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Jacob Forster (1739–1806) and his connections with forsterite and palladium

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SUMMARY. The person after whom forsterite was named has been confirmed as Jacob Forster (1739–1806), a mineral collector and dealer of London. The discovery of palladium and rhodium by William Hyde Wollaston and of iridium and osmium by Smithson Tennant appears to have been made on crude platinum ore from South America supplied by Forster.

THE etymology of some mineral names is unknown, but in most instances these names arose in ancient or medieval times and only rarely, especially when the name is given after a person, does the origin of more recent names come into question. This is the case with forsterite. In his original description of this mineral, published in 1824, Armand Lévy stated that the name was given '. . . in honour of the late Mr. Forster, who has so much contributed to the advancement of mineralogy by his extensive connections in that branch of science in every part of the world, and by having laid the foundation of one of the finest private collections, now in the hands of Mr. Heuland'.

The later attributions of this name in standard reference works are varied. Hintze's *Handbuch der Mineralogie* (1889) states that the mineral was '. . . nach dem Amerikaner L. Forster benannt', and an attribution to L. Forster also appears in Zambonini's *Mineralogia Vesuviana* (1910). Albert H. Chester in his *Dictionary of the Names of Minerals* (1896) states that forsterite was named '. . . probably in honor of Professor J. R. Forster'. This is a reference to the German mineralogist and student of natural history Johann Reinhold Forster (1729–98). Dana's *System of Mineralogy* states in the fifth edition (1868) that the mineral is named after '. . . Mr. Forster, a patron of mineralogy' and in the sixth edition (1892) as '. . . after Mr. J. Forster, founder of the Heuland cabinet'.

With reference to J. Forster, Poggendorff's *Handwörterbuch* (1863) provides the following information about Jacob Forster:

Prof. d. Mineralogie zu St. Petersburg; in den letzten Jahren Privatmann. Geb. 1739 etwa, gest. 1806, Mai 27, St. Petersburg. A.a.O. keine Schriften gennant. Besass eine grosse Mineralien-Sammlung, die er dem russ. Bergcorps für 50,000 Rubel verkaufte.

This account is drawn from a brief memorial to Jacob Forster published in Leonhard's *Taschenbuch* (1807), which reads in entirety as follows:

Professor der Mineralogie, starb zu St. Petersburg am 27ten Mai, 1806, im 67ten Jahre s.A. Er lebte seit 10 Jahren als Privatmann zu St. Petersburg, woselbst er vor 3 Jahren an den

Kaiser Alexander I, für das Bergkadettenkorps, eine sehr beträchtliche Mineralien-Sammlung für 50,000 Rubel verkaufte. Seit mehr als 40 Jahren hatte er in vielen Ländern Europas bedeutende Reisen und sehr ansehnlichte Geschäfte im Mineralien-Handel gemacht. Mehrere Kabinete, unter andern das des Königs von Spanien, verdanken ihm wichtige Beiträge.

Through the very kind aid of Professor Dimitri P. Grigoriev of the Mining Institute, Leningrad, a search was made for mention of Forster in early manuscript transactions of the Academy of Science of St. Petersburg and in a work by D. Sokolova, written in 1830, on the history of the Mining Institute. The most interesting new information found was a communication from Forster to the Academy, dated 27 February, 1805, relating to the discovery of the element palladium. This is discussed in a following section. Forster also appears in the transactions of the 1 May, 1805, meeting of the Academy in connection with the purchase from him by the Museum of the Mining Institute of 1139 fine mineral specimens for 50 000 rubles. The purchase was arranged in 1802 by the Russian chemist A. Moussin-Poushkin, academician and Vice-President of the Institute, and was authorized by Czar Alexander Pavlovich [Alexander I, 1777–1828] who had then newly acceded to the throne. The acquisition, which included an emerald ring 'of which few have seen the like', was said to have raised the mineral collection of the Museum to a level comparable to that of the renowned mineral cabinets of Europe. Moussin-Poushkin (1804) stated that Forster's specimens mostly came from American, Spanish, French, and English localities. Payment to Forster included a transfer of gold specimens from the Institute collection together with cash sums over a period of time. His will indicates that he died before the transaction was effected. What happened to the matter over the following eventful years in Russian history is not known.

Reference is made elsewhere in the Academy records to gifts by Forster during 1804 and 1805 of fossil madrepores and of a large mass of selenite from the neighborhood of Madrid. Forster is referred to throughout as the 'foreigner Forster', the 'Englishman Forster' or as the 'naturalist Forster'. There is nothing to support the belief that he was a Professor in St. Petersburg.

Additional information about [Adolarius] Jacob Forster has been obtained through his will[1], and through unpublished manuscript notes left by Sir Arthur Russell in the Department of Mineralogy of the British Museum (Natural History) and kindly brought to my attention by Mr. Peter G. Embrey. Reference to Forster also was found in the memorial by Sir Arthur Russell (1950) to John Henry Heuland (1778–1856), an English mineral collector and dealer who was Forster's nephew.

Forster is believed to have been of the family that included the naturalists George [Johann George Adam] Forster (1754–94) and Johann Reinhold Forster (1729–98),[2] both of whom travelled with Cook on his second world voyage in 1772–5. This family left Yorkshire on the death of Charles I in 1649 and settled in Polish Prussia, where Jacob Forster is known from correspondence associated with his will to have had

[1] This and certain other information relating to Forster derives from a search made by Mr. Brian G. C. Brooks, genealogist, of London.

[2] *Allgemeine Deutsche Biographie*, Berlin, 7, 166–81, 1968; *Dictionary of National Biography*, Oxford University Press, London, 7, 455–6.

relatives. Forster dealt actively in minerals over a period of about 45 years, and formed a large and valuable personal collection of minerals. His mineral business in London was carried on at the Piazza, Covent Garden, as early as 1789, and later by his wife, during his long stays in Russia, at No. 26 Gerrard Street, Soho, a few blocks off Leicester Square. Forster also had a mineral store in Paris, run by his brother [Igham] Henry Forster. This Forster also was a mineral collector, and Jacob acknowledges that many of the finest specimens in his own collection came from him. Forster is known to have held sales of minerals in Paris in 1760, 1769, and 1783. Forster's wife, *née* Elizabeth Humphrey, of London, had a relative, George Humphrey, who ran a shop in Leicester Square dealing with minerals and natural curiosities before 1800.[1] Her sister Hannah was a publisher and print seller whose London shop was portrayed in 1808 by James Gillray, celebrated caricaturist of the period (cf. Hill, 1965).

Jacob Forster's will, in the form of three letters written in St. Petersburg to his wife in London in 1800 and 1806, gave his main collection of minerals, kept in his house on Gerrard Street, London, jointly to his brother Henry and to his nephew John Henry Heuland. It was stipulated that the collection be catalogued and then sold by Heuland, with the proceeds to be divided. Other small collections and stocks of minerals at various locations, including '5 or 6 boxes of specimens collected in Russia for the King of Spain [Charles IV], worth 1000 pounds', together with a collection of rare money, were variously disposed of to his wife and relatives. His oil portrait went to Heuland. A valued 'ring with two eyes' mentioned in the will is identified, by a ring of the same period presently exhibited in the jewelry collection of the Hermitage Museum, Leningrad, as a small agate so cut as to reveal the concentric banding in two areas.

Forster's private collection was ultimately sold together with additional material from Heuland, who was himself an active collector, to C. H. Turner. Lévy's three volume catalogue *Description d'une collection de minéraux, formée par M. Henri Heuland* refers to Turner's collection and not to Heuland's personal collection proper. The stock of Forster's store was sold by auction beginning 2 May, 1808. The description of forsterite by Lévy was made on a specimen from Vesuvius in Turner's collection that Heuland had purchased himself from the collection of an unidentified Mr. Desse.

Turner's collection was later acquired by Henry Ludlam, and the Ludlam collection is now in the possession of the Geological Survey Museum, London. It contains two specimens of forsterite from Vesuvius that perhaps represent the type material, but inadequacies of the labelling prevent a definite identification.

Palladium

Jacob Forster and an unidentified nephew, undoubtedly J. H. Heuland, appear as shadowy figures in the curious circumstances attending the discovery of the element palladium. The written history of palladium begins with a privately printed circular

[1] George Humphrey (1745(?)–1830) supplied to, and catalogued specimens for the Revd. C. M. Cracherode, F.R.S. (1730–99), whose manuscript catalogue and some of whose specimens are now in the British Museum (Natural History) (P. G. Embrey, *priv. comm.*).

distributed in April or earlier in 1803 by Jacob Forster of No. 26 Gerrard Street, London. It announced the discovery of a new metal named palladium, stated the diagnostic chemical and physical properties thereof, and offered samples for sale. Although Moussin-Poushkin (1804) suggested that the matter originated with a nephew of Forster, described as a promising young chemist and mineralogist but not named,[1] to whom he had given certain information about the metallurgy and chemistry of platinum, it is quite certain from the accounts of L. W. Gilbert (1806) and of L. F. Gilbert (1952) that the transaction had been arranged by William Hyde Wollaston directly with Mrs. Forster. Wollaston is known from his laboratory notebooks, described by Gilbert (1952), to have recognized and named palladium in 1802 at least nine months before the appearance of the Forster circular. Both the propriety of the circular and the validity of the new element were questioned by the chemist Richard Chenevix, and led to an unfortunate controversy with Wollaston, who first appeared in the matter anonymously, that was not resolved until the latter published his formal description of palladium in 1805. Detailed accounts of the matter have been given by McDonald (1960), Reilly (1955), White and Friedman (1932), Partington (1962), and others.

Jacob Forster had knowledge of the matter, although not in London in those years, since he presented a communication on the properties of palladium, identical in content with the circular first mentioned, at the meeting of the Academy of Sciences of St. Petersburg on 27 February, 1805. The handwritten record by the Secretary of the meeting clearly states that Forster himself was demonstrating that palladium was a new metal, but this must have been an oblique and impersonal reference by Forster, not clearly caught in the transcription, to the work of Wollaston.

Although no definite evidence has been found, Wollaston probably obtained his initial supplies of crude platinum, for use in his commercial preparation of platinum ware, from Forster. Wollaston's account books establish that he purchased a total of 6000 troy ounces of crude platinum near the end of 1800 and over 1000 additional ounces by the end of 1803, at an average price of 2*s.* 10*d.* per ounce, but the sour are not identified. According to Gilbert (1952), Wollaston's later purchases, in 1[illegible]c were probably at first from John Johnson and then from either him or his son P. Johnson (founders of the firm that became Johnson, Matthey and Co. Ltd., London). That Forster did deal in platinum appears from a statement by Moussin-Poushkin (1804) that on two occasions he had obtained considerable quantities of the metal from Forster by purchase or exchange (presumably of mineral specimens). It was used for his own experiments on the working of platinum, as recounted by Menschutkin (1934).

At the time, platinum was supplied from South America largely via Spain. The Russian occurrences of platinum were not discovered until about 1820, after Forster's death. Forster had business connections in Spain as is evident both from the memorial

[1] John Henry Heuland, 26 years old in 1804, is known to have been active in mineralogy at that time and to have travelled in Russia. Heuland also had an interest in platinum since he published in 1818 an account of a large platinum nugget in Madrid, and his sale catalogues listed both platinum and palladium.

in Leonhard (1807) and from a comment by Heuland, cited by Russell (1950), that Charles IV of Spain had given Forster a grant to work a sulphur deposit near Cadiz. Forster's two older nephews, Christian and Conrad Heuland, are known from correspondence to have been in Spanish America in 1800, possibly in connection with the platinum trade.

Information about the thriving trade in platinum in London during these years, in which Wollaston played a key role, is given by McDonald (1960) and Weeks (1968). Prior to about 1800 platinum ware could be obtained only in Paris and, according to Knight (1800), was of very indifferent quality. The chemical processes used by Wollaston to prepare sponge platinum from the crude ore resulted in his recognition of both palladium and rhodium. The discovery of osmium and iridium in 1803 by Smithson Tennant, who was in financial partnership with Wollaston in the platinum refining and fabricating business from at least 1800 to his death in 1815, probably also connects with these operations on Forster's (?) ore. Tennant gave no information on the source of the insoluble residues from crude platinum in which he discovered iridium. Wollaston, however, must have produced these residues in abundance since he had extracted (in aqua regia) over 7000 ounces of crude platinum by the end of 1803. In his 1804 paper on rhodium, Wollaston commented that Tennant had communicated to him certain observations on the '. . . shining powder that remains undissolved from the ore of platinum . . .', but whose residue it was remains unclear. Very likely it had been turned over to Tennant by Wollaston.

Specimens of the original palladium do not appear to be extant. Neither the British Museum (Natural History) nor the Geological Survey Museum possess specimens of palladium or platinum that can be tied in with either Forster or Heuland. Records of the Harvard University Museum mention a specimen of palladium 'in the form of a thin foil' acquired in the early 1800's but without a specific date or source, and also slips of platinum purchased in 1808 in London. The specimens can not now be found.

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