kupfer für die holländische und chine-

sische Faktorei liefert, und sahen hier die Bereitung des Kupfers durch alle Stufen, von Roherz an bis zum Gusse in Barren. Dieser äußerst reiche Mann bewirtete uns ganz auf europäische Weise und hatte sogar ein holländisches Tafelservice. Auch gab mir dieser Freund der Niederländer eine kurze Beschreibung der Kuofierzubereitung nebst einer hübschen Sammlung der progressiv hergestellten Produkte, von den rohen Erzstufen bis zur gereinigten Kupferbarre.

(We visited a merchant, who delivered copper to the Dutch and Chinese factories and saw all the stages of copper preparations, from raw copper ore to casting in rods.

He gave me a book that had short descriptions of both copper preparation and a splendid systematic collection of copper refinement products from raw ore to refined copper rods.)

Generally speaking, the descriptions of minerals by Siebold in his diary are fragmentary and not systematic. Bürger pursued geological observation, collection of mineral, rock and fossil specimens and chemical analysis of hot spring water. Further, Bürger measured the latitude and the longitude in various places and measured the height of mountains together with Siebold during the journey. This indicates that Siebold showed interests in the geographical information of Japan much more than the geological and mineralogical data. Siebold was also very much interested in the volcanoes and their activities, which might correspond to the precise analyses of hot spring water.

The complete collections of Siebold were finally sent to the Netherlands when he left Japan. The botanical specimens, mostly pressed plants, including seeds and living plants are preserved mainly at the National Herbarium of the Netherlands and the Hortus Botanicus of Leiden University. The zoological and mineralogical specimens are at the National Natural History Museum, Leiden.

We have been investigating the mineral collections of Siebold at the National Natural History Museum, Leiden, which includes 830 specimens consisting of minerals and small amounts of fossils and stone tools. The mineralogical trace of specimens along with historical trace of the Siebold's collection and labels show how Siebold and Bürger collected and sorted out collections as well as what aspects of mineralogy were prevailing in Europe and Japan at that time. Here are some findings:

Based on identification of handwriting and types of labels, it can be concluded that 96 specimens were labeled with labels written by Siebold himself (herein called 'Siebold specimens'). Almost always he used a slender rectangular label with a double rectangle in black, like a frame on which the characters of 'Siebold, Japonia' were printed. On the label he usually wrote the mineral or rock name in German sometimes with its Japanese name phonetically written by alphabet, and often with its locality and characteristics of the specimen. For example; '*Kalkspath*' (calcite), '*Bergkrystal, Kai*' (rock crystal as quartz, Kai as yamanashi Prefecture), '*Braunkohle (Kok'tanseki), Jamasiro*' (brown coal as lignite (Japanese name as Kokutanseki) , Yamashiro as Kyoto Prefecture), '*Thon durch Eisenhydrat gefärbt wird zu Topfarbeit verwenden, Fizen*' (Clay colored by iron hydroxide is used for pottery work in Nagasaki and Saga districts) Sixty-nine specimens were labeled with labels written by Bürger (herein called 'Bürger specimens'). As for labels he usually used a square thick paper on which he wrote mineral names and sometimes their localities in German and French. The German name was always followed by the character 'W.' and the French one by 'H.' such as '*Grauspiesglanzerz, W. Antimonie sulfuré, H. Aus der Landschaft Awa*'. This way of writing was standard to describe minerals in Europe at that time. The University Museum, the

University of Tokyo stored more than 3000 mineral specimens imported from Krantz Rheinisches Mineralien-Kontor, a geological warehouse in Germany in the latter half of the 19th century. The Krantz mineral specimens were always labeled with original labels on which the mineral names were printed in German, French and English. The German name was followed by ‘Werner’, French one by ‘Hauy’ and English one by ‘Jameson’. ‘Werner’ indicates Abraham Gottlob Werner who was a famous German mineralogist and a professor of the Bergakademie Freiberg. ‘Hauy’ indicates René-Just Hauy who was a famous French mineralogist and the founder of crystallography and he was a professor of Sorbonne University. ‘Jameson’ indicates Robert Jameson who was also a famous English mineralogist and was a professor of Edinburgh University. The German, French and English mineral names were written according to the notations of Prof. Werner, Prof. Hauy and Prof. Jameson, respectively. This standard way of writing mineral names was faithfully kept by Bürger. This fact indicates that Bürger knew the formal European way of naming minerals, while Siebold did not.

There is another kind of German labels in the collection. Although the writer has not been identified yet, a total of 242 specimens were labeled by this kind of unidentified label, including 36 of those that were corrected or retouched by Siebold. This indicates that the unidentified writer of the labels was contemporaneous with Siebold. The handwriting of this type of labels was confirmed to be different from those of J.J. Hoffmann, a Japanologist and an assistant of Siebold; C.J. Temminck, a zoologist and the first director of the National Museum of Natural History; H. Schleger, a zoologist and the second director of the National Museum of Natural History; and P.G. van Hoorn and E. M. Beima, geologists and the curators of the National Museum of Natural History.

The most abundant minerals in the collection are quartz (including chalcedony, agate and chert rock), calcite (including limestone and stalactite), petrified wood, chalcopyrite, sulfur, clay stone, and volcanic rocks (such as basalt, andesite, granite, including pumice and volcanic ash). We give some examples of the characteristic mineral collections as follows;

- Stibnite (Ehime Pref., probably presented by the brother of Junzo Miwa)
- Obsidian (Sakhalin, probably obtained from Tokunai Mogami)
- Chalcopyrite (Bessi Mine, probably obtained from Yubun Sumitomo)
- Clay (Amakusa, important for pottery)
- Lava and scoria (Mt. Fuji, Lava specimen from the crater by Keisaku Ninomiya)
- Quartz (Nikko, probably collected by Keisuke Ito)
- Obsidian (Wada Path, Nagano Pref.)
- Rocks from active volcanoes (Mt. Unzen, Mt. Aso, Mt. Kirishima and Mt. Sakurajima)
- Metallic copper rod (after refinement, probably by Yubun Sumitomo)

The localities of minerals are not always described. This may be because the Japanese students did not know the way of describing specimens or because most of the specimens were bought or given to Siebold and Bürger by local people as presents and not collected by the students themselves. However, we could identify the localities of some specimens, which cover the wide range from Sakhalin islands to Okinawa islands.

The number of minerals, whose localities are identified is 286 and of these, 107 specimens are from the Kyusyu area. The 50 specimens are from Nagasaki Pref; 18 from Mt. Unzen, 6 from Amakusa and 12 from the outskirts of Nagasaki-city (Mogi, Inasa, Iwayayama, Hikosan, Kaminoshima and so on). The characteristic localities are along the route to Edo, such as

Ureshino, Hakozaki, Shimonoseki, Osaka, Kyoto, Ujigawa, Chirifu, Fuji, Hakone and Edo.

The students seem to have made every effort to gather specimens from all over the country for Siebold. Unfortunately, the quality of the minerals collected by the students is not very high because the knowledge of mineralogy of the students was far below the level of that in Europe. Mineralogy was not a field of science in Japan before Siebold, but a part of herbalism in Japan. Herbalism was originally the old Chinese pharmacy to study effects of mainly botanical materials as medicines. However, some minerals, such as Hg-minerals, As-minerals, and sulfur, were recognized as medicine. The students collected minerals mainly according to their curious form, irregular surface pattern, unusual texture, etc. and not because of scientific considerations. Some specimens were collected from the viewpoint of economic resources, such as chalcopyrite for Cu, magnetite (magnetic sand) for Fe, kaolinite for porcelain, and galena for Pb.

We will show the whole list of the 830 mineral specimens and the selected 197 specimens with labels written or corrected by Siebold or Bürger themselves.