„Alchymistische Kunststücke in gutter Ordnungk“. Chemical Technology in Prague and Lower Austria around 1590

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For the volume "Alchymie a Rudolf II", published in Czech in 2011, the editors Ivo Purs and Vladimír Karpenko asked me to write a contribution about alchemy practiced around 1600. Well, I was very pleased with the appearance of this volume. Alas, I was not really happy with my own contribution. I kept thinking: perhaps one can get a little bit further on to an answer of the question: What was really done in the laboratories of Emperor Rudolf II on the Hradčany? In 2017, I asked one of my diploma students, Ms. Camen Birte, if she would like to write a diploma thesis about a very precious manuscript in the Austrian National Library (ÖNB) dedicated to Emperor Rudolf II.[1]

In the catalogue of the ÖNB the information on Codex 11.450 reads like this: 433 folio sheets, paper … gold embossing. On the front cover … the inscription: D(omine) RVDOLPHO II. SACRVM ANNO 1596. Previous owner: Emperor Rudolph II. Author: JOHANNES HEUMANN REISING (Fig. 1).[2]

This was the first information I had about this voluminous manuscript. Nobody could tell me anything about the author. Johannes Heumann Reising is obviously, an unknown person. A closer look led to a big surprise:

During a joint visit at the Augustinian Reading Room in Vienna, Birte Camen was the first to notice, that the author's name in the catalogue was a serious transcription error that runs through all the secondary literature. In reality, this manuscript of the Austrian National Library was written by the imperial servant, court physician and doctor of philosophy and medicine **Johann Henman (or Hennemann), called Reising.**

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[1] Birte Camen, “Alchymistische Kunst-Stücke in gutter Ordnungk“. Transkription und Beurteilung der Handschrift „Artificia Alchimica“ der Österreichischen Nationalbibliothek (Cod. 11450) von 1596, Diplomarbeit, Universität Wien 2018: https://phaidra.univie.ac.at/open/o:1344243 (8.1.2022)

[2] Franz Unterkircher, Die datierten Handschriften der Österreichischen Nationalbibliothek von 1501 bis 1600, Katalog der datierten Handschriften in lateinischer Schrift in Österreich, ÖAW, Vienna 1976, p. 134.

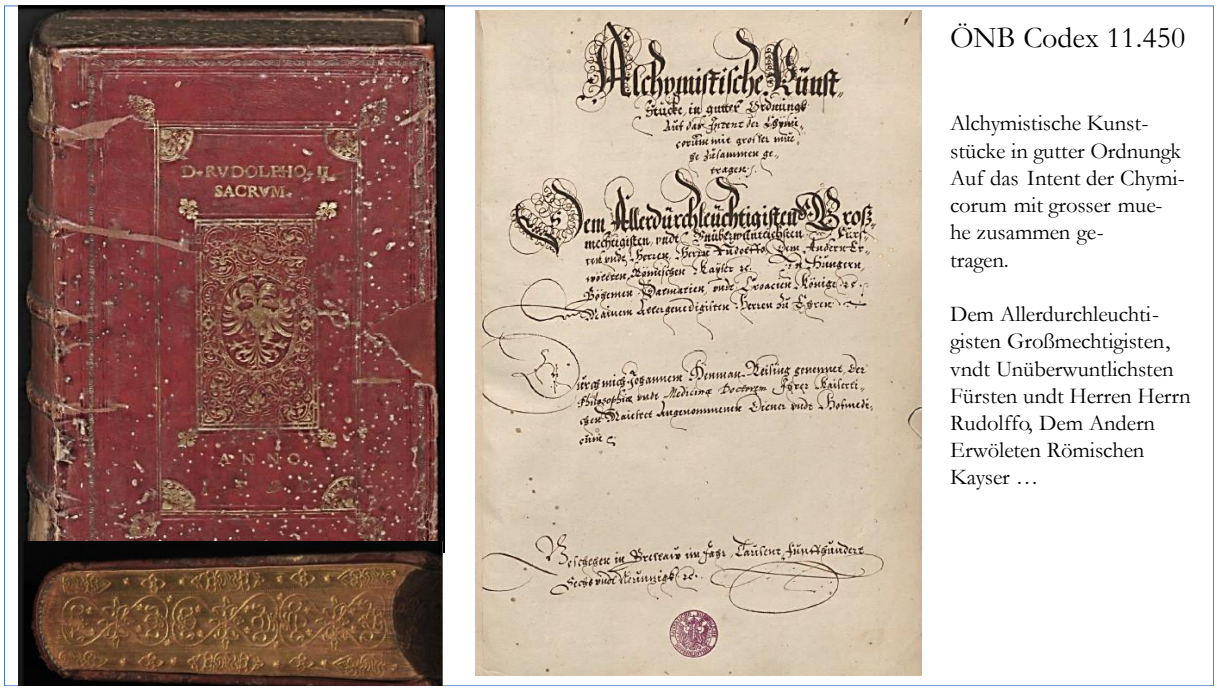


Fig. 1. Codex 11450 ÖNB

As soon as the correct name had been found, the author could easily be identified with the help of contemporary chronicles: The author of the manuscript was born in 1555 in Wrocław (Breslau) in Silesia as the son of an innkeeper (Fig. 2). The additional surname Reising (Reysing, Reysingk) was always used by the family and stems from the great-grandmother of the author.[3] Johann Hennemann studied medicine in Wittenberg, returned to Wrocław in 1576, and received his doctorate in Padua in 1578. He then worked as a physician. At least in 1595, Dr Hennemann became court physician to Emperor Rudolf II in Prague.[4] As can be seen from a letter "Dr Henneman" treated Georg Popel von Lobkowicz, who had been imprisoned by the emperor for insulting his majesty and died in the dungeon of Loket in 1607.[5]

[3] Oskar Pusch, Die Breslauer Rats- und Stadtgeschlechter in der Zeit von 1241 bis 1741, Forschungsstelle Ostmitteleuropa, Bd. 1, Dortmund 1986, S. 31, 240; Bd. 2, Dortmund 1987, S. 143: http://digibib.studienstelleog.de/fome/FOME.Pusch2_durchsuchbarW.pdf (15.1.2022);

[4] Caspar Sommer, Friedrich Lucae, Curiosi Silesii Animadversiones, Johann Brühl, Weißenfels 1687, p. 118f.

[5] František Dvorský, Sněmové, jednání léta 1593 i 1594 a právní proces Jiřího a Ladislava z Lobkovic, Grégra, Praha 1894, p. 38.

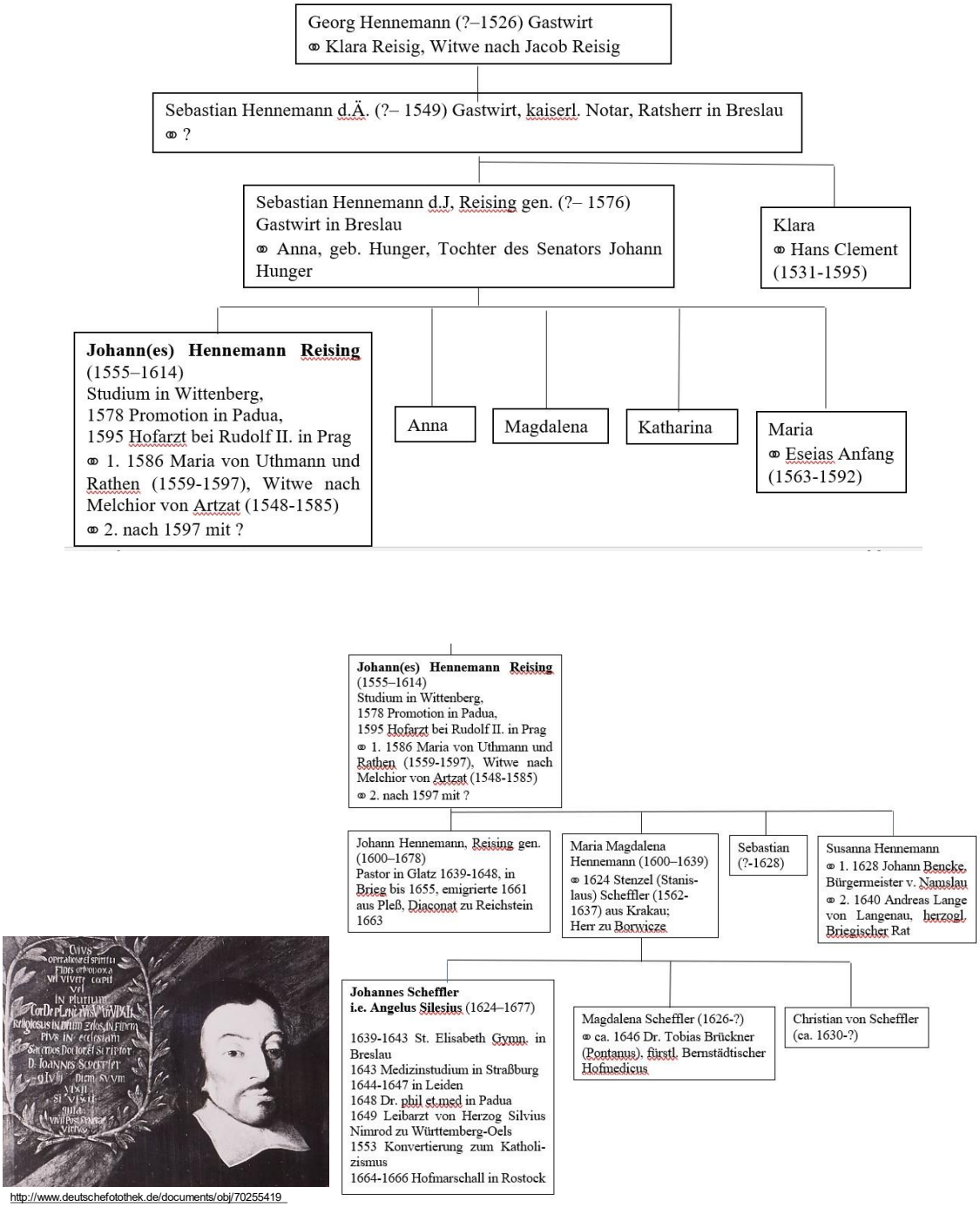


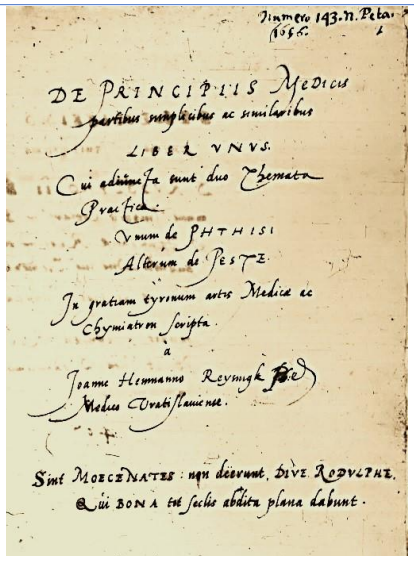
Fig. 2. Genealogy of Johannes Hennemann

Johannes Hennemann married two times.[6] After his second marriage four children were born: Johann, Maria Magdalena, Sebastian, and Susanna. Maria Magdalena Hennemann became is the mother of the famous Silesian poet,

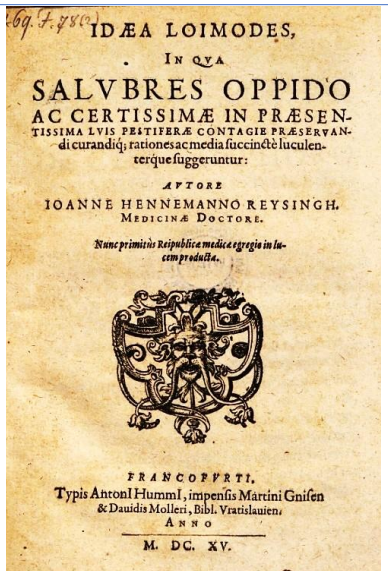
[6] Gregor Lange, cantor and organist in Breslau since 1583, wrote in 1586 a wedding motet for Johannes Hennmann. See: Allen Scott, "Simon Lyra and the Lutheran liturgy in the second half-century of the Reformation in Breslau", Myzika 2020, p. 13, Footnote 29: file:///C:/Users/Werner/Downloads/309-Article%20Text-817-1-10-20200329%20(1).pdf (14.3.2020)

theologian and physician **Angelus Silesius** (i.e. Johannes Scheffler). This was thr next surprising finding.

After the end of his activity in Prague, Dr Hennemann went to Glatz, where he wrote a plague pamphlet, which was publish in 1615.[7] Another one of his writings is known to be a medical manuscript that came into the Vatican library through Christina of Sweden (Fig. 3).


DE PRINCIPIIS Medicis
LIBER VNVS.
Cui adiuncta sunt duo Themata
Practica.
Vnum de PHTHISI
Alterum de PESTE.
In gratiam tyronum artis Medicæ ac
Chymiatrorum scripta
a
Ioanne Hennanno Reysingk
Medico Vratislauiense.
Sint MOECENATES: non deerunt, DIVE RODVLPHE,
Qui BONA tot sæclis abdita plana dabunt.

Ioanne Henmanno Reysingk, De principiis Medicis…, Catalogus Manuscriptorum Codicum Bibliothecae Reginae Sueciae in Vaticana 407 (REGIN. LAT. 1288)


IDÆA LOIMODES,
IN QVA
SALVBRES OPPIDO
AC CERTISSIMÆ IN PRÆSEN-
TISSIMA LVIS PESTIFERÆ CONTAGIE PRÆSERVAN-
di curandiq; rationes ac media succincte luculen-
terque suggeruntur:
AVTORE
IOANNE HENNEMANNO REYSINGH,
MEDICINÆ DOCTORE.
Nunc primùm Reipublicæ medicæ egregia in lu-
cem producta.
FRANCOFVRTI,
Typis Antonl Hummi, impensis Martini Gnisen
& Dauidis Molleri, Bibl. Vratislauien.
ANNO
M. DC. XV.

Ioanne Hennemanno Reysingh, Idea Loimodes …, posthum edierte Pestschrift, Frankfurt 1615

Fig. 3. Joannes Hennemann: De principiis Medicis; Idea Loimodes.

Dr Johannes Hennemann died in Breslau in 1614.[8] Bevor we have a look at his marvellous book, we focus on the following question:

What contacts did Hennemann have with important physicians, humanists and paracelsists of the late 16th century in Silesia?

In 1594, a booklet was published with poems in honour of a botanical garden established by the botanist and physician **Lorenz Scholz** in Wroclaw: *In Laurentii Scholzii Medici Wratisl(aviensis) Hortum Epigrammata Amicorum*.

[7] Ioanne Hennemanno Reysingh, Idea Loimodes, in qua salubres oppido ac certissimae in praesentissima luis pestiferae contagiae praeservandique, rationes ac media succincte luculenterque suggeruntur, Martin Gnisen, David Mollerus, Frankfurt 1615: https://onb.digital/result/10886B67 (11.3.2022)

[8] Johannes Hermannus Reysengh Medicus Vratislavensis, de principiis medicis, Item de phthisi & peste, Catalogus Manuscriptorum Codicum Bibliothecae Reginae Sueciae in Vaticana 407 (REGIN. LAT. 1288);

One of the 39 authors of poems of honour was "Ioh: Henman Reysingk Phil(osophiae) & Medicinae Doctor" (Fig. 4).

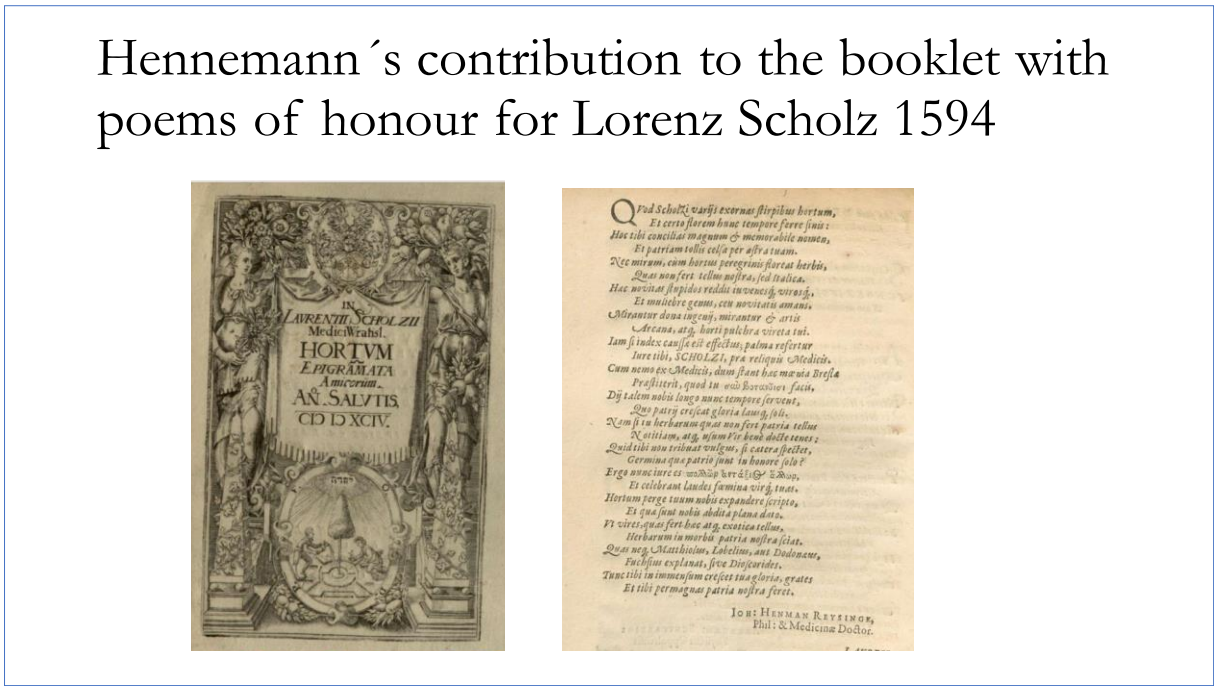


Fig. 4. *In Laurentii Scholzii Medici Wratisl(aviensis) Hortum Epigrammata Amicorum.*

This unique book **proves that Dr Johannes Hennemann belonged to the illustrious circle of Wrocław humanists, who visited the garden** artfully founded by Lorenz Scholz (1552 – 1599) within the city walls of Wrocław. In this garden festivals were celebrated (Fig. 5).

Hennemann and Scholz know each other since 1575, when they were fellow students at the University of Wittenberg. Scholz, who worked after his promotion as a doctor in Wrocław, was granted a coat of arms by the well-known humanist Johannes Crato von Crafftheim in 1585. Among the authors of the poems, we find Johann Matthäus Wacker von Wackenfels, Jacob Monau, Daniel Rindtfleisch, Nicolaus Steinberg, and Martin Mylius.

When Johann Matthäus Wacker wrote his poem of honour about Scholz's garden, he was Chancellor under Bishop Andreas von Jerin. In 1597 he was appointed Imperial Court Councillor to His Majesty Emperor Rudolf II in Prague. The imperial mathematician Johannes Kepler dedicated the booklet "Strena seu de Nive Sexangula" to him as a New Year's gift for 1611, in which the hexagonally densest sphere packing of atoms is described for the first time.

Johann Matthäus Wacker von Wackenfels, who was elevated to the nobility in 1594, died in Vienna in 1619.

The second poem was written by the Silesian banker Nicolaus Rhediger the Younger of Strisa and Sponsberg (1525 - 1587), who was involved in the alum, copper, and gravel mining business and was Wroclaw's council president from 1573 to 1587 and thus also governor of the Principality of Wroclaw. His father, Nicolaus Rhediger the Elder (who died in Breslau 1553), had correspondence with a prominent patient of Paracelsus, namely Adam Reißner (1496 - 1575).[9]

Among the numerous other authors is the physician Dr Daniel Rindtfleisch (1562 - 1621), who was employed as the city physicist in Breslau from 1603. Daniel Rindtfleisch the Younger (died in 1631) owned a letter from the Paracelsist Theodor Zwinger (1533 - 1588) from 1564 about Paracelsus and his publisher Adam von Bodenstein. Dr Daniel Rindtfleisch the Elder (1562 - 1621), the father of Daniel Rindtfleisch the Younger, received his doctorate in Bologna in 1593. He was personal physician to Archduke Charles of Austria.[10]

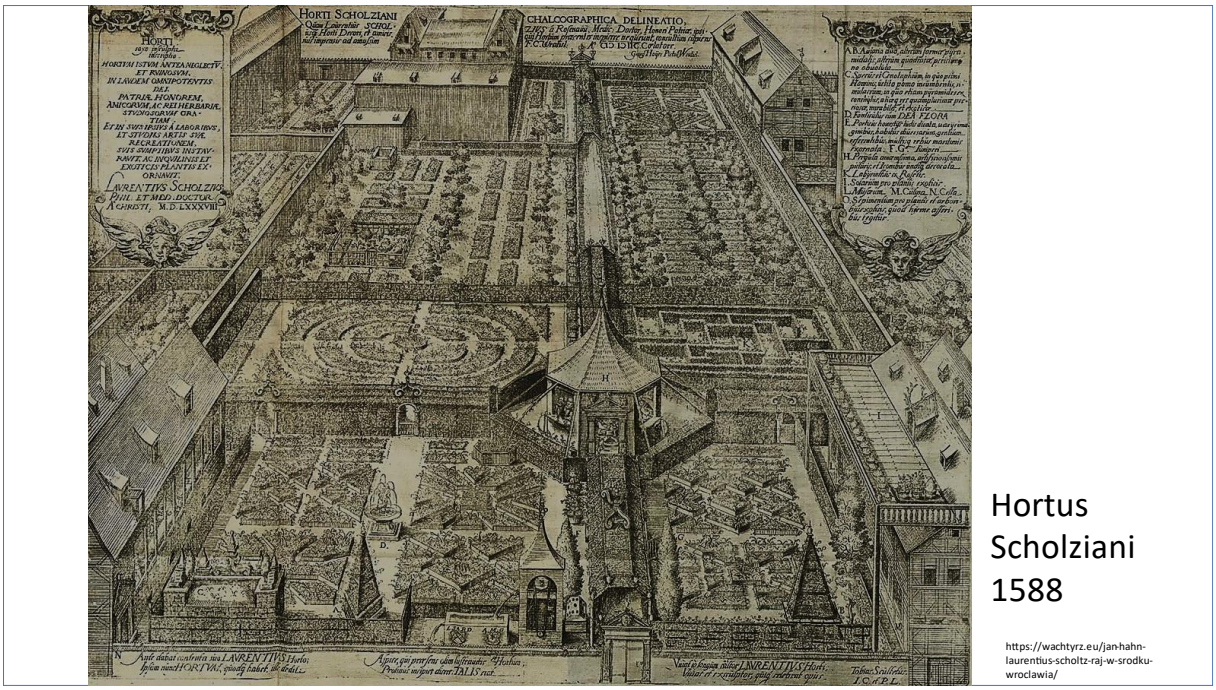


Fig. 5. The famous garden of Lorenz Scholz in Wrocław in 1588.

[9] Wilhelm Kühlmann, Joachim Telle, Corpus Paracelsisticum Bd. II, Der Frühparacelsismus, 2. Teil, Niemeyer, Tübingen 2004, p. 313.

[10] Frühneuzeitliche Ärztebriefe des deutschsprachigen Raums (1500-1700): www.aerztebriefe.de/pe/00000196 (5.1.2023)

Martin Mylius was rector of the grammar school in Görlitz; among his pupils was Michael Slavata, the brother of Vilém Slavata, chancellor of Emperor Rudolf II. Jacob Monau was the elder brother of Peter Monau, who studied in Heidelberg with Thomas Erastus, an irreconcilable opponent of the views of Paracelsus. Johann Hermann (1527 - 1605) was personal physician to Elector August of Saxony and within our context it is remarkable, that Elector August of Saxony was especially interested in alchemy.

Among other doctors we find as authors are: Phil. & Med. Dr Andreas Bütner, Phil. & Med. Dr. Ieremias Gesnerus, Phil. & Med. Dr Valens (Valentin) Acidalius (1567 - 1595), Phil. & Med. Dr Tobias Fischer, the Physicus of Schweidnitz Daniel Scepsius, the Physicus of Glogau Capar Fierling, the Physicus of Oppeln Andreas Schwalbe, the Medicus Christophorus Rumbaum (1555 - 1605) as well as Phil. & Med. Dr Iohannes Ferschius. In a didactic poem "De viris in materia medica et herbariam meritis", the latter versatile and learned physician Johannes Ferschius wrote down a list of names of other Silesian friends of botany at the time. Not only "Hennemann called Reysingh" is mentioned, but also Johann Scultetus (Tri)Montanus von Striegau (Johann Schulz ca. 1531-1604), a central figure of Paracelsianism in Silesia. He was the famous discoverer of the Striegauer Tonerde (clay from Striega).[11] Johann Scultetus collected numerous Paracelsus writings on his travels. He promoted the publication of works by Paracelsus by Georg Forberger and Johann Huser.

In the above-mentioned didactic poem, the Breslau physician Friedrich Sebiz (Fridericus Sebizius, Friedrich Sebisch 1544 – 1613)[12] is particularly emphasized. He was the personal physician of the Duke of Brieg. When Sebisch stayed in Vienna around 1577, he met Carolus Clusius. Afterwards, he sent Clusius interesting plants from the Krkonoše Mountains, which Clusius described in his famous work "Rariorum aliquot Stirpium per Pannoniam, Austriam... obseruatarum Historia" (Antwerpen 1583, on pp. 73, 269, 508, 510).

[11] Ursula Lang, Sabine Anagnostou, "Medizingeschichte: Terra sigillata – zur Geschichte antiker Heilerden", Dtsch Arztebl. 2012; 109(41): A-2034 / B-1657 / C-1627: https://www.aerzteblatt.de/archiv/131708/Medizingeschichte-Terra-sigillata-zur-Geschichte-antiker-Heilerden (31.1.2023)

[12] Johann David Köhler, Der Schlesischen Kern-Chronicke Anderer Theil, Frankfurt und Leipzig 1711, p. 675.

To sum up, Dr Hennemann was part of an illustrious circle of Silesian physicians, humanists, paracelsists and antiparacelsists. After all, Andreas Libavius listed Lorenz Scholz among the authors he followed (p. XVI), when he wrote his *Alchemia* in 1597.

Which names appear in Codex 11450?

It is remarkable that only two names are mentioned in Codex 11450 and not a single book is cited. In fact, only two names can be found: A "Kienast" appears on f.134r in connection with a "Fixirung des Mercurius", and the "Churfürst von Saxen" on f.287r in connection with the sublimation of “Martem".

The identification is simple in both cases: Johann Kienast von Fichtenberg was court medicus to Archduke Maximilian III. In 1599, Emperor Rudolf II ennobled Johann Kienast with the predicate "von Fichtenberg" (Fig 6).[13]

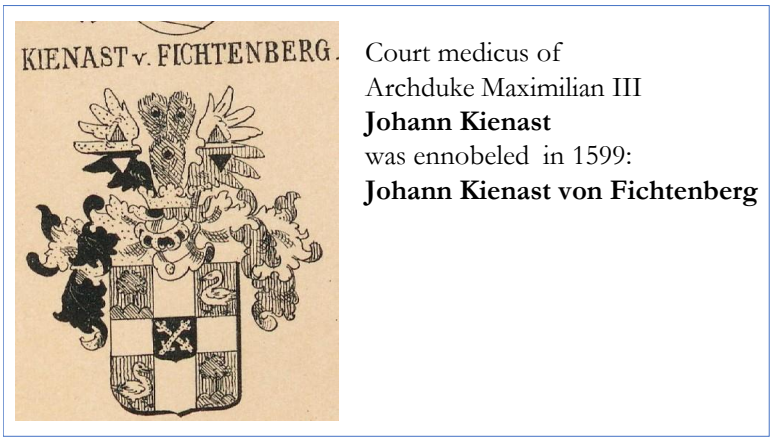


Fig 6. Coat of arms of Johann Kienast of Fichtenberg: Genealogischer Arbeitskreis Karlsruhe: https://carlsruhe.jimdofree.com/familienprojekt-kynast/wappen-kynast/ (2.1.2024)

By the “Elector of Saxony”, Hennemann meant August of Saxony (1526–1586). On folio 245v it is mentioned that "zue Dresten" (at Dresden) a *Mercurius Ex Saturno* was produced from oleum Victrioli (sulphuric acid) and Salamoniaci (ammonium chloride). One of August´s alchemists was the well-known Sebalt Schwertzer (1552-1598). In 1548, August of Saxony married Anna of Denmark (1532-1585), who is known for her intensive interest in medicine and pharmacy. She ran laboratories at Annaburg Castle. Furthermore, Castle Annaburg housed the first Saxon court pharmacy.

[13] Monatsblatt des Heraldisch-Genealogischen Vereines "Adler", Vol 4, 1900, p. 238. AT-OeStA/HHStA RHR Grat Feud Patentes und Steckbriefe 3-62: Neumar Georg, gegen Hanns Kienast, wegen Schulden 1588.

A closer look to Codex 11450

At first, I want to inform you, that in addition to the digital copy of the 850 pages of the manuscript "Alchymistische Kunststücke in gutter Ordnung"[14] (Alchemical Pieces of Art in good Order) a transcription is available[15] and a commentary.[16]

First of all, the segmentation and arrangement of the text is of interest. Already the title refers to a "good order". Surprising indeed is the scheme of order. At first, the author divides chemistry into the following parts: Details on the production of **salts,** of **sulphur compounds,** and of **mercury compounds**. So, the first three chapters are obviously reserved for the *tria prima* of sal, sulphur, and mercurius – the central concept of Paracelsus.

The following chapters contain **"mineralia"-recipes** (mixtures and compounds of arsenic, antimony, marcasites, of magnesiae, i.e. above all bismuth, of talc, of zinc, i.e. galmei and tutia, zinc carbonate, and zinc oxide respectively), at last on the preparation of **metals** and metal compounds, i.e. of lead, of tin, of iron, of copper, of silver & of gold (Fig. 7).

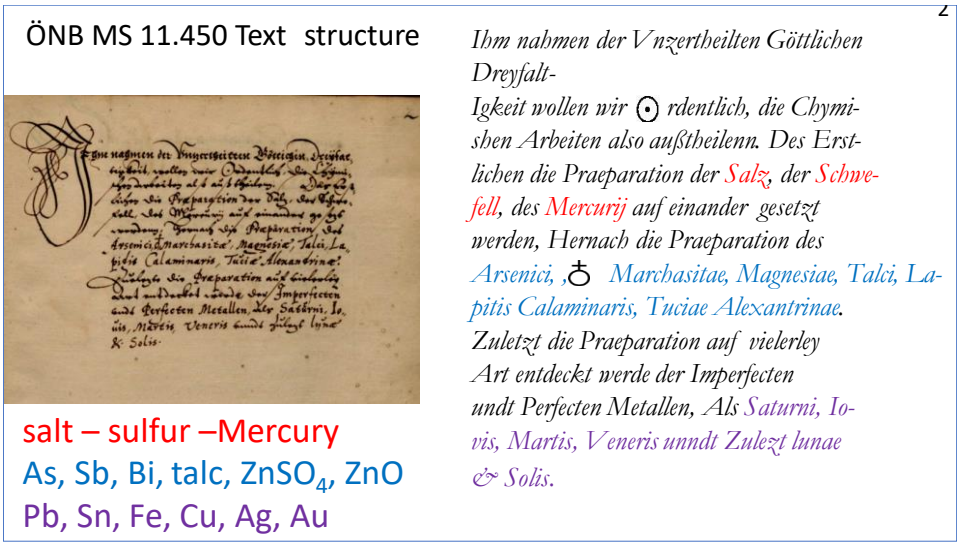


Fig. 7. Cod. 11450, f. 2r.

[14] https://digital.onb.ac.at/RepViewer/viewer.faces?doc=DTL_7173157&order=1&view=SINGLE (1.12.2021)

[15] Birte Camen, Rudolf Werner Soukup, Transkription der Handschrift „Alchymistische Kunst-Stücke in gutter Ordnungk" (Codex 11450 der ÖNB): https://www.rudolf-werner-soukup.at/Publikationen/Dokumente/Transkription_korrigiert_Dezember_2022.pdf (4.1.2024)

[16] Rudolf Werner Soukup, Kommentar zur Handschrift Codex 11450 der ÖNB „Alchymistische Kunst-Stücke in gutter Ordnungk" von 1596: https://www.dropbox.com/scl/fi/2towzkgy44m3s1eeq1szt/Cod-11450-Kommentar-Version-Jan.-2024.pdf?rlkey=mi4zf7hmdu06qg0cvbsakrg1s&dl=0 (1.2.2024)

Since the most probably literary source for Hennemanns concept is *Paracelsus, Von den ersten dreyen prinzipiis, edited by Adam von Bodenstein 156*3, we will focus now on the question: **How much of Paracelsian concepts can be found in Hennemann's recipes?**

In *De natura rerum, Strasbourg 1584* (Fig. 8), one finds the *tria prima* of Mercurius, Sulfur and Sal and the following enumeration (similar to Hennemanns chapering): "Marcarsite, Garnet, …Talc, Cachimia, Wismuth, Antimonium" etc. (The authorship of Paracelsus regarding this book was questioned often. My dear colleague Urs Gantenbein in Zurich recently examined the question whether Paracelsus was actually the author of all the books of *De natura rerum.* He found that books 1, 2, 3 and 8 were probably not written by Paracelsus. Regarding the books 4 and 7, there are no strong arguments against authenticity, and books 5, 6 and 9 were most likely penned by Paracelsus.)[17] In Hennemann's collection of recipes we occasionally find passages which remind us strongly on sentences in the books 5 and 7 of "De natura rerum".

Another characteristic of Hennemann´s book is: In a lot of the 1361 recipes **alloys** are described, in sum no less than 27 different alloys: 7 different copper alloys, 4 bismuth alloys, numerous different amalgams, but also antimony-alloys with lead or iron.

Fig. 8. *Von den ersten dreyen prinzipiis*, edited by Adam von Bodenstein 1563; *De natura rerum*, Strasbourg 1584.

[17] Urs Leo Gantenbein, "Real or Fake? New Light on the Paracelsian *De natura rerum",* Ambix 67 (2020) 4-29.

Some recipes in Codex 11450 deal with the production of **glass** or **glass-like masses**. Thus, *vitrum antimonii*, well known in the 16th century, is not missing (f. 189r, 1.; f. 202r, 2.).

It is particularly remarkable that Dr Hennemann reveals some **secrets of the glass colouring art**. Hennemann describes the well-known red colouring by copper(I)-oxide. The fact that a similar colouration of glass can be achieved by adding **antimonite in form of it´s orange-yellow modification** has, to my knowledge, never been documented in writing before - not even by Antonio Neri in *L' arte vetraria* of 1612. (Only in Kunckel's *Ars Vitraria Experimentalis*, Frankfurt 1679 a related reference can be found on p. 19).

Now to the chemistry presented in Codex 11450

As already mentioned, Chapter 1 is devoted to salts. Several prescriptions deal with the purification of common salt (i.e. rock salt) by means of filtration, but also by recrystallisation, almost as this would be described in a textbook for modern preparative chemistry!

Some of the recipes describe the **preparation of an *"Oleum salis".*** It turns out that *oleum salis* is nothing else than hydrochloric acid. Vague information on such a production can be traced back to Paracelsus, who obtained "aqua salis" by distilling calcined salt, “which becomes into a spiritum".[18] It was Leonhard Thurneisser who, in his Magna Alchemia of 1587, was the first to give a reasonable description of the production of *Oleum salis* using salt and clay.

Hennemann's recipe to get *Oleum salis* is astonishingly simple: take clay and salt in a mass ratio of 3:1 and heat this mixture in a retort (Fig. 9).

[18] Paracelsus, Sämtliche Werke, Herausgeber Karl Sudhoff, München, Berlin 1929, I. Abt, Vol. 2, p. 106: Das erste buch von den natürlichen dingen. Das vierd capitel. Von den salz und was salz begreift. Correctio und additio in das trocken salz.

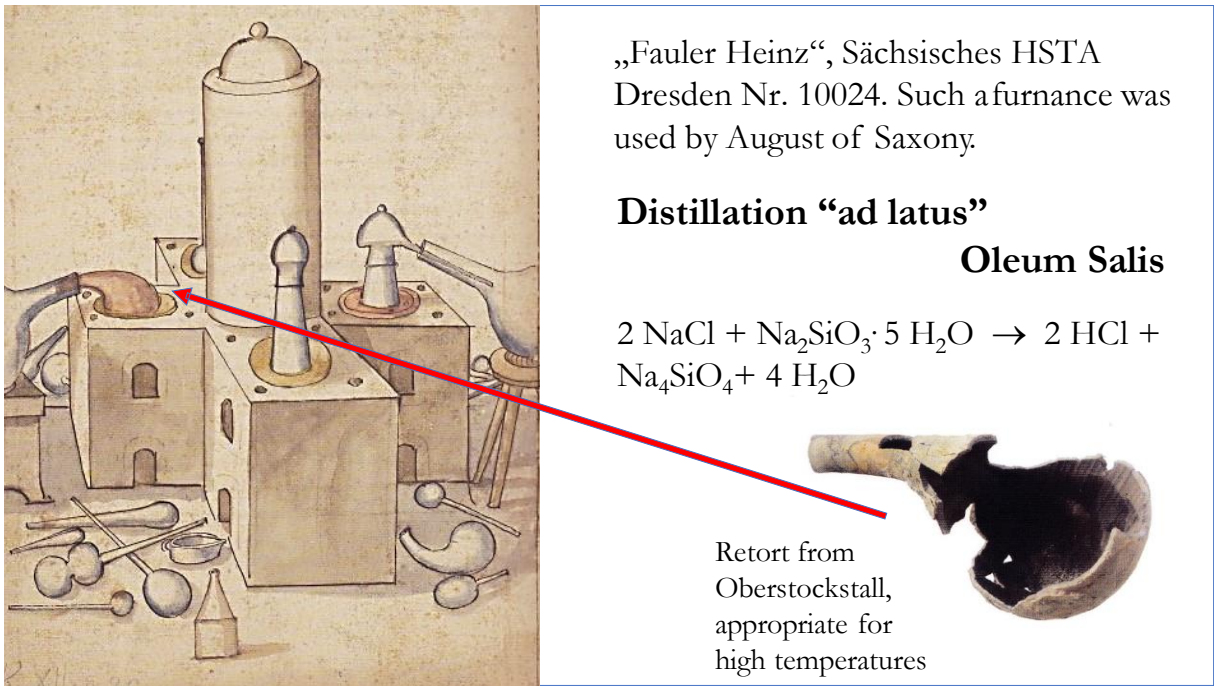


Fig. 9. Distillation of Oleum Salis in a retort.

The question of this production of hydrochloric acid was tested by Gerald Schröder at the Technical University of Braunschweig in 1957. When reworking those recipes, Schröder mixed 100g of salt with 300g of bolus and some water, formed balls, allowed to dry and finally distilled the mixture in a clay retort at 1000^0C. This yielded a hydrochloric acid solution of 25 percent.

In two of the Hennemann´s recipes dealing with the production of Oleum salis, the mixing of the salt with vinegar should take place in a "Walburgische Büchse" (e.g in f. 9r,v/11.). So, this may problably reminds us to the Walpurgis night. But: In earlier recipes of the 16th century no Walpurische boxes are used, but **Waldenburgische**! In an alchemical manuscript of the University of Kassel (4° Ms. chem. 60[7,1, f. 42 Bartholomäus Woldenburch, „Eine Tinctur durch oleum salis“ it reads: *"...R[e]z[ipe] 3 lib. Guth Hallisch dürhes [Salz] ... geuß ... ✠ in ein Waldenburgische Büchs...")*[19] In a letter from Augsburg dated April 1566, also the Electress Anna of Saxony mentions a "Waldenburgische Büchs".[20]

[19] https://orka.bibliothek.uni-kassel.de/viewer/image/1547810816969/83/ (2.1.2024)

[20] Karl von Weber, Anna Churfürstin zu Sachsen, geboren aus königlichem Stamm zu Dänemark, Tauchitz, Leipzig 1865, p. 135.

The name of this vessel after the pottery town of Waldenburg (near Zwickau) was probably the original name. A pottery workshop existed in Waldenburg since the end of the 14th century (Fig. 10.)

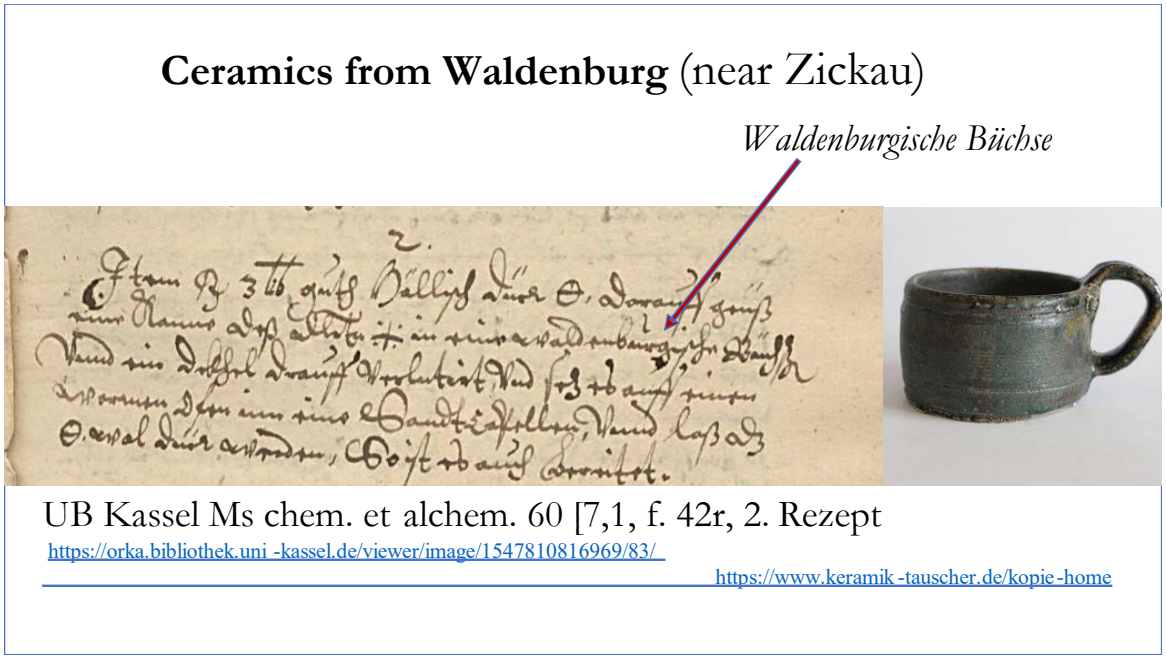


Fig. 10. “Waldenburgische Büchse”: A contemporary mentioning and a corresponding ceramic vessel from Waldenburg.

In Hennemann´s recipes we find another distillation *per retortam*, when *Oleum Antimonii* (antimonium(III)-chloride) should be produced. Hennemann presents us the classical preparation starting with stibnit and “sublimate” (mercury(II)-chloride), which goes back to Paracelsus.

$$Sb_2S_3 + 3\,HgCl_2 \rightarrow 2\,SbCl_3 + 3\,HgS$$

Paracelsus used the reactants in a mass ratio of 2 : 1, Hennemann´s ratio is 1 : 1, which is much closer to the quasi "correct" stoichiometry of 1 : 2.5.

As we know from archaeometrical data about retorts from Oberstockstall in Lower Austria antimony oil was distilled from antimonite and sublimate as starting materials using a retort (Fig. 11).

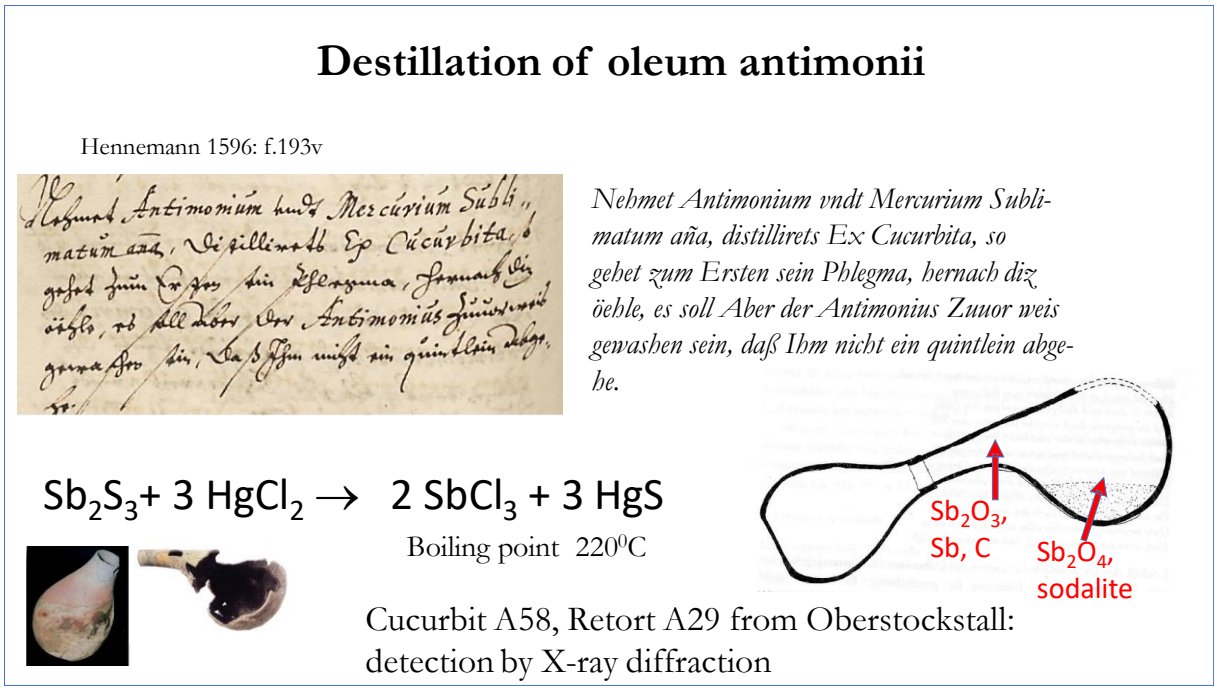


Fig. 11. Distillation of oleum antimonii with the help of a retort and a cucurbit.

In 1980, the more or less **complete equipment of a laboratory, dating back to the end of the 16th century**, was discovered **in the course of archaeological excavations at Castle Oberstockstall in the village of Kirchberg am Wagram in Lower Austria** (Fig. 12).[21] The pit with the apparatus and remnants was found by accident. In the ground floor room, adjacent to a 14th century chapel of the estate, the brick paving had begun to sink in. After removing a few bricks, the owner found a recess filled with a large quantity of ceramic and glass fragments. The excavations of two former waste dumps revealed relicts of approximately 1000 objects: 300 crucibles, 100 clay cupels, ceramic aludels, retorts, glass alembics, phiales, bottles, different metal objects, charcoal, minerals, bits of leather and textiles, bones.[22] Some of the objects are unique.

[21] Rudolf Werner Soukup, Helmut Mayer, Alchemistisches Gold, Paracelsistische Pharmaka, Laboratoriumstechnik im 16. Jahrhundert. Chemiegeschichtliche und archäometrische Untersuchungen am Inventar des Laboratoriums von Oberstockstall/Kirchberg am Wagram, Böhlau, Wien 1997. R. Werner Soukup, "Crucibles, Cupels, Cucurbits. Recent Results of Research on Paracelsian Alchemy in Austria around 1600" in: Lawrence M. Principe, Chymists and Chemistry, Watson Publ., Sagamore Beach 2007, 165 – 172.

[22] Sigrid von Osten, Das Alchemistenlaboratorium von Oberstockstall. Ein Fundkomplex des 16. Jahrhunderts aus Niederösterreich, Universitätsverlag Wagner, Innsbruck 1998.

Charcoal remnants made it possible to define the time span when the laboratory was used the most: it was from 1575 onwards.[23]

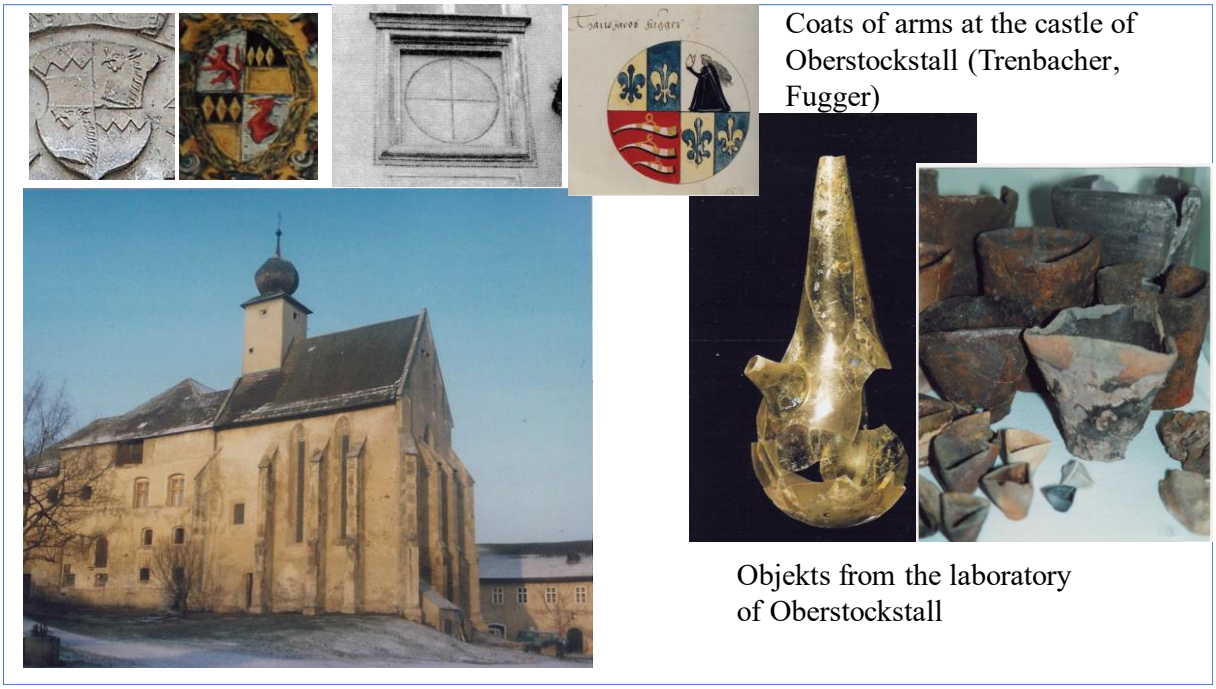


Fig. 12. Castle and Capel of Oberstockstall/Kirchberg am Wagram.

In the last third of the 16th century, castle Oberstockstall was owned by capitulars of Passau and Salzburg: The half-brothers Christoph and Urban von Trenbach, the two brothers Victor August and Sigmund Friedrich Fugger and their nephew Johann Jacob von Lamberg. These clerics had contact to scholars like Carolus Clusius and paracelsists like Michael Toxites.

It is most likely that the laboratory of Oberstockstall was set up by **Urban von Trenbach** (1525 – 1598), whom the great paracelsist Adam Haslmayr[24] calls "a great lover of alchemy". Urban of Trenbach was of noble birth – he was a descendant of a important Austrian family. He spent his youth studying at the universities of Vienna, Ingolstadt and – most notably – in Upper Italy, where he lived at Bologna, Ferrara, and Pisa for five years. Urban didn't stay at Kirchberg very long, he soon became bishop of Passau (Batavia).

[23] Otto Cichocki, "Holzartenbestimmung und Dendrochronologie in Oberstockstall" in: Das Alchemisten-laboratorium von Oberstockstall. Ein Fundkomplex des 16. Jahrhunderts aus Niederösterreich, ed. Sigrid von Osten, Universitätsverlag Wagner, Innsbruck 1998, pp. 30-324.

[24] In a letter to Karl Widemann, dated Dec. 24th 1611: Carlos Gilly, Adam Haslmayr. Der erste Verkünder der Manifeste der Rosenkreuzer, Amsterdam 1994, p. 102.

Michael Toxites, a very well-known paracelsist, dedicated his "Onomasticon" of 1574 to **Victor August Fugger** (1547 – 1586) – vicar of Kirchberg as one of the successors of Urban von Trenbach.[25]

Fig. 13. Urban of Trenbach an "Alchymiae singularis amicus".

From an archive's note[26] we know that the lab was still in use in 1594: The alchemist Michael Polhaimer stated in a cross-examination that he has worked for **Sigmund Friedrich Fugger** (1542 – 1600) in a laboratory 12 miles apart from Vienna. When he was 16 years old, Sigmund Friedrich Fugger became canon of Passau. He travelled - partly accompanied by Clusius - to Belgium, Spain, and Italy. In Florence he had a meeting with Cosimo de Medici. He visited the Medici court, just in those days when alchemical experiments were performed by Cosimo´s son, Francesco I. de Medici. In 1598, Sigmund Friedrich Fugger became bishop of Regensburg (Fig. 14).

Sigmund Friedrich Fugger´s successor in Kirchberg war his nephew **Johann Jacob von Lamberg** (1561 – 1630), who became bishop of Gurk in Styria in 1603 (Fig. 15).

[25] Wilhelm Kühlmann and Joachim Telle, Corpus Paracelsisticum Vol. 2. Der Frühparacelsismus. Zweiter Teil Max Niemeyer, Tübingen 2004, p. 321.

[26] Jost Weyer, Graf Wolfgang II. von Hohenlohe und die Alchemie, Jan Thorbecke Verlag, Sigmaringen 1992, p. 252.

Fig. 14. Sigmund Friedrich Fugger

Some years ago, I was in the position to hold several books of Lamberg´s valuable library in my hands. He possessed 3 copies of the *Pirotechnia* of Biringuccio, some copies of Portas *Magia naturalis* etc. etc. Furthermore, Johann Jacob von Lamberg´s brother was nobody else that **Karl von Lamberg** Archbishop of Prague and close friend of Emperor Rudolf II.

Fig. 15. Johann Jacob of Lamberg and his brother Karl of Lamberg.

Probably, the laboratory of Oberstockstall was destroyed in 1619 by imperial troops who were to fight in the Thirty Years' War.

Back to the chemistry presented in Codex 11450

In the 16th century **distillations** were carried out either "ad latus" (to the side with the help of a retort) or "per alebicum" (also called "per ascensum"), i.e. with the help of a cucurbite, a helmet (alembic) and a recipient. Hennemann used the terminus ”über den Helm ziehen”. Some of Hennemann´s recipes describe the distillation of *Oleum vitcrioli* (sulfuric acid) e.g. on f. 65r, recipe 5 by using an alembic (a helmet) (Fig. 16).

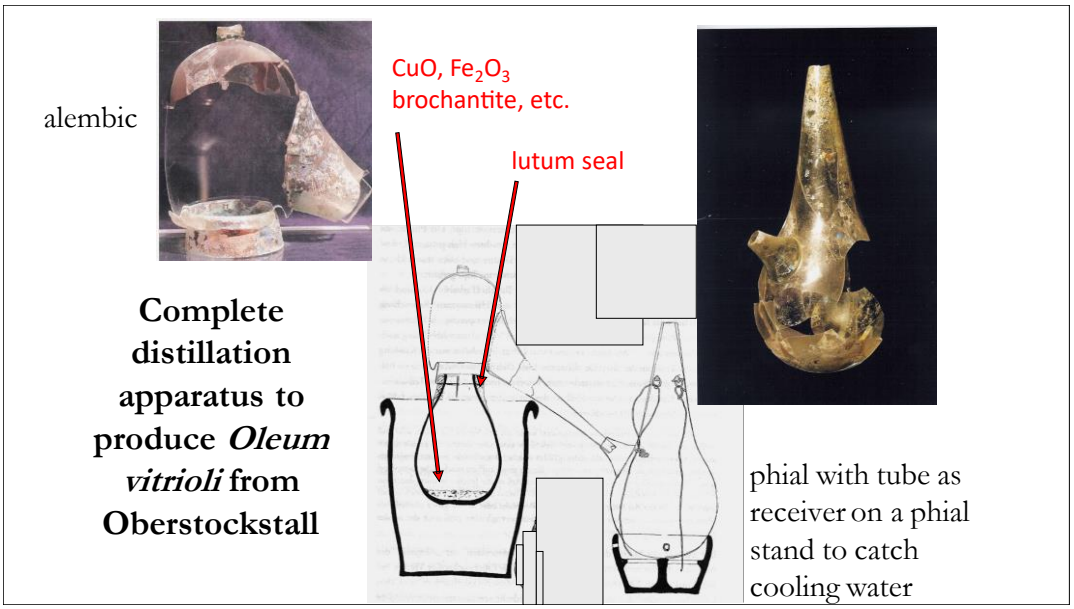


Fig. 16. Distillation apparatus from the laboratory of Oberstockstall.

Under the heading "Das Antimonium in ein waßer Zubereiten" (Preparing antimony in water), Hennemann's treatise contains a number of distillation procedures. The recipe 4 on f. 191v, in which the antimonite is to be heated together with raw tartar and the residue extracted with vinegar, leaving behind a red powder (probably consisting of iron(III) compounds), is strikingly similar to a prescription on p. 492 in the "Erleuterung des Andern Tractats Alexandri von Suchten" written by I. T. (Joachim Tancke)[27] and first published in 1604.[28]

[27] Gerhard Görmar, „Joachim Tancke (1557-1609) – Professor der Medizin und Chirurgie, Paracelsist, Astronom, Poet sowie Rektor der Universität Leipzig“, Mitteilungen der Gesellschaft Deutscher Chemiker Fachgruppe Geschichte der Chemie 25 (2017) p. 17f.

[28] I. T. (ed.), „Erleuterung des Andern Tractats von dem Antimonio Alexandri von Suchten“ in: Joachim Thölde (ed.), Antimonii Mysteria Gemina Alexandri von Suchten, Leipzig 1604, p. 492: https://www.digitale-sammlungen.de/de/view/bsb10726826?page=508,509 (9.1.2023)

Concerning possible connections to Johann Hennemann, it should be mentioned that Alexander von Suchten's second treatise on antimony was dedicated by Suchten to the imperial court servant Johan(n) Baptist(a) von Seebach (1546 - 1613),[29] who was experienced in spagyric alchemy. From November 1595 to February 1612, Seebach was "court servant [of Emperor Rudolf II] on two horses" at "20fl per month"[30] in Prague and therefore he could have met Hennemann at Prague Castle at that time.[31]

An often-used preparational technique of the 16th century was the **sublimation**: Under the heading "Den Mercurium zu sublimirenn" Hennemann gives (in a recipe on f.113r) hints for the preparation of a very interesting compound: **mercury(I)-chloride**: Dissolve mercury in cold nitric acid, then precipitated it with sea salt. Water is distilled off. Finally, a sublimation is performed. In the 17th century mercury(I)-chloride prepared by this procedure was called ***mercurius albus praecitpitatus*.** A corresponding recipe was written down by Jéan Beguin around 1610 in his "Tyrocinium chymicum", Wittenberg 1634, p. 310f.

Today we know, that ***mercurius albus praecitpitatus*** is identical to a product that was produced by a different procedure: Elemental mercury is added to an acidic solution of mercury(II)-chloride: In the language of today's chemistry, this results in the formation of mercury(I)-chloride = ***calomel*** by a synproportionation-reaction.

$$HgCl_2 + Hg \rightarrow Hg_2Cl_2$$

[29] I. T. M. D. (ed.), Tractatus Secundus De Antimono vulgari Alexandri von Suchten“ in: Johann Thölde (ed.), Antimonii Mysteria Gemina Alexandri von Suchten, Leipzig 1604, pp. 39, 4043: https://www.digitale-sammlungen.de/de/view/bsb10726826?page=410,411; https://www.digitale-sammlungen.de/de/view/bsb10726826?page=420,421 (9.1.2023)

[30] Hofstaatsverzeichnis: http://documenta.rudolphina.com/Regesten/A1612-02-00-02757.xml (7.1.2023)

[31] **Johan(n) Baptist(a) von Seebach** was born in 1546 at Burgschleinitz in Lower Austria as the son of the priest Peter (Petrus) Seebach(er). As we learn from a letter from Elias Corvinus from Vienna to Boldizár Batthyány dated October 9, 1575, "Seepacher" had tried to obtain a copy of an (antimony)treatise from the “Landschafts-arzt” Alexander von Suchten (died on November 7, 1575), who was terminally ill in Linz at the time (Dóra Bobory, The Correspondence of Boldizsár Batthyány, Kronosz Pub., Pecs 2019, p. 228. Oliver Humberg, Die Verlassenschaft des oberösterreichischen Landschaftsarztes Alexander von Suchten († 1575). In: Wolfenbütteler Renaissance-Mitteilungen 31 (2007) 31–51). Alexander von Suchten described Seebach as a “good friend”. In the course of his work at the Prague court in 1601, Seebach had contact with the Imperial Court Councillor Johann Matthäus Wacker von Wackenfels. (See: http://documenta.rudolphina.com/Regesten/A1601-12-05-01812.xml) Johann Baptist von Seebach died in Graz on November 22, 1613. See: Ulrike Burtscher 2019: Chronik Seebacher, Die Krainer Seebacher: Eine Spurensuche vom Bischof zu Laibach zum königlichen Hof in Innsbruck und Kaiserhof in Prag: https://chronik-seebacher.jimdofree.com/wissenswertes/krainer-linie/

We know that calomel was sublimed already in the last decennium of the 16th century from analytical data of two objects from Oberstockstall: At the inside of two conical sublimation aludels (A20 and A23) my colleague Helmut Mayer from the TU Vienna detected calomel by the X-ray diffraction-method.

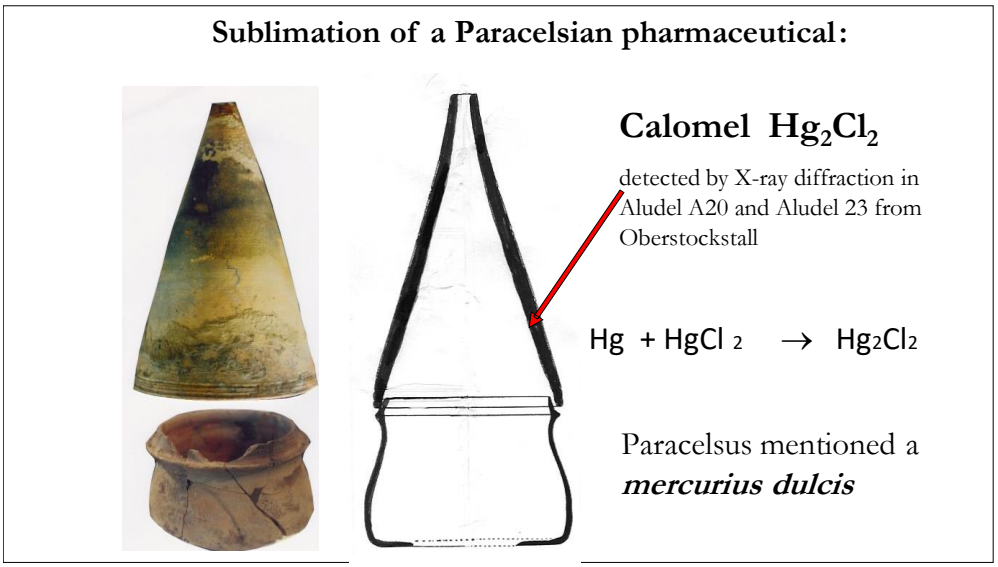


Fig. 17. Sublimation of mercurius dulcis at the laboratory of Oberstockstall.

The old name of mercury(I)-chloride was ***mercurius dulcis,*** sweet mercury, because it is by far not as aggressive and toxic as the corresponding mercury(II)-chloride, the so-called *sublimate*. The name stems from Paracelsus. Paracelsus mentions *mercurius dulcis* in the 1st and 2nd book of his "Die grosse Wundartzney" (1536). However, it is not quite clear how he managed to produce it. It is generally assumed that Quercetanus (Joseph Du Chesne) was the first to describe the process in detail.

Hennemann's manuscript contains many surprises. I, as a former inorganic chemist, was excited that he mentions **no less than 14 different chlorides**:

- HCl *Oleum Salis*
- NaCl Common salt; salt purified by recrystallisation: *chymistic salt*
- $CaCl_2$, namely both the anhydrous calcium chloride and several of its hydrates
- $FeCl_3$ - called *Crocus Martis zu sublimiren* or also *oil from Martem*
- the liquid $SnCl_4$, which was obviously not produced by Libavius for the first time. Hennemann calls this tin compound *Spiritus Iovis*

- the two mercuric chlorides $HgCl_2$ and Hg_2Cl_2
- *oleum antimonii* $SbCl_3$
- Hennemann also produced the corresponding compound $AsCl_3$ from arsenic with HCl;
- $(NH_4)_2HgCl_4$ *sal alembrot*
- NH_4Cl *salarmoniac*
- $PbCl_2$ *sublimiertes Blei*
- AgCl, which Hennemann apostrophises as the *essentia* to be drawn from silver, or as *Mercuris Lunae*.
- $AuCl_3$, which can be extracted with *spiritus vini* (alcohol) or *oleum salis* (hydrochloric acid) from gold dissolved in *aqua regis*, the starting product for the production of *aurum potabile*, the drinkable gold.

Some further highlights

Even just have a look at a recipe beginning on f. 66v. It starts with an extracted green sort of a "praeparirten Victriol". What follows is the sequence of colours known from classical alchemy: the green, the yellow, the red. After numerous further steps, the "noble blood of the green lion becomes red as a ruby". We encounter the symbol of the blood of the green lion in the poem "Rosarium Philosophorum" when it first appeared in print in Frankfurt in 1550. In the "Rosarium Philosophorum" the green lion (leo viridis) symbolises the highest conceivable level of refined matter.

The whole thing becomes fascinating when the author reports on f. 68r that the subsequently distilled oil "**should give light in the dark night,** [as bright] as a star, and a little brighter than a glowing fire" (Fig. 18)! Phosphorescence was not published before 1612,[32] as far as I know. Vincentius Casciarolus discovered phosphorescence after reducing barite (i.e. barium sulphate) with coal in Bologna around 1603 (the Bologna Stone).[33]

Unfortunately, I am not able to give a totally convincing interpretation of what Hennemann described in terms of modern chemistry. In the moment I think in the direction of a phenomenon, with was discovered in 1768 by John Canton in

[32] Giulio Cesare La Gallia, „Dissertatio de luce et lumine" 57-72, in: De phaenomenis in orbe Lunea, Venice 1612 (p. 58f. and 71f.).

[33] Lawrence M. Principe, „Chymical Exotica in the Seventeenth Century, or, How to Make the Bologna Stone", AMBIX 63 (2016) 118-144.

London: the *Phosporus Cantonis*. When heat is applied to a mixture of sulphur and calcium oxide, calcium sulfide (CaS) forms. Trace impurities (especially bismuth) act as doping agents, making reaction product phosphorescent. Phosphorescent calcium sulfide glows red.[34]

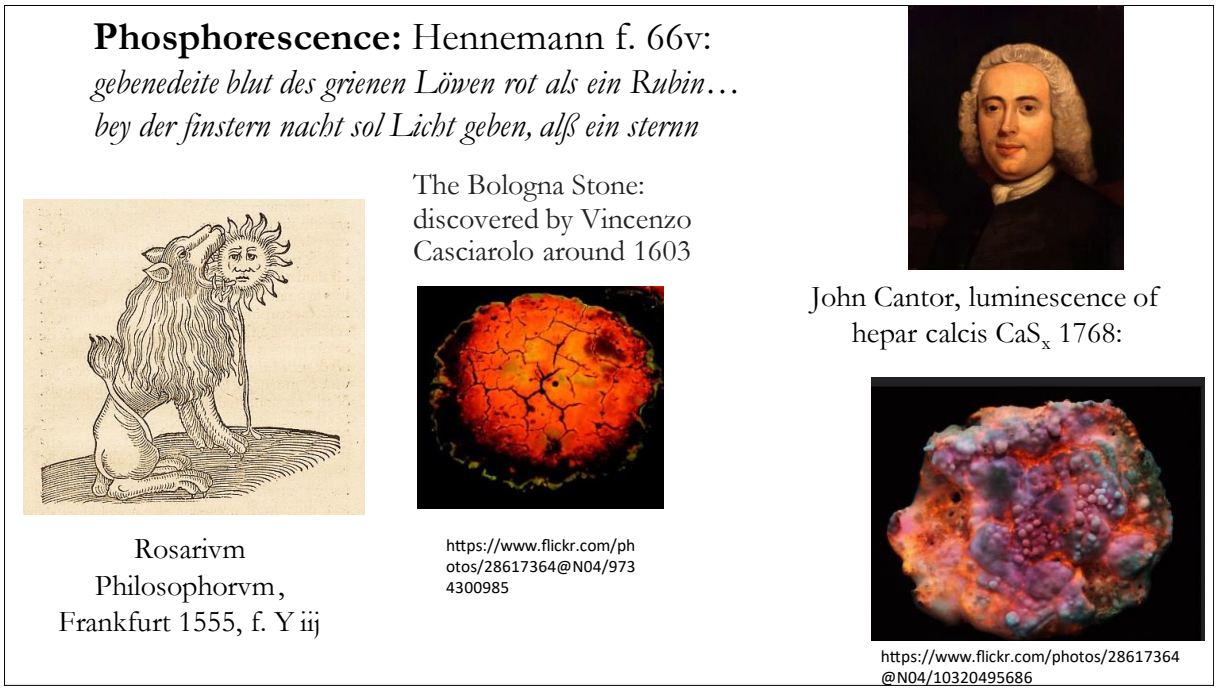


Fig. 18. Phosphorescence: Hennemann 1596, Casciarolo 1603, and Cantor 1768.

Among the approximately 120 different inorganic species, whose production are described in Codex 11450, one finds **lead sugar**, i.e. the sweet-tasting and rather poisonous lead(II)-acetate. Hennemann mentions the sweet taste (in the second recipe on f. 239r) of a product, when laminated lead and distilled vinegar are heated (Fig. 19). Oswald Croll in his *Basilica Chymica* reports to us, that the "sugar/salt/butter or honey of Saturn" is one of Paracelsus' medicines.

[34] Anne Helmenstine, "Make Glow in the Dark Powder From Oyster Shells (Calcium Sulfide Phosphorescence)", 2017: ciencenotes.org/make-glow-dark-powder-oyster-shells-calcium-sulfide-phosphorescence/ (18.11.2022)

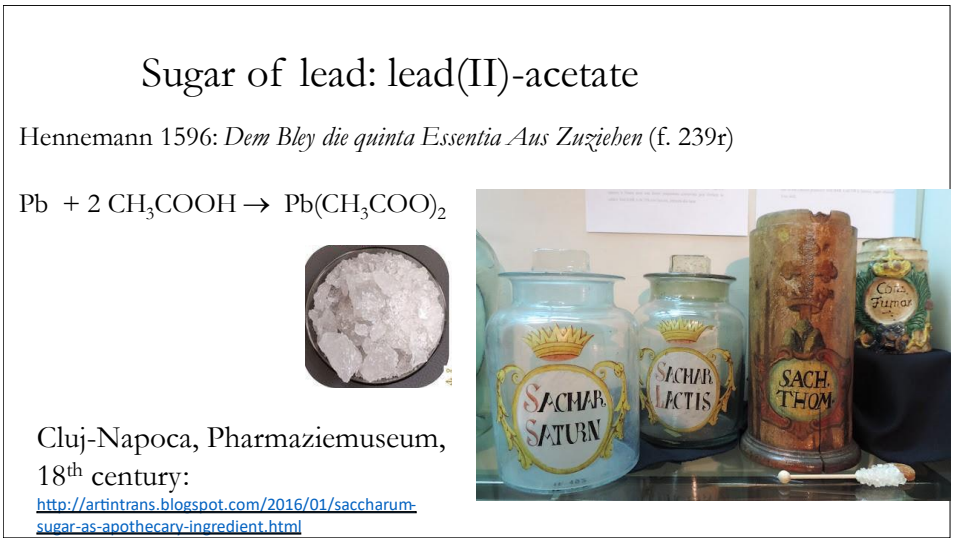


Fig. 19. Sugar of lead.

Recipe 4 on f. 176r is particularly noteworthy because it describes the production of a ***"Spiritus Iovis".*** For a long time, Andreas Libavius was considered to be the first to discover stannous chloride *(tin(IV)-chloride).* Therefore, this fuming liquid was called *Spiritus fumans Libavii.*

Two special raw materials

The second recipe "Dem Eisen die Röte auszuziehen" (Removing the redness from iron) starts as follows: *"Nehmet 3 lb* ***Zickenmentler Victriol****".* Zickenmentler Victriol labels vitriol from the Moravian-Silesian mining town of Zuckmantel (now Zlaté Hory). Obviously, Dr Hennemann was aware of this mining area, which had become important in the 16th century. In 1590 and 1591, two gold specimens weighing over 1 kg each were found in the "Heilige Drei Könige Stolln" below the present-day Polish town of Głuchołazy (Ziegenhals) and presented to Emperor Rudolf II.[35]

The author of Codex 11450 was also well acquainted with the Bohemian town of Loket (Elbogen). On f. 77v he prescribes "**Ellenboger shwefell**" (sulfur from the sulfur-bath Elbogen) to obtain "Rothen Schweffel" (red sulfur).

[35] https://de.wikipedia.org/wiki/Zlat%C3%A9_Hory (7.1.2023)

What´s about classical transmutation-experiments in Codex 11450?

On folio 289 we find several recipes "To transmute “martem into venerem": Iron sheets are soaked in (copper containing) water. The copper, which forms a "red stain" on the iron sheets, is scraped off. The result: "a creamy Venus ex Marte". For today's chemists, this is a simple "cementation reaction": the more noble metal is separated from its solution in metallic form, and the less noble metal is dissolved in its place.

$$Fe + CuSO_4 \rightarrow FeSO_4 + Cu$$

In the pseudo-Paracelsian treatise *De tinctura physicorum* (at first printed in 1570), it is reported that nearby the Upper Hungarian mines in the Zips (in Spiš), iron, which is put into “well water” (which contain copper vitriol), is “eaten away” to form "rust", whereby the "rust" produces pure copper when melted: a simple cementation-reaction in today's sense (Fig. 20 left).

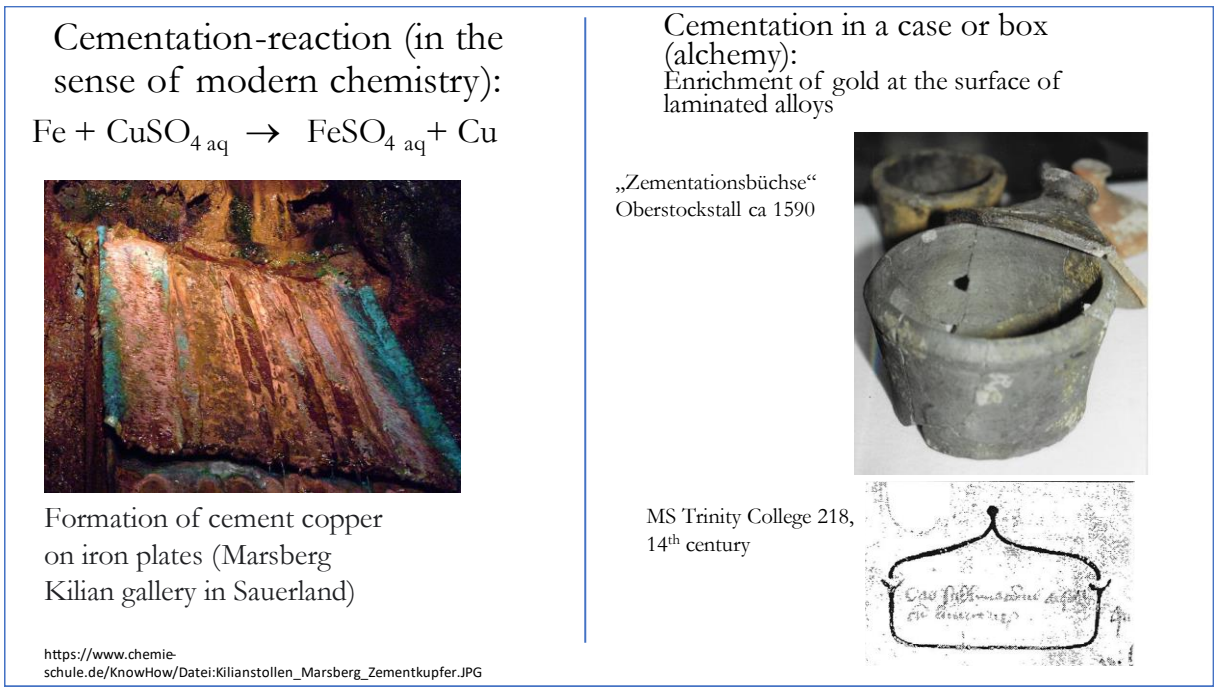


Fig. 20. Cementation

The emperor's most important advisor on mining matters, Lazarus Ercker, knew a lot about this phenomenon. (See his book *Beschreibung: Allerführnemisten Mineralischen Ertzt, vnnd Berckwercksarten*, Prague 1574). Nevertheless,

Ercker was not quite sure whether this copper precipitation is a genuine transmutation.

Apart from this cementation reaction in the modern chemical sense, we must not forget, that Hennemann described many **cementations in the old alchemical sense:** An enrichment of gold at the surface of laminated alloys in cementation boxes (Fig. 20 right) with the help of high temperatures, corrosive salt-mixtures in the presence of air.

Assaying

In this context, one more point should be emphasized: the author is familiar with some docimastic methods of assaying, i.e. with methods for the quantitative analysis of the precious metal content of alloys: especially with the **cupellation** (Fig. 21, 22). He prescribes "Ashen Cappellen" for the performance of no less than 32 experiments, about 20 times he mentions "Sandt Cappellen" and 10 times "Tests". He speaks about the method of cupellation as „zum Blick treiben“. (However, it should be noted, that in some cases Hennemann used cupels not used for analytical purposes but for preparative processes.)

Assaying: MS Speculum Metallorum, Schwaz 1575

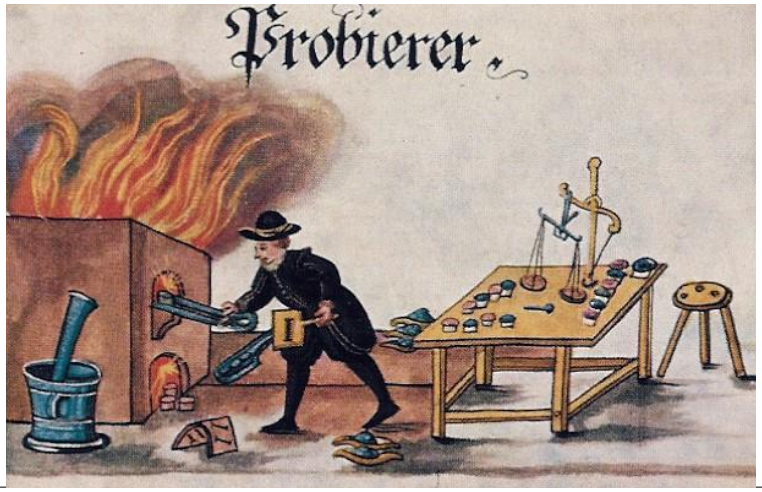


Fig. 21. The assayer putting a cupel into his test-furnace: MS Speculum metallorum 1575.

16 times "Gisbuckel" are mentioned in the manuscript. In the 16th century, these conic crucibles were used for the **casting method of the separation with antimonite**. Pure gold was deposited at the bottom.

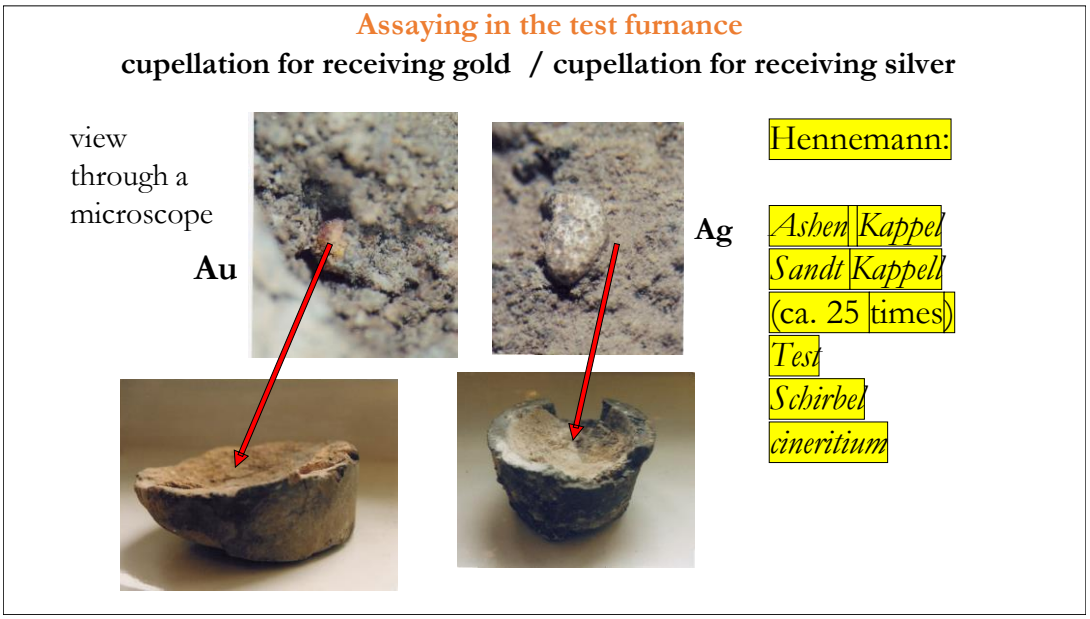


Fig. 22. Assaying with the help of tests: Tow ash-cupels with adhering residues from Oberstockstall.

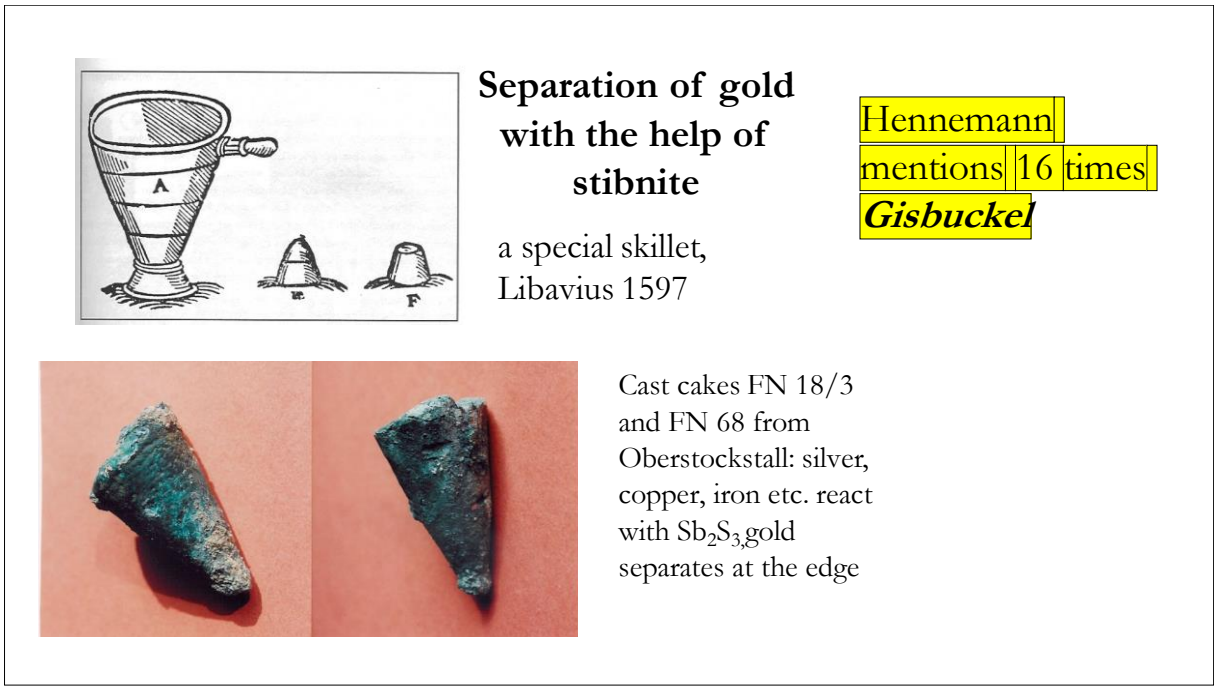


Fig. 23. Assaying with the help of stibnit Sb_2S_3 and a “Gießbuckel”

Regarding the wet methods of assaying, it is noticeable that a description of the production of aqua fortis cannot be found in the manuscript, only a hint that this acid is capable of dissolving silver (on f. 212v, 2. recipe).

The last chapter of Codex 11450 is devoted to gold.

At the latest at folio 408r, it becomes obvious that the content of an entire chapter is the production of a substance that was highly valued in the 16th century, *id est "**Mercurius Solis**"* (Fig. 24). We know from a letter of the Emperor Rudolf II that even the emperor was interested in the production of *Mercurius Solis* and that he therefore asked the Oberstlandeskämmerer (state treasurer) of Bohemia, Wilhelm von Rosenberg, to send the alchemist "Eduard" (Kelley) to him to produce it.

The early 16th century tract "Lux in tenebris lucens" was dedicated to the production of "Mercurius Solis": *"First, you shall solve fine gold in his own ▽ [water]…. Then the phlegm is drawn off, down to the oil, and the solution, together with the oil, is to be placed in a cool and damp place, until the solvated gold shudders into crystals …"* [36]

Fig. 24. Mecurius Solis

[36] Benedictus Figulus (ed.), Thesaurinella Olympicae Aureae Pars III. Genannt und intitulirt Lux in tenebris lucens, Frankfurt 1608, p. 126 This book was dedicated also to the already mentioned Johann Baptist von Seebach. As we know from Johann Joachim Bechers Glücks-Hafen, Frankfurt 1682, p. 366, J. B. à Seebach was well acquainted with the production of Mercurius Solis, even long bevor 1608. At the end of an aqua fortis-recipe Seebach wrote: *"vertirt den ☿ ⊙ in der Arzney."* (transforms the Mercurius Solis in medicine). On the next line of this recipe, we read *"An. 1597. 17. Aug. Pragae Joannes Lucianus senex narravit mihi…."* (For further information about Mercurius Solis see: R. Werner Soukup, "Mercurius Solis: Hunting a Mysterious Alchemical Substance" 2010, p. 11: https://rudolf-werner-soukup.at/Publikationen/Dokumente/Mercurius_Solis.pdf (6.1.2023)

The first step of the preparation of Mercurius Solis was always the dissolution of gold in aqua regia:

$$Au + NOCl + 2\ Cl + HCl \rightarrow HAuCl_4 + NO$$

By careful heating, volatilisable acid-residues are to be removed. If now cooled, crystals of gold(III)-chloride $AuCl_3$ appear.[37] Such gold-solutions were the prerequisite for the next highly esteemed gold-preparation: the **"Aurum potabile"** (Fig. 25). High attention was paid to "Aurum potabile" (the drinkable gold) in Hennemann´s days. Hennemann, praises the "Aurum potabile" with the following words: "*dz rechte vndt warhaffte vndt aller Edelste Aurum potabile Zu curiren allerley Kranckheiten, vndt kan ohne gefehr vndt s(c)haden gebraucht werden".*

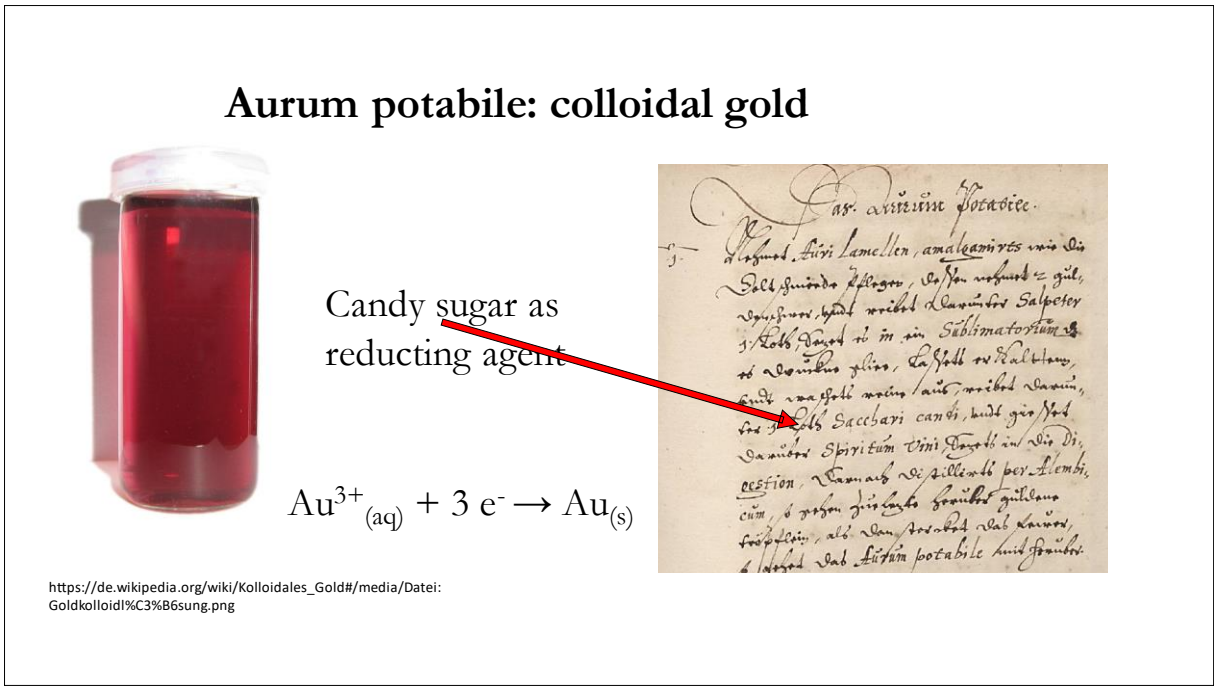


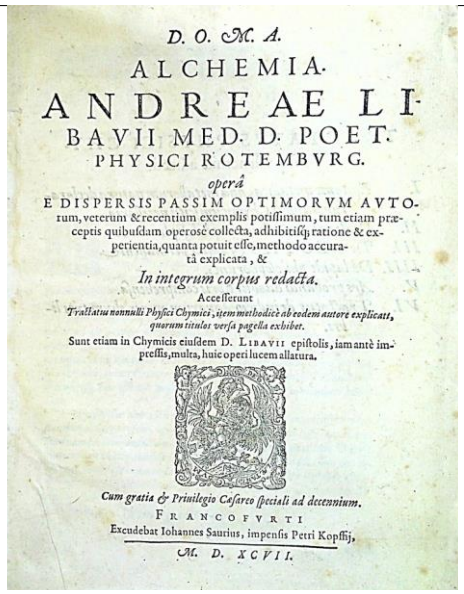
Fig. 25. Aurum potabile.

"Mercurius Solis" and "Aurum potabile" are - as far as their production is concerned - closely connected. However, there is an important difference: While the Mercurius Solis-procedure stops at the highly corrosive gold(III)-chloride, the Aurum potabile-synthesis-instructions indicate that an addition of an additive to the gold-solution is now necessary. Hennemann reveals the secret in recipe 1 on f. 413r: The additive is **candy sugar dissolved in water containing aqua vitae** (water/alcohol-mixture). The gold(III)-salt is reduced to elemental gold, which precipitates in the form of a colloidal red or violet precipitate.

[37] By the way, Hennemann was well acquainted with the alcohol solubility of gold(III)-chloride.

Conclusion

In the summary of the book *Alchemy and Rudolf II*, Ivo Purs and Vladimír Karpenko stated that “The Rudolfine epoch produced unique masterpieces”. Without any doubt, Codex 11450 ÖNB is one of this masterpieces. In my opinion, the "Alchemistische Kunst-Stücke" (Alchemical Pieces of Art) of Dr Johannes Hennemann should be classified among the most important documents of the art of chemical experimentation of the time around 1600. From a chemical-history point of view, Codex 11450 is quite comparable with the "Alchemy" of Andreas Libavius of 1597 and the "Basilica Chymica" of Oswald Croll of 1609 (Fig. 26).


D. O. M. A.
ALCHEMIA.
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BAVII MED. D. POET.
PHYSICI ROTEMBVRG.
operâ
E DISPERSIS PASSIM OPTIMORVM AVTO-
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ceptis quibusdam operosè collecta, adhibitisq; ratione & ex-
perientia, quanta potuit esse, methodo accura-
tâ explicata, &
In integrum corpus redacta.
Accesserunt
Tractatus nonnulli Physici Chymici, item methodicè ab eodem autore explicati, quorum titulos versa pagella exhibet.
Sunt etiam in Chymicis eiusdem D. LIBAVII epistolis, iam antè im-
pressis, multa, huic operi lucem allatura.
Cum gratia & Priuilegio Cæsarco speciali ad decennium.
FRANCOFVRTI
Excudebat Iohannes Saurius, impensis Petri Kopffij,
M. D. XCVII.

Andreas Libavius, Alchemia,
Frankfurt 1597

Oswald Croll, Basilica Chymica,
Editio princeps: Frankfurt 1609
Deutsch: Frankfurt 1623, 1629 …

Fig. 26. Andreas Libavius, Alchemia; Oswald Croll, Basilica Chymica.

It´s a pity that the 1361 recipes were not received anywhere. Why not? **This manuscript was apparently considered so valuable that the emperor never let it out of his hands.** And when Rudolf II died in 1612, the book was immediately brought to the court library in Vienna because of its importance. Therefore, this codex had not the misfortune of the second manuscript by Hennemann *De principiis medicis*, which was also dedicated to the emperor and was transported during the Thirty Years War by Swedish soldiers from Prague

to Sweden. With Queen Christina of Sweden this manuscript was transported to Rome in 1655.

What is impressive about Hennemann's text is its systematic approach: 1361 recipes are presented in 10 chapters within the framework of a specific scheme: Purification, preparation of aqueous solutions, preparation of oily preparations, of sublimates, of extracts, of glasses....

The Codex 11450 from 1596, in connection with contemporary objects from the laboratory of Oberstockstall allow us to draw the picture of a highly developed inorganic-preparative chemical technology in those days. The epithet "scientifical" should not be withheld. Both - the experimental descriptions in the recipes of MS 11450 and the residues (e.g. in the large cucurbites, but also in the melting crucibles and the ash-cupels of Oberstockstall) - point to an intended **reproducibility of the processes by ensuring the reaction conditions**. This includes the temperature or duration of heating, the definition of the starting products, and the docimastic examination of the final products.

Epilogue

We all know what happened shortly after Rudolf died. In Czech historiography you speak of "temno" - the now coming darkness. During - and even after - the Thirty Years' War, it was not possible in Prague, Vienna or anywhere else in Bohemia or in Austria to continue the achievements in chemistry of the end of the 16th century.

In the course of the Thirty Years' War, the image of alchemy in Austria and Bohemia changed dramatically. From letters exchanged between Emperor Ferdinand III and his brother, the commander-in-chief of the imperial troops Archduke Leopold Wilhelm, we learn that the performance of transmutational experiments was now understood as a kind of leisure activity - even near the battlefields.[38]

[38] R. W. Soukup, „In meiner chimischen sudlerei dahier…“ Goldmacherei im Dreißigjährigen Krieg. Der Alchemie gewidmete Passagen in den Briefen Erzherzog Leopold Wilhelms an seinen Bruder, Ferdinand III., 1646 und 1647: https://www.rudolf-werner-soukup.at/Publikationen/Dokumente/Goldmacherei_im_Dreissigjaehrigen_Krieg_Juni_2018.pdf

Some decades later, under Emperor Leopold I, the "royal art of alchemy" even degenerated into show experiments staged for public effect: a *theatrum alchymicum.* Sex & crime stories can be told about the most important alchemist of Leopold I, Wenzel Seiler (ca. 1648 – 1681), who was imprisoned at the Augustinian monastery in Brno in 1671, due to a prostitute found in his bed. He fled at first to Prince Carl Eusebius von Liechtenstein in Valtice in Southern Moravia. In 1672, Emperor Leopold I was interested in Wenzel Seiler, because Seiler pretended to be able to transmute lead in gold. Seiler became "Hofchymicus "and was ennobled. Even the famous Robert Boyle in London was eager to get information about this alchemist.[39]

At the end of the 17th century the alchemist Johann Friedrich von Rain even went so far to argue, that a denial of the *transmutatio specierum* is equal to the crime of a *lesae Maiestatis* (an insult to majesty).[40]

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[39] Rudolf Werner Soukup und Jaromír Hladík, „´Des deifels goltmacher haben kein golt im Peitl´. Die Geschichte des kaiserlichen Hof-Chymicus Wenzel Seiler im Lichte von Dokumenten des Mährischen Archivs Brünn", dèjiny ved a techniky XLI, Praha 2008/2, pp. 103 – 129: https://www.rudolf-werner-soukup.at/Publikationen/Dokumente/Wenzel_Seiler.pdf (last access: 2.1.2024)

[40] Elisabeth Tauschitz, „´Mit diesem einzigartigen Mittel wirst du, Österreich, über die übrigen Länder herrschen!´ Eine kritische Durchsicht der Schriften des Alchemisten und Allegorikers Johann Friedrich von Rain", Diplomarbeit, Universität Wien 2019. Rudolf Werner Soukup; Alchemistische Kunststücke am kaiserlichen Hof. Alchemie unter den Habsburgerkaisern Rudolf II., Ferdinand III. und Leopold I." in: Sarah Lang (ed.), Alchemische Labore: Texte, Praktiken und materielle Hinterlassenschaften, Grazer Universitätsverl., Graz 2023, pp. 21 – 52.