

Phycological Trailblazer No. 10 Adelbert von Chamisso

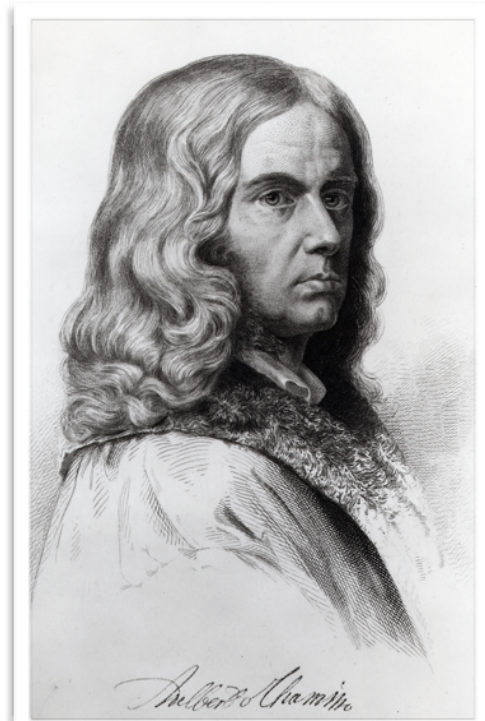
(originally printed in the Phycological newsletter. 1997.
Vol. 33 No. 1)

Chamisso was a charismatic figure who qualifies to be counted in the ranks of "phycological trailblazers", even if his phycological pursuits were secondary to his being a poet, author, explorer and broad-based naturalist. He was born in late January 1781, at the Château de Bancourt in Champagne and given the name Louis Charles Adelaide de Chamissot. When he was nine, the family was uprooted because of the French Revolution, their ancestral castle was destroyed, and they fled to Prussia. At the age of 15 he served as a page in the court of Queen Louise, wife of Frederick Wilhelm II of Prussia. About this same time he assumed the more Germanic name of Adelbert von Chamisso. This service to the royal court led to his being commissioned as a lieutenant in the Prussian army in 1801. But the military life bored him; so he used his time to learn languages (Latin, Greek, Spanish, and Italian) to supplement those he already knew (French and German). With several friends he published a magazine (1804-1806) devoted to poetry, and he

contributed some of his sonnets. He was about to resign from the military when Napoleon's troops defeated the Prussian army at Jena, and a resignation at that time would have been interpreted as an act of disloyalty. He was stationed in the fortress of Hameln, when the commander surrendered to the French without firing a shot. Chamisso ended up back in France as a prisoner, but in 1807 he was allowed to return to Berlin. The treaty of Tilsit ended the war between France and Prussia. By 1810, Chamisso was back in France; his family had arranged for him to take on a teaching post at Napoléonville. When in Paris, he hobnobbed with celebrities. He also met Madame de

Stael, the authoress of a book which had sufficiently irritated Napoleon to cause her to be exiled. She took a fancy for the younger Chamisso and invited him to accompany her in exile to Coppet on the shore of Lake Geneva in Switzerland (Rogers, 1949). He spent 1811-1812 there, where in the vicinity of Mont Blanc he took up the study of botany in a serious way. He also spent his time learning another language--English. In 1812, he enrolled as a medical student at the University of Berlin, where he studied anatomy, zoology, and botany. Chamisso and his

botanist friend Schlechtendal often set out on collecting trips, into swamps and thickets, alternately soaked with heavy rains and scorched by the burning sun. To save time and be ready for an early morning start, they



Adelbert von Chamisso 1856

often slept on the ground without any shelter (Schechtendal, 1843).

When war broke out anew between France and Prussia in 1813, Chamisso found himself in a precarious position, not wanting to bear arms against his native country. This was a time of danger to him. His friends recognized his predicament and found for him a teaching position in the family of Count Itzenplitz, about a day's journey outside of Berlin, where he taught French and botany. It was in this period that he came up with the idea for a novel, "Peter Schlemihl-The Man Who Lost His Shadow", in which Chamisso revealed his own sense of being an exile. The novel's hero lost his fatherland and nationality but finds his salvation in wandering over the face of the earth in search of nature. This was a prediction of how Chamisso's own life was to unfold. The book was a major success, a masterpiece of German Romantic literature. Indeed this book by itself brought him lasting fame, even had he never accomplished another thing. But he did do much more in his life.

What then were the events then that led to Chamisso's being hired as naturalist on the Romanzof expedition? Count Nikolai Petrovitch Romanzof was a very wealthy and powerful Russian, in fact, Grand Chancellor of the Russian Empire. He was advised by his friend Adam Krusenstern that a scientific expedition to the South Pacific islands and the polar regions would be timely, now that the Napoleonic Wars had abated. The purposes of the voyage were several: to impress the world with the prestige of the Imperial Russian Navy, to explore for new geographic discoveries, to gather plants and animals from these remote shores, and to search the northwest coast of America south of the Bering Strait for that elusive passage to Baffin Bay (Brosse, 1983).

A two-masted brig was bought and re-christened the *Rurik*. The fact that the

Rurik was mounted with 8 cannons, that it was dispatched under the war flag, and that it carried an impressive bronze bust of its sponsor Romanzof revealed that another purpose of the voyage was to satisfy the personal vanity of Romanzof (Mahr, 1932). Romanzof acquired the services of Otto von Kotzebue, a lieutenant in the Imperial Russian Navy, to be the ship's commander. Kotzebue, as a mere 15-year-old cadet, had accompanied Krusenstern on his expedition of 1803-06 on board the *Nadezhda*. News of this upcoming Romanzof expedition reached Chamisso in Berlin in 1815 through Julius E. Hitzig, a mutual friend of both Chamisso and Romanzof and Chamisso's later biographer. Chamisso applied to be a naturalist. His application was passed along and eventually got into the hands of Krusenstern. Prof. C.F. von Ledebour had been appointed to be the expedition naturalist but became ill and was unable to go. Thus, Chamisso was a last-minute replacement. The *Rurik* left Kronstadt, Russia, on July 30, 1815. Chamisso boarded the ship on its stop in Copenhagen. He later admitted that when he signed on for the voyage he had no idea of just what coasts were to be explored (Kratz, 1986). Included in the ship's contingent were a surgeon, Johann F. Eschscholtz, who also served as scientist and entomologist, and a painter, Login A. Choris, a German by birth and only 20 years old. There was one other (volunteer) naturalist, Martin Wormskjold.

Limited space here does not permit a detailed account of the stops, but a partial abstract of the log of the *Rurik* for the voyage indicates the following stops: Plymouth, England; Tenerife, Canary Islands; Santa Catarina, Brazil; around Cape Horn; Talcahuano, Chile; Easter Island; crossing the Equator; and Awatcha Bay, Kamchatka Peninsula, Russia. By now it was midsummer, 1816, and *Rurik* touched down at St. Lawrence Island in the northern Bering Sea. Chamisso (1830) noted that the vegetation

barely covered the black soil and "the dwarfish Willows do not reach to one's knee". The alpine/arctic flora here adorned the foot of the mountains.

The *Rurik* proceeded farther north, entering the Bering Strait. It sailed east into a sound on the north side of the Seward Peninsula, which came to be known as Kotzebue Sound. Other commemorative names persist in this region: Cape Krusenstern to the north and Eschscholtz Sound to the east. In his historical account of botanical exploration in Alaska, Hultén (1940) was highly laudatory of Chamisso and his efforts at botanizing during his relatively brief time spent in Alaska. Hultén stated that: "Chamisso stands out as the one splendid exception to this rule [of being content to publish only general descriptions of the flora]. This prescient and brilliant investigator was the first systematically to collect all vascular plants found in the places he visited From his work the scientific world was for the first time able to form some conception of the total flora of vascular plants found in one place in Alaska." In Sept., 1816, the *Rurik* stayed at Unalaska Island in the Aleutians, where Chamisso (1830) observed that the sea along the coast was rich in algae, with gigantic *Fucus esculentus* [= *Alaria*], the "sea kale of the Russian inhabitants." He noticed that although the terrestrial fauna and flora became diminished as they sailed farther north, the marine life increased. "The Sea became more and more peopled" (Chamisso, 1990). Chamisso later admitted that it was on Unalaska that he experienced his only incident of real danger. The *Rurik* was ready to weigh anchor the next dawn, but Eschscholtz had not returned from his botanizing, even though darkness had fallen. Chamisso led a search party into the rugged mountains. The sound of a cannon shot let them know the doctor had returned safely and called them back. In the pitch-black

night, Chamisso led his group down a near-perpendicular gorge, made hazardous by melting snow water and rolling stones. Looking back on that gorge, he could hardly believe how he and his men had got down without mishap. Sailing southward, the ship arrived in San Francisco Bay on Oct. 2, 1816, where it stayed until Nov. 1. During this two-month stay in California, Chamisso collected a number of plants and algae. The best known species that he described is the California poppy, *Eschscholtzia californica*, California's State Flower. Earlier botanists, such as Archibald Menzies, had visited California prior to Chamisso, but they arrived during the seasons when this species was not in flower and thus missed it. Chamisso named the genus after Dr. Eschscholtz, his great friend and traveling companion on the *Rurik* (Schmid, 2001).

The next landfall for the *Rurik* was Hawaii, the Sandwich Islands. Several days were spent in the harbor of "Hana-ruru" (Honolulu). The dignified ruler King Kamehameha I invited Kotzebue, Chamisso, and the others within the hallowed area of the "heiau" (temple) for a ritual meal of roast pork, and the visitors were treated to an exhibition of hula dancers. Chamisso later remarked that in his life he had the honor of shaking hands with three great men: Sir Joseph Banks, Lafayette, and Kamehameha (Schweizer, 1973). Yet Chamisso still had time to make plant collections and to study the Hawaiian language, during his two stops in Hawaii. His linguistic research was eventually published in 1837 (*Über die Hawaiische Sprache*). The ship proceeded in a southwesterly direction to the northern Marshall Islands, where they discovered the Ratak atoll chain. Then in an impressive leg, the *Rurik* returned to Unalaska, where two months (late April-late June 1817) were spent. The more northerly lying Pribilof Islands (St. Paul and St. George) were next visited, and Chamisso noted that Nature

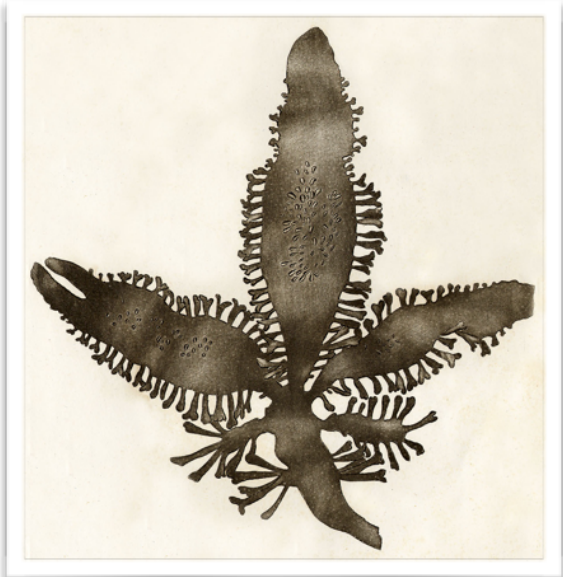


Fig. 1. *Sphaerococcus volans* C. Agardh [pl. XVIII in C. Agardh, 1821b.] [= *Mazzaella volans* (C. Agardh) Fredericq.]



Fig. 2. *Fucus antarcticus* Chamisso in Choris (1822, pl. 7) [= *Durvillaea antarctica* (Chamisso) Hariot.]

showed herself to be much more frigid than at Unalaska. The *Rurik* then sailed to St. Lawrence Island in the northern Bering Sea. It was at this point on the voyage, on July 12, 1817, that Kotzebue, with concerns about the sight of increasing masses of icebergs and his own health, made the decision to abandon the search for the Northeast Passage (Mahr, 1932). It was from here that the *Rurik* made its gradual way homeward, via Unalaska, Hawaii, the Philippines, Madagascar, Cape Town, Portsmouth, Copenhagen, Kronstadt, and finally St. Petersburg--the ship actually sailing right up to the front of Romanzof's palace.

C.A. Agardh in Lund, Sweden, was the recipient of many of Chamisso's algal collections, and he described these collections from remote sites around the world (C. Agardh, 1820b, 1821a, b, 1822). According to Papenfuss (1976) a problem with Chamisso's work is that there was much confusion in regard to the origins of some of his collections. For example, at least three species with obvious Pacific North American

affinities, *Fucus furcatus*, *Sphaerococcus papillatus*, and *S. volans*, were stated to be from Unalaska, Hawaii, and the Cape of Good Hope, respectively. But when one takes into account the difficult circumstances of the voyage, such errors are more excusable. Beneath Chamisso's sleeping berth were three drawers (the artist Choris had only one drawer), and it was this extremely limited space that was allocated for storage of his collections for a voyage of three years. Occasionally, collections would be crated up and sealed using pitch. Kotzebue "constantly complained about the natural history collections piling up" on the deck or between-decks (Brosse, 1983). The crew members were totally unsympathetic toward the scientific efforts, and they showed their contempt for the research by tossing

collections overboard. On top of this, Chamisso, like Darwin after him, was plagued by seasickness, against which he ceaselessly struggled but in vain. My point is that there were very good reasons for getting some of the collection data mixed up.

Another adverse factor was that Chamisso often arrived to make his collections just as the rainy season began. Rainy weather occurred at Teneriffe in the Canary Islands; the rainy season prevailed during the stay in Brazil and again when they were in the interior of Oahu in Hawaii (Schlechtendal, 1843).

Dawson (1954) demonstrated how some detective work can resolve this problem of the provenance of Chamisso's collections. *Sphaerococcus salicornia* [now *Gracilaria salicornia* (C. Agardh) E.Y. Dawson] was collected allegedly from Unalaska Island (C. Agardh, 1820b, pl. VIII). It was highly unlikely that this tropical species could occur in the far North Pacific. When collecting in Manila Harbor in the Philippines, Dawson obtained specimens that were in full agreement with *S. salicornia*. He examined the log of the *Rurik* and saw that the *Rurik* spent a total of six weeks in Manila. Thus, circumstantial evidence strongly pointed to the conclusion that material of *S. salicornia* came from Manila Harbor, not from Unalaska. The status of other Chamisso-collected algae follows:

Sphaerococcus chamissoi C. Agardh (1820b, 1822); J. Agardh (1846, as *Gigartina chamissoi*), with a provenance of Chile, has been treated (Hommersand et al., 1993) as the correct name of the type of resurrected genus *Chondracanthus* Kütz., viz., *C. chamissoi* (C. Agardh) Kütz.

The status of genuine *Rhodomela aleutica* C. Agardh (1820b, pl. V); J. Agardh (1846, as *Odonthalia aleutica*), from Unalaska, remains uncertain. Masuda & Yamada (1980) questioned whether it is an

independent species or synonymous with *O. floccosa*.

During the eight days in Cape Town, Chamisso collected with the help of J.L. Mund and G.L. Drebs. A red alga growing on a green algal host was the source of much consternation. Both Chamisso and C. Agardh misinterpreted the relationship (C. Agardh, 1820a; Chamisso, 1821). They regarded the pair of algae to be an example of "metamorphosis," of one type of alga transforming into the other. The red algal epiphyte, *Sphaerococcus mirabilis* C. Agardh (1820b, pl. VII) [= *S. confervicola* Mertens ex Chamisso (1821), is now known as *Heringia mirabilis* (C. Agardh) J. Agardh (1846). Its green algal host, *Conferva mirabilis* C. Agardh (1820b, pl. IX) [= *Lychaete mirabilis* (C. Agardh) J. Agardh in C. Agardh (1846)], is now known as *Cladophora mirabilis* (C. Agardh) Rabenhorst. *Sphaerococcus volans* C. Agardh (1821b, pl. XVIII) [= *Gigartina volans* (C. Agardh) J. Agardh (1846)] (Fig. 1) is now known as *Mazzaella volans* (C. Agardh) Fredericq.

Sphaerococcus papillatus C. Agardh (1821 b, pl. XIX), with the erroneous attribution to Hawaii, is thought to have been collected while the *Rurik* was in San Francisco Bay. Formerly treated as *Gigartina papillata* (C. Agardh) J. Agardh (1846), this alga is now known as *Mastocarpus papillatus* (C. Agardh) Kütz. (Guiry et al., 1984).

Sphaerococcus difficilis C. Agardh (1822), based on a collection made by Chamisso from Brazil, is now known as *Cystoclonium difficile* (C. Agardh) J. Agardh, but it remains a poorly known taxon.

Cystoseira spicigera C. Agardh (1820b, pl. III) was said to be from Kamchatka. Setchell & Gardner (1903) treated it as of uncertain status.

Sporochnus medius C. Agardh (1821a, 1821b, pl. XVI) from Unalaska was transferred to *Desmarestia* (J. Agardh, 1846, as *D. aculeata* var. *media*) and is now treated

within *D. viridis* (O.F. Müller) J.V. Lamour. *Sphaerococcus concinnus* (Turn.) C. Agardh var. *immersus* C. Agardh (1822) was based on specimens collected by both Chamisso and Gaudichaud from Hawaii. It is now known as *Ahnfeltiopsis concinna* (J. Agardh) Silva & DeCew (Silva & DeCew, 1992).

C. Agardh (1821a, 1821 b, pl. XIII) described *Fucus evanescens* based on collections made from Kamchatka by Chamisso and from Sakhalin by Tilesius.

Batrachospermum kamtschaticum C. Agardh (1821 b, pl. XX) was described from Kamchatka, Russia. J. Agardh (1846) transferred it to *Draparnaldia*.

Chamisso prepared the magnificent plate and provided the description of his own species *Fucus antarcticus* (Fig. 2) for inclusion in Choris (1822, pl. 7). This alga, now known as *Durvillaea antarctica* (Chamisso) Hariot, was collected in the vicinity of Talcahuano, Chile. By October of 1818, Chamisso had returned to Berlin, and in the following year he received an honorary PhD degree from Friedrich Wilhelm University. A faculty member and friend was Alexander von Humboldt, who nominated Chamisso for membership in the Royal Prussian Academy of Sciences (Rogers, 1949). Chamisso was appointed to be the custodian of the Royal Botanical Gardens of Berlin, and thus with a salaried position he finally had some financial security. In 1819 he married the 19- year-old Antonie Piastre, whom he had known when she was still a child (he was twice her age). This marriage produced seven children.

Kotzebue's account of the voyage was published in 1821, comprised of two volumes and an appended third volume consisting of Chamisso's writings on scientific topics (*Bemerkungen und Ansichten*, or "Notes and Opinions"). It was not until 1836 that Chamisso published his own account of the voyage. Vol. I was subtitled *Tagebuch*, or

"journal", which was the diary he kept while aboard the *Rurik*, while vol. 2 was essentially a reprinting of his earlier work published in 1821. These two volumes are the first two volumes in his collected works (1856). While Kotzebue's (1821) account of the voyage suppressed many incidents and bordered on the inaccurate, Chamisso felt no constraints and thus spoke the whole truth (Rogers, 1949). Chamisso was critical because Kotzebue, afraid that approaching ice would injure his health, turned the ship back and thus abandoned one of the main motives for the voyage, geographic discoveries in the far North Pacific (Mahr, 1932). He was upset that the commander had not at least discussed his decision with the staff. Chamisso's criticism of Kotzebue dealt a severe blow to Kotzebue's reputation. Upon the ship's safe return, Count Romanzof accepted Kotzebue's report without question (Brosse, 1983).

The period 1826-1837 was the time of Chamisso's major poetic and scientific productivity. One of his poems, *A Woman's Life and Love*, was so lyrical that it was set to music by the composer Robert Schumann. With his old friend Schlechtendal, Chamisso founded the botanical journal *Linnaea*. In its early volumes, Chamisso described many of his collections made while on the *Rurik*.

In regard to Chamisso's fellow shipmates on the *Rurik*, Choris, the talented artist who began his world travels at the young age of 18, spent 8 years in Paris after the expedition, learning the art of lithography from the masters. His splendid volume of lithographs published in 1822 showed scenes from the Romanzof expedition, including scenery, people, plants, and animal life encountered. Chamisso is credited for having done the illustrations for several of the plates, including those on jellyfish and a new species of coconut from Brazil. Another book of his illustrations by Choris, *Vues et Paysages des Regions*

Equinoxiales, appeared in 1826. In 1828, when Choris was traveling in Mexico, he was murdered by bandits near Veracruz (Garnett, 1913). He was only 33. Eschscholtz was to serve on a later voyage with Kotzebue but died at the age of 38, back in his hometown of Dorpat [now Tartu, Estonia]. By 1831 Chamisso's health began its steady decline. He had a cough that persisted for years. According to Schlechtendal (1843) Chamisso risked his health by taking long walks and by his incessant exposure to rain, wind, and snow. Chamisso outlived his wife by only a year, dying on Aug. 21, 1838.

- Agardh, C.A. 1820a. *Dissertatio de metamorphosi algarum* Officina Berlingiana, Lundae. [Not seen.]
- _____. 1820b. *Icones algarum ineditae*. Fasciculus primus, pls. I-X. Lundae. [Not seen.]
- _____. 1821a. *Species algarum*. Vol. I, part 1, pp 1-168. Gryphiswaldiae.
- _____. 1821b. *Icones algarum ineditae*. Fasciculus secundus, pls. XI-XX. Ex Officina Ecksteiniana, Holmiae.
- _____. 1822. *Species algarum*. Vol. I, part 2, 169-531. Lundae. Agardh, J. G.
- Agardh, J.G. 1846. *Icones algarum ineditae. Fasciculi qui exstant duo*. Editio nova. Berlingiana, Lundae. pls. I-XX. [re- issue of C. Agardh's '*Icones algarum*' with text by J.G. Agardh].
- Bois-Reymond, E. du. 1889. *Adelbert von Chamisso als Naturforscher*. 64 pp. Von Veit & Co., Leipzig.
- Brosse, J. 1983. *Great Voyages of Discovery. Circumnavigators and Scientists, 1764-1843*. Translated by S. Hochman. 228 + [4]pp. Facts on File Publ., New York.
- Chamisso, A. von. 1821. Ein Zweifel und zwei algen. *Gesellsch. Naturforsch. Freunde Berlin Verhandlungen* pp. 173-180, pl. V.
- _____. 1830. Notices respecting the botany of certain countries visited by the Russian voyage of discovery under the command of Capt. Kotzebue. [Translated from the German edition of the Voyage.] *Hooker's Botanical Miscellany I*: 305-323.
- _____. 1836. *Reise um die Welt, mit der Romanzoffischen Entdeckungsexpedition in den Jahre 1815-18 auf der Brigg Rurik, Cpt. Otto von Kotzebue*. 2 vols. Leipzig.
- _____. 1856. *Adelbert von Chamisso 's Werke*. 4th ed. Edited by J.E. Hitzig and F. Palm.] 6 vols. Weidemannische Buchhandlung, Berlin.
- _____. 1990. The Berings Straits. In J. A. Murray (ed.) *A Republic of Rivers. Three Centuries of Nature Writing from Alaska and the Yukon*. Pp. 57-62. Oxford University Press, New York.
- Choris, L. 1822. *Voyage pittoresque autour du monde 1815- 1818*. [Part I]. Firmin Didot, Paris.
- Dawson, E.Y. 1954. Notes on tropical Pacific marine algae. *Bull. S. Calif. Acad. Sci.* 53: 1-7.
- Fischer, R. 1990. *Adelbert von Chamisso. Weltbürger, Naturforscher und Dichter*. Vorwort von Rafik Schami. 205 + [2] pp. Erika Klopp Verlag, Berlin, München.
- Garnett, P. 1913. San Francisco one hundred years ago. Translated from the French of Louis Choris. A. M. Robertson, San Francisco. v + 20 pp.
- Guiry, M.D., J.A. West, D.-H. Kim, & M. Masuda. 1984. Reinstatement of the genus *Mastocarpus* Kützing (Rhodophyta). *Taxon* 33: 53-63.
- Hommersand, M.H., M.D. Guiry, S. Fredericq, & G.L. Leister. 1993. New perspectives in the taxonomy of the Gigartinaceae (Gigartinales, Rhodophyta). *Hydrobiologia* 260/261: 105-120.
- Hultén, E. 1940. History of botanical exploration in Alaska and Yukon territories from the time of their discovery to 1940. *Bot. Notiser* 1940: 289-346.
- Kotzebue, O. von. 1921. *Entdeckungsreise in die Süd-See und nach der Berings-Strasse zur Entdeckung einer nordöstlichen Durchfahrt. Unternommen in den Jahren 1815-18* 3 vols. Weimar. [English translation by H.E. Lloyd] *A Voyage of Discovery into the South Seas and Behring's Straits, 1815- 18 ...* , 3 vols. London, 1821.
- Kratz, H. (Translator and Editor) 1986. *A voyage around the world with the Romanzov Exploring Expedition in the years 1815-1818 in the brig Rurik, Captain Otto von Kotzebue by Adelbert von Chamisso*. XXIV + 375 pp. University of Hawaii Press, Honolulu.
- Lowenstein-Wertheim, L. von. [Translator] 1957. *Peter*

- Schlemihl* by Adelbert von Chamisso. 93 pp.
John Clader, London.
- Mahr, A.C. 1932. The visit of the "Rurik" to San Francisco in 1816. Stanford University Publ. University Series, History, Economics, and Political Science 2(2). 194 pp., 7 pls.
- Masuda, M. & I. Yamada. 1980. On the identity of the so-called *Odonthalia aleutica* (Rhodophyta, Rhodomelaceae) in Japan. Jap. J. Phycol. 28: 183-189.
- Papenfuss, G.F. 1976. Landmarks in Pacific North American marine phycology, pp. 21-46. In: I.A. Abbott & G.J. Hollenberg (eds.) *Marine Algae of California*. XII+ 827 pp. Stanford University Press, Stanford, CA.
- Rogers, C. 1949. Trodden-Glory. The story of the California poppy with a description of some Russians. 130 pp. Published at Santa Barbara by Wallace Hebbard.
- Schlechtendal, D.F. L. von. 1984. A tribute to the memory of Adelbert von Chamisso, (especially with reference to his devotion to botany). London J. Bot. 2: 483 ['481']-491. [Translated from German, which appeared in Linnaea 13: 93-112 (1839).]
- Schmid, G. 1942. Chamisso als Naturforscher, eine Bibliographie. 175 pp., frontispiece. K.F. Koehler, Leipzig.
- Schmid, R. 2001. Eschscholtz and Chamisso linked in California and elsewhere. Taxon 60: 1806-1807.
- Schneebeli-Graf, R. (Ed.) 1983. *Adelbert von Chamisso ... und lassen Gelten, was Ich beobachtet habe. Naturwissensch. Schriften mit Zeichnungen des Autor*. 324 pp. Dietrich Reimer Verlag, Berlin.
- Schweizer, N.R. 1973. *A Poet among Explorers: Chamisso in the South Seas*. 55 pp. Verlag Herbert Lang, Bern and Frankfurt M.
- Setchell, W.A. & N.L. Gardner. 1903. Algae of northwestern America. Univ. Calif. Publ. Bot. 1: 165-418.
- Silva, P.C., & T.C. DeCew. 1992. *Ahnfeltiopsis*, a new genus in the Phylloporaceae (Gigartinales, Rhodophyceae). Phycologia 31: 576-580.

Michael J. Wynne
University of Michigan, Ann Arbor