



## An Overview on some Geological Relationships between Austrian and Italian Scientists in the 18<sup>th</sup> Century

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### Zusammenfassung

Während der österreichischen Herrschaft über das Königreich Neapel (1707–1734) wurden von der Regierung in Wien Versuche unternommen, die Bergbauaktivitäten in Kalabrien und Sizilien auszuweiten. Auch die Bourbonen-Regierung des Königreiches Neapel hielt gegen Ende des 18. Jahrhunderts an der österreichischen Bergbautradition fest. Sechs junge Studenten aus Neapel wurden nach Wien geschickt, um sowohl die deutsche Sprache als auch die Bergbau-Fachausdrücke zu erlernen, die in den verschiedenen Gegenden der Österreichischen Monarchie verwendet wurden; sie setzten in den frühen 90er-Jahren ihre Studien an der Bergakademie Schemnitz fort. Nach ihrer Rückkehr nahmen sie bedeutende Positionen in der Entwicklung mineralogischer Kenntnis im Königreich Neapel ein. In der Republik Venedig entwickelten sich besonders in der 2. Hälfte des 18. Jahrhunderts zwischen venezianischen und österreichischen Gelehrten individuelle wissenschaftliche Beziehungen auf der Basis allgemeinen geologischen Interesses.

### Abstract

During the Austrian domination in the Kingdom of Naples (1707–1734) certain attempts were made by the government of Vienna for increasing the mining exploitations in Calabria and Sicily. At the end of the 18<sup>th</sup> century the reference to the Austrian mining tradition was still highly considered in the Kingdom of Naples by the Bourbon government. Six young Neapolitan scholars were sent to Vienna to learn the German language as well as the mining dialects spoken in the various territories of the Austrian Monarchy, and later on to study at the Mining Academy of Schmenitz in the early 1790s. After their return to Italy they held important positions for the development of mineralogical science in the Kingdom of Naples. In the Republic of Venice individual scientific relationships, based on common geological interests, were established between Venetian and Austrian scientists particularly in the second half of the 18<sup>th</sup> century.

### 1. Introduction

The relationships between Austrian and Italian scientists in the field of geology were part of a large intellectual network of scientific communication which became gradually established in Europe during the second half of the 18<sup>th</sup> century: this network included in particular scholars from Italian and German States, Switzerland, the Austrian Empire, France and England and extended up to northern countries such as Sweden.

These early geologists considered themselves as part of a real European scientific community which was in constant correspondence through letters and personal contacts, thanks to the frequent scientific travels on a regional,

national and international basis. Mining expertise was also shared by many of these scientists, as for example in the case of Italy<sup>1)</sup>. This common knowledge and practical research field were much more important than the academic contacts within the universities, also because mining exploitation was greatly supported by the governments in Sweden, in some German States (in particular Saxony and Thuringia) and in the Austrian Empire, especially in the mining district of Bohemia and Hungary. Moreover, the scientific academies played an important role in the transmission of geological knowledge and in promoting contacts between scientists from different countries, mainly with the increase of their publications and meetings, but also through the establishment of the first specialized miner-

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<sup>1)</sup> VACCARI, E.: Mining and knowledge of the Earth in Eighteenth-century Italy. – In: *Annals of Science*, **57** (2000), p. 163–180.

alogical and paleontological collections: the development of the museum of the Italian Academy of Fisiocritici in Siena between the 18<sup>th</sup> and the 19<sup>th</sup> century may be considered a significant example<sup>2)</sup>.

In consideration of this historical context the aim of the present paper is to identify two kinds of Austrian-Italian geological relationships which occurred during the second half of the 18<sup>th</sup> century: those promoted by the governments, which concerned the mineralogical research for the development of mining and those established by individuals for pure scientific research purposes and common geological interests.

## 2. Relationships with the Kingdom of Naples

During the Austrian domination in the Kingdom of Naples (from 1707 to 1734) some attempts were made by the government of Vienna for increasing the mining exploitations in Calabria and Sicily, the southern regions of Italy which had a few iron mines<sup>3)</sup>: This determined the presence of Austrian, German and later Hungarian mining experts in these Italian regions, but it was a short and unsuccessful experience.

However, at the end of the 18<sup>th</sup> century, the reference to the Austrian mining tradition was still highly considered in the Kingdom of Naples also by the Bourbon government. Thus, in the early 1790s, six young Neapolitan scholars were sent first to Vienna to learn the German language and the mining dialects spoken in the various territories of the Austro-Hungarian Monarchy, and later to study at the Mining Academies of Freiberg (in Saxony) and Schemnitz<sup>4)</sup>. After their return to Italy these scientists held important positions for the development of mineralogical science in the Kingdom of Naples<sup>5)</sup>. Although further attempts to revitalize the mining industry in the south of Italy substantially failed (for technical and financial reasons), what remained of this experience was the reinforcement of the links between Austrian and Italian mineralogical and geological studies.

In fact, one of the Neapolitan students at Schemnitz, Carmine Antonio LIPPI (1761–1823), returned to stay in Vienna for some years after his long mineralogical travel through the European mining districts. And in Vienna he published in 1798 a treatise in Italian on the exploitation of the mines in southern Italy<sup>6)</sup>.

In the late 18<sup>th</sup> century the renowned Bergakademie of Schemnitz was visited by mineralogists from the Italian regions controlled by the Austrian Monarchy, such as Lombardy and Tuscany, as well as from a State with former Austrian links such as the Kingdom of Naples: however

some of these scientists also came from the Kingdom of Piedmont and Sardinia<sup>7)</sup>.

Moreover, from 1769 to 1776 the professor of chemistry, mineralogy and metallurgy at Schemnitz was Giovanni Antonio SCOPOLI (1723–1788), born in South Tyrol and formerly a physician in the mining town of Idria in Carniola<sup>8)</sup>. SCOPOLI became an important reference for Italian scientific travellers in Hungary and was well known for his mineralogical and botanical works. His “*Principia mineralogiae*” (Prague, 1773), then republished as “*Anfangsgründe der systematischen und praktischen Mineralogie*” (Prague, 1775), were also translated in Italian by Angelo GUALANDRIS and edited by Giovanni ARDUINO in 1777<sup>9)</sup>, the same year that SCOPOLI joined the University of Pavia as professor of chemistry and botany. At that time Pavia was the only university of Lombardy (formerly Duchy of Milan), a region which had been incorporated within the Habsburg Monarchy since 1714.

Other distinguished Italian naturalists who worked in Lombardy and were involved in geo-mineralogical studies, had several contacts with Austrian personalities and institutions: a colleague of Scopoli, Lazzaro SPALLANZANI (1729–1799), professor of natural history at the University of Pavia and a great scholar of volcanology and lithology, was one of these naturalists<sup>10)</sup>.

Among his correspondents in Vienna there was the Counselor Joseph VON SPERGES (1725–1791), also responsible for the Italian provinces of the Monarchy, who constantly helped SPALLANZANI to enlarge and enrich the museum of natural history at the University of Pavia, with a particular attention for the mineralogical collections<sup>11)</sup>. For this reason VON SPERGES also encouraged and financially supported the scientific travels of SPALLANZANI, in particular that of 1785/86 to Constantinople, which also included some mining areas in Romania, Transylvania and Hungary. There SPALLANZANI made several geological observations in the mines, in order to understand the structure of the surrounding mountains, and concluded that these regions of central and eastern Europe had provided him with much more useful data than the Apennines and parts of the Alps.

Another Austrian distinguished correspondent of SPALLANZANI, who also supported the Museum of Natural History in Pavia as well as the scientific travel in Eastern Europe, was count Johann Joseph WILZECK, the minister for Lombardy who lived in Milan from 1782 up to the arrival of the French army in 1796. The numerous letters of SPALLANZANI to WILZECK (from 1783 to 1795) contain a great amount of detailed scientific information (reports of his travels, catalogues of mineral and rock specimens with

<sup>2)</sup> VACCARI, E.: The museum and the academy: Geology and paleontology in the Accademia dei Fisiocritici di Siena during the 18<sup>th</sup> Century. – In: GHISELIN, M.T. & A.E. LEVITON, A.E. (eds.): *Cultures and Institutions of Natural History*, p. 5–25, San Francisco 2000.

<sup>3)</sup> DI VITTORIO, A.: *Gli austriaci e il Regno di Napoli, 1707–1734: ideologia e politica di sviluppo*. – p. 26–29, 59–60, Napoli 1973.

BALDANZA, B. & TRISCARI, M.: *Le miniere dei Monti Peloritani*. – p. 31–36, Messina 1987.

<sup>4)</sup> RAO, A.M.: *Esercito e società a Napoli nelle riforme del secondo Settecento*. – In: *Studi Storici* 28 (1987), p. 657–661.

VLACHOVICH, J.: *Die Bergakademie in Banská Štiavnica (Schemnitz) im 18. Jahrhundert*. – In: AMBURGER, E., CIESLA, M. & SZIKLAY, L. (Hrsg.): *Wissenschaftspolitik in Mittel- und Osteuropa*. – p. 217, Berlin 1976.

<sup>5)</sup> VACCARI, E.: *Mineralogy and Mining in Italy between eighteenth and nineteenth centuries: the extent of Wernerian influences from Turin to Naples*. – In: FRITSCHER, B. & HENDERSON, F. (eds.): *Toward an History of Mineralogy, Petrology and Geochemistry*, p. 119–124, München 1998.

<sup>6)</sup> LIPPI, C.: *Memoria relativamente alla coltura delle miniere delle Sicilie*. – 176 p., Vienna 1798.

<sup>7)</sup> VACCARI, E.: *Mineralogy and mining in Italy*. – p. 112. BULFERETTI, L.: *I viaggi minerari di Carlo Antonio Napione «innovatore» nel Piemonte e nel Brasile*. – In: *Rassegna Economica*, 34 (1970), p. 7–31.

<sup>8)</sup> VOSS, G.: *Della vita e degli scritti di Giovanni Antonio Scopoli*. – 22 p., Rovereto 1884.

<sup>9)</sup> SCOPOLI, G.A.: *Principj di mineralogia sistemata e pratica*. – Traduzione dal latino in Italiano con aggiunta di varie note ec., 246 p., Venezia 1777.

<sup>10)</sup> FERRARESI, A.: *Spallanzani docente di storia naturale all'Università di Pavia. Gli esordi*. – In: *Il cerchio della vita. Materiali di ricerca del Centro Studi Lazzaro Spallanzani di Scandiano sulla storia della scienza del Settecento*, a cura di W. BERNARDI e P. MANZINI, p. 263–299, Firenze 1999.

VACCARI, E.: *Spallanzani e le scienze geologiche del Settecento: un percorso interpretativo tra carteggi e diari di viaggio*. – In: *La sfida della modernità. Atti del Convegno Internazionale di Studi nel Bicentenario della morte di Lazzaro Spallanzani*, a cura di W. BERNARDI e M. STEFANI, p. 293–317, Firenze 2000.

<sup>11)</sup> SPALLANZANI L.: *Edizione Nazionale delle Opere. Parte Prima. Carteggi. Volume X: Carteggi con Sperges ... L. Vallisneri*, a cura di P. DI PIETRO, Letters from 1773 to 1797, p. 5–29, Modena 1988

comments, etc.) which clearly show that WILZECK was not only a politician but also a man with a deep scientific interest and knowledge in geological matters<sup>12)</sup>. Not by chance, SPALLANZANI dedicated to WILZECK his most important geological and volcanological work in six volumes: the "Viaggi alle Due Sicilie"<sup>13)</sup>.

## 2. Relationships with the Republic of Venice

In the Republic of Venice individual scientific relationships, based on common geological and mineralogical interests, were established between Venetian and Austrian scientists particularly in the second half of the 18<sup>th</sup> century. This was the case of the correspondence between the geologist Giovanni ARDUINO (1714–1795) and the Austrian mineralogist Ignaz VON BORN (1742–1791), which concerned geological questions about the formation and the lithological subdivision of the mountains<sup>14)</sup>; or the personal meeting in Venice between ARDUINO and Benedikt Franz Johann HERMANN (1755–1815), who later sent a piece of information about a new scientific journal published in Vienna<sup>15)</sup>. ARDUINO was also in contact with Belsazar HACQUET (1739–1815) a scientist, although French-born, who studied extensively the geological, mineralogical and botanical features of the Alpine regions of the Austrian Monarchy. HACQUET accepted ARDUINO'S idea that the primitive schist (hornschiefer) was older than granite and also sent to ARDUINO a detailed description of the mines of Eisenerz in Steiermark<sup>16)</sup>.

Also the Venetian naturalist and polymath Francesco GRISELINI (1717–1787) was in contact with Ignaz VON BORN and – as in the case of SPALLANZANI – benefited from the patronage of some Habsburg authorities<sup>17)</sup>. In fact GRISELINI was a Freemason like VON BORN and had the protection in Vienna of the powerful Wenzel Anton count KAUNITZ RITBERG, who was the person responsible for the foreign affairs of the Austrian Monarchy from 1753 to 1792, as well as a good relationship with Joseph VON SPERGES. These protections granted to GRISELINI, at the end of his career, the nomination directly from MARIA THERESIA as secretary of the newly established scientific society called "Società Patriottica" in Milan.

GRISELINI was the founder and the editor of the first series of the scientific journal *Giornale d'Italia* (printed in Venice

from 1764 to 1776) which published some of the best Italian geological studies of the second half of the 18<sup>th</sup> century and provided a great amount of bibliographical and scientific information. GRISELINI'S works concerned agronomy, industry, techniques and natural sciences, with particular attention to zoology and geology. From 1774 to 1777 he undertook an extensive naturalistic travel, mainly in the region of the "Bannat of Temeswar" (in southern Hungary) and in 1780 he published in Italian and in German the report of this travel<sup>18)</sup>. The German edition was edited by Ignaz VON BORN and printed in Vienna in two volumes. To date this work has not attracted particular interest among the historians, apart from some aspects concerning the "Volkshelkunde", the popular medicine, studied by GRISELINI<sup>19)</sup>. However this work is an interesting example of the influence led by Ignaz VON BORN on the new style of regional scientific geological travel in the eastern provinces of the Austrian Empire. Compared to VON BORN'S "Briefe"<sup>20)</sup>, the work of GRISELINI was not exclusively focused on mineralogical subjects: on the other hand GRISELINI was a naturalist and an agronomer also interested in different aspects of the life of the inhabitants of the various regions. Consequently, also according to the interests of the recipient, each letter proposed a different scientific, agronomic, political, artistic, archeological or even anthropological content. Several observations on the lithological structure of the mountains, as well as descriptions of various fossils, were sent to his friend Giovanni ARDUINO in Venice who immediately published these letters in the *Giornale d'Italia*, between 1774 and 1778, like a sort of scientific reportage<sup>21)</sup>.

In GRISELINI'S letters we can also easily find clear evidence of his personal relationships with Austrian and Hungarian scientists and scholars (VON BORN, SONNENFELS, PODA, VON CRANZ, VON SPERGES), mainly during the year spent in Vienna after the travel in Temeswar<sup>22)</sup>. During this period, GRISELINI also defined Vienna<sup>23)</sup>

*"... a beautiful city, with lots of people, where I would like to stay forever".*

This short overview of the 18<sup>th</sup> century relationships between Austrian and Italian geologists is only the very beginning of a possible large research work. Certainly these scientific relationships continued and expanded also in the nineteenth century<sup>24)</sup>, but in a different form, and were strongly influenced by the activities of the Geologische Reichsanstalt.

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<sup>12)</sup> SPALLANZANI, L.: Edizione Nazionale delle Opere. Parte Prima. Carteggi. Volume XI: Carteggi con Vassalli ... Zuliani. – A cura di P. DI PIETRO, p. 138–205, Modena 1989.

<sup>13)</sup> SPALLANZANI, L.: Viaggi alle Due Sicilie e in alcune parti dell'Appennino, Pavia 1792–1797. German translation: Reisen in beyde Sicilien und einige gegenden der Appenninen, Leipzig 1795–98, 4 Bd.

<sup>14)</sup> VACCARI, E.: Giovanni Arduino (1714–1795). Il contributo di uno scienziato veneto al dibattito settecentesco sulle scienze della Terra. – p. 246, 294–295, Firenze 1993.

<sup>15)</sup> Lettera del signor B.J. Hermann Professore della Technologia, e Membro delle Società Patriottiche in Austria, Stiria, ec. Al ch. Sig. Giovanni Arduino. [...] Vienna 25 aprile 1781. – In: *Nuovo Giornale d'Italia V* (1781), Venezia n. XLV 26 maggio 1781, p. 353–354.

<sup>16)</sup> VACCARI, E.: Giovanni Arduino, p. 258, 296. [B. HACQUET] Osservazioni Metallurgico-Mineralogiche, con Figure, sopra le rinomate miniere di Ferro di Eisenartz nella Stiria. – In: *Giornale d'Italia XI* (1775), Venezia, n. XVII 29 ottobre 1774, p. 131–150.

<sup>17)</sup> TORCELLAN, G.F.: Francesco Griselini. – In *Illuministi italiani. VII. Riformatori delle Antiche Repubbliche, dei Ducati, dello Stato Pontificio e delle isole*, a cura di G. GIARIZZO, G.F. TORCELLAN & F. VENTURI, p. 91–120, Milano – Napoli 1965.  
DE TONI, G.B.: Francesco Griselini viaggiatore e naturalista veneziano. –

<sup>18)</sup> GRISELINI, F.: Lettere Odeporiche. – 330 p., Milano 1780.

GRISELINI, F.: Versuch einer politischen und natürlichen Geschichte des Temeswarer Banats in Briefen an Standespersonen und Gelehrte. – 2 Bd., Wien 1780.

Some of these letters had been previously published in 1775–1777 by Giovanni Arduino in the "Giornale d'Italia".

<sup>19)</sup> STOIAKOVICI, A.: Die Volkshelkunde der Banater Rumänen im 18. Jahrhundert nach der Beschreibung Griselinis. – In: *NTM 4* (1967), Heft 9, p. 84–93.

<sup>20)</sup> VON BORN, I.: Briefe über mineralogische Gegenstände auf seiner Reise durch das Temeswarer Bannat, Siebenbürgen, Ober- und Nieder-Hungarn. – Frankfurt & Leipzig 1774.

<sup>21)</sup> VACCARI, E.: Giovanni Arduino. – p. 233, 246.

<sup>22)</sup> Letters from Griselini to Arduino (Temesvar 2 september 1776, Vienna 9 march 1777). – In: *Nuovo Giornale d'Italia I* (1777), p. 129, 297.

<sup>23)</sup> Letter from Vienna, 9 march 1777. – In: *Nuovo Giornale d'Italia I* (1777), p. 299: "Vienna è una bellissima città, popolatissima, ed io vi starei in eterno".

<sup>24)</sup> VACCARI, E.: Austro-Italian scientific Relationships in the field of the Earth Sciences. The Geologische Reichsanstalt and the geologists of the Lombardo-Venetian Kingdom (1850–1866). – In: H. LOBITZER & P. GRECULA (Red.): *Geologie ohne Grenzen. Festschrift 150 Jahre Geologische Bundesanstalt*. – *Abh. Geol. B.-A.*, **56/1**, p. 95–114, Wien 1999.