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Bavarian plant collectors in Greece – 1. Franz Xaver Berger, Franz Zuccarini and Carl Nikolaus Fraas

Abstract

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Short biographies are presented of three Bavarian plant collectors in Greece. Franz Xaver Berger (1806–1834), a catholic priest, and Franz Zuccarini (1799–1833), the brother of the Munich Professor Joseph Gerhard Zuccarini, came to Greece with King Otho in 1833. Both died in Nauplia. The third, Carl Nikolaus Fraas (1810–1875), came to Athens in 1835, evolved in Greece from a pure plant systematist to an economic botanist, and returned to Munich in 1841, where he became later Director of the Royal Central School of Veterinary Medicine and Professor at the University.

Key words: biography, history of botany, vascular plants, herbaria, time of King Otho of Greece (1832–1863).

Introduction

Many papers and books have been published on Bavarian philhellenism and its role during the Greek liberation war and the time of King Otho I (1832–63), a Bavarian prince who was selected by the three guaranty states United Kingdom, France and Russia to be King of Hellas. For detailed information see Bower & Bolitho (1997) and Heydenreuter & al. (1995). However, little attention has been paid to the associated botanical exploration. In 1859 the journal "Flora" published anonymously a translation of an essay in "Moniteur Grec" of 27 May 1855, entitled "Über die botanischen Untersuchungen, welche in Griechenland seit der Ankunft des Königs Otto I. gemacht worden sind". This was partly based on Fraas (1845: appendix), and mentioned a number of plant collectors, who nearly all came from Bavaria. The flowering plant species *Thesium bergeri* Zucc., *Crepis fraasii* Sch. Bip., *Silene sartorii* Boiss. & Heldr. and *Ophrys spruneri* Nyman, familiar to students of Greek botany, are named after these intrepid scientists, who belong to the generation after Smith and Sibthorp but preceding Heldreich. Their lives and their activities as plant collectors in Greece have fallen into oblivion.

A short biography of Wilhelm von Spruner was published by Ascherson (1906) 32 years after Spruner's death. Heldreich (1880) wrote an obituary on Josef Sartori. Link (1834) and Fraas

(1845) appreciated the activities of the army chaplain Franz Xaver Berger. Nikolaus Fraas is an exception. He became more widely known by a report on his excursions in Greece (Fraas 1845), Löbe (1878) provided a short biography of him and there is an extensive recent biography by Zehetmair (1995). Hardly anything is known about others such as Franz Zuccarini, the younger brother of the Munich botanist Joseph Gerhard Zuccarini, and Franz Josef Schuch. All these collectors came to Greece between 1833 and 1835 with the Bavarian Brigade or the Bavarian Volunteer Corps and with the exception of Josef Sartori and his superior Xaver Landerer they all had to leave Greece by 1844 or they died there. This paper will present the curricula vitae of Berger, Zuccarini and Fraas. More exhaustive biographies of Spruner, Sartori, Landerer and Schuch are in preparation.

Franz Xaver Berger (1806-34)

Franz Xaver Berger was born on 18 May 1806 in Rott am Inn as the third child of Lorenz Berger and his wife Katharina, née Bucher. According to the baptismal register his father was a barber by profession and later a surgeon (Doc. 1). On the day of his birth he was christened Franz Xaver [sic!] after his godfather, the inn keeper Franz Xavier Obermayr. In 1830 he was listed as one of the 52 candidates to be ordained as a priest in the archbishop's clerical-seminary in Freising. On 21 August 1830 he was ordained as a priest. Thereafter in 1831 he was "Kooperator" in Schellenberg (nowadays Marktschellenberg) near Berchtesgaden and in 1832 the third chaplain in Berchtesgaden (Doc. 2). Concerning his function as a chaplain in Kay near Tittmoning, there is no evidence in the archives of the Archbishopric of Munich and Freising.

Plants collected by Berger in the Berchtesgaden area attracted the attention of two botanists from Munich, Carl Friedrich Philipp von Martius and Joseph Gerhard Zuccarini, and they persuaded Berger (Fraas 1845) to accept the tempting offer to accompany the Bavarian Brigade to Greece in 1832 as a field chaplain.

The brigade consisted of four infantry battalions, one cavalry division and one artillery company. At the beginning of November 1832 they set out from their garrisons in Landau, Würzburg, Amberg and Lindau, and gathered in Munich in order to cross the Alps. In mid December they arrived at Triest, went on board at the end of the month and sailed off on 5 January 1833. On 31 January the 32 ships anchored in the port of Nauplia, the temporary capital of Greece. Apart from other military officials, surgeons, pharmacists, etc. two catholic field chaplains (Joseph Schaeffer from Partenkirchen and Franz Xaver Berger from Berchtesgaden) as well as a protestant field preacher (Julius Mayer) (Schuster 1909: 329) belonged to the military contingent. The fact that there were women and children as well joining the baggage train can be concluded from the detailed reports about the crossing of the Alps, the voyage and the sojourn of the brigade that lasted until 1835 (Abele 1836, Bronzetti 1842, Chursilchen 1838, Predl 1841). These reports and unpublished documents (Doc. 4) of the Bayerischen Hauptstaatsarchiv Abt. Kriegsarchiv (Bavarian Main State Archives, Section War Archives) show that far more members of the expedition corps died from illness than from military activities. Chaplain Schaeffer died in September 1833, so that the pastoral service for the widely spread Bavarian military contingents (for stationing plans and dislocations see Predl 1841 and Chursilchen 1838) as well as the recording of christenings, marriages and deaths were left to Berger and Mayer. For such registration duties and others directly connected with military activities the clergymen were paid out of the war chest. In addition, according to official archive documents (Doc. 3) there existed a legacy of the "Kappellendirektion zu Altötting" to the amount of 500 fl for 1000 holy masses to be said in Greece, which was used to reimburse the chaplains. The receipt for 14 fl for masses said in October 1833, which Berger made out on 31 October 1833, is possibly the most extensive document of Berger's handwritings that has remained (Fig. 1). The texts of his herbarium sheets are very short and show only the name of the plant, as was the standard practice at that time.

Immediately after his arrival Berger started to collect plants in the area of Nauplia (Anonymous 1859: 489). In spring and summer 1833 he accompanied numerous military expeditions and under their protection collected plants in the mountains along the main roads. There are two short reports on the time Berger spent in Greece and especially about his plant collecting activi-

Auflistung

1833 14 fl - x. f. gering. auf Goldenf. wulst
 von den Herrn. bis auf Arzgada - Comando
 Caffa. Schatzgräber für ... Monts.
 Oberbaus gering. nur Methana aufgelöst, gegeben
 auf jährl.

Nauplia den 31 Oct. 1833

*F. Xav. Berger
 Rath. Pfl. Kystan.*

Fig. 1. Handwriting of Franz Xaver Berger – receipt for 14 fl for masses said in October 1833. – Bayerisches Hauptstaatsarchiv, Abt. IV Kriegsarchiv.

ties, one by Link (1834-35) and one by Petter (1835). Both are, in a way, obituaries, for Berger had already died in Nauplia on 20 January 1834.

Link (1834: 129-130), who travelled around in Greece, writes [translated, original text see Appendix, (1)]: "In August of the year 1833 I undertook a journey to Greece, which by the Bavarians became a part of Europe. I was accompanied by the nobleman Leopold von Buch, an experienced geographer". After the description of their route he continues: "The Reverend Berger, a priest from Bavaria, was living in Nauplia. He was very fond of Botany and told us about many plants he had collected on different journeys through Greece. We had him and another gentleman, the pharmacist Sartori, as extremely pleasant companions on our journey to Athens". ... "From Nauplia we quickly came to Epidaurus, then we took our course over high and rough mountains to ruins of the antique Troizen and a port of the new kingdom, which is now named Poros. In this port we embarked on a small vessel, sailed past Cape Methana and landed on Aegina, an island better cultivated than other areas of new Greece. Again we used a small ship and arrived at Piraeus and Athens ...". On their return from Athens via Eleusis, Megara, the Skyronian rocks, the Isthmus, Korinth and the Nemenion planes see Link (1834: 130). Later Link (1835) adds [translated, original text see Appendix, (2)]: "After I had sent the first pitiful small part of these contributions to the highly esteemed publisher [i.e. Schlechtendal] I received, woe!, a letter from Greece, which announced the far too early death of the praiseworthy Mister Berger. Although he was tall in stature, his delicate constitution was unable to cope with the warm dry climate of the country and the strenuous mountain climbing. Having returned from a journey through the Peloponnese and not in good health, yet driven by his the love of botany, he could

not resist another journey with us to Athens. On this journey he was permanently ill and not really able to collect plants. After our return we left him in Nauplia (October 1833) in a better state of health, however, and we hoped for the recovery of this man, who was inspired by such a great love of botany. But two months after we had said farewell to Greece (November 1833), this kind and honourable man succumbed to his fate. He left a herbarium, which he had collected in Greece with great care. Unfortunately he did not write the places down, where he had found the plants, although he had them in mind."

The other source where Berger and his collecting activities are mentioned is Petter (1835: 551) [translated, original text see Appendix, (3)]: "Two of my appreciated correspondents were claimed by relentless death last year, namely Mr Franz Xaver Berger, field chaplain in the Bavarian Brigade of Hellas, who died in Nauplia. He was a passionate botanist, to whom Greece offered a wide field for botanical activities. If he had lived longer he would certainly have given proof of this". The other deceased was Dr Michahelles, who followed a division of Bavarian volunteers to Greece as an army doctor in 1834. All that Petter (1835) reports about him is that he travelled in Dalmatia and that he was more interested in ornithology. Petter received many plants and other natural history specimens from him. According to Petter, Michahelles died in Nauplia on 15 August 1834. For more details of his life see Gebhardt (1964).

In the Bayerischen Hauptstaatsarchiv there is a second receipt about 10 fl for masses, said between 1 and 20 November 1833, which is no longer Berger's handwriting (Doc. 3). The signature Berger wrote on 2 January 1834 shows that his hand must have trembled, a sign for his serious illness at that time. Concerning the demise of Berger there is another document (Doc. 4) in the archives that was directed to the "kgl. b. Landgericht in Wasserburg" [Royal Bavarian district court in Wasserburg] by the commander of the Bavarian brigade in Greece. It says [translated, original text see Appendix, (4)]: "Franz Xaver Berger born in Rott am Inn, army chaplain in the Bav. Brigade under my command in Greece died on 20 January this year of a lingering fever (febris gastrica nervosa = typhoid fever) in the military hospital in Nauplia. His estate was sent to the Royal District and Municipal Court of Munich for further inheritance regulations; I herewith decree that the Royal District Court shall inform the heirs of the deceased". From another document (Doc. 5) we know that the cash left amounted to 90 fl 44 ob. Another document relating to the rest of his belongings, says [translated, original text see Appendix, (5)]: "The whole estate of the deceased army chaplain FX Berger brought here by the ship Bafranese, namely 2 chests and 1 small suitcase with collections and a suitcase with clothes, have been sent to Munich by the homebound carts of the carter Kränkel, who had brought Royal Greek troops here, and they were addressed to the trading house Banquid and Eichthal to be delivered there because they were in charge of such transports. These carts left here on 15 April. Triest, 3 May 1834".

We know from Martius (1850) quoted here after Fürnrohr (1851) that Berger's collections, which did not only consist of a herbarium but amphibians (reptiles included) and molluscs as well (Anonymus 1859: 484), were acquired by the Bavarian academy in 1834 for 500 fl (Hertel & Schreiber 1988) from the heirs. The money was part of the amount of 1200 fl that had been installed by "most merciful extraordinary subsidies". From this legacy 1040 species from the Cape countries collected by Zeyher & Ecklon were also purchased. Berger's herbarium contains about 1200 specimens of Greek plants, most of which were collected in the area of Nauplia, Argolis, Greek Roumelia and the Peloponnesos. Other plants collected by Berger found their way into the Munich collection (M) with the herbarium of Joseph Gerhard Zuccarini, as is confirmed by Boissier (1879) and Halász (1904).

Berger was also very much interested in molluscs, as is documented in the names of *Erjavecia bergeri*, an endemic genus of the eastern Alps discovered by him, and in *Chondrula bergeri*, first collected by him in Greece.

Franz Zuccarini (1799?-1833)

Franz Zuccarini, the younger brother of Joseph Gerhard Zuccarini, a philhellene who had already visited Greece before 1833, must have been born after 1797. His father, Franz Zuccarini senior,

an outstanding member of the Munich theatre “with great mimic talent, wide knowledge and cosmopolitan education” had come to Munich with Karl Theodor from Mannheim (Fürnrohr 1848). His mother, née Lang, was a lady with “Anmuth und edlem Charakter” [“grace and noble character”]. After his mother’s death his father, who had left the theater at an advanced age, devoted nearly all his time to the education of his children. Joseph Gerhard and Franz had a younger sister, who like the two boys, was given an excellent education. While they were young, the three children wrote poems, some of which were published in 1839 under the title “Kleeblätter, Lieder dreier Geschwister” [“Clover Leaves, Songs of Three Siblings”].

One can assume that Franz was given a similar education as his older brother, who, prepared by private teachers, successfully attended the Gymnasium [grammar school] and the Royal Lyceum, which qualified him to study medicine (Fürnrohr 1848). Whether Franz studied in Erlangen like his brother is not certain. In contrast to Joseph Gerhard, Franz saw his main task in the profession of a surgeon, at the same time maintaining a vivid interest in botany as well. It is not known, whether he collected only for his brother or kept his own herbarium. Hertel & Schreiber (1988) think that his samples found their way into the Munich herbarium together with his brother’s collection, whereas Martius (1850) after Fürnrohr (1851) does not cite Franz Zuccarini’s collection amongst the collections that came to the Bayerische Staatsherbar (M) along with the herbarium of Joseph Gerhard Zuccarini but completely separately. Fraas (1845) writes [translated, original text see Appendix, (6)]: “The basis of all the collections of Greek plants in Munich was laid by the prematurely deceased captain Dr Fr. Zuccarini, who was renowned for his work as a medical officer in Greek service. He combined the outstanding courage of a soldier with the profound knowledge of a surgeon and the sensitive heart of a noble philanthropist, who, in dangerous activities in the wild mountains of the mainland and the islands – especially of Crete – did not forget, in his hours of leisure, to enjoy the pleasures that the most peaceful and amiable science provides”. Botanical papers by Franz Zuccarini do not exist. That is probably why he is not mentioned by Anonymous (1859).

He had already been in Greece during the struggle for liberation and had among other activities worked as surgeon in Nauplia (Bronzetti 1842: 159). A spot check in the Munich herbarium showed that he had collected *Valerianella discoidea* in Epidaurus in March 1830. Quotes prove that he had collected near Thebas (Halácsy 1902: 158), on Tymphrestos mountain in Aetolia (Halácsy 1904: 69), in Evvia (Halácsy 1904: 69), at Lerna (Halácsy 1904: 300, 308, 315), at Eleusis (Halácsy 1904: 77), on Acrocorinth (Boissier 1879: 732), ‘ad promontorium Taenarum’ (Halácsy 1904: 305) and ‘ad mons Palamidi prope Nauplia, rupes verticales’ (Halácsy 1904: 247). I could not find out in which year he went to Greece and when he returned to Bavaria. However he is registered as Captain of the medical corps in the entourage of the young King Otho for whom Graf Armansperg, as the head of the Regency, applied for passports for passing through Austria, Tuscany, Modena and the Papal States to the Kingdom of Naples (facsimile edition in Kotsowilis 1998). In the transcription of this document Joseph and Gerhard are added falsely as the Christian names of the captain of the medical corps, Dr Zuccarini. Joseph Gerhard Zuccarini, however, never went to Greece (Fürnrohr 1848, 1851, Martius 1850). Franz Zuccarini boarded the British frigate ‘Madagascar’ in Brindisi with the young king and they arrived at Nauplia on 30 January 1833. It is not certain whether he was still collecting plants in 1833.

His accidental death at the end of December 1833 is mentioned by Bronzetti (1842: 158) [translated, original text see Appendix, (7)]: “A tragic event that happened during the last days of our stay here moved the whole town (Nauplia) and roused general sympathy. Dr Zuccarini, a German philhellene, went to Itzkali in matters of the hospital with the Bavarian captain in the medical corps Dr Fleschütz. On the way to the fort they talked about the possibility of climbing the rock on whose southern side the fort is situated. Zuccarini told him that he had already done this during an earlier visit to Nauplia; despite all attempts to dissuade him, he took off his sword and, confident of his skill and his knowledge of the terrible path through the cliffs, he started to climb. But suddenly a slab of rock came loose under his feet and he fell into a deep abyss where he found his grave. His humane attitude, his tireless and active life, his devotion to a good cause

and especially the keen enthusiasm, with which, conscious of his rewarding vocation, he sympathetically tried to soothe his patients' sufferings, had, during his earlier visits to Nauplia, already gained him general esteem, which he later justified even more in his new position as a Greek captain in the medical corps."

According to the Bavarian Brigade's register of deaths this accident happened on 21 December 1833 and he was buried on 24 December. This text and the register in Predl (1841) confirm that he had entered Greek service and did not belong to the Bavarian brigade, which was in Greece from 1833 till 1835.

Carl Nikolaus Fraas (1810-75)

Carl Nikolaus Fraas was born on 8 September 1810 in Rattelsdorf near Bamberg. Löbe (1878) and Zehetmair (1995) quote 6 September. The 8 September, however, is documented in the police registration of the family (facsimile in Zehetmair 1995: 325-327), the staff list of the Ludwig Maximilian University (copy in Zehetmair 1995: 333) and on the gravestone on the Munich South Cemetery. The present contribution focuses on his collecting activities and his time in Greece, since his further life is described in detail by Zehetmair (1995).

Carl Nikolaus Fraas was born as an illegitimate child of Elisabeth Maria Müller, the daughter of a farmer, and of the young Rentamtaktuar Josef Andreas Fraas. When later Carl's mother married the Rentmeister Valentin Dumbroff, his natural father, who was working at Schloss Banz at that time, took care of him. At that time Carl Nikolaus was 10 years old. He was sent to the Lateinschule and later to the Altes Gymnasium in Bamberg. In 1830 he left grammar school with such good results that after one and a half years at the Lyceum he was allowed to start studying medicine at the Ludwig Maximilian University in Munich. After only one semester he took a botany examination and came out best. That earned him an annual grant of 100 fl combined with an assistant's job at the botanical garden and the herbarium of the academy (nowadays M). So he was able to work with the two famous Munich university botanists, Carl Friedrich Philipp von Martius and Joseph Gerhard Zuccarini. On 1 August 1834 he received a medical doctorate for a purely botanical topic "De Smilaceis brasiliensibus", and combined with his doctorate he was granted the qualification for the teaching profession at grammar schools.

"In connection with the great migration of the Bavarians to New Hellas, Fraas seized the opportunity of undertaking a botanical excursion on a larger scale, took on the job of a court master with the Graf Saporta, who was major-domo of King Otho of Greece, and went to Athens in January 1835" (Fraas, handwritten autobiography, Bayerische Staatsbibliothek München, facsimile in Zehetmair 1995: 329-332 [translated, original text see Appendix, (8)]). On the way to Greece he already took the opportunity to make excursions (Fraas 1845: appendix). He stopped in Korfu, interrupted his voyage in Navarino, from where he made excursions up to Modon. "After I had spent three days in Poros searching the area, I came to Athens in the spring of 1835, just at the time of most varied abundance of our vegetation, started to pile treasure upon treasure and shied away neither from roving through the moist and fever-ridden Attic lowland – at that time boggy from the waters of the River Cephissos – nor from the dry, steep and shadeless mountains. I was in good health and, in due course, supported by the government, the collections expanded and under my direction (from 1837 onwards) the beginnings of a botanical garden were laid out, close to the town by the holy road to Eleusis, not far from Plato's Academy and the Cephissos, which provided the water. ... Thus both devotion and vocation encouraged me to make numerous annual botanical excursions to the Parnes of Attica, Eleusis and the Theban plane, Marathon, Oropos with the picturesque Pentele, Sunium and especially the Hymettus, rich in herbs, with the strand of the Saronian Gulf" (Fraas 1845: appendix [translated, original text see Appendix, (9)]).

In early spring 1836 Fraas had the chance to take part in a journey of the kings Otho of Greece and Ludwig von Bayern to the Cyclades (Ross 1848). On this journey they visited the islands of Milos, Santorini, Anaphi, Ios, Naxos, Syros, Tinos, Delos, Rhinia, Paros and Milos again, whereas Fraas returned to Athens from Tinos via Andros (Fraas 1845: appendix). He writes about his journey: "... without collecting many new specimens, for I found that the vege-

tation of these isles is similar to that of the eastern coast of Greece, apart from a few exceptions. I later received many specimens from Dr Landerer, the court pharmacist, who often visited these isles and described some of them more precisely." (Fraas 1845: appendix [translated, original text see Appendix, (10)]). Immediately after his return to Athens he visited the island of Salamis. Later in 1836 he was ordered by the Ministry of the Interior to travel in the northern mainland of Greece, called Greek Roumelia, to give a botanical report. For details see Fraas (1845: appendix); the map of this journey in Zehetmair (1995: after 55) contains mistakes since Zehetmair drew it to correspond with the headline and not the text of this chapter. For the borders of Greece at that time see the map in Bower & Bolitho (1997: 121).

In 1837 some events turned out to be positive for Fraas. On 14 February King Otho came to Athens with his wife Amalie, a princess of Oldenburg whom he had married on 22 October 1836 (Henneberg 2004). Amalie was very much interested in nature and gardening and arranged immediately that 300 little lemon and orange trees, which had been given as a present to her by the town of Sparta, were planted south of the castle, which was still being built, and thus initiated the laying out of the park that is now called Ethnikos Kipos (for more information on the history of this park see Papageorgiou-Vardas (2004) and Schmidt (2004)).

Favoured by the obligingness of the government Fraas was already able to start out on an excursion to the Peloponnese in March. He visited Killini, Parnon and the Taygetos mountains, studied the vegetation of the fertile plains of the Argolis and the barren rocks at Nauplia "überrascht durch den großen Unterschied der Vegetation der Küste gegenüber dem ebenso trockenen und felsreichen Attika" ["surprised by the big difference in the vegetation of the shore here and the similarly barren and rocky Attica there"] and searched for plants in the Mani down to Gerolimin. On his way back to Argos he was informed by fugitives that the plague had broken out in Poros. Therefore he decided to return to Athens via Argos and Korinth. For details see Fraas (1845: appendix), the itinerary is mapped in Zehetmair (1995: after 55).

In the same year of 1837 Graf Saporta returned to Bavaria after the death of his wife. That meant that Fraas lost his job and was available to perform other tasks. He was appointed professor of botany at the newly founded university in Athens. He held lectures in Katharevousa, a heavily archaized form of modern Greek, and in the same year he wrote a textbook "Stoicheia tis botanikis" ["Elements of Botany"], also in Katharevousa, to be used by his students. In addition, he was given the task of laying out a botanical garden and was appointed ephore of all royal gardens. So at the end of 1837 he was both a civil servant and in the service of the court.

Together with the young Queen a young lady called Adelheid Voigt had come to Athens as a lady-in-waiting. She was born on 12 June 1819 in Oldenburg. Carl Fraas married her at the beginning of 1838. Their love-match as a Bavarian-Oldenburg connection stood under the special protection of the royal couple. The first child, a son, Heinrich Perikles, was born on 30 October 1838 in Athens, the second child, a daughter, Amalie Irene, on 29 September 1840, also in Athens. Altogether Carl and Adelheid had nine children, of whom six reached adulthood.

For 1838 and 1839 there are no reports of any extensive excursions, but in 1840 he wrote a report on his last major excursion in Greece. In summer 1840 it took him from Athens via Thebes to Livadia and to Orchomenos from where he explored the Topalia swamp and the plain of Cheronia which he estimated to be the most fertile region of Greece. He climbed Parnassos from Davlia and via the monastery of Ierousalim and passing the *Abies* region, he very quickly got to the bare rocks where he noticed that there were hardly any deciduous trees on Mt Parnassos. Concerning the wide plateau of this massif he writes [translated, original text see Appendix, (11)]: "Not a single tree or shrub covers the wide upland plateau here and only in the deeper gorges can one find *Juniperus nana*, *Ribes uva-crispa*, *Daphne oleoides*, *Potentilla speciosa* and *Prunus prostrata*. A little further down *Pinus laricio* and then soon the tops of the black firs. But the wide plateau interrupted by more than 28 peaks is covered with fresh short grass, densely matted ..." (Fraas 1845: appendix). Rambling for 12 days in the Parnassos he returned via Arachova and turned towards Distomo, where he stayed for some days. Passing along the western slopes of Helikon via the monastery of Hosios Lukas, he climbed Mavrovouni, crossed the

Helikon in order to go back to Livadia. There he met Wilhelm von Spruner, who planned to do the same excursions Fraas had already completed. Deterred by the growing danger in the region they went together via Thebes to Evvia, where they collected plants on Mt Dirphis. From there Fraas returned via Steni, Chalkis and Aulis to Athens (Fraas 1845: appendix).

As with Wilhelm von Spruner he was also friendly with Joseph Sartori. The latter took part in excursions that had been organized by Fraas, but later visited many places that were accessible to very few botanists, because as court pharmacist he took part in the journeys of the King. Fraas attended the sessions of the scientific circle that regularly met in the laboratory of the court pharmacist Dr Xaver Landerer, after the court had moved to Athens in 1834 (Barth 1936: 12). There he had the idea of founding a scientific society to promote scientific thinking. So the "Natur-historische Gesellschaft" [Society of Natural History] was founded, which installed a little museum where lectures were given in German, Greek and Latin.

Fraas offered herbarium specimens for 10 fl per 100, but it seems that he only came into contact with Schultz-Bipontinus (1842a) and not with others as Joseph Sartori and Wilhelm von Spruner did. Therefore only very few plants collected by Fraas became the sources for new descriptions. The ones named after him are *Crepis fraasii* Sch. Bip. (Schultz-Bipontinus 1842a) from Hypathi, a place visited by Fraas in 1836, *Achillea fraasii* Sch. Bip. (Schultz-Bipontinus 1842b), which was collected at Timfristos, also in 1836, *Centaurea saxicola* var. *fraasii* Sch. Bip. (Schultz-Bipontinus 1842b), *Orobanche fraasii* F. Schultz (1843), now synonymous with *Orobanche lavendulacea* Rchb., and *Ischarum fraesianum* Schott (1859), now *Biarum fraesianum* (Schott) N. E. Br. It is not known what happened to the undoubtedly very significant personal herbarium of Fraas (1861). In Index Herbariorum (Holmgren & al. 1990) the collection of Fraas is not cited as an important part of any great public herbarium. Some specimens are preserved in Munich (M) and Vienna (W).

Apart from his books on botany (Fraas 1837, 1843, 1845 and 1847), his paper of 1861 is his only publication of pure botanical content that was found by searching relevant journals of his time (Flora, Linnaea, Österreichisches Botanisches Wochenblatt, Österreichische Botanische Zeitschrift and Gartenflora).

Besides the purely floristic research of his new home Fraas was primarily interested in plant geographical and ecological questions. In addition he must have recorded phenological observations and compared them with dates of antique authors. He watched the fall of leaves during the dry period in summer and the renewed sprouting of many species during the period of the first rainfall in autumn and recognized a very short vegetation period before the first frosts came, in many older trees and in those he had planted himself. He realized that the cultivation of Central European and North American plant species was difficult or failed, whereas it was easy to acclimatize species from the Cape provinces and Australia. He observed the time of seeding and harvesting of cultivated plants and thus came to agricultural botany. Observations of the climate and temperature readings, ordered by the King and performed first by Graf Saporta, later by Fraas and the royal personal physician Dr Wibmer, became the basis for agricultural and forestry experiments. He always compared plant pathological phenomena with antique texts, especially with those of Theophrast. He used the measurements of geographical altitudes provided by a commission of French land surveying officers to determine the vertical spread of certain plant species and to illustrate the altitudinal structure of the vegetation. He recognized four altitudinal zones to which he assigned characteristic indicator species. To these zones he gave a system of subdivisions in the Appendix of his Synopsis florae classicae (Fraas 1845). He evaluated his statements critically and discussed different views. Concerning plant geography Fraas compared the flora of Greece with that of the Levante, N Africa and Sicily.

Besides his tasks as professor of botany, Fraas as ephore of the royal gardens achieved a great deal, even beyond the extent of supervision and giving advice. A tree nursery in the botanical garden in the area of the summer estate of the former Turkish governor of Athens, the Haseki estate (for detailed information on structure and history of this place see Bofilia 2004), and a model farm near Tyrins were initiated by Fraas. He classified the soils of the Greek plains in

three grades and illustrated how to identify them (Fraas 1845). In addition, he gave advice as to which plants should be grown in which grade of soil. In grade 1 areas wine, cotton, tobacco and wheat should be cultivated, in grade 2 regions, predominantly wheat, barley, melons and pulse and finally on grade 3 soils, barley, chick-peas, olives and fruit-trees. In doing this he made sure of taking local traditions into account. During that time Fraas was responsible for the botanical garden, which was then a model farm. Thousands of seedlings of olive and fig trees were planted, date palms were imported and vines from the Rhine Palatinate. A ship from Genoa brought 15 000 plants for the royal garden at the castle in Athens and the botanical gardens. Many seeds and fruit trees were imported for the model farm at Tiryns. Hence, from 1838 onwards Fraas evolved from a pure plant systematist to an economic botanist.

In these years the political circumstances in Greece dramatically worsened the living conditions for the Bavarian philhellenes, caused by governmental errors, by the differing interests of the regional warlords and by the different policies of the three guaranty states, the United Kingdom, France and Russia. In Athens, Bavarians could hardly dare to go into the street without being molested. This and the prevailing hygienic conditions caused more and more Bavarian Greeks to leave the country. Fraas' wife and his eldest son suffered from the "endemisches Wechselfieber" ["endemic malaria"] so that Fraas decided to send his wife and the children back to his recently widowed mother in Bavaria in summer 1841. He himself followed in November of the same year. The Bavarians who had been enlisted for the service of his Majesty the King of Greece (Abele 1836: appendix IV), were regarded as being on leave for two years. If they preferred to stay longer, they forfeited their right to return to Bavarian service. However this regulation did not apply to civilians such as Fraas, so he could not make a claim on an official job on his return to Bavaria.

After his return he applied for a chair in natural sciences or botany at one of the Bavarian universities or for a job at a grammar school or a polytechnical school. On 9 March 1842 he was given a job as a teacher of "Naturgeschichte und Realien" [natural history and science] at the royal "Landwirtschafts- und Gewerbeschule" [agricultural and trade school] in Freising. At the same time he was appointed director of the royal silk-worm breeding farm. On 9 October 1843 he passed the medical state exam that enabled him to teach natural sciences at higher educational levels. This exam was necessary because regulations had been altered during the time of his stay in Greece. During his time in Freising, where his tasks did not completely satisfy him, Fraas wrote his most important botanical opus: "Synopsis plantarum florae classicae", where he attempted to assign the Greek and Latin plant names of antique authors to species in the sense of modern science (Fraas 1845). In the same year he was appointed inspector and professor of chemistry and technology at the "Höhere landwirtschaftliche Lehranstalt" [higher agricultural school] in Schleißheim. During his time there he made many agrochemical experiments, which gave him a greater insight into fertilization problems and enabled him to prove that Liebig's Patentdünger [patent fertilizer] had no effect.

For the winter semester 1847/48 he was appointed associate professor of agriculture at the faculty of political sciences at Munich University. In the same year the family moved to Munich. On 18 February 1848 Josef Gerhard Zuccarini died and immediately after that, on 24 February, Fraas applied for the vacant chair of "Forstbotanik, ökonomisch-technische Botanik und forstliche Produktion" ["Forestry Science, Economic-technical Botany and Forestry Production"] (copy of Fraas' application in Zehetmair 1995: 336-337). Among the six other applicants were Friedrich Schultz and Adalbert Schnitzlein, both respected botanists. Fraas was given the chair on 26 September after the board of the faculty had recommended him unanimously on 16 March 1848.

Fraas developed great journalistic activities and also did editorial work with the journal "Die Schramme" and the "Centralblatt des landwirtschaftlichen Vereins in Bayern". As head of the board of the "Königliche Central-Thierarzneischule" ["Royal Central School of Veterinary Medicine"] he had to deal with the training of veterinary surgeons and tried to solve problems in co-operation with the students. His agrochemical experiments led to the invention of the lysimeter,

an instrument for the measurement of the concentration of solutions, an important gadget for soil research and then soil qualification. He initiated the production of chemical fertilizers in Bavaria and also the foundation of agricultural societies.

King Maximilian II., a great enthusiast for the sciences, was more interested in the renewal of natural sciences than in art and architecture in Bavaria. In consequence, outstanding new scientists were offered chairs at the Ludwig Maximilian University, among whom Justus Liebig was the most important. Others were Karl Nägeli (botany), Karl Theodor Siebold (zoology) and Philipp Jolly (physics). First Fraas and Liebig cooperated quite well but later due to their different positions they became involved in ever more bitter disputes. Fraas was actually a pugnacious scientist, who was really capable of defending agro-political positions, but could not cope with Liebig's occasional polemic attacks and certain intrigues. He became somewhat resigned, lived a secluded life and was forced to witness the gradual disappearance of agricultural sciences from the university curriculum. He died on 10 November 1875, aged just 65.

Portraits of Fraas are published in Haushofer (1941) and Zehetmair (1995). A facsimile of his handwriting is reproduced in Zehetmair (1995: 329-332).

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References

- Abele, J. A. S. 1836: Griechische Denkwürdigkeiten und die K. bayerische Expedition nach Hellas. – Mannheim.
- Anonymus 1859: Über die botanischen Untersuchungen, welche in Griechenland seit Ankunft des Königs Otto I. gemacht worden sind (Übersetzung aus dem Moniteur Grec vom 27. Mai 1855). – *Flora* **42**: 483-495.
- Ascherson, P. 1906: Nachrichten über das Leben von Wilhelm v. Spruner. – *Bull. Herb. Boissier*, ser. 2, **6**: 582-584
- Barth, W. 1936: Geschichte der deutschen Gesellschaft Philadelphia in Athen. – Athen.
- Bofilias, A. 2004: Erster botanischer Garten Athens und Versuchsbauernschule in Gut Haseki. Die Pflanzenwerkstatt für ein grünes Königreich. – Pp. 65-82 in: Kunst- und Kulturkreis Rastede e.V. (ed.), Amalie: 1818-75; Herzogin von Oldenburg, Königin von Griechenland. – Oldenburg.
- Boissier, E. 1879: *Flora orientalis* **4**. – Genevae, etc.
- Bower, L. & Bolitho, G. 1997: König Otto von Griechenland. – Autenried [Translation of: Otho I, King of Greece. London 1939].
- Bronzetti, C. J. 1842: Erinnerungen an Griechenland aus den Jahren 1832-1835. – Würzburg.
- Chursilchen, M. 1838: Die Bayerische Brigade in Griechenland. – Nürnberg.
- Fraas, C. N. 1837: Stoicheia tis botanikis. – Athina.
- 1843: Beitrag zur Geschichte europäischer Kulturpflanzen: Der Weinstock, der schwarze und weiße Maulbeerbaum. – *Jahresber. Königl. Landwirtschafts- und Gewerbeschule zu Freising* **1842**: 43.
- 1845: *Synopsis plantarum florae classicae*. – München.
- 1847: Klima und Pflanzenwelt in der Zeit, ein Beitrag zur Geschichte beider. – Landshut.
- 1861: Zur neuen arcadischen Tannen-species. – *Flora* **44**: 62-63.
- Fürnrohr, A. E. 1848: Bericht über die Gedenkrede auf Joseph Gerhard Zuccarini. Gelesen in der öffentlichen Sitzung der königl. bayer. Akademie der Wissenschaften am 28. März 1848 von Carl Friedrich von Martius, Secretär der math. phys. Classe. – *Flora* **31**: 625-638.

- 1851: Literaturbesprechung zu K. Fr. Ph. v. Martius: Das königliche Herbarium zu München.
 — Flora **34:** 3-15.
- Gebhardt, L. 1964: Die Ornithologen Mitteleuropas. — Giessen.
- Halácsy, E. von 1902, 1904: Conspectus florae Graecae **2, 3.** — Lipsiae.
- Haushofer, [H.] 1941: Carl Fraas, Herkunft und Wirken eines fränkischen Landwirts im 19. Jahrhundert. — Familiengesch. Schriften Ges. Familienforsch. Franken **6.**
- Heldreich, Th. von 1880: Josef Sartori. — Bot. Centralbl. **1:** 1182-1184.
- Henneberg, J. M. 2004: Die königliche Hochzeit 1836 in Oldenburg. — Pp. 11-18 in: Kunst- und Kulturkreis Rastede e.V. (ed.), Amalie: 1818-75; Herzogin von Oldenburg, Königin von Griechenland. — Oldenburg.
- Hertel, H. & Schreiber, A. 1988: Die Botanische Staatssammlung München 1813-1888 (Eine Übersicht über die Sammlungsbestände). — Mitt. Bot. Staatssamml. München **26:** 81-512.
- Heydenreuter, R., Murken, J. & Wünsche, R. 1995 (ed.): Die erträumte Nation. Griechenlands Wiedergeburt im 19. Jahrhundert, ed. 2. — München.
- Holmgren P. K., Holmgren, H. N. & Barnett, L. C. (ed.) 1990: Index herbariorum. 1 The herbaria of the World, ed. 8. — New York.
- Kotsowilis, K. 1998: Die griechische Kirche in München als Gotteshaus zum Erlöser, Gemeinde der Hellenen und Mittelpunkt des bayerischen Philhellenismus. — München.
- Link, H. F. 1834-35: Symbolae ad floram graecam. — Linnaea **9:** 129-141, 567-588.
- Löbe 1878: Fraas, Karl F. — Pp. 202-203 in: Allgemeine deutsche Biographie **7.** — Leipzig.
- Martius, K. F. P. von 1850: Das königliche Herbarium zu München. — Münchener Gelehrter Anzeiger **31.**
- Papageorgiu-Venetas, A. 2004: Amalie von Oldenburg (1818-1875), Königin von Griechenland, und der königliche Garten in Athen. — Pp. 29-44 in: Kunst- und Kulturkreis Rastede e.V. (ed.), Amalie: 1818-75; Herzogin von Oldenburg, Königin von Griechenland. — Oldenburg.
- Petter, F. 1835: Correspondenzen — Flora **18:** 551.
- Predl, F. X. M. A. von 1841: Erinnerungen aus Griechenland in den Jahren 1832, 1833, 1834 und 1835 nebst einer gedrängten Darstellung des griechischen Freiheitskampfes von 1821-33, ed. 2. — Würzburg.
- Ross, L. 1848: Reisen des Königs Otto und der Königin Amalia von Griechenland **1.** — Halle.
- Schmidt, F. 2004: Der königliche Hofgarten in Athen. — Pp. 46-49 in: Kunst- und Kulturkreis Rastede e.V. (ed.), Amalie: 1818-75; Herzogin von Oldenburg, Königin von Griechenland. — Oldenburg.
- Schott, H. W. 1859: Aroideen-Skizzen — Österr. Bot. Z. **9:** 98-101. [[CrossRef](#)]
- Schultz, F. 1843: Andeutungen zur Kenntnis einiger Orobanchen Griechenlands. Fragment aus den Vorarbeiten zur Monographie der Gattung *Orobanche*. — Flora **26:** 125-132.
- Schultz Bipontinus, C. H. 1842a: Correspondenz. — Flora **25:** 172-174.
- 1842b: Notiz über einige neue und wenig bekannte *Compositae*, welche Dr. Fraas in Griechenland gesammelt hat. — Flora **25**, Beibl. **1:** 158-160.
- Schuster, J. 1909: Die Expedition des bayer. Hilfskorps nach Griechenland 1832-1835 in sanitätsgeschichtlicher Hinsicht. — Oberbayer. Archiv Vaterländ. Gesch. **54:** 325-363.
- Zehetmair, F. A. 1995: Carl Nikolaus Fraas (1810-1875). Ein bayerischer Agrarwissenschaftler und Reformer der intensiven Landwirtschaft. — Misc. Bavaria Monacensis **151.**

Unpublished documents

- Archiv des Erzbistums München und Freising:
 Doc. 1: AEM Taufbuch Rott am Inn. Bd. 3: 477
 Doc. 2: AEM Schematismen der Jahre 1830-1833
- Bayerisches Hauptstaatsarchiv, Abt. IV Kriegsarchiv:
 Doc. 3: Bayerische Brigade in Griechenland 1833-1835 Regularien: Rechnung über 500 fl., welche die Kappellen Direction zu Altötting für die in Griechenland zu lesenden 1000 heiligen Messen gestiftet hat.

Doc. 4: Bayerische Brigade in Griechenland 1833-1835 Matrikel der Taufen, Hochzeiten und Sterbefälle

Doc. 5: Bayerische Brigade in Griechenland 1833-1835 Verlassenschaften [= Nachlässe, Anmerk. Verf.]

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Appendix – Original texts

- (1) “Anno 1833 mense Augusto iter in Graeciam, Europae per Bavarios redditam, feci, comite viro ill. Leop. De Buch Geognos peritissimo” ... “Naupliae vir reverend. Bergerus degebat, Presbyter Bavarus, Flora deditissimus, qui multas plantas in variis itineribus per Graeciam lectas nobiscum communicavit. Hunc et alium virum clar. Sartorium, Pharmaceuticum gratissimos itineris Atheniensis comites habuimus” ... “A Nauplia dicens Epidaurum contendimus, tum per montes altos asperosque cursum versus antiquae Troezenes rudera et novi regni portum nunc Poron vocatum direximus. Scapham in hocce portu ingressi et promotorium Methanae prae-tervecti Aeginam adpulimus insulam melius cultam, quam aliae Helladis novae regiones. Iterum parvo navigio vecti Piraeum Athenasque ...”. (Link 1834).
- (2) “Postquam harum Symbolarum Particulam I. Editori celeberr. Misera, accepi, heu!, litteras e Graecia mortem praematuram reverendi viri Bergeri nuntiantes. Statura magnus, pectore angusto minus bene tempestatem calidam et sicciam illius terrae; continuosque montium altorum adscensus perferebat. Ex itinere per Peloponesum redux, et adhuc nonoptima valetudine fruens, attamen amore Botanices perictus non potuit recusare nobiscum aliud iter Athenas versus suscipiendi. In itinere jamjam laborabat et plantis colligendis minus erat aptus. Post reditum vero meliore valetudine fruentem Naupliae reliquimus et multa speravimus de viro tanto Botanices amore flagrante. At post duos menses, quam Graecia ipsique vale diximus, vir integer, probus, mitis fato occubuit. Reliquit herbarium in Graecia magna diligentia collectum; dolendum vero loca natalia non adscripsisse, quae memoria tenebat. Sit illi terra levis.” (Link 1835).
- (3) “Zwei meiner schätzbarsten Correspondenten hat mir der unerbittliche Tod im vorigen Jahr entrissen, nämlich Hrn. Franz Xaver Berger, Feldkaplan der bayer'schen Brigade von Hellas, welcher in Nauplia starb. Er war ein leidenschaftlicher Botaniker, dem sich in Griechenland ein grosses, weites Feld für die botanische Wirksamkeit aufthat. Hätte er länger gelebt, so würde er gewiss Proben derselben gegeben haben”. (Petter 1835).
- (4) “Franz Xaver Berger von Rott am Inn gebürtigt, Feldkaplan bey der unter meinem Comando stehenden bayer. Brigade in Griechenland ist am 20sten Jänner d. J. an einem schleichen Knotenfieber (febris gastrica nervosa) im Militärkrankenhaus zu Nauplia gestorben. Dessen eingelagerte Effekten wurden ans königliche Kreis- und Stadtgericht München zur weitern Verlassenschaftsverhandlung übersendet. Ich verfüge das königliche Landgericht, die Erben des Defuncti hiervon zu verständigen.” Doc. 4.
- (5) “Sämtliche auf dem Schiff Bafranese mit hierher gebrachten Effekten des verstorbenen Feldgeistlichen FX Berger nämlich 2 Kisten und 1 kleiner Koffer mit naturhistorischen Sammlungen und 1 Koffer mit Kleidung sind durch die rückgesandten Wägen des Fuhrmann Kränkel, welcher königlich griechische Truppen hierher brachte, nach München abgesendet worden und wurden dem Handlungshaus Banquid und Eichthal zur Ablieferung adressiert, weil dort die Frachtgabung angewiesen ist. Die Wägen sind den 15. April hier abgegangen. Triest, den 3. Mai 1834”. Doc. 5.
- (6) “Die erste Grundlage aller Sammlungen griechischer Pflanzen, wie sie in München vorliegen, legte der durch ärztliches Wirken berühmte so früh verstorbene Stabsarzt im griechischen Dienst, Dr. Fr. Zuccarini; ein Mann, der mit dem hervorragenden Muthe eines Kriegers die tiefen Kenntnisse des Arztes und das gefühlvolle Herz eines edlen Menschenfreundes verband, der auch auf den gefahrsvollen Zügen in die wilden Hochgebirge des Festlandes und der Inseln – namentlich Creta's – nicht vergass, sich in Mussestunden den Genüssen, welche die friedlichste und lieblichste Wissenschaft spendet, zu ergeben.” (Fraas 1845).
- (7) “Ein tragisches Ereignis, welches sich in den letzten Tagen unseres Aufenthalts dahin zugegragen hat, setzte die ganze Stadt [Nauplia] in Bewegung und erregte allgemeine Theilnahme. Dr. Zuccarini, ein deutscher Philhellene, begab sich mit dem bayerischen Stabsarzt Dr. Fleschütz in Angelegenheiten des Spitals auf Itzkali. Auf dem Weg nach dem Fort entspann sich ein Gespräch über die Möglichkeit den Felsen zu ersteigen, auf welchem dasselbe gegen der südlichen Seite hinliegt. Zuccarini erzählte, dass er dieses schon während seines früheren Aufenthalts in Nauplia

gethan habe; er legte im Vertrauen auf seine Gewandtheit und Kenntnisse des furchtbaren Klippenwegs, trotz allen Abredens den Degen ab, und begann zu klettern. Plötzlich aber lösst sich eine Felsplatte unter seinen Füßen, und er stürzt in den tiefen Abgrund, wo er sein Grab findet. Seine humanen Gesinnungen, sein rastlos thätiges Leben, seine Liebe für die gute Sache und besonders sein reger Eifer, womit er im Gefühle seines schönen Berufes, theilnehmend die Leiden der Kranken zu lindern suchte, hatten ihm schon bei seinem früheren Aufenthalte in Nauplia allgemeines Vertrauen erworben, das er später in seiner neuen Stellung als griechischer Stabsarzt noch mehr rechtfertigte.” (Bronzetti 1842).

(8) “Gelegentlich des großen Zuges der Bayern nach Neuhellas ergriff Fraas die Gelegenheit, eine größere botanische Exkursion zu machen und nahm die Stelle eines Hofmeisters bey dem Hrn. Grafen Saporta, dem Hofmarschall des König Otto von Griechenland an und ging im Januar 1835 nach Athen.” (Fraas after Zehetmair 1995).

(9) “Nachdem ich in Poros drei Tage verweilt und die Umgebung abgesucht hatte, kam ich in Athen im Frühling 1835 an, gerade zur Zeit der üppigsten Gestaltung unseres Pflanzenreichthums, begann dann Schätze auf Schätze zu häufen und scheute deshalb weder die feuchte und fieblerzeugende attische Niederung – damals vom Cephissus durchsumpft, noch die trockenen und steilen, wasser- und schattenlosen Berge zu durchziehen. Von Krankheiten frei und durch die Regierung bald unterstützt, wuchsen die Sammlungen und entstand unter meiner Leitung die erste Anlage eines botanischen Gartens, nahe der Stadt, am heiligen Weg nach Eleusis, unfern von Platos Akademie und dem wasserverleihenden Cephissos. ... So also forderten mich Neigung und Stellung zu alljährlich oft wiederholten botanischen Exkursionen gleichmäßig auf, deren Endpunkte dann gewöhnlich der attische Parnes, Eleusis und die thebanische Ebene, Marathon, Oropos mit dem malerisch schönen Pentele, Sunium und vorzüglich der kräuterreiche Hymettus mit dem Gestade des Saronischen Golfes waren”. (Fraas 1845).

(10) “... ohne viel Neues zu sammeln, denn ich fand die Vegetation der Inseln jener der Ostküste Griechenlands nur mit geringen Ausnahmen gleich. Vieles erhielt ich später durch Dr. Landerer, den Hofapotheker, der die Inseln oft besuchte und manche beschrieb.” (Fraas 1845).

(11) “Nicht Ein (sic!) Baum oder Busch bedeckt hier die weite Bergebene und nur in den tieferen Schluchten finden sich *Juniperus nana*, *Ribes uva-crispa*, *Daphne oleoides*, *Potentilla speciosa* und *Prunus prostrata*. Etwas tiefer *Pinus Laricio* und schon die Wipfel der schwarzen Tannen. Wohl aber bedeckt frisches kurzes Gras, dichtverfilzt die ausgedehnte und von mehr als 28 Bergkegeln unterbrochene Platte ...”. (Fraas 1845).