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In Search of the Phoenix in Eighteenth-Century Naples

Raimondo di Sangro, Nature Mimesis, and the Production of Counterfeit Stones between Palingenesis, Alchemy, Art, and Economy

Francesco Paolo de Ceglia | ORCID: 0000-0002-8307-8780
Interuniversity Research Center "Seminario di Storia della Scienza", Department DIRIUM, University of Bari, Bari, Italy
francescopaolo.deceglia@uniba.it

Andrea Maraschi | ORCID: 0000-0002-5220-0114
Interuniversity Research Center "Seminario di Storia della Scienza", University of Bari, Bari, Italy
andrea.maraschi@uniba.it

Alessandro Monno | ORCID: 0000-0002-6018-2577
Interdepartmental Centre "Research Laboratory for the Diagnostics of Cultural Heritage", DiSTeGeo, University of Bari, Bari, Italy
alessandro.monno@uniba.it

Gioacchino Tempesta | ORCID: 0000-0003-0513-5206
Interdepartmental Centre "Research Laboratory for the Diagnostics of Cultural Heritage", DiSTeGeo, University of Bari, Bari, Italy
gioacchino.tempesta@uniba.it

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Abstract

Raimondo di Sangro (1710–1771), Prince of Sansevero, is renowned for having made experiences on mineral palingenesis, among other things. This multidisciplinary article brings together approaches and methodologies of the history of science and of mineralogy, and presents innovative results obtained during two distinct surveys at the Museo Cappella Sansevero. It focuses on the techniques Raimondo implemented to

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create the blue and red pigments which he used to adorn the family chapel, as well as on his choice to use fluorite as a sculptural material. Our analyses confirm for the first time that the Prince of Sansevero was able to create artificial ultramarine. As of today, this seems to be the earliest ever recorded example of the production of this artificial pigment. Consequently, this study suggests that historical sources documenting di Sangro's experiences should be seriously reconsidered. This article also contextualises Raimondo's efforts within the Neapolitan networks of Freemasons, engravers and antiquarians.

Keywords

Raimondo di Sangro – palingenesis – counterfeit gemstones

1 Trinkets in the Silence

Roughly three months had passed since the prince's death in March 1771. The family notary Francesco de Maggio had the onerous task of drafting an inventory of all the objects and furnishings in the rooms of Raimondo di Sangro's palace.[1] Raimondo, the Prince of Sansevero (1710–1771), had inherited heavy debts from his family, and he had further squandered his wealth to complete the family chapel. The document, now preserved at the Archivio Notarile di Napoli (District Notary Archive of Naples), casts light on the construction progress (which was still very much on-going), as it captures a snapshot of Raimondo's and his servants' daily life. The inventory describes food leftovers, kitchen utensils, jewellery, books, wardrobes, statues, horses, coaches, canvases, and even a clay model of the *Veiled Christ*. In particular, in the room of Gennaro Tibet, the prince's loyal assistant, the notary records a few little boxes with some stones inside, including old fragments of lapis lazuli.[2] There he also found a gilded copper mitre, adorned with fake gems, which was intended for the statue of St. Oderisius.[3]

1 Archivio Notarile di Napoli, *Inventario de' beni rimasti nell'Eredità del fu Ecc.mo D. Raimondo di Sangro P.npe di S. Severo, Notaio F. De Maggio, giugno 1771*, now largely republished in Sergio Attanasio, *In casa del principe di Sansevero. Architettura, invenzioni, inventari* (Naples: Alós, 2011), 115–162.

2 "Colonnette vecchie di Lapislazaro tutte vecchie rotte." Ibid., 119. Translations are always our own, unless otherwise stated.

3 Ibid.

There may not be anything too impressive about the discovery of such stones and gems in the house of a Neapolitan nobleman of the mid-eighteenth century. However, the production of counterfeit materials was one of Raimondo di Sangro's eclectic interests, and it represented an important part of his scientific endeavours. He would run them in his own chemical laboratory, which had been installed in the basement of his palace by 1752. Imitation of natural things was a way to gain knowledge of nature, for it required a direct experience with the causes of natural phenomena and a thorough understanding of surface effects and visual properties of the substances that were being reproduced.[4] Since the sixteenth century, the idea of "material mimesis"[5] had been meant to imitate these underlying causes rather than the effects of nature, to (re)produce nature instead of copying it.[6] Material mimesis required knowledge of nature in order to create materials that were barely distinguishable from the original ones—even though they did not exist in the world. This made mimesis a proper art of invention, a way to create a sort of hyper-nature. A way to play God.[7]

4 Pamela H. Smith and Isabella Lores-Chavez, "Counterfeiting Materials, Imitating Nature," in *The Matter of Mimesis. Studies of Mimesis and Materials in Nature, Art and Science*, ed. Marjolijn Bol and Emma C. Spary (Leiden-Boston: Brill, 2023), 27–53, in part. 28–29.

5 Marjolijn Bol, "Imitating Crackles: Material Mimesis in Stones and Textiles," in *Ownership of Knowledge: Beyond Intellectual Property*, ed. Dagmar Schäfer, Annapurna Mamidipudi, and Marius Buning (Cambridge, MA: The MIT Press, 2023), 153.

6 Karin Leonhard, "Painted Gems. The Color Worlds of Portrait Miniature Painting in Sixteenth- and Seventeenth-Century Britain," in *Early Modern Color Worlds*, ed. Tawrin Baker, Sven Dupré, Sachiko Kusukawa, and Karin Leonhard (Leiden-Boston: Brill, 2015), 165–167. The original development of alchemy was pushed by the attempt to imitate the visual characteristics of natural objects such as precious gems, and the fundamental processes performed by alchemists resembled those practiced by artisans and artists. The Prince of Sansevero did not practice alchemy, but rather the art of recombining and reassembling materials, somewhere between alchemy and proto-chemistry. See Tawrin Baker, Sven Dupré, Sachiko Kusukawa, and Karin Leonhard, "Introduction: Early Modern Color Worlds," in *Early Modern Color Worlds*, 3–4; Robert Halleux, *Le savoir de la main, savants et artisans dans l'Europe pré-industrielle* (Paris: A. Colin, 2009), in part. 134; Sylvie Neven, "Transmission of Alchemical and Artistic Knowledge in German Mediaeval and Premodern Recipe Books," in *Laboratories of Art. Alchemy and Art Technology from Antiquity to the 18th Century*, ed. Sven Dupré (Cham: Springer, 2014), 25–26; Marco Beretta and Maria Conforti, eds., *Fakes!? Hoaxes, Counterfeits, and Deception in Early Modern Science* (Sagamore Beach, MA: Science History Publications, 2014); Michael Bycroft, "Style and Substance in Rococo Science," *Journal of Interdisciplinary History* 48, no. 3 (2018): 359–384.

7 Denis Ribouillault, "Ingenuity in the Garden. From the Poetics of Grafting to Divine Mathematics," in *Ingenuity in the Making. Matter and Technique in Early Modern Europe*, ed. Richard J. Oosterhoff, José Ramón Marcaida, and Alexander Marr (Pittsburgh, PA: University of Pittsburgh Press, 2021), 161.

The half of the century represented a crucial turning point in Raimondo's life, which estranged him from the political life of the kingdom and kept him in the basement more often and for much longer. A series of dire events took place in those years. Firstly, in 1751, the Sacred Congregation of the Index (*Congregatio pro Indice Librorum Prohibitorum*) placed his *Lettera apologetica* on the List of Prohibited Books (*Index Librorum Prohibitorum*) due to its highly controversial doctrine.[8] Secondly, in the same year, Charles of Bourbon condemned the Neapolitan Masonic lodge, whose Grand Master was Raimondo himself.[9] Thirdly, he was not reappointed as a member of the Deputation of the Royal Chapel of the Treasure of St. Gennaro after he reproduced the miracle of the liquefaction of the saint's blood.[10]

Though he could count on the support of King Charles, his friend and kinsman, who wanted to protect him and the Kingdom of Naples from interference by Benedict XIV and the Jesuits, it was a troubled time for Raimondo. Therefore, his attention turned to the family chapel, to his experiments, and to Masonic ideals. The latter, however, were fostered quite cautiously after Freemasonry was banned in the Kingdom of Naples. One of the fundamental *traits d'union* of these three aspects was the idea of regeneration, i.e. the search for the life force—Raimondo called it *Archea*[11] (feminine singular)—which could unlock

8 Clorinda Donato, "Between Myth and Archive, Alchemy and Science in Eighteenth-Century Naples: The Cabinet of Raimondo di Sangro, Prince of San Severo," in *Life Forms in the Thinking of the Long Eighteenth Century*, ed. Keith Baker and Jenna Gibbs (Toronto: University of Toronto Press, 2016), 208–232; Raimondo di Sangro, *Supplica a Benedetto XIV*, ed. Leen Spruit (Naples: Alós, 2006), 10. The modern edition of the *Lettera apologetica* is: Raimondo di Sangro, *Lettera Apologetica*, ed. Leen Spruit (Naples: Alós, 2014). Raimondo replied in 1753 with the publication of his *Supplica* addressed to Pope Benedict XIV. The Pope was willing to reexamine the *Lettera Apologetica*, but the Congregation dismissed the petition by invoking technical-procedural reasons.

9 Rosanna Cioffi, "Allegoria, natura e ragione nella decorazione pittorica della sala delle Quattro stagioni nel palazzo Sansevero di Napoli," *Il Capitale culturale. Studies on the Value of Cultural Heritage*, Suppl. 8 (2018): 283–299, in part. 288–289.

10 Francesco Paolo de Ceglia, "Thinking with the Saint: The Miracle of Saint Januarius of Naples and Science in Early Modern Europe," *Early Science and Medicine* 19, no. 2 (2014): 133–173; id., *Il segreto di San Gennaro. Storia naturale di un miracolo napoletano* (Turin: Einaudi, 2016), 283–300.

11 Raimondo di Sangro, *Lettera Apologetica*, 158–159; Donato, "Between Myth and Archive." Spruit suggests that this *Archea* may reflect Paracelsus' *Archeus* (*Lettera Apologetica*, 159, fn. 228). Curiously, Raimondo does not make any comment on *Archea* in his *Supplica* (*Supplica*, 61), other than to state that, in the *Lettera Apologetica*, he only aimed at providing readers with a brief explanation of what others meant by this word and with its etymology. In fact, in the *Lettera* he writes that "*Archea*" refers to "a certain universal spirit that some believe is intrinsically spread everywhere and is the reason for all the effects of Nature"

the secrets of palingenesis. It was not by chance that he named his laboratory "Phoenix room" (*Appartamento della Fenice*; more on this later).[12]

Stones, gems, and marbles are relevant in this discussion because experiences of palingenesis could concern either plants, animals, or minerals.[13] And while the production of artificial stones was hardly a novelty in the eighteenth century, Raimondo di Sangro's interests went far beyond science and craftmanship. His activities in the laboratory and his investigations in *prisca sapientia* coalesced into the highly innovative design of the chapel, which he could conceive thanks to some of the most important and talented sculptors of the time (some of whom were Freemasons belonging to his own lodge).[14] The Sansevero Chapel became a masterpiece of Baroque art and esoteric symbolism, and the experiences of mineral palingenesis (here to be understood as the recreation of visual properties of stones that replicated natural ones) soon turned out to be rather useful in this sense.

At least during the last twenty years of his life, Raimondo made a great effort to "search for the phoenix" inside his laboratory. As the mythological bird turned to ashes and was reborn completely renewed, the prince's goal was to unravel the mineral world and create something that did not exist in nature: imitation stones, counterfeit gems, and peculiar chromatic effects. Something that originally came from nature and eventually did not belong to it; something where nature was reflected, but which man's skills had perfected.

This multidisciplinary article brings together approaches and methodologies of the history of science and mineralogy featuring two interconnected

("un certo spirito universale, che credono sparso intrinsecamente da per tutto, e che sia la cagione di tutti gli effetti della Natura"). They—he continues—held that all bodies in the universe contain a portion of such *Archea* (*Lettera Apologetica*, 159). Not only does this explicitly connects Raimondo's *Archea* to the Paracelsian tradition, but also to the Platonic tradition of the notion of *anima mundi*, to the Stoic one of the *logoi spermatikoi*, and to all those dynamising entities (hylarchic nature, spirit of nature, ferments, etc.) that "animate" seventeenth-eighteenth century matter, which was mostly considered ontologically passive. Francesco Paolo de Ceglia, "Matter Is Not Enough: Georg Ernst Stahl, Friedrich Hoffmann and the Issue of Animism," *HOPOS: The Journal of the International Society for the History of Philosophy of Science* 11, no. 2 (2021): 502–527.

12 *Breve nota di quel che si vede in casa di Raimondo di Sangro principe di Sansevero d. Raimondo di Sangro nella città di Napoli* (Naples: s.n., 1766), 19–20. See also Lucia Dacome, *Malleable Anatomies. Models, Makers, and Material Culture in Eighteenth-Century Italy* (Oxford: Oxford University Press, 2017), 246.

13 On gem collections, see also Michael Bycroft, "The Hand of the Connoisseur: Gems and Hardness in Enlightenment Mineralogy," *History of Science* 60, no. 4 (2022): 504.

14 Rosanna Cioffi, *La Cappella Sansevero. Arte barocca e ideologia massonica* (Salerno: Edizioni 10/17, 1994 [1987]), 109–110.

parts: one concerns the historical background and contextualisation of Raimondo di Sangro's endeavours with reference to palingenesis, while the other presents innovative results obtained during two distinct surveys at the Museo Cappella Sansevero between July and September 2023. The study aims to explore Raimondo's efforts as a way to deeply understand the causes of natural phenomena in order to recreate a "parallel" world (or a "second world," in the words of Cardinal Giovanni Ganganelli, the future Pope Clement XIV).[15] It also focuses on the techniques Raimondo implemented to create the (artificially made) blue and the red pigments, with which he adorned the family chapel, as well as on his choice to use fluorite as a sculptural material.

Both Raimondo's engagement with palingenesis and the scientific analysis of his techniques are mostly unexplored topics (and particularly with regards to the production of counterfeit stones), despite the great importance of the Prince of Sansevero as an exponent of Neapolitan radical Enlightenment, his achievements in the field of Masonic artisanship, and the impressive artistic value of the sculptures in the family chapel.[16] While historical sources tend to link the use of counterfeit stones with Raimondo's financial difficulties, we suggest that a critical role was also played by his palingenesis project, that is, the intention to reproduce natural processes in the laboratory.

The essay is structured as follows: the section following this introduction focuses on works and expenditures concerning the family chapel; sections 3 and 4 highlight material traces of Raimondo's experiences of mineral palingenesis and integrate them with the results of *in situ* mineralogical analyses carried out at (and with samples from) the Museo Cappella Sansevero; section 5 discusses said experiences within the broader context of Masonic craftmanship and nature mimesis, with attention to the role of mineral palingenesis in strengthening Masonic networks. Lastly, in section 6 we provide concluding remarks. This article suggests that Raimondo's endeavours resulted in the creation of what may be the earliest historical evidence of artificial ultramarine.

15 "Ella tira fuori un secondo mondo dal primo con tutto ciò che va creando." "Lettera xcvii. Al principe di San-Severo," in *Lettere, bolle e discorsi di papa Ganganelli* (Florence: Le Monnier, 1845), 212.

16 On this subject, see Andrea Maraschi "'You Bring Out a Second World from the First'. Raimondo di Sangro's Experiments on Palingenesis," in *Souls of Naples. Corporeal Ghosts and Spiritual Bodies in Early Modern Naples*, ed. Francesco Paolo de Ceglia (Rome: Viella, 2023), 291–304. In this article we provide just an overview of the results of our mineralogical analyses. All technical details will be published separately in a peer-reviewed journal of mineralogy.

2 A Commissioner and His Peculiar Spending Review

Raimondo di Sangro's fame in Naples was one of a kind. The prince contributed to spreading rumours throughout the city that he was as an ingenious magician, a bit of an alchemist and a bit of an inventor, who could play God in his laboratory by replicating natural phenomena, prolonging life, and even bringing back humans and animals from death.[17]

The image of a Neapolitan Dr. Faust that grew around him attracted attention both from the common people and the European elite.[18] Yet, it did not do justice to the several achievements he was credited for, for instance in the field of stone imitation. According to his contemporary biographer, the Freemason Giovanni Giuseppe Origlia, Raimondo di Sangro was able to make "a crystal identical in all respects to the English one" (including weight and brightness), which could be used to make chandeliers and tableware.[19] Furthermore, he "counterfeited various types of gemstones, such as bloodstone, many kinds of agate, lapis lazuli, and others," which replicated the hardness of their real counterparts.[20] One of his counterfeit stones was as white as ivory and as transparent and ductile as porcelain, and he managed to colour it both on the surface and in the inside.

Origlia is not exactly the most reliable source, since he was financed by the prince and had a good reason to fuel his fame as an eclectic genius who could obtain the most impressive results.[21] In his biography of Raimondo, Origlia portrays him as a scientist committed to reproducing in the laboratory the process

17 Francesco Paolo de Ceglia, "Playing God: Testing, Modeling, and Imitating Blood Miracles in Eighteenth-Century Europe," *Bulletin of the History of Medicine* 91, no. 2 (2017): 391–419; Raimondo di Sangro, *Lettera Apologetica*, 217; Fabio di Colonna di Stigliano, "La cappella Sansevero e d. Raimondo di Sangro. VII," *Napoli nobilissima* 4 (1895): 153–155.

18 Benedetto Croce, "Storie e leggende napoletane," in *E parve castigo dal cielo. Voci di fine Ottocento sul principe di Sansevero e il suo palazzo*, ed. Fiammetta Rutoli (Naples: Alós, 2003), 105–109.

19 "Un cristallo in tutto uguale a quello d'Inghilterra." Giovanni Giuseppe Origlia, *Istoria dello Studio di Napoli; in cui si comprendono gli avvenimenti di esso più notabili da' primi suoi principi fino a' tempi presenti, con buona parte della storia letteraria del Regno*, 2 vols. (Naples: Giovanni di Simone, 1753–1754), vol. 2, 378.

20 "Egli contraffè poscia anche varie sorte di pietre dure, come il diaspro verde sanguigno, l'Agata di più maniere, il Lapislazzuli, e altre." Ibid.

21 Rosanna Cioffi, "Storie e leggende di un principe e della sua cappella. Da Raimondo di Sangro a Benedetto Croce," *Napoli nobilissima. Rivista di arti, filologia e storia* 5, no. 1 (2019): 37–47, in part. 39–40.

of gemstone formation that occurred underground.[22] The laboratory was called Phoenix room, by definition a place devoted to research in the regeneration of life.[23]

It is no coincidence that the biographer then goes on to describe Raimondo's endeavours in animal palingenesis, as well as his seemingly successful reproduction of blood and of a perpetual lamp. However, Origlia also notes that the secrets behind the production of counterfeit gemstones and other materials used in cheap jewellery (such as Austrian silver and Parisian tombac) were put to the service of his palace-academy's personnel: sculptors, painters, chisellers, engravers, ebonists, inlayers, and the likes.[24] So, aside from scientific research, the prince's achievements had an additional purpose: they were meant to provide materials to decorate his palace and the family chapel.

However, Raimondo seemed to spare no expense when it came to turning his chapel into a manifesto of Baroque art. Starting from the 1740s, he began hiring several workers and artists to renovate and enlarge the chapel.[25] The documents of the Banco del Salvatore show that he paid hundreds and hundreds of ducats to artisans, suppliers, and workers.[26] Not to mention the thousands of ducats he paid to some of the most brilliant sculptors of his time, such as Giuseppe Sanmartino, Antonio Corradini, Francesco Queirolo, and Francesco Celebrano. Thanks to the prince's brilliant team of artists and craftsmen, the family chapel bloomed into a temple of esoteric artisanry,[27] where the statues

22 This was particularly evident in Naples, where Vesuvius "epitomized the capacity of nature to transform matter." Helen Hills, *The Matter of Miracles. Neapolitan Baroque Architecture and Sanctity* (Manchester: Manchester University Press, 2016), 143.

23 The documents of the Banco della Pietà show that on the 9th of May 1754 the Prince of Sansevero paid the last 200 ducats (for a total sum of 538) to Pompeo Serio, his master builder (*capomastro fabbricatore*), "in full and final payment for all fabrication work, materials and other things carried out in the crystal and enamel workshop and foundry" ("a saldo e finale pagamento di tutti i lavori di fabbrica, materiali ed altro fatti nel laboratorio e fonderia di cristalli e smalti"). Fabrizio Masucci and Leen Spruit, eds., *Raimondo di Sangro. Cronaca di vita e opere* (Naples: Alós, 2020), 183. See also Clorinda Donato, "The Prince of San Severo's Esoteric Baroque: Body and Soul in the Museum and Cappella di San Severo," in *Corporeality and Performativity in Baroque Naples: The Body of Naples*, ed. Alessandro Giardino (London: Lexington Books, 2017), 93–112, in part. 101–102.

24 Origlia, *Istoria dello Studio di Napoli*, vol. 2, 380.

25 Eduardo Nappi, *Dai numeri la verità. Nuovi documenti sulla famiglia, i palazzi e la Cappella dei Sansevero* (Naples: Alós, 2010), 96 ff.

26 Ibid., 55 ff., 96, 115; Giuseppe Russo, "I maestri marmorari napoletani della seconda metà del Settecento nel Cosentino. Alcuni documenti sulla committenza degli altari," *Archivio storico per la Calabria e la Lucania* 81 (2015): 87–135, in part. 91; Masucci and Spruit, eds., *Raimondo di Sangro. Cronaca di vita e opere*, 57–59.

27 Donato, "Between Myth and Archive," 211.

of the *Virtues* epitomised the idea of rebirth via Masonic initiation and the difficult path to higher knowledge.[28]

The high expenditure incurred by Raimondo, amounting to some tens of thousands of ducats over a period of about twenty years, added up to the hundreds of thousands of ducats in debt that he had inherited from his family.[29] What is more, according to documents preserved at the Archivio Storico del Banco di Napoli (Historical Archives of the Banco di Napoli), Raimondo began renovation works in his own palace between 1761 and 1765 in view of the wedding of his son Vincenzo.[30] To this must be added the cost of materials for his work in the laboratory.[31] In 1762 he went so far as to be arrested for having hosted gambling activities in his palace, due to the increasing amount of debts he had to manage.[32]

According to the sources closest to him, mineral palingenesis would have allowed Raimondo to save a considerable amount of money to adorn the family chapel, because his sculptors could thus access to faux precious materials that were reproduced in the Phoenix room. The anonymous *Breve nota*, published in 1766 and possibly written by Raimondo himself or someone funded by him, is pretty clear with regard to this: "The most beautiful of the Prince's inventions is that of counterfeiting Lapis lazuli with very little expense."[33] It

28 Salvatore Napolitano, "The Sansevero Chapel: A Case Study of the Neapolitan Enlightenment," in *Delirious Naples. A Cultural History of the City of the Sun*, ed. Pellegrino D'Acierno and Stanislao G. Pugliese (New York: Fordham University Press, 2019), 204–223, in part. 216–217.

29 From 1760 to 1765, work on the chapel was interrupted for this reason. Eduardo Nappi, "La famiglia, il palazzo e la cappella dei principi di Sansevero. Dai documenti dell'Archivio Storico del Banco di Napoli," *Revue internationale d'histoire de la banque* 11 (1975): 100–161, in part. 113.

30 Cioffi, "Allegoria, natura e ragione," 289–290.

31 Nappi, *Dai numeri la verità*, 77, docs. 236, 237.

32 Dacome, *Malleable Anatomies*, 248. This did not stop him, on 10 January 1763, from paying 145 ducats to buy rubies and diamonds ("per Prezzo d'una pioggia di Rubini e brillanti") from Giuseppe Talamo, a well-known Neapolitan supplier who also provided rubies and other gemstones for some jewels owned by Donna Sofia Russo, Marquise of Brienza, in 1773. Masucci and Spruit, eds., *Raimondo di Sangro. Cronaca di vita e opere*, 237. On the demand for *piogge* and pendants from the Neapolitan elite, see Angela Catello, "Il gioiello napoletano del Settecento," in *Settecento napoletano. Documenti 1*, ed. Franco Strazzullo (Naples: Liguori, 1982), 14–15.

33 "La più bella tra le Invenzioni del Principe è quella di contraffare il Lapislazuli con picciolissima spesa." *Breve nota*, 35. It is worth noting that even King Charles of Bourbon was encountering difficulties in obtaining precious stones for his Real Laboratorio, due to their costs and provenance (most often, Sicily). Gabriella Tassinari, "Antonio Pichler e gli incisori di pietre dure a Napoli: ipotesi e suggestioni," *Napoli nobilissima. Rivista di arti, filologia e storia* 1, no. 1–2 (2010): 30.

seems that, being in constant financial difficulties, Raimondo and his artisans were very active in producing imitation stones.

But was this the case?

3 Follow the Red and the Blue

Although Raimondo's fame was that of a genius inventor and a magician, making fake gemstones and marble tinting were no groundbreaking discoveries. Not only did the Comte de Caylus achieve interesting results in the same years (marble and encaustic paintings), but there is plenty of evidence that artificial stones and coloured marbles had been circulating for centuries.[34] Michel de Montaigne, who visited Florence in 1580, noted that Francesco de' Medici was quite eager to "counterfeit oriental stones and work crystal."[35] The Florentine art historian Filippo Baldinucci reported a recipe to age marble, calling for soot cooked in urine or vinegar, or alternatively for cinnamon or cloves similarly cooked.[36] If in 1753 the Venetian connoisseur Michele Lazzari could claim that some men "discovered the artifice of colouring the hardest marbles, penetrating them with factitious and appropriate juices," it means that the practice was no mystery whatsoever.[37] So, evidence suggests that recipes to counterfeit or colour stones were handed down for centuries with hardly any interruption.[38]

34 Fabio Barry, "'Painting in Stone': Early Modern Experiments in a Metamedium," *The Art Bulletin* 99, no. 3 (2017): 30–61, in part. 45–48.

35 "Contrefaire des pierres orientales et à labourer le cristal." Michel de Montaigne, *Journal de voyage en Italie par la Suisse et l'Allemagne en 1580 et 1581* (Paris: Garnier, 1955), 85–86.

36 Filippo Baldinucci, *Vocabolario toscano dell'arte del disegno nel quale si esplicano i propri termini e voci, non solo della Pittura, Scultura, e Architettura etc.* (Florence: Santi Franchi, 1681), 61. See also Marlise Rijks, "Gems and Counterfeited Gems in Early Modern Antwerp: From Workshops to Collections," in *Gems in the Early Modern World. Materials, Knowledge and Global Trade, 1450–1800*, ed. Michael Bycroft and Sven Dupré (New York: Palgrave MacMillan, 2019), 309–342; William R. Newman, *Promethean Ambitions: Alchemy and the Quest to Perfect Nature* (Chicago: Chicago University Press, 2004); Marco Beretta, *The Alchemy of Glass. Counterfeit, Imitation, and Transmutation in Ancient Glassmaking* (Sagamore Beach, MA: Watson Publishing International LLC, 2009), 151–152.

37 "Non si nega, che la umana sagace industria non abbia trovato l'artificio di colorire i marmi più duri, facendoli penetrare da succhi fattizi, ed appropriati." "Discorso del Signor Michele Lazzari sopra le Macchie naturali di una Pietra, rappresentante un Ritratto," *Raccolta d'opuscoli scientifici e filologici* 48 (1753): 281.

38 Anne-Françoise Cannella, *Gemmes, verre coloré, fausses pierres précieuses au Moyen Âge: Le Quatrième livre du "Trésorier de Philosophie naturelle des pierres précieuses" de Jean d'Outremeuse* (Geneva: Droz, 2006); Beretta, *The Alchemy of Glass*, 95. On the use of glass

This practice was still likely widespread in eighteenth-century Italy, with Venice and Naples being two of the main production centres.[39] Unfortunately, much of the information provided by sources concerning the Sansevero Chapel cannot be proven or disproven due to the lack of material evidence. However, *some* material evidence exists.

During the 1750s, Raimondo's palace became one of the essential legs in the Grand Tour.[40] The French historian Pierre-Jean Grosley visited di Sangro in 1758, and one detail of his account demands particular attention. In a passage where he mentions Raimondo's blocks of white marble which he had dyed red, he adds: "we saw a Cardinal's hat so dyed."[41] And we know he was telling the truth.

Indeed, traces of red/pink are easily visible on St. Oderisius' cardinal hat, which shows that the marble was entirely coloured (Fig. 1). The 1782 expanded edition of the *Nuova guida de' forestieri*, which was originally published in 1688 by the Bishop of Bisceglie Pompeo Sarnelli and was among the most popular guides of Naples of the time, notes that something similar was visible on the prince's tombstone.[42] "The background [of the tombstone] is coloured red",

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to counterfeit stones, see Beretta, *The Alchemy of Glass*, 3 ff., 95; Thijs Hagendijk, Márcia Vilarigues, and Sven Dupré, "Materials, Furnaces, and Texts: How to Write About Making Glass Colours in the Seventeenth Century," *Ambix* 67, no. 4 (2020): 323–345; Gabriella Tassinari, "Osservazioni sulla produzione di paste vitree nel XVIII secolo e il caso di Venezia," *Journal of Glass Studies* 52 (2010): 167–199, in part. 176–177; Bol, "Coloring Topaz, Crystal and Moonstone"; Stefanos Karampelas, Lore Kiefert, Danilo Bersani, and Peter Vandenabeele, *Gems and Gemmology. An Introduction for Archaeologists, Art-Historians and Conservators* (Cham: Springer, 2020), 67; Fabio Barry, *Painting in Stone. Architecture and the Poetics of Marble from Antiquity to the Enlightenment* (New Haven, CT-London, 2020), 7.

39 Tassinari, "Osservazioni sulla produzione di paste vitree," 176 ff.

40 Maurizio Torrini, "Raimondo di Sangro e la cultura scientifica napoletana," *AION* 35 (2012): 109–122.

41 "Nous vîmes un chapeau de Cardinal ainsi teint." Pierre-Jean Grosley, *Nouveaux mémoires, ou observations sur l'Italie et sur les italiens, par deux gentilshommes suédois, traduits du suédois*, 3 vols. (London: J. Nourse, 1764), vol. 3, 91.

42 Eloisa Soidero, *Ancient Marbles in Naples in the Eighteenth Century. Findings, Collections, Dispersals* (Leiden-Boston: Brill, 2019). On the reliability of this text, see Attanasio, *In casa del principe*, 11–12, 22–23. The Marquise de Sade used this guide for his visit to Naples. Francesco Ruvolo, *"La vera Guida de' Forestieri curiosi*. Patrimonio culturale e spoliazione nell'Italia meridionale e nella Sicilia del *Grand Tour*, Tra Sei e Settecento," in *Le guide touristique: lieu de rencontre entre lexique et images du patrimoine culturel*, ed. Carolina Flinz, Elena Carpi, and Annick Farina, vol. 1 (Florence: Firenze University Press, 2018), 23; Béatrice Didier, "Sade, Juliette et le Vesuve," in *Viaggio nel Sud*, ed. Emanuele Kanceff and Roberta Rampone, 3 vols. (Geneva: Slatkine, 1990–1993), vol. 2, 351–369.

FIGURE 1 Detail from Francesco Queirolo, *St. Oderisius*, 1756, Museo Cappella Sansevero, Naples. Red pigment debris is still clearly visible on the cardinal hat
PHOTO BY RAFFAELE AQUILANTE AND ALESSANDRO SCARANO FOR 327COLLECTIVE. © ARCHIVIO MUSEO CAPPELLA SANSEVERO

states the compiler.[43] This statement is similarly correct, for the gravestone has preserved its reddish colouration to this day. In this case, the prince probably aimed at imitating porphyry.

The guide also paid particular attention to the high altar, made by Francesco Celebrano and Paolo Persico in the 1760s. "Surrounding the high relief," it reads, "is a frame of lapis lazuli invented by the Prince Raimondo, who, spending very little money, forged the lapis lazuli so well that it would fool any expert craftsman, even after being sawn into very thin strips. In this paste one can clearly see the exact same gold stains as in real lapis lazuli, and it has the same hardness and weight."[44] According to notary de Maggio's inventory, the lapis lazuli

43 "E il fondo è colorito rosso." Pompeo Sarnelli, *Nuova guida de' forestieri, e dell'Istoria di Napoli, con cui si spiegano le cose più notabili della medesima, e suo Distretto etc.* (Naples: s.n., 1782 [1688]), 136–137.

44 "Intorno al Quadro vi è cornice di lapislazuli d'invenzione del Principe D. Raimondo, che con picciolissima spesa contrafacea il lapislazuli in guise tale, che inganna ogni Professore, dopo che è stato segato in sottilissime porzioni: in questa pastiglia vi si veggono ben espresse le macchie d'oro tali quali sono nel vero lapislazuli, del quale ha la stessa durezza, e peso." Ibid., 140.

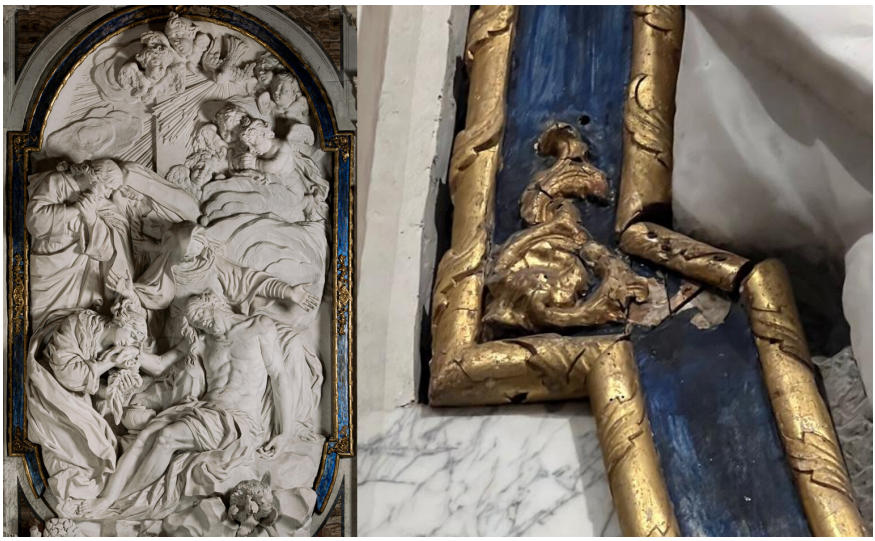

FIGURE 2 Left: Francesco Celebrano, *Deposition*, 1760s, Museo Cappella Sansevero, Naples. Right: Detail of the frame encircling the *Deposition* high relief. One can see greyish shades alternating with deep blue, typical of lapis lazuli rock, which shows the artist's great skill
LEFT: PHOTO BY RAFFAELE AQUILANTE AND ALESSANDRO SCARANO FOR 327COLLECTIVE. © ARCHIVIO MUSEO CAPPELLA SANSEVERO

frame had not yet been completed in 1771, and the stone was to be recreated according to the prince's "recipe."[45] Clearly, it was made in the years following Raimondo's death, but before 1782.[46]

While, from a certain distance, the blue pigment may well deceive a casual observer (also due to later re-paintings), a closer examination reveals that the material used for the frame is wood, and that the artists coloured it by means of a well-crafted coloured paste that closely imitates real lapis lazuli.

45 Attanasio, *In casa del principe*, 76; Gianluca Forgione, *I simulacri delle cose. La Cappella Sansevero e il barocco romano* (Turin: Fondazione 1563 per l'Arte e la Cultura della Compagnia di San Paolo, 2022), 21.

46 In the 1769 edition of the *Breve nota*, no mention is made of the frame. See *Breve nota di quel che si vede in casa di Raimondo di Sangro principe di Sansevero d. Raimondo di Sangro nella città di Napoli* (Naples: s.n., 1769), 10–11.

4 Results of Two *In Situ* Scientific Inspections (July–September 2023)

To validate the intriguing clues found in historical sources and periegetic literature, part of which can be checked via visual inspection, we decided to integrate them by means of scientific analysis. For this reason, we carried out two distinct mineralogical sets of analyses of material samples from the Museo Cappella Sansevero.

The first set of non-invasive analyses was performed using Raman Spectroscopy and Visible and Near Infrared Reflected (VIS-NIR) Spectroscopy in order to identify minerals and pigments used by Raimondo and his entourage of artists and the possible presence of resins.[47] They were aimed at examining, among other things: (1) the blue-coloured frame encircling the high altar; (2) red pigment debris on the cardinal hat of St. Oderisius' statue; (3) the cushion placed at the base of the same statue.

The second set of analyses was carried out to further investigate the composition of the materials used by Raimondo di Sangro and his entourage, with specific attention to the lapis lazuli frame around the high altar and the statue of St. Oderisius. They were aimed at clarifying the presence of natural ultramarine pigment (lapis lazuli) on the frame and of red microgranules (cinnabar) on St. Oderisius' hat, so as to reveal how the pigments were produced.[48] In this case, spectroscopic and microscopic analyses were carried out on microsamples of material from the lapis lazuli frame and the statue of St. Oderisius.

47 VIS-NIR Spectroscopy enables the measurement of light reflected by the surface of the pictorial layer. Each mineral or organic pigment exhibits characteristic light reflection, absorbing specific ranges of the electromagnetic spectrum depending on its chemistry. Raman spectroscopy is a rapid and non-destructive vibrational technique that provides identification of Raman active minerals or organic compounds. Acquiring the characteristic spectrum represents a unique fingerprint.

48 Before the genesis of modern chemistry, the production of colorants or other substances was identified as "obtained by alchemy" ("artificiato per [*or* con] archimia"), as already stated by Cennino Cennini, the most reliable extant treatise on painting. *Il libro dell'arte di Cennino*, ed. Veronica Ricotta (Milan: FrancoAngeli, 2019). On this treatise, see Thea Burns, "Cennino Cennini's *Il Libro dell'Arte*: A Historiographical Review," *Studies in Conservation* 56, no. 1 (2011): 1–13. See also Srebrenka Bogović Zeskoski, "Historical Pigments and the Role of Alchemy in their Production: An Interdisciplinary Study," *Portal: godišnjak Hrvatskoga restauratorskog zavoda* 8 (2017): 21–41; Joost Mertens, "The History of Artificial Ultramarine (1787–1844): Science, Industry and Secrecy," *Ambix* 51, no. 3 (2004): 219–244.

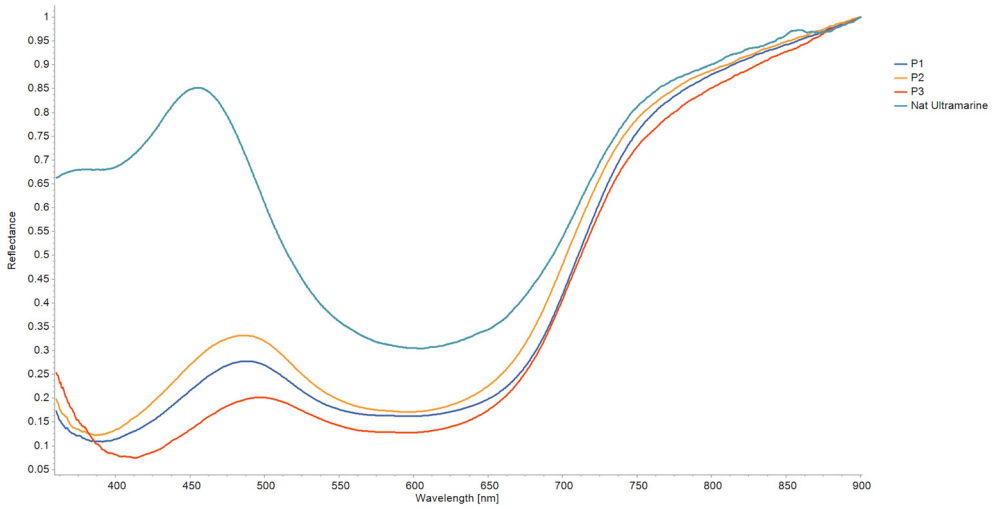

FIGURE 3 VIS-NIR spectra of the blue pigment on the frame (blue; orange; red) compared with natural ultramarine (green).

4.1 *The Lapis Lazuli Frame*

For what concerns the pigment in the blue frame imitating the lapis lazuli rock, as the VIS-NIR spectrum shows (Fig. 3), the test proved that it is compatible with natural ultramarine (lazurite), a mineral that gives the rock its blue colour.

The microsample was embedded in resin and prepared for both light and electron microscopic observations. The light microscope images of the sample (Fig. 4) reveal the presence of a golden and (below) a red layer next to the blue pictorial layer. The section in Fig. 5 shows the stratigraphic sequence highlighting the blue pictorial layer (1), generally less than 80μm thick, which rests on the gold foil (a few μm thick) lying on the preparatory *bolus* layer (a common preparation for gluing the gold leaf to the wooden surface). The layers were made on a mixture of glue and plaster (4).

Raman (Fig. 6) and VIS spectroscopy analysis (Fig. 3) confirmed the identification of ultramarine blue as the blue pigment used.[49] However, they did not give any information about its natural or artificial composition. Conversely, SEM-EDS analyses (Fig. 7) confirmed the hypothesis that the pigment is artificial. In particular, elemental chemical analyses carried out on individual pigment clasts, compared with those found in the literature, show a high sulphur

49 See Barbara Lafuente, Robert T. Downs, Hexiong Yang, and Nate Stone, "The Power of Databases: the RRUFF Project," in *Highlights in Mineralogical Crystallography*, ed. Thomas Armbruster and Rosa Micaela Danisi (Berlin: De Gruyter, 2015), 1–30.

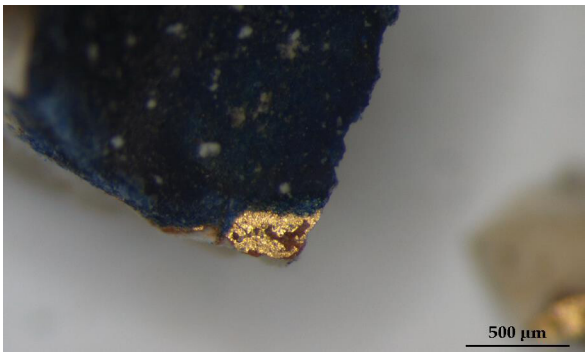

FIGURE 4
Fragment of a homogeneous pictorial layer under the stereomicroscope showing a gold leaf and red *bolus* as substrate

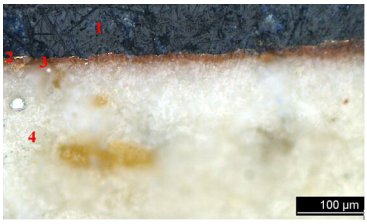

FIGURE 5
Stratigraphic section of the fragment: 1) pictorial layer; 2) gold foil; 3) *bolus*; 4) preparatory layer of glue and plaster

content, a low sodium content and the absence of calcium, consistent with analyses of artificial ultramarine.[50]

Raimondo and his collaborators were able to create a blue pigment that perfectly matches natural ultramarine, as historical sources and periegetic literature suggested. Instead of using real lapis, they employed other natural elements that, when processed and combined, allowed to obtain an imitation of natural ultramarine. This is per se a clear example of nature mimesis: as in the case of Raimondo's anatomical machines, the scientist employed natural materials to create a hyper-nature and play God in the laboratory.[51] Natural ultramarine is obtained by purifying lapis lazuli through complex processes that

50 Monica Favaro, Alessandro Guastoni, Federico Marini, Sara Bianchin, and Arianna Gambirasi, "Characterization of Lapis Lazuli and Corresponding Purified Pigments for a Provenance Study of Ultramarine Pigments Used in Works of Art," *Analytical and Bioanalytical Chemistry* 402, no. 6 (2012): 2195–2208. See also Paolo A. Rossi, "'Non solo il vero color del sangue, ma altresì il sapore'," *Anthropos & Iatria. Rivista italiana di studi e ricerche sulle medicine antropologiche e di storia delle medicine* 2 (2007): 20–25.

51 Lucia Dacome and Renata Peters, "Fabricating the Body: The Anatomical Machines of the Prince of Sansevero," in *Objects Specialty Group Postprints, Volume 14, 2007: Proceedings of the Objects Specialty Group Session April 19 and 20, 2007, 35th Annual Meeting Richmond, Virginia*, ed. Virginia Greene, Patricia Griffin, and Christine Del Re (Washington, DC: Objects Specialty Group of the AIC, 2008), 161–177.

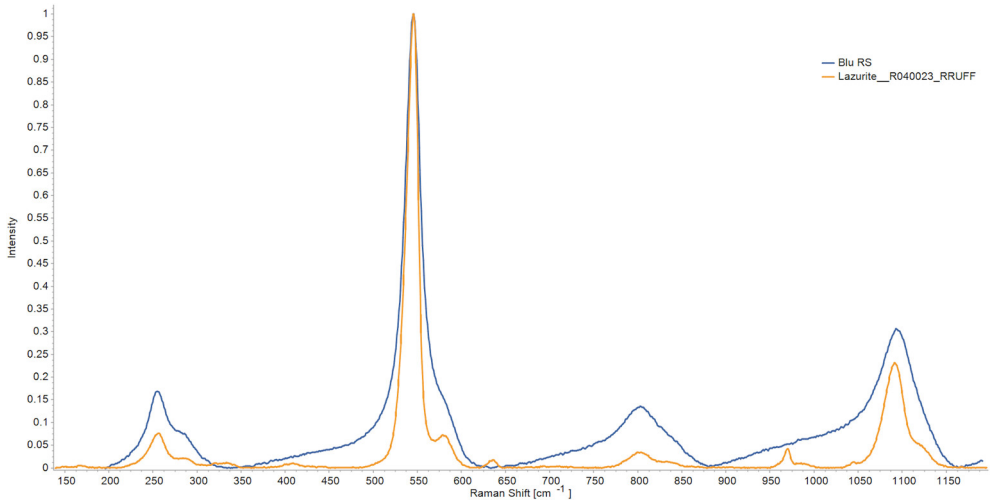

FIGURE 6 Raman spectrum of the blue pigment (blue) compared with lazurite (orange) from RRUFF (Database of Raman Spectra, X-ray diffraction and chemistry data for minerals)

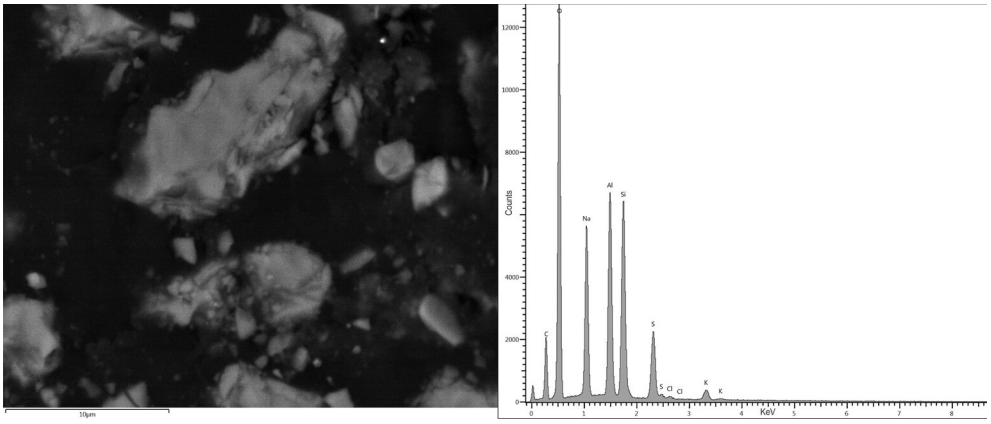

FIGURE 7 Scanning Electron Microscope (SEM): image of backscattered electrons (BSE) of blue pigment crystals (left) and its EDS spectrum (right)

make it possible to separate its blue mineral (lazurite). This natural pigment was considerably popular among early modern artists. It was obtained from true lapis lazuli that was usually imported from Badakhshan (now Afghanistan) to Constantinople and Persia, and via these it reached the western ports of Italy (especially Venice).[52] The complex technique, which is detailed for example in

52 Barbara H. Berrie, "Mining for Color: New Blues, Yellows, and Translucent Paint," in Baker, Dupré, Kusukawa, and Leonhard, *Early Modern Color Worlds*, 24.

Cennino Cennini's *Libro dell'arte* (dated to the late fourteenth or the early fifteenth century), required a series of steps which, combined with the rarity of lapis lazuli and a laborious process of extraction, made the final product "as expensive as gold" or even prohibitive, and restricted its use to works commissioned by wealthy commissioners.[53]

At any rate, however refined the pigment may be, natural ultramarine will always contain traces of other mineral phases associated with lazurite. On the contrary, the most striking aspect of the blue pigment produced in Raimondo's Phoenix room is that it does not contain traces of other minerals. Its chemical composition, which is similar in all respects to that of lazurite, differs in the abundance or absence of certain constituent chemical elements such as sulphur, sodium, and calcium, in particular. The latter is totally absent in the pigment composition, while it is present in natural samples.

Underneath the artificial ultramarine, the analyses also identified a gold layer (which was intended to make the thin layer of blue pigment much brighter) and, below it, a *bolus* iron-rich red layer. Analyses on the preparatory layer revealed the presence of gypsum ($CaSO_4 \cdot 2H_2O$).

This may be the first ever recorded example of "artificial" ultramarine, predating Goethe's account of 1787 (which we address later), and the official synthesis of lazurite by Jean Baptiste Guimet in 1828.

4.2 *St. Oderisius' Cardinal Hat*

As regards the red pigment debris on the cardinal hat of St. Oderisius' statue, which is still visible in the decoration margins (Fig. 1), VIS-NIR analyses (Fig. 8) show that Francesco Queirolo used cinnabar (also known as vermilion), a mercury sulphide mineral widely employed in art. Raman analyses confirmed the presence of cinnabar and calcite (marble) signals in the spectrum. So, while scholars have thought that the artist's original intent might have been to recreate porphyry red as in the case of the prince's gravestone, it is safe to assume that he aimed at imitating the vibrant scarlet red of cardinal vestments.[54]

53 Joyce Plesters, "Ultramarine Blue, Natural and Artificial," in *Artists' Pigments: A Handbook of their History and Characteristics*, ed. Ashok Roy, vol. 2 (Washington, D.C.: National Gallery of Art, 1993), 37–65, in part. 39. See also Mary Virginia Orna, *The Chemical History of Color* (Heidelberg-New York-Dordrecht-London: Cham, 2013), 59–60.

54 Rosanna Cioffi, "Arte, illuminismo e massoneria tra la Cappella Sansevero e il Palazzo Reale di Madrid," *Napoli nobilissima. Rivista di arti, filologia e storia* 3, no. 2–3 (2017): 75–88, in part. 86, fn. 8.

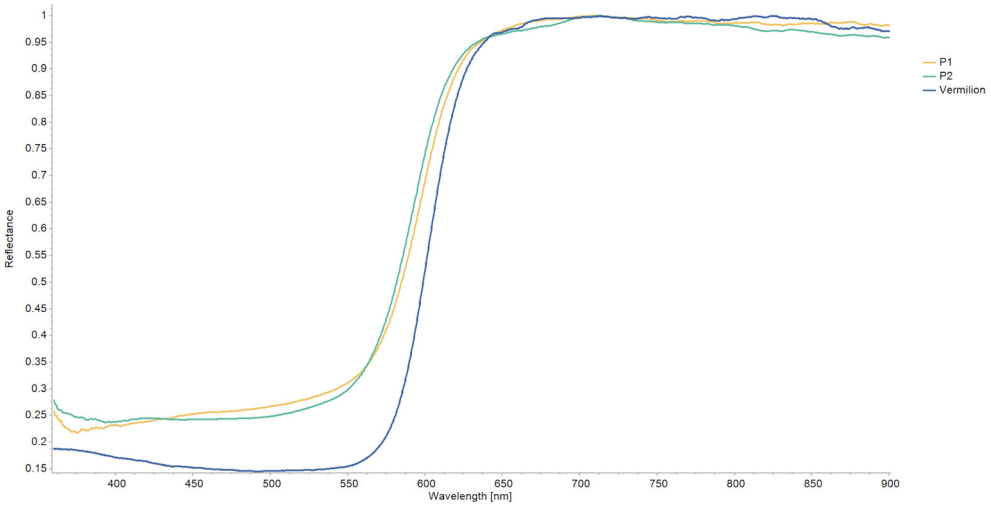

FIGURE 8 VIS-NIR spectra of the red pigment (orange; green) on St. Oderisius' hat compared with vermilion (blue)

Cinnabar is found widely in the world, though not abundantly. Its use dates as far back as to the sixth century B.C. in Greece. Previously, it was probably used in Asia Minor but not among the Egyptians.[55] In ancient times, it was prepared by breaking the red ore into small pieces and then by grinding them in a mortar. The tiny fragments were then washed and heated repeatedly to remove any impurities.

4.3 *St. Oderisius' Cushion*

We also analysed the cushion of St. Oderisius' statue because of its peculiar features (Fig. 9). The cushion shows a strong blue fluorescence (Fig. 10) and appears to be an aggregate consisting of centimetre-sized fluorite clasts. Raman analysis confirmed the assumptions made from observing the appearance and fluorescence characteristics and identified the mineral as fluorite (CaF) (Fig. 11). One can also see green fluorescence due to residual organic matter between the fluorite clasts.

The mineral fluorite can occur in a wide range of colours, depending on impurities, exposure to radiation, and the presence of other minerals during formation. It has long been used as a flux in metal smelting, in glassmaking,

55 Rutherford J. Gettens, Robert L. Feller, and W.T. Chase, "Vermilion and Cinnabar," in Roy, ed., *Artists' Pigments*, vol. 2, 159–182.

FIGURE 9 Detail from Francesco Queirolo, *St. Oderisius*, 1756, Museo Cappella Sansevero, Naples
PHOTO BY RAFFAELE AQUILANTE AND ALESSANDRO SCARANO FOR 327COLLECTIVE. © ARCHIVIO MUSEO CAPPELLA SANSEVERO

FIGURE 10
Blue fluorescence of fluorite under UV-360 nm led lamp. Green fluorescence due to residual organic matter between the fluorite clasts can also be seen

and as a pigment.[56] Fluorite is found in various geological settings around the world. In Europe, notable deposits are in Russia, Spain, England, and Germany. Its vibrant fluorescence (when exposed to ultraviolet light) makes it a colourful and peculiar mineral.

Officially, the underlying principle of fluorescence was discovered around the half of the nineteenth century by Fredrick W. Herschel,[57] but earlier observations were made by Carl Wilhelm Scheele (1742–1786), who particularly focused on fluorite.[58] Given his meticulous attention to details when it came to

56 Marika Spring, "Occurrences of the Purple Pigment Fluorite on Paintings in the National Gallery," *National Gallery Technical Bulletin* 21 (2000): 20–27.

57 The Prince of Sansevero claimed to have created a lamp that could burn indefinitely without consuming any fuel, which also emitted fluorescent light. The project was inspired by the finding of an ancient lamp in Munich, which was still burning at the time of the excavation. Raimondo investigated the subject and later published the *Dissertation sur une lampe antique* (1756), thanks to some of his acquaintances in Germany who sent him a copy of the original lamp and a sample of the liquid contained. According to Raimondo, the eternal lamps found in tombs owed their luminosity to salts extracted from human bones, that is, to phosphors derived from these salts. Although the accounts concerning the circumstances of the discovery of such lamps are unreliable, several sources confirm that their light was caused by phosphors, which had been discovered in the second half of the seventeenth century. However, there is no extant proof that Raimondo fabricated a specimen of a fluorescent light. See Raimondo di Sangro, *Dissertation sur une lampe antique trouvée à Munich en l'année 1753* (Naples: Morelli, 1756). See also Leen Spruit's comment in Raimondo di Sangro, *La materia del fuoco. Lettere a Giraldi e Nollet, Dissertation*, ed. Leen Spruit (Naples: Alós, 2018), 16–17; E. Newton Harvey, *A History of Luminescence from the Earliest Times Until 1900* (Philadelphia: American Philosophical Society, 1957). Origlia records a clumsy accident that occurred in the Phoenix room in 1753 as Raimondo and his assistants were trying to reproduce the experiment to make the perpetual light, presumably by extracting phosphors from human skull bones. Origlia, *Istoria dello Studio di Napoli*, vol. 2, 380–381.

58 Philip Ball, *The Elements: A Visual History of Their Discovery* (Chicago: Chicago University Press, 2021), 128; Anders Lennartson, *The Chemical Works of Carl Wilhelm Scheele* (Cham: Springer, 2017), 22 ff.

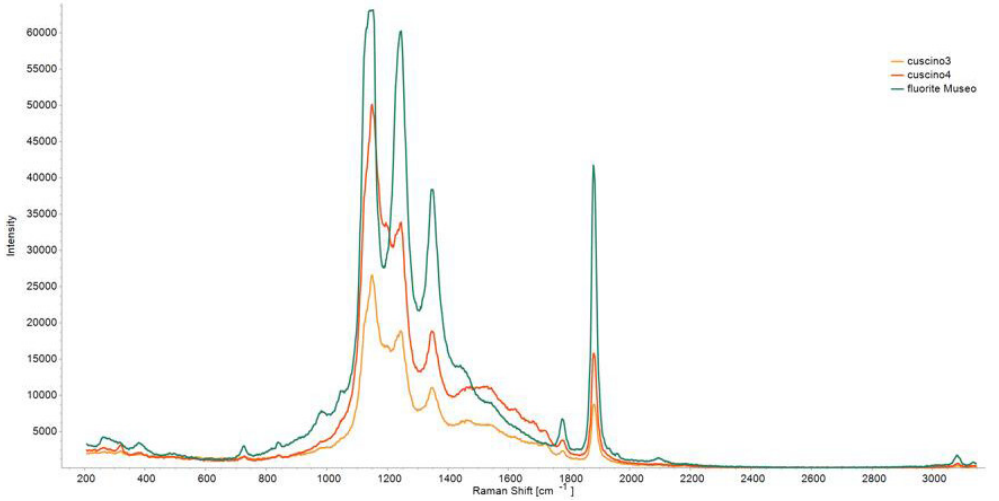

FIGURE 11 Raman spectra of the cushion clasts (orange; red) compared with a fluorite sample (green) from the Department of Earth and Geo-environmental Sciences Museum (University of Bari)

materials and visual effects, it is not unlikely that Raimondo may have used this stone because of its blue fluorescence, which would have added to the vibrant red colour of St. Oderisius' hat. Blue was also the most important colour in Freemasonry.[59]

5 The Big Picture: Mineral Palingenesis, Nature Mimesis, and Masonic Networks

5.1 *The Rebirth of Nature*

In the light of his financial issues, the ability to recreate counterfeit stones and to colour marbles with home-made pigments must have been especially useful to the Prince of Sansevero, as confirmed in the *Breve nota*, in Sarnelli's *Guida*, and by Origlia. However, this was part of a larger set of projects that he started boasting during the 1750s. As suggested above, the production of counterfeit pigments, marbles, and gems was consistent with the search for *Archea*. Raimondo and his group of collaborators aimed at imitating and perfecting natu-

59 Clorinda Donato, "Masonic Friendships and Shared Visions: Wilhelmine von Bayreuth and Raimondo di Sangro, the Prince of San Severo," in *Markgräfin Wilhelmine von Bayreuth und die Erlanger Universität: Künste und Wissenschaften im Dialog*, ed. Christina Strunck (Petersberg: Michael Imhof Verlag, 2019), 297.

ral forms and at recreating natural processes in the laboratory.[60] To Raimondo, reproducing lapis lazuli was not so different than regenerating river crabs or commissioning anatomical machines. From a practical standpoint, however, things were not as simple.[61] It was all part of an esoteric and Masonic master-plan, which the prince also wanted to encode in the family chapel project.[62]

In the eighteenth century, discussion on spontaneous and artificial regeneration already had a long tradition in the Western world, even though the concept of palingenesis had undergone numerous evolutions.[63] The Christian concept of palingenesis referred to resurrection and/or purification through baptism, but around the 1750s the term was more commonly used to address the alchemical "secret to restore destroyed things to their original state" (plants or animals).[64]

Palingenesis was considered an essential knowledge for members of Freemasonry. At the end of the eighteenth century, the Mason and occultist Duchanteau-Touzay wrote in *Le grand livre de la nature* that "a true philosopher knows about palingenesis, otherwise known as the phoenix of plants," because it "leads to the resurrection of animals and the transmutation of metals."[65] Many other examples could be given. For instance, palingenesis was also a major interest of the German Mason Rudolph Johann Friedrich Schmidt (1702–

60 Henrike Haug, "Artificial Inventions in the Natural Form of Things: Shared Metallogenetical Concepts of Goldsmith and Alchemists," in Dupré, *Laboratories of Art*, 97.

61 Dacome, *Malleable Anatomies*, 246.

62 Cioffi, *La Cappella Sansevero*, 109–110; de Ceglia, "Thinking with the Saint," 135; Donato, "Between Myth and Archive," 217–218; Anna Maria Rao, "La massoneria nel Regno di Napoli," in *Storia d'Italia. Annali 21. La massoneria*, ed. Gian Mario Cazzaniga (Turin: Einaudi, 2006), 516–517.

63 On palingenesis, see Jacques Marx, "Alchimie et Palingénésie," *Isis* 62, no. 3 (1971): 274–289; Allen G. Debus, "A Further Note on Palingenesis: The Account of Ebenezer Sibly in the *Illustration of Astrology* (1972)," *Isis* 64 (1973): 226–230; Dag Nikolaus Hasse, "Spontaneous Generation and the Ontology of Forms in Greek, Arabic, and Medieval Latin Sources," in *Classical Arabic Philosophy: Sources and Reception*, ed. Peter Adamson (London-Turin: The Warburg Institute—Nino Aragno Editore, 2007), 150–175; Maaike van der Lugt, *Le ver, le démon et la vierge. Les théories médiévales de la génération extraordinaire* (Paris: Les Belles Lettres, 2004), 131–187.

64 "Secret pour ramener des choses détruites à leur premier état." *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers etc., par une société de gens de lettres*, ed. Denis Diderot and Jean le Rond d'Alembert, vol. 11 (Paris: Briasson, 1765), 784–785. See also Marx, "Alchimie et Palingénésie," 275.

65 "Un vrai philosophe connoit la palingénésie, autrement appellée, le phoenix des végétaux. Cette curieuse résurrection des plantes, conduit à la résurrection des animaux, & à la transmutation des métaux." Duchanteau (Touzay), *Le grand livre de la nature, ou l'apocalypse philosophique et hérmetique* (Paris: L'imprimerie de la vérité, 1790), 14.

1761), who was deeply involved in hermeticism, alchemy and Rosicrucianism.[66] Schmidt authored the *Enchiridion alchymico-physicum, sive Disquisitio de menstruis universalibus* (Jena, 1739), and was fully engaged in the search for remedies to defeat death.

There was an important symbolic aspect to it, too. In Masonic beliefs, palingenesis was an alchemical process that reflected the introduction of the new initiates to a higher knowledge, as if they rose from their own ashes like phoenixes.[67] In a letter to Haugwitz written in 1782, the French Freemason Jean-Baptiste Willermoz (1730–1824) held that one of the three kinds of alchemist Masons was the one who professed that true Masons believed to be reborn (i.e., regenerated bodily) by water and Spirit as Jesus told to Nicodemus in John 3:5.[68]

As a radical Enlightenment thinker and Freemason,[69] Raimondo di Sangro was deeply captivated by the theme of rebirth (both symbolically and alchemically speaking), which he also planned to encode at various levels in the family chapel.[70] Among other things, he was particularly interested in mineral palingenesis. The production of artificial stones and pastes had been considered a form of alchemical palingenesis since the late seventeenth century.[71] In alchemy, this term usually referred to techniques by which metals could regain their original malleability, or to the creation of dendrites (the so-called Tree of Diana), which were thought to demonstrate the reality of palingenesis and the unity of the vegetal, mineral, and animal realms.[72] The forces involved in

66 On Schmidt and his affiliation to the Rosicrucians, see Martin Mulsow, "You Only Live Twice: Charlatanism, Alchemy, and Critique of Religion, Hamburg, 1747–1761," *Cultural and Social History* 3, no. 3 (2006): 273–286.

67 Gilles Le Pape, *De l'admirable palingénésie. La mort lui va si bien! Du phénix alchimique à la problématique théologique* (Milan: Arché, 2011); Dacome, *Malleable Anatomies*, 246; Angelo Sebastiani, *La pietra grezza. L'esperienza iniziatica nella Massoneria* (Rome: Hermes, 2000), 51–52. See also Ruggiero Di Castiglione, *La Massoneria nelle Due Sicilie e i 'fratelli' meridionali del'700*, 2 vols. (Rome: Gangemi, 2014), vol. 1, 69 ff.

68 Didier Kahn, "Franc-maçonnerie et alchimie" (2012), https://shs.hal.science/halshs-00674236, accessed August 30, 2023.

69 Clorinda Donato, "Esoteric Reason, Occult Science, and Radical Enlightenment: Seamless Pursuits in the Work and Networks of Raimondo di Sangro, the Prince of San Severo," *Philosophica* 89 (2014): 179–237.

70 Francesco Paolo de Ceglia, "The Fantastic Anatomy of Raimondo de Sangro, Prince of Sansevero," *Medicina nei secoli* 32, no. 2 (2020): 657–678, in part. 658–659; Donato, "The Prince of San Severo's Esotetic Baroque," 106.

71 Carlos Solís, "La ciencia de la resurrección," *Asclepio. Revista de Historia de la Medicina y de la Ciencia* 64, no. 2 (2012): 366.

72 Jean-Jacques Dortous de Mairan, *Dissertation sur la glace, ou Explication physique de la formation de la glace, et de ses divers phénomènes* (Paris: Imprimerie royale, 1749), 302–

mineral formation were studied in depth by Robert Boyle, one of the figures who most deeply inspired Raimondo for what concerns palingenesis.[73] The German philosopher Karl von Eckartshausen (1752–1803) included the regeneration of stones among the "natural" type of palingenesis, alongside animal and human palingenesis (as opposed to "supernatural" palingenesis).[74] In the early eighteenth century—following the (pseudo-)Paracelsian *Liber de natura rerum*, which briefly explained how the regeneration of stones and gems was possible[75]—Chymiphilus maintained that the natural growth of minerals and metals could be imitated (*nachgemacht*). Alchemists could thus replicate the effects of rainfall and of the sun's heat by imbibition and distillation.[76] Not many years later, the German scholar Johann Michael von Loën argued that minerals and metals should be treated like plants and animals, because they were all generated by the *Universal-Saamen* ("universal seed") of things.[77] Furthermore, the Swedish mineralogist Johan Gottschalk Wallerius considered the

303. See Allen G. Debus, *The French Paracelsians. The Chemical Challenge to Medical and Scientific Tradition in Early Modern France* (Cambridge: Cambridge University Press, 2002 [1991]), 159–160.

73 Claire Sabel, "The Impact of European Trade with Southeast Asia on the Mineralogical Studies of Robert Boyle," in Bycroft and Dupré, *Gems in the Early Modern World*, 87–116; Dennis Elwell and Hans J. Scheel, *Crystal Growth from High-Temperature Solutions* (London: Academic Press, 1975), 23–25. See *The Works of Robert Boyle*, ed. Michael Cyril William Hunter and Edward B. Davis, 14 vols. (London: Pickering & Chatto, 1999–2000), vol. 7, 12–27. Boyle's works were widely read at the Neapolitan Academy of Investigators, and his experiments are mentioned by Origlia. The English experimenter had famously published the *Essay about the Origine & Virtues of Gems*, where he explained how he made glass—and then fake gems—with water instead of fire. Robert Boyle, *Essay about the Origine & Virtues of Gems Wherein Are Propos'd and Historically Illustrated Some Conjectures about the Consistence of the Matter of Precious Stones Etc.* (London: W. Godbid, 1672), 134–135. On Boyle and the Investigators, see Alessandro Dini, *Filosofia della natura, medicina, religione. Lucantonio Porzio (1639–1724)* (Milan: FrancoAngeli, 1985), *passim*; Salvatore Serrapica, *Per una teoria dell'incertezza tra filosofia e medicina. Studio su Leonardo di Capua (1617–1695)* (Naples: Liguori, 2003), 5 ff.; Maria Conforti, *Medicina sotto il vulcano. Corpi e salute a Napoli in età moderna* (Milan: Editrice Bibliografica, 2021), 104, 128 fn. 195.

74 Karl von Eckartshausen, *Aufschlüsse zur Magie aus geprüften Erfahrungen über verborgene philosophische Wissenschaften und verdeckte Geheimnisse der Natur*, vol. 2 (Munich: J. Lentner, 1790), 385–392. The difference was that only in real palingenesis was it possible to regenerate animals, vegetables, or minerals back to their original state, whereas in apparent palingenesis the body only came back to life for a short time.

75 (Pseudo-)Paracelsus, *Die IX Bücher De Natura Rerum*, in Paracelsus, *Sämtliche Werke*, ed. Karl Sudhoff, Part I, 14 vols. (Munich-Berlin: R. Oldenbourg, 1922–1933), vol. 11, 319–320.

76 J.J. Chymiphilus, *Der wahren chymischen Weisheit Offenbahrung etc.* (s.l.: s.n., 1720), 21–27.

77 Johann Michael von Loen, *Sod rikvah u-serefah i. e. das Geheimnuß der Verwesung und Verbrennung aller Dinge* (Frankfurt am Main: J. Fr. Fleischer, 1733), 69.

restoration of some properties of stones and marbles (such as their hardness) an example of *palingenesia mineralis*.[78]

Palingenesis was plausibly appealing to those guided by Masonic ideals. Within the context of Raimondo's experiences, mineral palingenesis could also refer to the recreation of visual properties of stones so as to reproduce nature in the laboratory by understanding the causes of natural phenomena.[79] This can also be inferred from the long entry for "palingénésie" featured in Bartolomeo De Felice's *Encyclopédie*.[80] During the eighteenth century, the gap between *naturalia* and *artificialia* widened, with the latter acquiring particular prestige.[81] Counterfeiting was not necessarily considered as an act of falsification, but was associated with the alchemical practice of imitating natural materials, which implied an in-depth knowledge of their physical and visual properties.[82]

78 Johan Gottschalk Wallerius, with Gerhard Reinhold Höijer, *Dissertatio chemico-physica, de Palingenesia etc.* (Uppsala: s.n., 1764), 6. As observed by Barry, the ancient techniques for colouring marbles and creating artifacts in artificial substances were "the origin of alchemy" (Barry, *Painting in Stone*, 7).

79 Bycroft, "Style and Substance in Rococo Science."

80 "Palingénésie," in *Encyclopédie, ou Dictionnaire universel raisonné des connoissances humaines*, ed. Fortunato Bartolomeo De Felice, 58 vols. (Yverdon: s.n., 1770–1780), vol. 31, 748–755. De Felice was the prince's protégé and, while he wrote the entry himself, he originally intended it to be penned by Raimondo. On De Felice's relationship with the prince, see Donato, "Esoteric Reason," in part. 207–208. De Felice draws on Bonnet's hypothesis, among others, according to which there were no sharp divisions between minerals, plants, and animals. Charles Bonnet, *Palingénésie philosophique*, in *Œuvres d'histoire naturelle et de philosophie*, 8 vols. (Neuchâtel: S. Fauche 1770–1783). On Bonnet, see also Arthur McCalla, "*Palingénésie philosophique* to *Palingénésie sociale*: From a Scientific Ideology to a Historical Ideology," *Journal of the History of Ideas* 55, no. 3 (1994): 421–449.

81 Lorraine Daston, "Nature by Design," in *Picturing Science. Producing Art*, ed. Peter Galison and Caroline A. Jones (London-New York: Routledge, 1998), 232–253; Lorraine Daston and Katharine Park, *Wonders and the Order of Nature 1150–1750* (New York: Zone Books, 1998), 300–301.

82 Peter Parshall, "*Imago contrafacta*: Images and Facts in the Northern Renaissance," *Art History* 16, no. 16 (1993): 555. See also Claudia Swan, "Counterfeit Chimeras: Early Modern Theories of the Imagination and the Works of Art," in *Vision and its Instruments, c. 1350–1750: The Art of Seeing and Seeing as an Art*, ed. Alina Payne (State College: The Pennsylvania State University Press, 2015), 216–237; Sachiko Kusukawa, *Picturing the Book of Nature: Image, Text, and Argument in Sixteenth-Century Human Anatomy and Medical Botany* (Chicago: University of Chicago Press, 2012), in part. 8–15; Edward H. Wouk, "From Nabeeld to Kopie: The After-Image and the Copy in Early Modern Netherlandish Art," *Word & Image* 35, no. 3 (2019): 223–242; Rijks, "Gems and Counterfeited Gems," 324; Lawrence Principe, *The Secrets of Alchemy* (Chicago: Chicago University Press, 2013), 107; Sietske Fransen and Katherine M. Reinhart, "The Practice of Copying in Making Knowledge in Early Modern Europe: An Introduction," *Word & Image* 35, no. 3 (2019): 216; Smith and Lores-Chavez, "Counterfeiting Materials, Imitating Nature," 34; Marjolijn Bol, "Color-

Raimondo and his retinue of artists and craftsmen aimed at recreating reality "in a fantastic and imaginative way" and with a strong sense of theatricality so as to amaze and entertain the observer, like when he reproduced the miracle of the liquefaction of St. Gennaro's blood:[83] artisanship held a prominent place in eighteenth-century "theatrical culture of demonstration".[84] The ability to distinguish between what was real and its imitation (i.e., between a natural thing and a man-made artefact) became a sign of connoisseurship,[85] and Raimondo's library helps to shed light on his readings and knowledge about these subjects.[86] The prince was educated at the Jesuit's Collegio Romano, where Kircher's legacy of making "magical instruments" for both entertainment and functional purposes was strong.[87]

His Jesuitic background is quite interesting in this context. When, in April 1787, Johann Wolfgang Goethe visited the polishers of semi-precious stones near Palermo, he noted that they were able to produce a bright blue colour substance which they used as a substitute for lapis lazuli in the nearby Jesuit church.[88] This passage would be later cited as the first ever recorded example of artificial ultramarine, whose procedure would be officially discovered only in the following century.[89] "But to the Jesuits, was anything impossible?", won-

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ing Topaz, Crystal and Moonstone: Gems and the Imitation of Art and Nature, 300–1500," in Beretta and Conforti, eds., *Fakes!? Hoaxes, Counterfeits, and Deception*, 108–129; Daston and Park, *Wonders and the Order of Nature*, 280 ff. On counterfeiting gemstones, see also Making and Knowing Project, Pamela H. Smith, Naomi Rosenkranz, Tianna Helena Uchacz, Tillmann Taape, Clément Godbarge, Sophie Pitman, Jenny Boulboullé, Joel Klein, Donna Bilak, Marc Smith, and Terry Catapano, eds., *Secrets of Craft and Nature in Renaissance France. A Digital Critical Edition and English Translation of BnF Ms. Fr. 640* (New York: Making and Knowing Project, 2020), https://edition640.makingandknowing.org.

83 de Ceglia, "Playing God," 414. See also id., *Il segreto di San Gennaro*, 283–300.

84 Dacome, *Malleable Anatomies*, 16–17.

85 Marlise Rijks, "Scales, Skins, and Carapaces in Antwerp Collections," in Bol and Spary, *The Matter of Mimesis*, 309.

86 For instance, he owned a copy of the French translation of Antonio Neri's *Arte vetraria* (1612), with comments by Christopher Merret; *Le secret des nouvelles teintures de Saxe* by Johann Heinrich Gottlob von Justi (1751; translated into French in 1752); the *Lettres sur la minéralogie* by Diederick Wessel Linden (1750; translated into French in 1752); and Johann Heinrich Pott's *Lithogéognosie* (1746; translated into French in 1753).

87 Koen Vermeir, "Athanasius Kircher's Magical Instruments: An Essay on Science, Religion and Applied Metaphysics (1602–1680)," *Studies in History and Philosophy of Science Part A* 38, no. 2 (2007): 363–400.

88 Johann Wolfgang von Goethe, *Italian Journey, 1786–1788*, trans. W.H. Auden and Elizabeth Mayer (San Francisco: North Point Press, 1982), 293.

89 Firtz Seel, Gisela Schäfer, Hans-Joachim Güttler, Georg Simon, "Das Geheimnis des Lapis lazuli," *Chemie in unserer Zeit* 8, no. 3 (1974): 65–71; "Ultramarine," in *Pigment Compendium.*

ders Goethe.[90] Raimondo had important contacts in Sicily, where his famous anatomical machines were made by the priest-anatomist and artist-artisan Giuseppe Salerno.[91] It may be worth wondering whether, some twenty years earlier, the prince could have learned the techniques to produce ultramarine from Sicilian Jesuits.

5.2 *Knowledge and Networks*

The case could be made that Raimondo's intuitions were hardly original and that he enjoyed mocking intellectuals who visited Naples as part of their Grand Tour, but his activity allowed him to strengthen his relationship both with them and the European Freemasons.[92] Allegedly, only few people, those who were closest to him, had access to some of the prince's inventions.[93] Grosley claimed to have seen with his own eyes blocks of white marble which the prince had dyed red even on the inside, a characteristic he also noted about a piece of white marble depicting the Virgin: the painting could be seen even on internal layers.[94] The French Abbot Jérôme Richard went to Naples in 1764, and he too was shown marbles and alabaster that had been coloured throughout their entire thickness, as well as Raimondo's counterfeit lapis lazuli and bloodstone.[95]

According to Sarnelli's *Guida*, the portrait of Raimondo's son Vincenzo di Sangro, which was located above the church's side door, "is betwixt white marble dyed in various colours that penetrated into the marble of the Prince D. Raimondo's invention."[96] Similarly, the main entrance of the church was surrounded by "marble dyed green, a surface colour that has penetrated into the bowels of marble, which was previously white."[97] In 1796, the physicist, chemist

A Dictionary of Historical Pigments, ed. Nicholas Eastaugh, Valentine Walsh, Tracey Chaplin, and Ruth Siddall (Burlington, MA: Elsevier/Butterworth-Heinemann, 2004), 375–376.

90 Goethe, *Italian Journey*, 293.

91 de Ceglia, "The Fantastic Anatomy."

92 Maurizio Torrini, "Raimondo di Sangro e la cultura scientifica napoletana," *AION* 35 (2012): 109–122, in part. 120.

93 Koen Vermeir, "Openness versus Secrecy? Historical and Historiographical Remarks," *The British Journal for the History of Science* 45, no. 2 (2012): 165–188, in part. 180.

94 Grosley, *Nouveaux mémoires*, vol. 3, 91–92.

95 Jérôme Richard, *Description historique et critique de l'Italie, ou Nouveaux mémoires sur l'état actuel de son gouvernement, des sciences, des arts, du commerce, de la population et de l'histoire naturelle*, 6 vols. (Dijon-Paris: F. Des Ventes, 1766), vol. 4, 200.

96 "Attorniata di marmi bianchi trasformati in vari colori penetrati nel marmo d'invenzione del Principe D. Raimondo." Sarnelli, *Nuova guida*, 142.

97 "Sono di marmo fatto colorir verde, colore superficiale penetrato nelle viscere del marmo, che prima era bianco." Ibid., 135–136.

and natural philosopher Giuseppe Saverio Poli confirmed that Raimondo di Sangro had been able to colour marble and that he taught this knowledge to Francesco Celebrano, who still utilised it in those days. Poli went as far as to describe di Sangro's method: spirit of wine or petroleum was to be soaked in a given colour and then poured on a piece of marble (duly heated). After a while, the colour would penetrate the marble so deeply that it dyed even its innermost layers.[98]

Richard confirms that these "secrets" had an artistic purpose: Raimondo made stucco having "the silvery sheen of mother-of-pearl," which he used to adorn the frieze of his chapel, for instance.[99] A few years later, the famous French astronomer Joseph-Jérôme de Lalande added that the prince also produced a stucco that was harder than *lastrica*.[100] He then saw two rooms paved with a particular mastic that perfectly imitated marble as far as hardness, brightness, and coloration were concerned.[101] Lalande also notes the prince's ability to bleach precious gems to complete whiteness or to enhance the colour of pale ones (especially in amethysts)[102]—the Polish naturalist Michał Jan Borch would actually quote Raimondo as the authority in whitening lapis lazuli.[103] Most importantly, Lalande reports that the Prince of Sansevero gave a shaving of one of his counterfeit lapis lazuli to his Mason friend, the Margravine of Bayreuth, when she went to visit him in May 1755. Once she was back to Germany, she had it examined by chemists, who used nitric acid and placed it under an enameller's lamp to see if it behaved as simple coloured glass—but it did not.[104]

98 Giuseppe Saverio Poli, *Elementi di fisica sperimentale*, vol. 1 (Venice: A. Curti q. Giacomo, 1796), 24–25.

99 "De l'éclat argenté de la nacre de perle." Richard, *Description historique*, vol. 4, 201.

100 Joseph-Jérôme Le Français de Lalande, *Voyage d'un françois en Italie, fait dans les années 1765 et 1766, contenant l'histoire et les anecdotes les plus singulières de l'Italie, et sa description, etc.*, 8 vols. (Paris: Desaint, 1769), vol. 6, 130, 134.

101 Ibid., 131.

102 Ibid., 133–135.

103 Michał Jan Borch, *Minéralogie sicilienne docimastique et métallurgique, ou Connaissance de tous les minéraux que produit l'île de Sicile etc.* (Turin: fr. Reycends, 1780), 155.

104 Lalande, *Voyage d'un françois*, vol. 6, 134. See Donato, "Masonic Friendships." The Margravine mentioned her visit to Naples in her Italian journey diary: *Markgräfin Wilhelmine von Bayreuth, Tagebuch der Italienischen Reise*, ed. Helke Kammerer-Grothaus (Bayreuth: Rabenstein, 2002), 57. De Felice records the same fact in his *Encyclopédie*. "Severo, Raimond de Sangro, prince de San-," in *Encyclopédie*, vol. 38, 482–485. Hopefully, future research will allow us to understand if this account is consistent with the results of our analyses.

The *Breve nota* confirms all this information but adds several details to the snapshot taken in 1771 by the notary de Maggio. According to the text, in a room located on the first floor of his palace, the prince had several pieces of glass that had been coloured in depth, and yet they retained their brightness and clearness as if the hues had been applied in the furnace.[105] Ninety-six small blocks of Carrara marble were kept inside a chest, all variously coloured down to the deeper layers, most of which "imitate several known stones, such that they would be indistinguishable from natural ones."[106] Others were simply *ideali*, so called because their colouration was "beyond the natural order."[107] We may understand them as hyper-natural colours, maybe an attempt to show that, once man had learnt to recreate nature, he could avail himself of such knowledge to create seemingly natural things that however did not exist in the natural world. When compared with the more limited palette of his precursors, Raimondo's achievements must have surely looked impressive.[108]

Not only was Raimondo aware of the procedures to create counterfeit stones and pigments, but he was in contact with important antiquarians and engravers in Naples and Florence such as Anton Francesco Gori, who held him in high regard and read his works.[109] In 1735, Gori and other erudite persons and collectors founded the Società Colombaria Fiorentina, of which Raimondo di Sangro became a member in 1753.[110] The Società Colombaria was a place for meeting and conversation about archaeological topics, as well as for display-

105 *Breve nota*, 29.

106 "Contraffanno varie pietre conosciute, di maniera che non si distinguerebbero dalle naturali." Ibid., 30–31.

107 "Fuori dell'ordine naturale." Ibid.

108 Barry, "'Painting in Stone,'" 46.

109 Gori's rich epistolary, now preserved at the Biblioteca Marucelliana in Florence, unveils a network of engravers working in Naples and in the Grand Duchy, as well as at the Real Laboratorio delle Pietre Dure. Raimondo di Sangro was well integrated into such a network, and the close relationship he had with other figures in the circuit of gemstones production, collection, and trading likely allowed him to perfect his knowledge and techniques. See Biblioteca Marucelliana, Florence (henceforth, BMF), ms. BVIII 3.29, fol. 375r; BMF, ms. BVII 7, fols. 218^{r}–219^{v}; BMF, ms. BVII 9, fols. 119^{r}–119^{v}. See also Gabriella Tassinari, "Collezionisti, committenti e incisori di pietre dure a Venezia nel Settecento," in *Collezionisti e collezioni di antichità e di numismatica a Venezia nel Settecento*, Atti del convegno del 6–7 dicembre 2019 (Trieste: EUT, 2022), 99–211, in part. 149–150. On the epistolary, see Cristina De Benedictis et al., eds., *L'epistolario di Anton Francesco Gori: saggi critici, antologia delle lettere e indice dei mittenti* (Florence: Florence University Press, 2004).

110 Anton Francesco Gori, "Prefazione," in *Memorie di varia erudizione della Società Colombaria Fiorentina* (Florence: Stamperia all'Insegna d'Apollo, 1747), i, xi–xx.

ing materials that were often provided by the collector and Freemason Philipp von Stosch.[111] Such a network was particularly important for Raimondo, since creating stones involved several skills.[112] Collectors and connoisseurs were as actively involved in the circulation and evaluation of such stones as alchemists and craftsmen were in their production, due to their experience with optical and tactile characteristics of natural and fake gems.[113]

In the eighteenth century, the production of counterfeited gemstones was often linked with economic issues. Between 1716 and 1718, for instance, the Regent of France Philippe II needed to rekindle the country's internal and foreign trade (due to previous wars France was in harsh financial difficulties at the time), and worked numerous experiments to make false gems, as well as copies of cameos and medals.[114] The *art* of imitating precious stones was considered a respectable chemical enterprise, as suggested by Pierre-Élisabeth Fontanieu, intendant of the Gard-Meuble de la Couronne, who dedicated his study on the production of artificial gems to the king in 1778.[115]

As mentioned above, Naples was one of the major centres of artificial gemstone production in the entire peninsula. Here, in 1730, Gennaro Muzio's press printed the encyclopaedic work on minerals and gemstones, *Della storia naturale delle gemme*, written by the Abbot and erudite Giacinto Gimma. Among other things, the author addressed the topic of gemstone frauds, for which

111 Fabia Borroni Salvadori, "Tra la fine del Granducato e la reggenza: Filippo Stosch a Firenze," *Annali della Scuola Normale Superiore di Pisa. Classe di Lettere e Filosofia*, Ser. 3, 8, no. 2 (1978): 565–614, in part. 573, 583. See Gabriella Tassinari, "Lettere dell'incisore di pietre dure Francesco Maria Gaetano Ghinghi," *LANX* 7 (2010): 67; Renato Pasta, "Fermenti culturali e circoli massonici nella Toscana del Settecento," in Cazzaniga, *La massoneria*, 455–456; Renato Pasta, "Dalla prima loggia all'età francese: idee, dinamiche, figure," in *La massoneria a Firenze. Dall'età dei Lumi al secondo Novecento*, ed. Fulvio Conti (Bologna: il Mulino, 2007), 48. Stosch taught the technique of counterfeiting gems to well-known antique enthusiasts and dealers.

112 Nadia Baadj, "Painting on Stone and Metal: Material Meaning and Innovation in Early Modern Northern European Art," in *Almost Eternal. Painting on Stone and Material Innovation in Early Modern Europe*, ed. Piers Baker-Bates and Elena Calvillo (Leiden-Boston: Brill, 2018), 252.

113 Michael Bycroft and Alexander Wragge-Morley, "Introduction: Science and Connoisseurship in the European Enlightenment," *History of Science* 60, no. 4 (2022): 439–457; Bycroft, "The Hand of the Connoisseur."

114 Paola Bertucci, *Artisanal Enlightenment. Science and the Mechanical Arts in Old Regime France* (London-New Haven, CT: Yale University Press, 2017), 57–58; Jean Hellot, "Analyse chimique du zinc," in *Histoire et mémoires de l'Académie Royale des Sciences*, 97 vols. (Paris: Imprimerie Royale 1699–1797), Année 1735, 221–242, in part. 232–233.

115 Pierre-Élisabeth Fontanieu, *L'art de faire les cristaux coloré imitans les pierres précieuses* (Paris: Imprimerie de Monsieur, 1778).

he blamed the rarity of authentic ones, their cost, and the high demand for them.[116]

Apparently, doublets were sold at sky-high prices by Italian jewellers.[117] While imitation stones represented a cheaper alternative to their real counterparts, they also attracted intellectual and commercial interest.[118] Eighteenth-century Neapolitan family inventories show that people who could not afford real gems would often resort to imitations made with coloured glass.[119] Their lower standard of living did not prevent them from pursuing a refined aesthetic sense, which contributed to fuelling the Neapolitan counterfeit market.[120] The circulation of low-quality or fake jewels concerned King Ferdinand IV, so much so that in 1798 he forbid goldsmiths and silversmiths to make and sell jewellery with *pietre non fine*.[121]

6 The Quest for the Phoenix

Hordes of curious tourists standing before the statue of St. Oderisius in the 1970s, armed with a popular paper guide, would read that the saint's cushion was made of amethyst.[122] Today, should visitors check online, they would likely

116 Giacinto Gimma, *Della storia naturale delle gemme, delle pietre e di tutti i minerali, ovvero Della fisica sotterranea*, vol. 1 (Naples: G. Muzio, 1730), 186. James R. Johnson, "Stained Glass and Imitation Gems," *The Art Bulletin* 39, no. 3 (1957): 221–224; William Eamon, *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* (Princeton: Princeton University Press, 1994).

117 Antonio Neri, Christopher Merret, and Johann Kunckel, *Art de la verrerie* (Paris: Durand, 1752), 174. Merret describes the recipes as "une porte ouverte à la tromperie et à la fraude" ("an open door to deceit and fraud").

118 Rijks, "Scales, Skins, and Carapaces in Antwerp Collections," 298–299.

119 Catello, "Il gioiello napoletano," 31–32. For example, brides' trousseaux among the lower classes included golden rings with coloured fake stones.

120 Gaia Bruno, *Le ricchezze degli avi: cultura materiale della società napoletana nel Settecento* (Naples: Federico II University Press, 2022), 139 ff.; Barbara Bettoni, *Perle di vetro e gioie false. Produzioni e cultura del gioiello non prezioso nell'Italia moderna* (Venice: Marsilio, 2017), 38–41; Alessandra Magni and Gabriella Tassinari, "Gemme vitree e paste vitree: la questione delle officine," in *Atti delle XIX Giornate Nazionali di Studio sul Vetro: Siti produttivi e indicatori di produzione del vetro in Italia dall'antichità all'età contemporanea (Vercelli, Museo Camillo Leone, 20–21 maggio 2017)*, ed. Marina Uboldi, Silvia Ciappi, and Francesca Rebajoli (Rome: Arbor Sapientiae, 2019), 73–90, in part. 83.

121 Archivio di Stato di Napoli (State Archive of Naples), Sez. Diplomatica, Regali Dispacci, Vol. X (1798), v.

122 See, for instance, Vittorio Gleijeses, *La nuova guida storica, artistica, monumentale, turistica della città di Napoli e dintorni* (Naples: Società editrice napoletana, 1973), 223. This

read that the material is porphyry.[123] They would find little or no explanation whatsoever about the red pigment debris on St. Oderisius' hat, or about the oval blue frame encircling the *Deposition* high relief. Yet, all these works are hidden traces of Raimondo di Sangro's accomplishments.

As Raimondo and his collaborators were allegedly making and theatrically displaying their projects—among which the famous anatomical machines, experiences of palingenesis, the replica of St. Gennaro's blood liquefaction, perpetual lamps, and others—they were trying to save money by means of imitation stones and pigments. However, while economy may have been a good reason to attempt mineral palingenesis, the quest for searching the phoenix was clearly more nuanced.

Based on the study of historical sources and on our scientific analyses carried out at the Museo Cappella Sansevero, we suggest that Raimondo di Sangro and his retinue's efforts in mineral palingenesis had at least two further purposes. On the one hand, alongside other forms of palingenesis, that of minerals was part of the Masonic search for the secret of regeneration or rebirth. On the other hand, it allowed them to produce a mimesis of nature, or even a hypernature (i.e., enhanced natural materials, colours, etc.). This research has thus revealed how Raimondo di Sangro's project reconciled economic needs and symbolic purposes, to the extent that they almost blurred together.

By combining historical and scientific methodologies, we were able to gain a more comprehensive understanding of aspects that had only been analysed separately and in different fields until now. The results achieved are considerably important, among other things, because they link the history of science with earth sciences and cultural heritage. In particular, even though historians have long considered sources concerning Raimondo's experiences relatively unreliable, our analyses show that they provide trustworthy information. Such is the case of the *Breve nota*, of Sarnelli's *Guida*, and of Origlia's *Istoria*: their use as precious resources to reconstruct processes of nature mimesis in the Phoenix room should be reconsidered.

This study also confirms for the first time that the Prince of Sansevero and his entourage of artisans and artists were able to create artificial ultramarine. As of today, this seems to be the earliest ever recorded case of the production of this artificial pigment, predating Goethe's account by more than a decade

idea had been circulating for over a century, at least. See, for instance, the 1850s reprint of Carlo Celano's guide: Carlo Celano, *Notizie del bello, dell'antico e del curioso della città di Napoli etc.* (Naples: A. de Pascale, 1856–1860), vol. 3, 448.

123 Wikipedia, s.v. "Cappella Sansevero," last modified September 1, 2023, https://it.wikipedia.org/wiki/Cappella_Sansevero.

and Guimet's synthesis by fifty years. Such an achievement likely entailed years of research. Based on the sources, Raimondo and his collaborators might have started making artificial ultramarine already in the 1750s.

Furthermore, the red cardinal hat of St. Oderisius' statue attests to Raimondo's skill in creating vibrant colours that have lasted to our days, and—again—that some of the information provided by contemporary sources is reliable. The choice of fluorite for the cushion at the base of the statue of St. Oderisius (and of St. Rosalia, on the opposite side of the chapel) is particularly interesting, given its blue fluorescence and the importance of the blue colour in Freemasonry.

As suggested by the 1771 inventory of Raimondo di Sangro's riches and by the documents preserved at the Archivio Storico del Banco di Napoli (Historical Archive of the Banco di Napoli), the prince spent a considerable amount of money to turn the Sansevero Chapel into a Masonic temple, both symbolically and materially.[124] Part of his experiences in the Phoenix room then found their place in the chapel, not only because counterfeit gems and artificially coloured marbles were useful to imitate precious materials with little expense, but also because the prince enjoyed theatrically displaying them to the European elite visiting Italy in their Grand Tour.[125] Our multidisciplinary research has thus contributed to a deeper understanding of the philosophy of nature in Neapolitan Freemasonry, which combined philosophical echoes, experiences in the laboratory, a theatrical culture of demonstration, and encoded Masonic messages.

Displays of imitation gemstones and other counterfeited materials appealed observers because they showed that human skills could reproduce natural processes with an impressive degree of accuracy.

And that is how man learnt how to "recreate" nature.

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124 Napolitano, "The Sansevero Chapel"; Márton Szentpéteri, "The Body of Christ and Hiram. The *Veiled Christ* by Giuseppe Sanmartino and the Cappella Sansevero in Naples," in *Studies on Western Esotericism in Central and Eastern Europe*, ed. Nemanjia Radulović and Karolina Maria Hess (Szeged: JATEPress, 2019), 211–228.

125 de Ceglia, "The Fantastic Anatomy," 669.

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