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# *Electrum* in the *Kunstkammer* of Rudolf II.

## Objects Made from Seven Metals

Alchemische Labore. Alchemical Laboratories, Sarah Lang (Hg.), unter Mitarbeit von Michael Fröstl & Patrick Fiska, Graz 2023, S. 115–131, DOI: https://doi.org/10.25364/97839033740417



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## Abstract

Three groups of objects associated with the court of Rudolf II. and his *Kunstkammer* that are said to be made from a seven-fold alloy, called *Electrum,* are presented in this essay: divinatory mirrors, spirit-summoning bells, and talismanic medals. Originating in Paracelsian literature, the *Electrum* was a curious material that let the paths of alchemists and goldsmiths cross, demanded great technological skill, and promised power and knowledge to its bearer.

**Keywords:** art and alchemy, Electrum, *Kunstkammer* of Rudolf II., Paracelsus, talismans

## Zusammenfassung

Dieser Beitrag stellt drei Objektgattungen vor, die aus einer siebenfachen Legierung, dem sogenannten *Electrum,* hergestellt worden sein sollen und mit der Kunstkammer Rudolfs II. in Verbindung stehen: divinatorische Spiegel, Geisterglocken und talismanische Medaillen. Das *Electrum* hat seinen Ursprung in der paracelsischen Literatur. Seine Umsetzung ist an der Schnittstelle zwischen Kunst- und Alchemiepraxis angesiedelt, erfordert handwerkliches Können und verspricht seinem Träger Wissen und Macht.

**Schlagwörter:** Kunst und Alchemie, Electrum, Kunstkammer Rudolfs II., Paracelsus, Talismane

In the (Pseudo-)Paracelsian literature of the late 16th century, a special material evolved: an alloy made of seven metals which was to become known as *Electrum*.[1] From this metallic alloy, a welter of talismanic objects was supposed to be created: divinatory mirrors, talismanic medals and rings, anti-toxic drinking vessels, and spirit-summoning bells. The court of Rudolf II. in Prague was a fertile ground for Paracelsian ideas and particularly the *Electrum* seems to have been well-received. A goldsmith working for the emperor could successfully produce the legendary alloy. This essay will analyze the textual background of the *Electrum* and the Rudolfine reception by presenting three groups of objects: divinatory mirrors in a Rudolfine manuscript, the Emperor's so-called "Alchemical Hand Bell", and talismans in the shape of medals. The question to be answered is why the sevenfold alloy found entrance into the emperor's *Kunstkammer* and why Rudolf II. was keen on realizing a material which had until then only existed in theory.

In the 1570s, a text corpus named *Archidoxis Magica* and ascribed to the Swiss physician and alchemist Paracelsus began to circulate first in manuscript and then in print.[2] In book V, *De speculi constellatione*, and book VI, *De compositione metallorum*, the mystery of the *Electrum* is elaborated. Traditionally, the term "Electrum" refers to a naturally occurring as well as artificially produced alloy of gold and silver (at least 20 %) which is mentioned as early as in Pliny's *Historia naturalis* (Book 33, Chapter XXIII).[3] This ancient source already ascribes supernatural qualities to the alloy: "Natural electrum also has the property of detecting poisons; for semicircles resembling rainbows run over the surface in poisoned goblets and emit a crackling noise like fire, and so advertise the presence of poison in a twofold manner."[4] In the 16th century, the myth of the *Electrum* was revived, yet transformed. The (Pseudo-)Paracelsian author, who will be referred to as "Paracelsus" for convenience since his writings were conceived as authentic "Paracelsica" around 1600, describes the *Electrum* as an alloy made from the seven "planetary metals" gold, silver, mercury, copper, iron, lead and tin which may only be created under specific astrological conditions.

Book V of the *Archidoxis Magica* was literally copied in a beautifully illuminated codex today located in the Austrian National Library, titled *Reconditae philosophiae*

1. My research on this topic was facilitated by the Society for the History of Alchemy and Chemistry who awarded me with the New Scholars Award in 2019. I am grateful for the generous financial support and the extended deadline to complete my work during the pandemic.

2. The oldest known manuscript from 1570 is in the *Germanisches Nationalmuseum* in Nuremberg (MS 9829). For the first time, the complete *Archidoxis Magica* were published in Huser 1590, Appendix, 67–138. For a critical evaluation of Paracelsus' authorship see Sudhoff 1898, 677; Schneider 1982.

3. Even though Pliny the Elder is the first to use the Latin expression, the alloy had been known and used since 3000 B.C. Today, it is debated whether "Electrum" ever referred to a naturally occurring alloy or whether it was always artificially produced. For a recent discussion see the comprehensive anthology edited by Van Alfen and Wartenberg 2020.

4. Andrews et al. 2014, Book 33, Chapter XXIII, 63

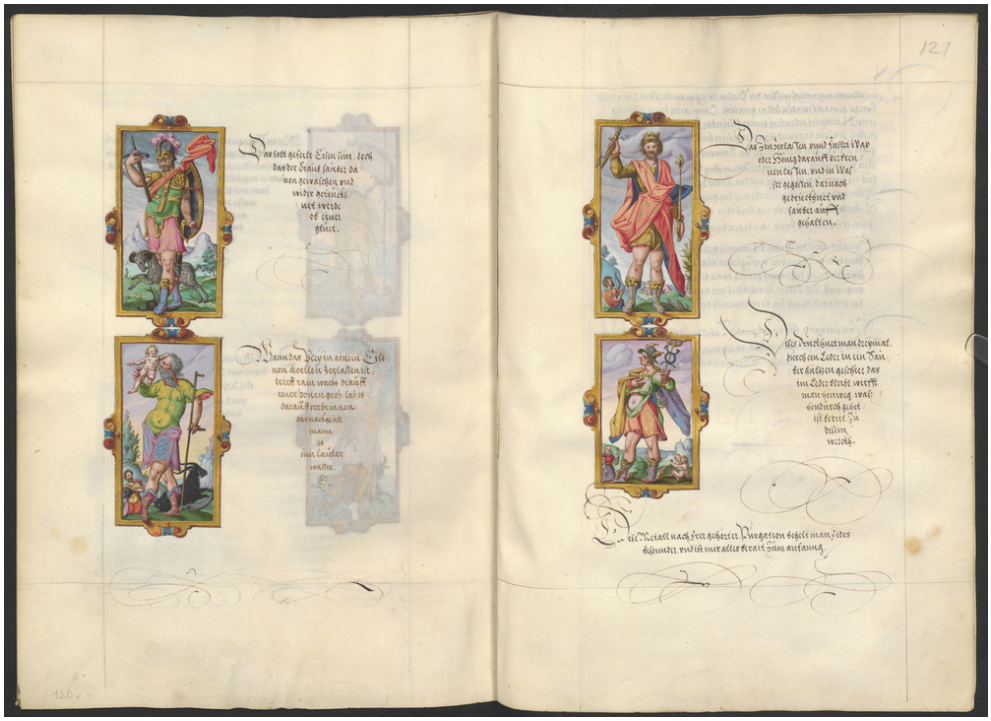

Figure 17.: **Vienna, Österreichische Nationalbibliothek, Cod. 11414, fol 120v–121r**

*monumenta,*[5] dated 1589 or 1591,[6] written by Philipp Knodius von Schlammersdorf,[7] and dedicated to Emperor Rudolf II. The dedication and the content show great similarities to the famous *Heidelberger Schicksalsbuch*.[8] The main subject of this book is another occult divinatory practice: geomancy. Colorful paper astrolabes to determine planetary hours (fol 6r) as well as the planets' hours of rising and setting (fol 5r), and geomantic figures fill the greater part of the codex. The Paracelsian book *De speculi*

5. Vienna, ÖNB, Cod. 11414. An almost literal copy of the manuscript text is located in the *University Library* of Leipzig MS 0401. The illuminations, however, are not as elaborate and must have been added quickly. Another copy is part of the Wellcome Library in London, MS. 394. A fourth manuscript with this title is located at *Columbia University Library* (MS X133 K75), yet the content differs from the other copies. It consists of two volumes, has no paper astrolabes and does not seem to include the Paracelsian text. The main focus seems to be on geomancy. I am grateful to Emily C. Runde, Curator of *Medieval and Renaissance Collections*, for providing me with information on this manuscript (correspondence on November 12th, 2019).

6. Unterkircher 1976, 133. The date on fol. II (MDXIC) is misleading and supposed to mean MDLXXXIX or MDXCI.

7. No biographical information about this person could be traced.

8. UB Heidelberg, Cod. Pal. germ. 832. Another related astrological manuscript is Cod. Pal. germ. 833. Cf. Haage 1981; Zimmermann 2010.

*constellatione*, here captioned *Speculum Philosophicum Regium*, was added at the end of the manuscript by the same scribe.[9] The text contains astrological, alchemical, metallurgical, and artisanal instructions to create three divinatory mirrors from *Electrum*. According to the text, the following amounts of the seven metals will have to be purged and alloyed: ten parts of gold, ten parts of silver, five parts of copper, two parts of tin, two parts of lead, one part of iron, five parts of mercury.[10] What follows is a minute description of how to prepare the individual metals. Each of the seven steps is illustrated by a full-figure planetary deity emphasizing the cosmological analogy between planets and metals (fig. 17).

Before the seven purged metals can be alloyed, though, the conception horoscope[11] of the person going to use mirrors will have to be cast in order to determine the lord of the geniture[12] and thus the appropriate moment and metal to begin with: if the person is a child of Saturn, for example, the process is to begin with lead; if the person is a child of Mars, the process is to begin with iron, and so forth.[13] From the resulting alloy, three divinatory mirrors, royal instruments, as the author calls them, are supposed to be cast: in the first mirror, everything that has ever happened can be seen, the second mirror reveals everything that has ever been spoken and the third everything that has ever been written. In this way, three instruments to gain insight into the world's secrets are being created. The steps of casting, polishing, and cleaning the three mirrors must also obey astrological laws. Altogether, this procedure is said to take 13 months.

The manuscript does not only provide written information but also an image of the mirror's mold and the finished object: a metallic hand mirror with an ornamental golden frame which is certainly an invention of the manuscript's anonymous illuminator and an object worthy of the imperial *Kunstkammer* (fig. 18). It is not known whether Rudolf II. had any *Electrum* mirrors realized even though the 1607/11 inventory of his collection contains a great number of mirrors made from crystal, glass or metal, among them are various burning mirrors also used for alchemical experiments.[14] An image of a "horoscopic mirror" by an artist from the Hoefnagel

9. ÖNB, Cod. 11414, fol. 118r–124v.

10. In German: „Man nimpt diese nachfolgende siben Metalla bey diesem Gewicht, doch nachdem sie Purgieret und gereiniget worden sind, jedes auff seine arth wie hernach folgt: Gold ein zehen theil oder Loth. / Silber ein zehen theil. / Kupffer fünff theil. / Zinn zwey theil. / Bley zwey theil. / Eisen Ein theil. / Quecksilber fünff theil." Huser 1590, Appendix, 116.

11. On conception horoscopes referring to the moment of quickening instead of birth see: Frommhold 2004.

12. On the "domus geniturae" and how to determine this planet see Eade, 59–89.

13. The only exception is Mercury since the fugitive metal "does not stay in the fire". If the person is a child of Mercury, the eponymous metal must be added last.

14. Bauer and Haupt 1976, 69, fol. 194, 196. On Rudolf's use of burning mirrors see Bukovinská 2006; Purš 2013.

circle can be found in Cod. Min. 31, fol 1, depicting the emperor's fictive horoscope in a gigantic (burning) mirror held by two angels.[15] These sources attest a deeper interest in the magical, alchemical and scientific use of reflecting surfaces, that is catoptromancy as well as catoptrics – a context in which the *Electrum* mirrors must be seen.

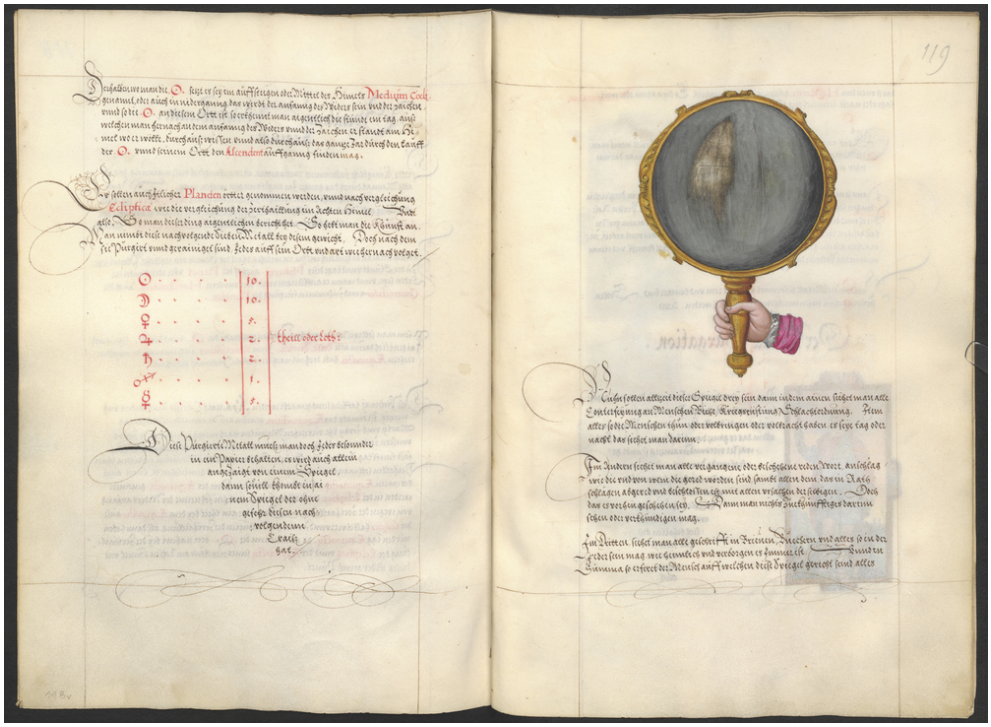

Figure 18.: **Vienna, Österreichische Nationalbibliothek, Cod. 11414, fol. 118v–119r**

Whereas the three mirrors must for now be mainly considered as part of a written tradition, another object made from *Electrum* has evidently been realized: the so-called "Alchemical Hand Bell of Rudolf II." (fig. 19). This little piece of goldwork by the Prague artist Hans de Bull serves as a "touchstone of art alchemy."[16] Its enigmatic decoration is full of references to the astro-alchemical practices previously described: seven full-figure planetary deities, not unlike those in Cod. 11414, adorn the bell's mantle; at their feet, the respective signs of the zodiac; above their heads, corruptions of Chaldean and Arabic letters as well as the traditional symbols of

15. Vienna, ÖNB, Cod. Min. 31, fol. 1. Reproduced in Purš 2009, 212. I am dedicating a chapter to this image in my dissertation.
16. Gannon 2019

the seven planets. The inside of the bell contains a Greek inscription, and the iron clapper is inscribed with pseudo-Hebrew letters.[17] In a letter to Rudolf's successor, Emperor Mathias I., Hans de Bull claims that he cast *two* bells from seven different metals. In the 1607/11 inventory of the Rudolfine *Kunstkammer*, these two bells can be identified as: "Zwo gegoßene glogken von mehrerley metall, darauf die 7 planeten und 12 zaichen erhebt."[18] While the second piece seems to be lost, a chemical analysis of the remaining bell recently conducted at the *Kunsthistorisches Museum* in Vienna could prove that it really consists of *Electrum*.[19] Book VI of the *Archidoxis Magica, De compositione metallorum,* provides the intellectual background of this object. In addition to elaborating the *Electrum*'s wonder-working properties such as its healing and anti-toxic effect already mentioned by Pliny, Paracelsus recites an encounter with a Spanish necromancer who supposedly owned a bell made from this alloy. This bell, inscribed with various, unspecified characters, was said to be used to summon spirits.[20] The implementation of a summoning bell is enhanced in a related text also associated with the name of Paracelsus which later became known as *Geheimnüß aller seiner Geheimnüsse*.[21] Here, the reader is explicitly advised to produce *two* bells, one to summon planetary spirits and the other to summon angels from the angelic choir. In this text, which reads like a Solomonic grimoire, the bells become part of minutely described and well-staged rituals to invoke supernatural beings who are said to impart secret and divine knowledge.[22] It is not known whether Rudolf II. actually implemented the bells and tried to seek contact with the spirit world even though some authors claim that he did.[23] Conversing with celestial beings had a long-standing tradition in the 16th century. The most prominent example is the English magus John Dee who documented his angel conversations and sought Rudolf's patronage in Prague during the 1580s. The modern analysis of his séances show that such practices were part of a greater longing to uncover the world's secrets and therefore posed an alternative, yet not contradictory approach to science.[24] This must also be presumed for artefacts like the divinatory mirrors and the spirit-summoning bells.

17. For a more detailed description, see Gannon 2019.
18. Bauer and Haupt 1976, 87
19. Prague, *Archiv Pražského hradu* [The Archives of Prague Castle], Dvorská komora [Court Chamber], box 5, no. 698. The analysis of the bell by the means of X-ray fluorescence spectrometry was carried out at the *Kunsthistorisches Museum* by Katharina Uhlir on August 24th, 2020. Gold, silver, copper, tin, lead and iron could be detected. Only mercury could not be found which is not surprising since the fugitive metal most likely volatilized during the melting process. The technical results of this analysis are to be published in the upcoming *Wiener Jahrbuch für Kunstgeschichte*.
20. "Spectra und Visiones der geister" Cf. Huser 1590, Appendix, 126.
21. ÖNB Cod. 11266, fol 70r–80v, edited by Spunda 1923. A version of this text was later published as Paracelsus 1686.
22. For a detailed description of the text see: Gannon 2019, 89f.
23. Schwarzenfeld 1963, 483
24. Harkness 1999

Figure 19.: **Hans de Bull, Alchemical Hand Bell, c. 1600, alloy of seven metals, H: 7,8cm, D: 6,3cm, Vienna, Kunsthistorisches Museum, inv. no. KK 5969, © KHM-Museumsverband**

Another group of objects supposedly made from *Electrum* has survived: talismans in the shape of medals to be worn close to the body or as pendants around the neck. These medals are not directly associated with the Rudolfine *Kunstkammer*, yet they must be mentioned in this context as they complement the picture. Unlike the emperor's hand bell and the three mirrors, these talismans are not reserved for an aristocratic elite but part of everyday use. Such medals were most likely created on behalf of the Paracelsian physician Leonhard Thurneysser and were sold together with medicines to increase their effect.[25] Thurneysser had corresponded with Rudolf's father, Maximilian II. and is said to have moved between the Dresden and Prague courts.[26] His talismans were in great demand and thus he had the goldsmith Andreas Hindenberg from Cologne create them according to his instructions.[27] Obviously, the talisman industry proved to be very profitable for Thurneysser. Not only his own patients gratefully received his medals, also his fellow physicians requested and paid large sums for such objects. The great number of medal-shaped talismans that must have been produced by the "Thurneysser company" is attested by the many medals which can still be found in various numismatic collections today. Even though there are many different versions, the medals seem to spring from a common source.[28] All of them measure about 49mm in diameter, refer to the seven planets and their respective metals. The standard versions of this talisman seem to be MK 15349b$\beta$[29] and MK 147072 in the *Münzkabinett* of the *Kunsthistorisches Museum* in Vienna. The obverse of the latter shows a radiant sun enclosed by a pentagram and surrounded by the symbols of the remaining six planets and five stars (fig. 20, left).[30] The circumferential inscription reveals the medal's materiality. It is said to be made from seven metals, labeled as "minerals"[31] here: "DISER TALER IST V DENEN 7 MINERALIEN PREPARIERT." The reverse informs about the talisman's agency and depicts a bridge over a river, probably a reference to the disease "Fluss" (rheumatism) (fig. 20, right).

25. Moehsen 1783, 138f. For a depiction of the medals see the figure appended to Moehesen's book. It must be stressed that Moehsen's biography is the only source that connects these talismans with Thurneysser. Regrettably, the author does not cite his sources.

26. On Thurneysser's activities under the Habsburg emperors, see: Soukup 2007, 248–254; Watanabe-O'Kelly 2002, 105.

27. Moehsen 1783, 138

28. For example: Basle, *Pharmaziemuseum*, Inv. No. A86; Nuremberg, *Germanisches Nationalmuseum*, Münzkabinett Med. 5894 and Med. 5896; Stuttgart, *Landesmuseum Württemberg*, Münzkabinett, MK 19320; Vienna, *Kunsthistorisches Museum*, Münzkabinett, MK 145559, MK 15349b$\beta$, MK MD 007193; Vienna, Institut für Numismatik und Geldgeschichte, Universität Wien, Sammlung Brettauer, Inv. No. 2364 and 2363; London, Science Museum, Inv. No. A661126. Variants include MK 7358b$\beta$, MK 145558, MK 38781, MK 145560, MK 145562, and MK 147072 (all in the *Kunsthistorisches Museum*).

29. On this variant see Gannon 2021, Cat. No. 106, 338–339

30. On MK 15349b$\beta$ the sequence of the surrounding planets is according to their ascending order in the geocentric model (Moon, Mercury, Venus, Sun, Mars, Jupiter, Saturn). This is not the case here.

31. Metals are labelled thus in mineralogy when occurring as native element minerals. Cf. Lüschen 1979, 23.


Figure 20.: **Talisman supposedly made from seven metals, Vienna, Kunsthistorisches Museum, inv. no. MK 147072, © KHM-Museumsverband**

Including rheumatism, the medal is supposed to prevent seizures and skin rashes when worn close to the body: "DISE MINERALISCHE V MERCURIALISCHE MATERI DINET VOR / VOR FLVSS KRAMPF VNT ROTLAVFEN WAN ER BEY DEN MENSCHENN GETRAGEN WIRT."[32] Without a doubt Thurneysser drew inspiration from Paracelsus' *Archidoxis Magica* where such healing effects of the sevenfold alloy are mentioned. According to Paracelsus, rings made from *Electrum* could prevent strokes and seizures and stop epileptic fits. He adds that *Electrum* rings could also indicate "hidden diseases" to their bearer by emitting sweat.[33]

Talismans made from a certain metal referring to its respective planet and adorned with the respective planetary symbol or sigil were quite common. A talisman made

32. Some talismans were obviously worn on a necklace as indicated by small holes drilled through the metal as in: Nuremberg, *Germanisches Nationalmuseum*, Münzkabinett, Med. 5896.

33. „So können wir hie nicht unangezeigt lassen, etliche wunderbarliche Tugenden und krefften unsers Electri […]Finger Ring, wer die angetragen, ihme der Krampff und Lähme nie nichts gethan, oder schmertzen gemacht hatt: Deßgleichen der Schlag und die Fallendsucht keinen berührt hatt. Und so man ein solchen ring einem Epileptischen an den Hertzfinger gesteckt hatt […]ist der Paroxysmus als bald auß gewesen, und der Fallende auffgestanden. So haben wir auch gesehen, und selbst erfahren, daß ein solcher Ring, so er am Hertzfinger getragen wirdt, unnd sich im Menschen ein verborgene Kranckheit eroffnen will, hebt der Ring auch an stettigs zuschwitzen […]." Huser 1590, Appendix, 126.

from seven metals, though, was definitely innovative and promised exceptional efficacy by combining the benefits of all seven planets. No wonder, these medals sold like hot cakes! However, the question remains whether Thurneysser's bestsellers were in fact made from what the inscription promises and whether they were actually produced according to the time-consuming procedure described in the Paracelsian recipe. Given the high demand, it would not be surprising if cheaper alternatives were sought to save time and money. Recently, the *Pharmaziemuseum* in Basle and the *Kunsthistorisches Museum* in Vienna analyzed their medals by the means of X-ray fluorescence spectrometry (XRF).[34] It turned out that none of the medals contain gold or silver. Instead, the main constituent is tin, sometimes alloyed with lead.[35] Smaller amounts of other metals were detected as well but these might simply be trace elements or impurities. It therefore seems like Thurneysser's talismans were indeed fraud or cheap copies of more valuable pieces. Nevertheless, the inscription definitely places these objects in the tradition of the Paracelsian *Electrum* and gives an idea of its vast dissemination into different social strata.

Let us return to the court of Rudolf II. The divinatory manuscript and the hand bell are undoubtedly indicative of a heightened interest in the alloy called *Electrum* and its supernatural properties in Prague around 1600. Another evidence is provided by a recipe book which unquestionably originates from the Rudolfine court. Today in the collection of the University Library in Leiden where a large part of the remaining Rudolfine alchemical manuscripts are stored, this manual gives insight into the practices carried out in the imperial laboratories.[36] It contains a recipe on how to make *Electrum* and is fittingly captioned "Wie man diss Electrum machen soll."[37] Unlike the *Archidoxis Magica* and their related sources, this recipe seems to be much closer to the reality of a goldsmith's or alchemist's workshop and gives more precise technical instructions which overshadow the supernatural qualities of the alloy. However, astrology remains a determining factor when carrying out the individual steps; the metals may only be processed on the corresponding day of the week (gold on Sunday, silver on Monday, etc.).

34. The analysis of the medal from Basle was undertaken by the *Sammlungszentrum* of the *Schweizerisches Nationalmuseum* on January 29th, 2020. I am grateful to Philippe Wanner for coordinating this analysis. Five medals from the numismatic collection of the *Kunsthistorisches Museum* (MK 15349b$\beta$, MK 145558, MK 145559, MK 147072 and MK MD 7193) were analyzed in their own laboratory by Katharina Uhlir on January 25th, 2021. I am grateful to Katharina Uhlir and Heinz Winter for conducting this analysis upon my request.

35. This is the case with four of the medals in Vienna: MK 15349b$\beta$, MK 145559, MK 147072 and MK MD 7193.

36. The manuscript in question is Voss. Chym. O3. On the destiny of the emperor's alchemical manuscripts see: Boeren 1975, on this manuscript: 241f.; Richterová 2016.

37. Voss. Chym. O3, fol. 182r.

To give the reader an idea of the recipe's diction, the transcription of the first section referring to the processing of iron on Tuesday will be provided:

> *Man nimbt Eisen Flauden vnnd Kupferschlag iedes ein viertling und mischets wol durcheinander thues in ein tigel und 1 lb gestossen wenedigisch glaß darauf geschütt und lassts 7 Stundt aneinader fließen, darnach nimbts mans heraus, lasts erkalten schlagt den Konig ab und feylt denselben und das glaß, stößt man wider klein, was aber an dem glas abgangen, das ergenzt man mit frischen gestoßenen wenedischen glaß das wieder ein pfundt ist, wie zuvor, setzts ab ein, und laß solches in Die Martis widerumb 5 Stundt lang fließen, hernach widerumb gefeyhlet, das glasß gestossen, und was am glas abgangen wieder ergenzt und das dritte mal aber in Die Martis 3 Stund an einandr fliessen laßen dan den Konig wieder gefeylt und das glaß gestossen, und den abgang mit frischem gestossen glaß ersetzt und das 4te mal aber in Die Martis ein stund lang fließen laßen."*[38]

In short, the seven-step procedure contains the following instructions: together with one pound of glass as a flux agent, the first metal is molten on its respective day of the week. After having cooled off and having hardened, the resulting bodies of glass and metal are separated. The metal is being filed and then molten again with another pound of glass. This smelting process is repeated four times, taking seven, five, three and one hour before the next metal can be added. The sequence suggested is: iron (Tuesday), gold (Sunday), silver (Monday), copper (Friday), lead (Saturday), tin (Thursday) and mercury (Wednesday). Altogether, if followed precisely, this process takes at least 23 days.[39]

This recipe with its hands-on instructions suggests that experiments to reproduce the Paracelsian *Electrum* were undertaken at the court of Rudolf II. The alloy's astrologically determined, quasi-theurgical process of creation and the supernatural qualities ascribed to the finished product are challenging and tempting at the same time. Given the emperor's interest in the writings of Paracelsus and his patronage of the arts and of alchemy in general,[40] the *Electrum* becomes an embodiment of the Rudolfine mindset. The production of objects from *Electrum* required a close cooperation of alchemists and artisans, that is of the alchemical laboratories at Prague Castle and

38. I am grateful to Roman Fischer (Frankfurt am Main, *Institut für Stadtgeschichte* ) for helping me with the transcription of the text.

39. I am grateful to Christoph Jäggy for his expertise on this recipe. Christoph Jäggy and I currently conduct a hands-on project to reproduce the *Electrum* which is generously funded by the *Stiftungsfonds Anthroposophische Medizin*. In the course of this project, different recipes will be put to the test to examine the practicability of such instructions.

40. The emperor himself was highly interested in the writings of the Swiss. After the death of Johannes Huser in 1601, the editor of the Paracelsian texts, Rudolf made sure to have all philosophical-medical writings delivered to Prague. Cf. Soukup 2007, 224 and Purš 2016.

the so-called "Prager Hofwerkstatt".[41] Naturally, the boundaries between the professional fields of goldsmiths and alchemists were fluid.[42] Other artists like the painter and compiler of the Rudolfine inventory, Daniel Fröschl, were also suspected to have worked in the laboratories.[43] It remains an open question, though, in how far, artists and alchemists rather acted as rivals or whether they took advantage of each other's particular expertise and cooperated peacefully behind the walls of Hradčany Castle to produce such alchemically charged objects.[44] Hardly anywhere does a fruitful cooperation become more evident than in the "Alchemical Hand Bell."

Producing the Paracelsian recipe thus served at least three purposes. On the one hand, it was a technological challenge to create an object that had theretofore only existed in Paracelsian literature. Considering the fact, that artisans were constantly vying for patronage, the *Electrum* bells must have been a convincing masterpiece to win the emperor's favor. In his letter to Emperor Mathias I., Hans de Bull therefore emphasizes that Rudolf II. had been particularly fond of the two objects. On the other hand, the *Electrum* satisfies the alchemical desire to produce new and potent materials. Many alchemists were employed in the laboratories of Prague Castle where a variety of alchemical practices were conducted.[45] Whereas the infamous philosophers' stone had to remain a dream, the *Electrum* with its complex and demanding formation served as a practicable "compromise." The benefits it promised to its owner were no less auspicious: The mirrors were supposed to serve as powerful instruments to acquire superior wisdom and gain control, the bells were said to endow their owner with the power to converse with angels and spirits and thus to be granted insight into divine secrets, and finally, the talismans were supposed to grant control over sickness and health and therefore guarantee longevity. These different object-based strands of reception all aim for the same and this must be seen as a third purpose, namely, to attain deeper and superior knowledge – knowledge that was of course synonymous with power.

Thus, objects from *Electrum* were at least a symbolical means to consolidate imperial power. It was not merely the technological goal to reproduce the Paracelsian recipe but also to produce representative *Kunstkammer* objects which would embody and make palpable the emperor's dominance over the cosmos to those who entered the collections. As Thomas DaCosta Kaufmann has shown, the Rudolfine *Kunstkammer* also served as a diplomatic showcase for the emperor's supremacy.[46] Artifacts like those made from *Electrum* certainly contributed to the intended effect by condensing

41. Bukovinská 1989/90
42. Haug 2014
43. Soukup 2016, 215f.
44. On this ambivalent relationship see: Newman 2005, Chapter 3, "The Visual Arts and Alchemy".
45. Soukup 2016
46. DaCosta Kaufmann 1978a, chapter 5; DaCosta Kaufmann 1978b.

a large variety of complex and intertwined discourses and by materializing Rudolf's II. claim to universal power.

**Corinna Gannon** studied art history and English Studies in Frankfurt am Main. From 2018 until 2022, she was a research assistant in the department of art history at Goethe University. Her teaching and research focused on the history and practice of collecting portraits. On behalf of the Dr. Senckenbergische Stiftung she conducted a research project on the foundation's collection of portraits of physicians (16th–20th century) and published a monograph dedicated to Frankfurt's medical and art history (2022). In her dissertation, *Efficacious Artefacts. Visual Concepts of Natural Magic in the Kunstkammer of Rudolf II.,* she pursued a materialiconological approach and focused on the connection between art, alchemy and natural magic at the court of Rudolf II. in Prague. Since January 2023, Corinna is an assistant curator at the Städel Museum in Frankfurt in the department of Dutch, Flemish and German Painting before 1800.

## Bibliography

[1] Andrews, A. C. et al., eds. 2014. *Pliny. Natural history. 9. Books 33–35*. Cambridge, MA: Harvard University Press.

[2] Bauer, Rotraud and Hebert Haupt, Herbert. 1976. "Das Kunstkammerinventar Kaiser Rudolfs II. 1607–1611." *Jahrbuch der kunsthistorischen Sammlungen in Wien,* 72: vii–191.

[3] Boeren, P. 1975. C. *Codices Vossiani chymici.* Leiden: Universitaire Bibliotheken Leiden.

[4] Bukovinská, Beket. 1989. "Prager Hofwerkstatt. Einige Erwägungen mit vielen Fragen." *Jahrbuch der kunsthistorischen Sammlungen in Wien*, 85/86, 1989/90: 123–129.

[5] Bukovinská, Beket. 2006. "Existuje 'mio specchio grande' Giovanniho Antonia Maginiho. Does Giovanni Antonio Magini's 'mio specchio grande' exist?" In *Pictura Verba Cupit*, edited by Beket Bukovinská and Lubomír Slavíček, 423–433. Prag: Ústav dějin umění AV ČR.

[6] DaCosta Kaufmann, Thomas. 1978a. *Variations on the imperial theme in the age of Maximilian II and Rudolf II*. New York: Garland Publ.

[7] DaCosta Kaufmann, Thomas. 1978b. "Remarks on the Collections of Rudolf II. The Kunstkammer as a Form of Representation." *Art Journal* 38: 22–28.

[8] Eade, John Christopher. 1984. The forgotten Sky. A Guide to Astrology in English Literature. Oxford: Clarendon Press.

[9] Frommhold, Katrin. 2004. *Die Bedeutung und Berechnung der Empfängnis in der Astrologie der Antike.* Münster, Aschendorff.

[10] Gannon, Corinna. 2019. "The Alchemical Hand Bell of Rudolf II. A Touchstone of Art and Alchemy." *Studia Rudolphina* 19: 80–97.

[11] Gannon, Corinna, 2021. "Cat. No. 106 and 105." In *Zeichen der Zukunft. Wahrsagen in Ostasien und Europa*, exhibition catalog edited by Marie-Therese Feist et. al., 338–339. Nuremberg: Germanisches Nationalmuseum.

[12] Haage, Bernhard D. 1981. *Das Heidelberger Schicksalsbuch. Das 'Astrolaboum planum' deutsch aus CPG 832 der Universitätsbibliothek Heidelberg*. Frankfurt am Main: Inselverlag.

[13] Harkness, Deborah E. 1999. *John Dee's Conversations with Angels. Cabala, Alchemy, and the End of Nature.* Cambridge: Cambridge University Press.

[14] Haug, Henrike. 2014. "Artificial Interventions in the Natural Form of Things. Shared metallogenetical concepts of Goldsmiths and Alchemists." In *Laboratories of Art. Alchemy and Art Technology from Antiquity to the 18th Century*, edited by Sven Dupré. Cham: Archimedes. 79–103.

[15] Huser, Johannes, ed. 1590. *Husersche Quartausgabe. Medizinische und philosophische Schriften*. Vol. 10: Dieser Theil (welcher der Dritte unter den Philosophischen Schrifften) begreifft fürnemlich das treffliche Werck Theophrasti, Philosophia Sagax, oder Astronomia Magna genannt: Sampt ettlichen andern Opusculis, und einem Appendice. Basle: Conrad Waldkirch.

[16] Lüschen, Hans. 1979. *Die Namen der Steine. Das Mineralreich im Spiegel der Steine.* Thun: Ott Verlag.

[17] Moehsen, Johann Carl Wilhelm. 1783. *Leben Leonhard Thurneissens zum Thurn.* Leipzig.

[18] Newman, William R. 2005. *Promethean ambitions. Alchemy and the quest to perfect nature.* Chicago et al.: University of Chicago Press.

[19] Paracelsus. 1686. *Philippi Theophrasti Paracelsi Bombast Des hocherfahrnen Berühmtesten Philosophi und Adepti Größtes und höchstes Geheimnüsz aller seiner Geheimnüsse, Welches noch niemahls wegen seiner unvergleichlichen Fürtrefflichkeit ist gemein gemacht, sondern allezeit in Geheim gehalten worden. Nach seiner eigenen Handschrift von einem unbekanndten Philosopho zum Druck treulichst mitgetheilt. Nebst einem Anhang noch mehr anderer fast unglaublichen raren Curiositäten, welche noch niemals offenbar worden*. Dresden.

[20] Purš, Ivo. 2009. "The Intellectual World of Rudolf II and the Kabbalah." In *Path of life. Rabbi Judah Loew ben Bezalel, ca. 1525–1609*, edited by Alexandr Putík and Peter Demetz, 199–219. Prague: Academia.

[21] Purš, Ivo. 2013. "Zápalná zrcadla císare Rudolfa II. a jeho alchymická laborace." In *Libellus amicorum Beket Bukovinská*, edited by Lubomír Konečný, 86–99. Prague: Artefactum.

[22] Purš, Ivo. 2016. "Rudolf II's Patronage of Alchemy and the Natural Sciences." In *Alchemy and Rudolf II. Exploring the secrets of nature in central Europe in the 16th and 17th centuries*, edited by Ivo Purš and Vladimír Karpenko, 139–204. Prague: Artefactum.

[23] Richterová, Alena. 2016 "Alchemical Manuscripts in the Collections of Rudolf II." In *Alchemy and Rudolf II. Exploring the secrets of nature in central Europe*

*in the 16th and 17th centuries*, edited by Ivo Purš and Vladimír Karpenko, 249–291. Prague: Artefactum.

[24] Schneider, Wolfgang. 1982. *Paracelsus. Autor der archidoxis magica?* Braunschweig: Pharmaziegeschichtl. Seminar d. Techn. Univ.

[25] Schwarzenfeld, Gertrude von. 1963. "Magica aus der Zeit Rudolfs II." *Antaios. Zeitschrift für eine freie Welt* 4: 478–481.

[26] Soukup, Rudolf Werner. 2007. *Chemie in Österreich. Bergbau, Alchemie und frühe Chemie.* Vienna et. al.: Böhlau.

[27] Soukup, Rudolf Werner. 2016. "'Transforming the whole corpus solis into liquor irreducibilis'. Laboratory alchemy at the court of Emperor Rudolf II." In *Alchemy and Rudolf II. Exploring the secrets of nature in central Europe in the 16th and 17th centuries*, edited by Ivo Purš and Vladimír Karpenko, 205–227. Prague: Artefactum.

[28] Spunda, Franz, ed. 1923. *Theophrastus Paracelsus. Magische Unterweisungen des edlen und hochgelehrten Philosophi und Medici Philippi Theophrasti Bombasti von Hohenheim, Paracelsus genannt.* Leipzig: Wolkenwanderer Verlag.

[29] Sudhoff, Karl, ed. 1898. *Versuch einer Kritik der Echtheit der Paracelsischen Schriften. II. Theil Paracelsische Handschriften I. Hälfte.* Berlin: Georg Reimer.

[30] Unterkircher, Franz, ed. 1976. *Die datierten Handschriften der Österreichischen Nationalbibliothek von 1501 bis 1600. Katalog der datierten Handschriften in lateinischer Schrift in Österreich,* vol. 4. Vienna: Verlag der Österreichischen Akademie der Wissenschaften.

[31] Van Alfen, Peter and Ute Wartenberg. 2020. *White Gold. Studies in Early Electrum Coinage.* Jerusalem: The Israel Museum.

[32] Watanabe-O'Kelly, Helen. 2002. *Court culture in Dresden. From Renaissance to Baroque.* Basingstoke: Palgrave.

[33] Zimmermann, Karin."Das Heidelberger Schicksalsbuch (Cod. Pal. germ. 832). Astrologisch-astronomische Sammelhandschrift am Hof der Pfälzer Kurfürsten und Zimelie der Universitätsbibliothek Heidelberg" In *Berthold Furtmeyr. Meisterwerke der Buchmalerei und die Regensburger Kunst in Spätgotik und Renaissance*, edited by Christoph Wagner and Wolfgang Neiser, 425–427. Regensburg: Schnell & Steiner 2010.