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Historical Article

Animal Oil, Wound Balm, Prussian Blue, the Fire and Light *Principium* and the Philosophers' Stone Made from Phosphorus: on the 350th Birthday of the Chymist Johann Conrad Dippel (1673-1734)

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Abstract. On the basis of many newly found archival sources and a close study of his relevant books, the life story of the chymist Johann Conrad Dippel is re-described. The preparation of his most important chymical products, i.e. animal oil, wound balm, and Prussian blue, is described. His own chymical theory was build around a fire and light *principium*. For decades, Dippel tried to find a process for the preparation of the philosophers' stone. He was convinced that phosphorus was the right starting material for this. This article does not deal with his theological and philosophical views and undertakings or his medical practice, but is focused on Dippel the chymist.

Keywords: alchemy, chymistry, Prussian blue, phosphorus, philosophers' stone.

INTRODUCTION

On August 10, 1673, Johann Conrad Dippel was born at castle Frankenstein near Darmstadt in Hesse, Germany. Therefore, in 2023 we celebrate the 350th birthday of this fascinating personality. During his lifetime, Dippel, whose portrait is shown in Figure 1, was a well-known but highly controversial theologian, as well as a physician and chymist. Although born in Germany, he lived a transnational life with longer stays in the Netherlands, Denmark and Sweden.¹

Today, Johann Conrad Dippel is mainly known as one of the two discoverers of the pigment Prussian blue in 1706 and as the alleged model for Mary Shelley's character Victor Frankenstein in her novel *Frankenstein or the new Prometheus* from 1818. [1] The latter speculation is based on Radu Florescu's (1925-2014) book *In Search of Frankenstein* from 1975. [2] But there are no

¹ See the recent conference: Ein transnationales Leben: Bausteine zur Biographie von Johann Conrad Dippel (1673–1734) on 26.–27. January 2023 at Forschungszentrum Gotha of the University Erfurt, Germany, Organisation: Martin Mulsow (Erfurt/Gotha), Vera Faßhauer (Erfurt/Gotha).



Figure 1. Johann Conrad Dippel (1673-1734), radical Pietist theologian, physician and chymist. (source: Justus-Liebig-Universität Gießen).

sources that support Florescu’s hypothesis. Quite the contrary, it has been shown convincingly that Florescu’s speculation has no basis. [3]

The fact that very little is known about Dippel’s activities as a chymist has certainly encouraged this kind of speculation, such as that of Radu Florescu or the even more ridiculous of the German journalist Walter Scheele. [4] But in the last 15 years, several new archival sources have been discovered or rediscovered which shed a new and much brighter light on Dippel’s activities as a chymist. Among these archival sources from archives in Berlin, Frankfurt am Main, Hamburg, Bad Laasphe and Münster are many previously unknown letters written by Dippel, extensive notes of Dippel’s young admirer Johann Christian Senckenberg (1707–1772) about talks he had with Dippel and last but not least several recipes concerning the preparation of the philosophers’ stone which can be attributed directly or indirectly to Dip-

pel. Together with a close reading of some of the books he published during his lifetime, a much more detailed picture of Dippel as a chymist emerges from the fog of unreliable internet sources which depict him as a mad scientist, [5,6] and creator of monsters who experimented with nitroglycerin and dead human bodies.

In the following chapters of this article I will present a short biography of Dippel the chymist, structured mainly according to the sources used.

DIPPEL’S BIOGRAPHY OF HIS FIRST 25 YEARS: 1673-1698

Johann Philipp Dippel (1636-1704), the local pastor, had registered the birth and baptism of his son Johann Conrad on August 10, 1673 in the church register of Nieder-Beerbach, [7] a village in the northern part of the Odenwald mountain range. According to this church book entry, the family had fled to nearby Frankenstein Castle (Figure 2) because of French soldiers (“Französische Völcker”) who were active in the area. It was the far-reaching Franco-Dutch War (1672-1678), during which French troops also attacked allies of the Republic of the Netherlands on the territory of the German Empire, leading a French army into southern Hesse. Because he was sickly and frail, Johann Conrad Dippel was baptized just one hour after his birth. Johann Conrad’s mother was Anna Eleonora Münchmeyer (ca. 1640-1710).

Before he went to Nieder-Beerbach as a pastor in 1672, Johann Conrad’s father had been a teacher in Zwingenberg. In 1678 he moved from Nieder-Beerbach to the nearby somewhat larger Nieder-Ramstadt as a



Figure 2. View of the ruins of Frankenstein Castle in 1818 by Johann Georg Primavesi (1774-1855). (source: Hessian State Archive Darmstadt, Signature R 4 No. 30788).

pastor. These three places, Zwingenberg, Nieder-Beerbach and Nieder-Ramstadt, were in the southern part of the Landgraviate of Hesse-Darmstadt, a protestant Lutheran state of the Holy Roman Empire (HRR), the German Empire of the time. Two different calendars were used in Germany between 1582 and 1700. Catholic states used the more modern Gregorian calendar, which is still in use today, while Protestant territories, whether Lutheran or Reformed, used the older and less accurate Julian calendar. At the time of Johann Conrad Dippel's birth the difference was 10 days. Therefore, according to the Gregorian calendar, he was born on August 20, 1673.

In his excellent study from 2001, Stephan Goldschmidt presented a detailed biography of Johann Conrad Dippel up to the year 1700. [8] Therefore, for the brief description of this period, we should follow his study, also because no new sources have been found for this period after Goldschmidt's study was published.

Goldschmidt assumed that Dippel attended the small Latin school in Nieder-Ramstadt between 1679 and 1685. The building of this school still exists today. It is shown in Figure 3. However, a modern commemorative plaque on the former school building indicates that it was a kind of elementary school for the town and the surrounding area, which cannot be described as a Latin school as in the Dippel literature. Dippel then went to the Paedagogium Darmstadtium, a higher school in Darmstadt, the



Figure 3. Old school house in Nieder-Ramstadt. (source: Photo by the author 2018).

capital of the Landgraviate of Hesse-Darmstadt. Dippel completed his schooling there in 1691. On May 9, 1691, Dippel was enrolled in the register of the university in Giessen. His Latin language entry read: "*Joh. Con. Dippelius, Straetaemontano-Francostenensis*", that means "Johannes Conradus Dippelius from Frankenstein on the Bergstrasse". The Bergstrasse, literally Mountain Road, is an ancient travel route parallel to the Rhine, but situated higher on the edge of the Odenwald to avoid flooding in the Rhine valley. The University of Giessen was the only university of the Landgraviate of Hesse-Darmstadt located in the northern part of this state.

Dippel finished the prescribed basic philosophical studies in Giessen in 1693 with obtaining the "*Magister*" degree. The thesis for his disputation was entitled "*De Nihilo*", i.e. "About Nothing". Dippel then started to study theology in Giessen until the middle or end of 1694. At that point, he had to interrupt his studies because of financial problems. For about one year, Dippel earned money as a private teacher for the children of a nobleman in the Odenwald forest. Then he decided to continue his studies in theology.

For this purpose he enrolled at the University of Strasbourg in Alsace. For centuries, Strasbourg had been a Free Imperial City of the German Empire. It was only annexed by France in 1681, 14 years before Dippel came to study here. Therefore, at that time, Strasbourg still had the character of a German Protestant city and not that of a French Catholic city. On August 2, 1695, Dippel was enrolled in the register of the University of Strasbourg as "*M. Johannes Conradus Dippelius, Darmstadtio-Hassus*". So this time he stated that he came from Darmstadt in Hesse, perhaps because Frankenstein Castle on the Bergstrasse was not well known in Alsace. In addition to studying theology, Dippel began to give first public sermons in Strasbourg. Besides that, he dealt with chiromancy and began first medical studies. A tutor position provided him with additional financial means. But Dippel was also active in student associations, there were brawls and trouble with the city authorities, so that in August 1696 he fled head over heels from Strasbourg to his Hessian homeland.

Dippel continued his study of theology in Giessen from spring 1697. At the same time he worked for one year as a prince's tutor for one of the sons of the Landgrave of Hesse-Darmstadt, which brought in a good income. If he wanted to give lectures at the university himself as a private lecturer, he still had to take an exam. After some quarrels with his professors, Dippel held his habilitation disputation on July 8, 1697. He was now allowed to lecture in the field of theology at the university and his aim was either to become a pastor like

his father and others of his ancestors or to get a permanent position at the university. But he, still a *magister* not a *doctor*, was not to achieve either goal.

In order to explain this, it is important to know that Dippel had switched from strictly orthodox Lutheranism to Pietism during his time as an aspiring theologian in Strasbourg. He quickly made a name for himself as a radical Pietist, mainly through two printed pamphlets in 1697 and 1698. In these two books and later in almost all other publications, he used the author's pseudonym *Christianus Democritus*. The first book was entitled *Orcodoxia Orthodoxorum* (= *The hellish doctrine of orthodoxy*), the second one *Papismus Protestantium Vapulans* (= *The beaten papacy of the Protestants*). Despite the Latin titles, these were German-language treatises. With these two writings, which harshly opposed the orthodox Lutheran variant of Protestant Christianity, Dippel ended his prospects of a career in the Protestant church for good. The government of Hesse-Darmstadt began an investigation against him and his time at Gießen University was over. In the next few years until 1704, Dippel lived again with his parents in Nieder-Ramstadt, but he also traveled a lot in the Hessian area and began to work together with various church dissenters such as Johann Henrich Reitz (1665-1720).

DIPPEL'S BOOK *WEG-WEISER ZUM LICHT UND RECHT* (= *GUIDE TO LIGHT AND JUSTICE*)

In 1704 Dippel published the first edition of the two volumes of his book *Weg-Weiser zum Licht und Recht* (= *Guide to light and justice*). [9] A third volume was announced, but never appeared in print. In an *addendum* at the end of the second volume it is stated that this *addendum* was written on March 23, 1704. So we can assume that Dippel completed this work in the first half of 1704, the time when he was still living in his native Hesse. Dippel moved to Berlin in late autumn of that year. The second edition of these two volumes was published in 1705. At that time, Dippel had already established himself in Berlin.

The second volume of this work with the title *Weg-Weiser zum Licht und Recht in der äußern Natur* (= *Guide to light and justice in outer nature*) contains two sections which are of special interest if we study Dippel's activities as a chymist.

The first section is *Fata Chymica*, the preface of the second volume of the *Guide to light and justice*. In this text, Dippel told the story of how he became a chymist. The second section of interest is chapter 7 of the second volume entitled *Kurtze Anatomie derer in*

so weit unspecificirten Körpern der eusseren Natur als des Feuers, des Wassers, der Erden, und der Luft. Und was endlich unter dem Namen, Licht und Recht, in der Natur zu verstehen sey (= *Brief anatomy of the unspecified bodies of external nature, i.e. fire, water, earth and air. And finally what is to be understood under the name of light and justice in nature*). Close reading shows that in this text and at a few places in the other chapters of this volume Dippel's chymical theory from that time is explained in great detail.

DIPPEL'S BEGINNING AS A CHYMIIST ACCORDING TO HIS *FATA CHYMICA*

In most of his writings, Dippel did not refer to himself as an "Alchemist", but as a "Chymist" and he usually called the corresponding natural science "Chymie" not "Alchemie". So he was, in his German mother tongue, already in line with the modern so-called "New History of Alchemy". [10] According to his *Fata Chymica*, he had a lot of time after he had published his highly controversial theological book *Papismus Protestantium Vapulans*. This book appeared in print in mid-1698, perhaps in June. In the following time, in the second half of 1698, he received an alchemical book from a pastor who was a friend of his, in which the *Experimenta* of Raymundus Lullus, the *Twelve Keys* of Basilius Valentinus and other classics of alchemy were printed. Dippel mainly studied *Lullii's Experimenta* and decided to try his hand at alchemy at the next opportunity.

He reported about what happened some time later:

In secret, I came across a chymical manuscript, which opened the way to a tincture in a very laborious way; which I resolved to follow at the earliest opportunity because both the method and the first matter were somewhat simpler than what I had found in *Lullio*. [11]

It was a text written by "a certain *Medicus* from Montpellier" called "Faber", i.e. Pierre-Jean Fabre (1588–1658). That was the process that he then successfully reworked, during which time he had to change his place of residence several times:

To put it briefly, among all this incommmodity I prepared within 8 months a tincture which, as soon as it was received, transmuted 50 parts of ☉ or ☿ into gold; which made me not a little happy and amazed. [12]

So Dippel informed us here that he had produced the tincture, i.e. the philosophers' stone, within 8 months and that he was able to convert 50 times the

amount of silver or mercury into gold. Can we believe him? Certainly not.

However, Dippel then went on to report that he was from now on very liberal with his money. He bought an estate for 50,000 fl. from a “certain baron” at a place where there was a glassworks and other necessary “*Requisitis*”. There he wanted, together some friends, further investigate chymistry. At first, Dippel was only able to make a small down payment for the estate.

To pay off this sum all the more conveniently, I wanted to increase and enhance the remaining quantum of my prepared tincture by multiplication. But unfavorable fate and an oversight in the preservation of fire shattered my glass in the process of this work, and what had taken so long to prepare perished in a moment. Especially since a strange and unfavorable salt from the ashes in which the glass had stood had completely altered and separated the tincture, parts of which I could otherwise have salvaged. [13]

By multiplication, so the alchemists believed, the potency of the tincture could be increased. So obviously Dippel worked on such a process when he lost the tincture altogether. Dippel now had to put off the baron to a new payment date. Dippel then attempted to make the tincture again. However, he wanted to achieve this in a faster way in just two instead of eight months.

In order to make some money during this time, Dippel sold various chymical particular recipes and thus made some money, 4,500 guilders. Of this he paid the baron a sum of 1,500 fl., the rest melted between his fingers. But crucially, he failed to reproduce the tincture again. Dippel reported:

In my precipitated work I gradually learned that in chymistry all haste and shortening of time is an infallible *dispendium* and the shortest way from one error to another. I wanted to force nature and burned my fingers in all the work I did. [14]

With this unsuccessful work three years passed. Dippel got more and more problems with his creditors and became the ridicule of his neighbors and his relatives. For example, they called him a great fool or arch-deceiver. Dippel continued:

But some felt sorry for me, and could scarcely believe how it could have been possible that so clever a mind could have been so presumptuously implicated in the follies and messes of the wretched laboratory workers. Others thought it a strange judgment upon me, for speaking blasphemous words against the holy places, and confusing the world with my theological writings. Others even believed that I was playing an adventurous comedy with diligence, in order to draw people’s minds into the light the better,

and to hide my things, which were already quite obvious, with such chimeras. [15]

According to Dippel, he had now in fact learned that in addition to knowledge and diligent work in such matters, a higher hand was at the helm, without whose direction the desired end could never be found. He could now easily see the reason why so many lovers of gold lose all their goods over the *lapide*; since even he, as an “*Adeptus*”, had roamed about for so long in vain.

So this is what Dippel himself told about his beginnings in chymistry. It is interesting that Dippel referred to himself as an *Adeptus*, meaning someone who knows how to make and use the *Lapis Philosophorum*. Therefore, this foreword from 1704 could also be seen as a kind of advertisement for the gold maker Dippel. Perhaps it helped him to be summoned to Berlin towards the end of 1704 as a promising alchemist?

DIPPEL’S CHYMICAL THEORY ACCORDING TO HIS *GUIDE TO LIGHT AND JUSTICE IN OUTER NATURE*

If studied by a chemist-historian, Dippel’s book *Guide to Light and Justice in outer nature* and especially its 7th chapter gives us new insight into his chymical theory. But what is interesting for us begins with a statement in the first chapter in which we can read:

So let us confidently say that all currently existing hypotheses, of the old and new natural researchers, such as *Epicuri* and *Cartesii Atomi*, of *Aristotelis* and his successors 4 elements; of the Paracelsists, and of the Chymists in general three *Principia Sal, Sulphur*, and *Mercurius*, the more recent *Alcali* and *Acidum*, ... are proving as much as nothing. [16]

So Dippel rejected the established teachings, particularly those of the four Aristotelian elements (fire \triangle , water ∇ , earth $\nab�$, air \triangleleft) and the three Paracelsian principles (sulphur \ddagger , mercury ☿ , salt \ominus). Regarding the latter, he also remarked in chapter 7: the illusion “of three visible *principiis*”, namely “*Sale, Sulphure, and Mercurio*” only arose in the “philosophers and chymists” “due to a lack of more thorough knowledge.” [17]

But what does he want to put in their place? This is explained in various places in the second part of the *Guide to Light and Justice*, for example in one place Dippel wrote that the whole

basis of true chymistry, which noble and correct art is concerned solely with drawing out the pure form of fire and light and elevating it to permanence in fire. ... so chymistry is generally content with this purpose, when it

can, through a thorough separation, separate out the pure form of light and fire ... and make it permanent in the fire through purer added *matrices*; [18]

Elsewhere he stated:

For it is, according to my experience, all about separating the light and fire form, and nothing else, from the natural bodies. Plants and animals easily give off such *principia*, solely through the *motum* of the kitchen fire, but metals and other earthly, firmly closed bodies require a wet fire and appropriate solvents, through which the light form is freed of the bands of the dark *Matricis*. [19]

Dippel developed the idea of a “light and fire *principium*” from the Aristotelian element fire. [20] Basically, as early as 1704 he tried to replace the three established alchemical principles with the new “light and fire principle”. Superficially, this points somewhat in the direction of Georg Ernst Stahl’s (1659-1734) emerging *phlogiston* theory, but also to Wilhelm Homberg’s (1652–1715) *matière de la lumière* [21] and, as we will see later, to Dippel’s preference for phosphorus as the starting point for the production of the philosophers’ stone. However, the difference between Stahl’s *phlogiston* principle and Dippel’s “light and fire principle” is enormous. While Stahl postulated an immutable principle which would be exchanged between the reactants in chemical reactions, Dippel’s principle was to be released from substances by separation, but then “raised to perfect permanence in fire”. Then it is the philosophers’ stone, the “*lapis philosophorum*”. With this “tincture” it is then possible “to make gold and silver out of base metals”. This “*lapidis*” would also be suitable for “medicine, in the human body” because it has “along with the highest subtlety also the highest fixity”. So this was nothing more than another theory of the philosophers’ stone, the *lapis philosophorum*.

DIPPEL’S CHYMICAL THEORY FURTHER EXPLAINED
IN A LETTER EXTRACT IN THE MELLON
COLLECTION OF ALCHEMY AND THE OCCULT

In the *Mellon Collection of Alchemy and the Occult* we can read an extract from a German language letter written by Dippel and dated March 1716. [22] It is interesting for the present study that this letter also contains fragments of Dippel’s chymical theory. So he wrote that for the tincture “the substance of the Δ itself, which must really grasp itself as the *principium Agens* in a matter” would be necessary. So there is Dippel’s fire and light principle again. Furthermore, Dippel explained

in the text that the “substance from the Δ ” would pass through the walls of the vessels standing in the fire, also through glass walls, and then “unite” with the contents of the vessels “*intimo* with it”. According to Dippel, it is a saline substance from the fire that would permeate the walls of the vessel. Mercury would be used in the process only to facilitate the “ingress” of the substance of fire. These are again interesting insights into Dippel’s chymical world of thought.

It has to be added, that an English translation of this letter extract can be found in the *Manly Palmer Hall collection of alchemical manuscripts*. [23] However, this is not a literal translation, but rather a free one, which does not always correctly capture the meaning of the original German text.

DIPPELIANA IN THE ARCHIVAL COLLECTION
OF COUNT AUGUST ZU WITTMENSTEIN IN BAD
LAASPHE

Today’s Bad Laasphe was only Laasphe in Dippel’s time, the small capital of one of the two small counties of Wittgenstein. In the private Princely Archive of Sayn-Wittgenstein-Hohenstein in the Rentkammer Wittgenstein near castle Wittgenstein in Bad Laasphe two folders are kept which deal with Johann Conrad Dippel’s connection to Count August David zu Sayn-Wittgenstein-Hohenstein (short: Count August zu Wittgenstein) roughly for the time of Dippel’s stay in Berlin since 1704 until his death 1734 and a few years later surrounding questions of Dippel’s heritage. [24] The majority of the material is however from the time in which Dippel lived in the Wittgenstein counties (1729 to 1734). This Dippe-liana collection also contains 10 letters written by Dippel himself between 1727 and 1734. We will come back to this collection in due time.

The area of the former county of Wittgenstein is now part of the German federal state of North Rhine-Westphalia, but is located directly on the border to the federal state of Hesse. In the Early Modern period, the county of Wittgenstein was under dominating Hessian influence. Since 1357 the county of Wittgenstein was ruled by the counts of Sayn, therefore the name Sayn-Wittgenstein for the ruling family. In 1603, the county of Wittgenstein was divided into the northern Berleburg and the southern Wittgenstein halves. These two counties, Sayn-Wittgenstein-Berleburg and Sayn-Wittgenstein-Hohenstein existed until the French period in Germany in the beginning of the 19th century.

Count August David zu Sayn-Wittgenstein-Hohenstein (1663-1735) was an almost life-long friend of Dip-

pel from 1701 to his death. He came from the line of the Counts zu Sayn-Wittgenstein-Hohenstein residing in Laasphe. From 1698 his older brother Henrich Albrecht zu Sayn-Wittgenstein-Hohenstein (1658-1723) ruled the small county, while Count August zu Wittgenstein sought foreign services. We find him in January 1701 as a privy councilor and *envoyé extraordinaire* of the Electoral Palatinate at the coronation of Friedrich I as the first King in Prussia in Königsberg (today Kaliningrad, Russia). From December 1701 he was Oberhofmarschall at the Prussian royal court in Berlin, a very influential and well-paid position. In December 1710, however, he was relieved of his offices as part of the disempowerment of Count Johann Kasimir Kolbe von Wartenberg (1643–1712), who had been in charge of government affairs up to that point. Wittgenstein was temporarily imprisoned in the Spandau citadel and then expelled from the country after paying a large sum. This meant severe humiliation for an imperial count. After that he was again in the service of the Electorate of the Palatinate until in 1719 he was placed alongside his brother as co-regent and finally, after his brother's death in 1723, became the sole regent of the small county of Sayn-Wittgenstein-Hohenstein. While his brother was strongly influenced by Pietism and opened the county to and sponsored all possible and impossible radical pietists, separatists, mystics, inspired and other sectarians, Count August zu Wittgenstein was a staunch opponent of such ecclesiastical dissenters. Assuming the regency of the county, he ruled with an iron fist, driving out the separatists and being merciless to the old-established population as well. This led to countless lawsuits that were conducted by him or against him.

But Count August zu Wittgenstein, who by his own admission had known Dippel since 1701, was also a passionate alchemist. He was not alone in this at the Berlin court. On the contrary, in the first decade of the 18th century, numerous more or less well-known alchemists were drawn to the royal Prussian residence city on the Spree to try their luck there. And the leading figures of the Berlin court, the king himself, Counts Wartenberg, Wittgenstein and Wartensleben and many others were very much interested in the alchemical production of gold.

DIPPEL'S LETTERS TO BARON GEUDER GENANNT RABENSTEINER IN UTRECHT

In the State Archives of North Rhine-Westphalia, unit Westphalia in Münster a collection of 22 letters from Johann Conrad Dippel to his friend Baron von

Geuder, genannt Rabensteiner² in Utrecht are preserved. [25] These letters were written in German or Latin between 1706 and 1715 and sent from Berlin, Amsterdam, Warmond or Hamburg to Utrecht. These letters are full of valuable information on Dippel's life at that time. But also new insights in his activities as a chymist and physician result from reading these letters.

Baron Friedrich Philipp von Geuder, genannt Rabensteiner (1659-1727), came from the aristocratic von Geuder family, which had lived in the German region of Franconia for centuries, especially in Nuremberg and Heroldsberg. He was a Pietist nobleman and secretly married to the widowed Duchess Ernestine Charlotte von Nassau-Siegen (1662-1732). The couple lived in Utrecht in the Netherlands and was part of an international Pietist network. Von Geuder and Dippel were close friends as can be seen from the letters Dippel wrote to von Geuder.

The first of these letters was sent by Dippel from Berlin to Utrecht in June 1706. This was apparently the letter accompanying a medicine that Dippel had sent at the request of the addressee. It is not clear what this medicine was, but the Baron could use it in "all current and future diseases", especially "in head diseases, and in women's diseases" as well. The dose was "from 60 to 80 drops in all [diseases] in distilled water." The second letter of July 27, 1706 contains two medical recipes, that of Dippel's wound balm including a description of a drastic animal experiment with a dog and a nail, and that of a "*Medicina ex Martialis*". The latter is perhaps the remedy that the first letter in this collection of letters was about.

DIPPEL'S WOUND BALM

Let's have a closer look at Dippel's wound balm, because although forgotten today it was thought to be an important remedy during his lifetime! Dippel told Baron von Geuder in the letter from July 1706:

It is a wonder-worthy *spiritus* as shown by the test that I myself made on various animals at my lodge. And now I believe with certainty that no wound is fatal *per se*, even if it goes right through the heart, if only it were possible to leave the weapon in the wound for so long until someone would be present to apply this *spiritum* through a syringe, the blood would certainly be staunched and the wound would soon be consolidated.

He followed with a detailed description of one of his animal experiments:

² Literally translated: Baron de Geuder named Rabensteiner

We drove a nail through the head of a young dog, in the presence of a *Medici*, who, as a good *anatomicus*, had to show where the principal *ventriculi* of the brain are located and the wound would be most fatal: The one who had driven the nail through and through, so that the dog was nailed properly, could not get the nail out again without using the greatest force and *desordre*, so that the dog's brains had not been stirred up in the head, but it was quite *ex animis*, nevertheless we appilorated several drops into the wound, and poured half a spoonful down his throat: The animal recovered *in momento*, the blood stopped, and before half an hour had passed, the dog barked at the chickens, that had endured the same fate, it also ate bread and whatever was served to it.

Dippel also stated in this letter that the recipe did not come from him at all, but from a French *medicus* who had immigrated to Berlin. Nevertheless, this medicine became known under Dippel's name.

The physician Johann Christian Kundmann (1684-1751) in Breslau (today Wrocław, Poland), who received his doctorate from Stahl in Halle in 1708, reported in 1716 in his book *Kurtze Abhandlung vom Verstande des Menschen vor und nach dem Falle* about the "Dippelian wound balm". [26] He mentioned that Dippel had given a sample of it to the Licentiate Johann Samuel Carl (1677-1757) in Berlin. Carl would have traveled to Halle with it and the drastic animal experiment with a dog and a nail would have been successfully repeated by the Halle medical professor Friedrich Hoffmann (1660-1742). As a result, Hoffmann's colleague Stahl also carried out this experiment. [27]

The recipe for the wound balm, which was given by both, by Dippel in his letter to Baron Geuder and by Kundmann in his book, was quite simple: You had to prepare the squeezed-out juice of fresh herbs from 1) *Betonica* (betony): 1 pound, 2) *Cerefolio* (chervil): 1 pound and 3) *Sanicula* (wood sanicle): 1 pound. You had to mix these liquids and add 4 pounds of *Aceti vini destillati rectificati* (rectified wine vinegar, i.e. highly concentrated acetic acid) and further add 1 pound of rock salt (NaCl). This would be distilled together from a flask in a water bath and the wound balm is ready, more of a tincture from today's perspective. Dippel added: "You can add other *herbar vulnerarias* [wound herbs] if you like, but the basis are the first three."

Around 1730 in Berleburg, a list of Dippel's medicines was printed in two quite similar versions. [28] As number 5, this list also contained a *Tinctura Vulneraria*, i.e. Dippel's wound balm. It was remarked in this rare print:

Otherwise it is known that all brain wounds in animals are cured by this tincture, and if you drive a nail through

their head and just pour some of it into the wound and also half a spoonful down its throat, the animal will soon recover to be salvaged.

So roughly 25 years after the letter to Baron von Geuder, Dippel or one of his followers still told the same improbable, hardly to believe story. According to the print, the price of Dippel's *Tinctura Vulneraria* was 22 kreutzer per ounce (= 29.23 g).

JOHANN CONRAD DIPPEL IN THE DIARY OF SENCKENBERG

In the early 1730s, Johann Christian Senckenberg (1707-1772), later a physician in Frankfurt am Main who was more than 30 years younger than Dippel, was an admirer of the radical Pietist theologian, physician and chymist. In his later years, the wealthy Senckenberg whose children had all died before him was the founder of several charitable and scholarly foundations. He is famous for his extensive diaries. 53 volumes of diaries and 600 folders with further entries comprise approx. 40,000 pages. In the last decade the first volumes of his diaries have been transcribed by Vera Faßhauer [29] and Veronika Marschall. Through these efforts, much valuable information has become available to the research community.

In April and August 1732, Senckenberg visited Dippel two times in Berleburg, the last place of residence of the old Dippel. The long conversations that Senckenberg had with Dippel himself and with others about Dippel were recorded in his diary. They give us many previously unknown details of Dippel's life including his activities as a chymist. In addition to that, also in later diary entries after his return to Frankfurt, Dippel remained an important topic for Senckenberg.

This new or additional chymical information include a slightly different narrative of the discovery of the pigment Prussian blue in Berlin in 1706, Dippel's preference for phosphorus as the starting material for the philosophers' stone and last but not least Dippel's chymical activities during his time in Berleburg.

THE DISCOVERY OF PRUSSIAN BLUE ACCORDING TO SENCKENBERG'S NOTES OF DIPPEL'S OWN REPORT

On August 22, 1732 Dippel told Senckenberg the story of the discovery of Prussian blue in Berlin. [30] Dippel's story is slightly different from what Georg Ernst Stahl had reported in his 1731 book *Experimenta, Obser-*

vationes, Animadversiones, CCC Numero, Chymicae et Physicae. [31] For a long time Stahl's account was the basis for the written history of the discovery of Prussian blue. [32] But since Dippel was part of the discovery team, we can believe his story more than Stahl's who was not even living in Berlin at the time of the discovery of this blue pigment. [33]

Dippel wanted to prepare *sal volatile*, so his story begins. For this purpose, he calcined tartar, mixed the potash thus produced with dried ox blood and distilled *sal volatile* from this mixture and perhaps also his infamous animal oil. Potash is potassium carbonate K_2CO_3 and *sal volatile* is $(NH_4)_2CO_3$. *Sal volatile* was a chymical product of the time and was used as a smelling salt.

Dippel wanted to throw away the six pounds of residual "sal" or *caput mortuum* from this process. But his young laboratory assistant Rösser collected it, extracted the salt from the residue and, after drying, stored this salt in a sugar glass labeled as "*sal tartari*", i.e. potash. We call it "Rösser's potash", because this potash was contaminated. Today we know that it also contained cyanide CN^- , perhaps also some hexacyanoferrate(II) $[Fe(CN)_6]^{4-}$.

Some time later, after Rösser had meanwhile left the laboratory, the following happened: A certain "Lieutenant Diesbach" also worked in Dippel's laboratory. According to Dippel, Diesbach usually prepared Florentine lake and other colors. On that day, he wanted to produce Florentine lake again by using, among other chemicals, potash and alum.

Diesbach, whose full name was actually Johann Jacob von Diesbach (ca. 1670-1748) according to the Berlin church records, [34] produced the red Florentine lake from a carminic acid extract. For this purpose, dried and pulverized cochineal insects were extracted in a warm, slightly acidic aqueous alum solution. By adding the right amount of alkaline potash solution, aluminum hydroxide precipitates in the neutralized aqueous solution, on which the carminic acid molecules adsorb. After filtering off and drying, the red Florentine lacquer pigment is obtained. If the aqueous alum solution contains additional metal salts, a pigment with a different color is formed. The addition of ferrous ion, for example, shifts the color from red to violet. That is exactly what Diesbach had done that day. However, things turned out very differently than Diesbach had expected.

Senckenberg noted what happened according to Dippel:

Diesbach picked up the glass which Rösser, who had already left Dippel, had only labelled as *sal tartari*. But he got *loco rubri coloris, caeruleum Berolinense*, made an agreement with the painters behind Dippel's back to deliv-

er them so and so much, but got caught out because after the glass was empty there was no more paint that looked blue with the common *sal tartari*. He came to Dippel and reported it to him, who knew, told him to take *sal tartari* with *sanguine bovino* so he would get it, and it worked. [35]

Let us summarize: Dippel's *sal volatile* production led to the formation of cyanide which remained in the residue of the process. Because Dippel's assistant Rösser wrongly labeled it as potash only, Diesbach used it for his Florentine lake preparation. But the cyanide in the potash led, together with the iron Diesbach had added, to the formation of blue iron(III) hexacyanoferrate(II), i.e. Prussian blue, besides the Florentine lake. The reaction scheme of the first Prussian blue synthesis is shown in Figure 4.

Diesbach sold this blue pigment to painters, but could not reproduce the process, after the source of contaminated potash (Rösser's potash) was gone. He had to ask Dippel what was special with this potash and Dippel told him to calcine potash with dried ox blood and the preparation of Prussian blue could be reproduced. Therefore, we can consider both, Diesbach and Dippel, as the discoverers of Prussian blue.

This discovery happened in Berlin in the year 1706. We know this from an entry in a handwritten chronicle

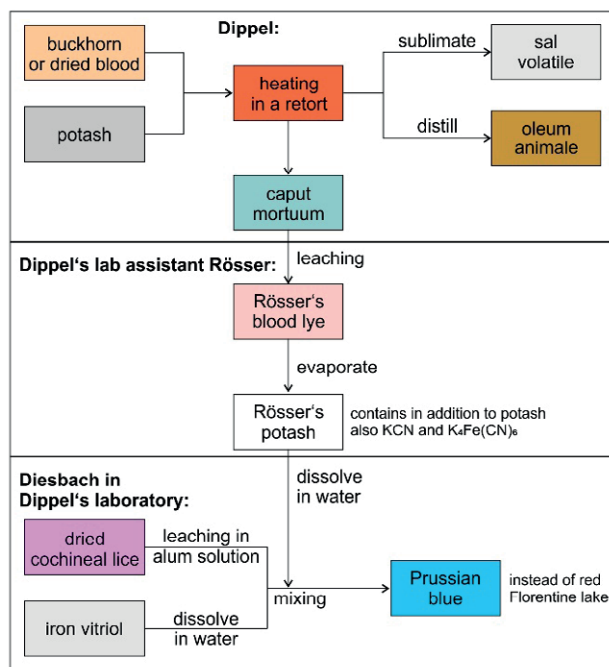


Figure 4. Reaction scheme of the first serendipitous preparation of Prussian blue by Diesbach using potash contaminated by Dippel and wrongly labeled by Rösser.

by Joachim Ernst Berger (1666-1734), Lutheran preacher in Berlin's Friedrichstadt district in which he recorded the first preparation of the "Prussian ultra-marine" by the "Swiss" Diesbach for this year. [36]

DIPPEL'S FLIGHT FROM BERLIN IN 1707 ACCORDING TO ARCHIVAL MATERIAL IN BERLIN

In the Secret State Archives of the Prussian Cultural Heritage Foundation in Berlin we can study a folder from which the events around Dippel's flight from Berlin in late February 1707 become clear. [37] Not much about chymistry can be found there, though. But let's tell the story:

The first thing we can learn from the material in this folder is that Dippel came to Berlin around early November 1704. In a letter he described that "I soon had to realize that because of alchemy, everyone was staring at me from all corners" and that "This pursuit meant that not only did I not do anything real in *Alchymices*, but I also resolved not to waste much time here." Roughly six months after Dippel came to Berlin he was so disappointed that he thought about leaving the city and try his luck elsewhere. Therefore he wrote a letter in Latin to the Swedish king Karl XII (1682-1718). Among other things, he wrote to the Swedish king that he wanted "to reveal his *arcanum* in alchemy to him as an inexhaustible source of wealth." [38] In addition, there was harsh criticism of the king and government of Prussia. So Dippel wrote:

I see their monstrous crimes, in which court and government are completely immersed, as a divine sign, they impel me daily to promote my departure, and even if I alternately allied with one of the Firsts around the King, they would betray me for their meanness, I can predict that with certainty. [39]

and another example:

Nor have I any confidence in the King's foul servants, who surround him on all sides, when he binds himself by solemn promises to any demands what they impede, known to the King or not, for I have already witnessed the *machinationes* of some of them.

Dippel did not send this letter directly to the Swedish king, but sent his servant to the Swedish "envoyé" in Berlin, Count Anders Lejonstedt (1649-1725), Swedish envoy in Berlin for the second time since 1703, "to be all the more certain about the address". Lejonstedt accepted the letter willingly and promised to forward it. However, when Dippel's servant approached him again after the agreed time:

... so the count mentioned took a nasty turn on him, gave him the opened letter back, said he hadn't sent it away and didn't want to have anything to do with such things, yes, he even threw insults and threats around. [40]

One gets the impression that the Swedes had no interest in secretly poaching a chymist who was in the service of the Prussian royal court to Sweden. Against the background of the Great Northern War, in which Sweden was involved at the time, this is also understandable. The Kingdom of Prussia remained neutral in this conflict and Sweden certainly did not want to provoke Prussia into entering the war on the side of the enemy coalition. On the contrary, it was hoped that Prussia would take the Swedish side.

Roughly one and half year later, towards the end of 1706, a book was published by Johann Friedrich Mayer (1650-1712) a well-known orthodox Lutheran theologian. From 1701 he was general superintendent of Swedish Pomerania, professor of theology at the University of Greifswald and pastor of St. Nikolai in Greifswald. He was the most important Lutheran theologian in the German lands under Swedish rule. After the occupation of Saxony by Swedish troops in the ongoing war, Mayer had rushed to the Swedish camp at Altranstädt and conferred with King Karl XII about the increasing influence of the Pietists and what to do about it. In nearby Leipzig he then had his book "A Swedish theologian's short report about Pietists" printed without naming the author. [41] This book was a fierce but not clumsy attack on the Pietists. Mayer personally attacked various Pietists in this book, including the Pietists from Halle and also Dippel. Dippel reacted to this with his own polemic, which was called "Impartial Thoughts" for short. [42] At the instigation of the Swedish envoy, Dippel was arrested around February 7th because of his book, in particular because of the harsh criticism it contained of the Swedish king.

According to the royal order of February 12, the imprisoned Dippel was then to be released on bail of 2,000 thalers. On February 14, August Count zu Wittgenstein took over the bail "*sub hypotheca bonorum*", whereby Dippel was not allowed to travel from Berlin before the matter was resolved, had to be available to the commission and had to refrain from all writing on religious matters. [43] Dippel was released from prison the same day. Figure 5 displays the short letter Dippel wrote to Count August zu Wittgenstein asking him to take over the bail of 2,000 thalers.

A week after his release, on February 21, 1707, Dippel wrote a rather unwise letter to the Prussian General-Fiscal³ Wilhelm Duhram (1658-1735). In this letter,

³ General-Fiscal was a kind of attorney general.

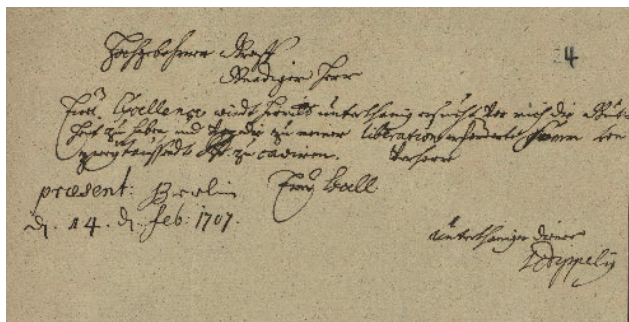


Figure 5. Letter from Johann Conrad Dippel to Count August zu Wittgenstein dated Berlin, February 14th, 1707 (source: GStA PK, I. HA Rep 9 Geheimer Rat Allgemeine Verwaltung D4c Fasc 24, f. 24).

Dippel wrote that among his still confiscated correspondence was a letter that he had written to the Swedish king in 1705. We have already discussed this letter. Dippel would fear that he would be questioned again about this letter and would like to avoid that by explaining it. He then went on to write that after his arrival in Berlin he had been put under great pressure because of his knowledge of alchemy and that he therefore wanted to leave Berlin again. That's why he wrote this letter to the Swedish king. Dippel then tried to explain further in his letter to Duhram why he had written so disparagingly about the Prussian court. However,

there is nothing in it other than what is complained about at every table, at every assembly, and in every street by the subjects themselves. [44]

In any case, the letter to the Swedish king was dug out, and based on its contents, Dippel was to be arrested again. He found out about this in good time and fled from Berlin at the end of February 1707 via several intermediate stops to the Netherlands.

THE STORY OF PRUSSIAN BLUE CONTINUES

After Dippel left Berlin, Diesbach teamed up with the teacher and natural scientist Johann Leonhard Frisch (1666-1743). Together they produced and marketed Prussian blue over the next years and both earned a lot of money from it. This emerges from a collection of letters that Frisch sent from Berlin to Gottfried Wilhelm Leibniz (1646-1716) in Hannover between 1706 and 1716. [45]

Another letter preserved in the correspondence of Leibniz proves that Dippel also continued to produce Prussian blue during his time in the Netherlands. In this letter, written in French and dated August 17, 1714 from Paris to Leibniz in Hannover, Heinrich Hasperg, church

councilor and secretary to Duke Anton Ulrich von Braunschweig-Wolfenbüttel (1633-1714), reported on “the blue color for the miniature ... that is made in Berlin”:

A German in Holland called Herr Dipelius also makes it and I brought a sample here [to Paris], but it's not as nice as the color made in Berlin. [46]

Until the end of the 1710s, the discoverers of Prussian blue had a kind of manufacturing monopoly, but then the first recipes began to appear underground, both incorrect and correct ones. But still only a few knew how to make Prussian blue. That was over, however, with a publication in the renowned *Philosophical Transactions of the Royal Society* in 1724. [47] Now anyone who could master the necessary chymical manipulations could make Prussian blue himself. The price then collapsed rapidly.

Today almost 300 years have passed since the manufacturing instructions for Prussian blue were published and this compound is still used as a pigment. In the meantime, however, it has also found other areas of application. It serves as an antidote for poisoning with thallium or radioactive caesium and as a sensor material for determining the concentration of certain substances, such as hydrogen peroxide. Many other applications are still being tested or are being examined on a laboratory scale, such as the use of Prussian blue as an active substance in batteries and electrochromic windows or its use in modern imaging processes in medical technology or even to combat tumors. [48] Surprisingly, several details in the composition, structure and chemical reactions of Prussian blue are still open more than 300 years after the discovery of this amazing compound. [49,50]

DIPPEL'S STAY IN THE NETHERLANDS 1707-1714

We had already heard that Dippel left Berlin for the Netherlands in 1707. Most of the newly discovered information about Dippel's time in the Netherlands we owe to the Rabensteiner letters, which we have already mentioned above. After arriving in the Netherlands, Dippel first lived in Amsterdam. This was reported by Kundmann who visited Dippel in early 1708 in Amsterdam. We can see this also from nine letters in the Rabensteiner collection which were dated Amsterdam between 1709 and 1711 and from the copy of another letter to a certain Herr Bergmann in Darmstadt dated Amsterdam, August 3, 1709. [51]

But, it is interesting to note that Dippel's letters to Baron Geuder were sent from Warmond between October 1710 and early June 1711. Warmond is a small village just north of the university town of Leiden. From a

brief remark by Dippel, which Senckenberg recorded in his diary, one can conclude that Dippel had bought an estate there, near Leiden. [53] What brought Dippel to this place? He, who, as far as is known, had never studied medicine, wanted to do a doctorate in medicine. However, it was not until April 1, 1711 that he enrolled as magister “*Johannes Conradus Dippelius Hassus*” in the register of the University of Leiden. And already on April 17th he defended his theses and received his doctorate in medicine. It can therefore be assumed that he has already been working on his planned doctorate before he enrolled and perhaps wrote his soon to become famous doctoral thesis entitled “*Vitæ Animalis Morbus et Medicina*” in Warmond.

In older biographies of Dippel it is usually mentioned that he lived in the Netherlands in Maarssen near Utrecht. But no letter from Maarssen is among Dippel’s 22 letters to Baron Geuder, only the last Dutch letter, written during his urgent departure on September 19, 1714, contained a crossed-out “Maarssen” as a sending location. But this maybe explained by the fact that it is not a long way from Maarssen to Utrecht, only a few kilometers, so that information could be exchanged personally between the two friends. But from the content of several letters [54] and from some notarial agreements [55,56] it becomes indeed clear that Dippel lived in Maarssen in his later years in the Netherlands. Here he owned an estate called Vredenhoef. This “buitenplaats” can easily be identified and it exists still today, however, the appearance of the house has probably changed a lot. It is located on the Straatweg, the old street between Utrecht and Amsterdam.



Figure 6. Buitenplaats Vredenhoef in Maarssen in 1836 (source: lithographic print by P.J. Lutgers / Desguerrois & Co, Amsterdam in the collection of the author).

In front of the house flows the Vecht, a small river that flows from Utrecht to the Gooimeer, a lake on the edge of the IJsselmeer. Figure 6 shows the Vredenhoef as it looked in 1836. It was built in the mid-17th century in the Dutch Classicist style; construction was probably started in 1666. It is not known who built the house. In Dippel’s time, the house had a stable, a garden, plus an orchard and a vegetable garden. The tea house on the river was built later. From the above mentioned letters we can also conclude; that Dippel had still to pay the purchase price for the estate which also included a “*laboratorio*”.

DIPPEL’S ANIMAL OIL BECOMES FAMOUS

After Dippel had received his doctorate in April 1711, he now, as a M.D., printed his theses again and his *Vitæ Animalis Morbus et Medicina* became a well-selling book. [57] Therefore, it was reprinted several times and also translated into German as “*Die Kranckheit und Arzney des thierisch-sinnlichen Lebens*” (= *Maladies and Remedies of the Life of the Flesh*). Of particular interest is a German-language critically annotated and appendix edition from 1736. [58] The editor and commentator, who knew Dippel well and was a well-versed physician and chymist, remained anonymous, but perhaps it was Johann Samuel Carl.

Through *Vitæ Animalis Morbus et Medicina*, Dippel’s animal oil became widely known, although he dedicated only a very small part of this book to it. He wrote:

I cannot avoid, for the benefit of the neighbor, to share a remedy which, as I have experienced myself very often, drives away all abating fevers, even if you have taken it only once, and with a quite wonderful effect, for the sick were overtaken by a pleasant sleep; and if at times they had passed about fifteen hours in sweet repose, with the face blooming and vivid in color, they arose fresh and healthy after they had slept through the attack of fever. [59]

The remedy would not bring sleep in healthy people, but even 30 hours of sleep in epileptics, after which they would also be cured. “*Medici*”, who had seen this,

almost no longer doubted the truth of the philosophical stone and the universal remedy, although it was nothing more than a very small remedy despised by the apothecaries, but which had been worked out with great patience.

That all sounds very unbelievable: someone with fever sleeps 15 hours, an epileptic 30 hours at a time after taking the remedy and then they are immediately

completely healed, while a healthy person does not fall asleep at all!

However, according to Dippel, this remedy has “a very penetrating and rather unpleasant smell” but

a pleasant and savory taste ... It is namely a distilled oil from all parts of the animals, separated from its salt, which has been rectified and purified through the retort without any addition of anything else until it no longer leaves any black, burnt deposits, which is only attained after the 15th repetition.

The dose was said to be 30 to 40 drops. – This rather short section of his dissertation established the fame of Dippel’s animal oil.

In the critically annotated edition of 1736, the commentator on Dippel’s animal oil warned that

not a single example has been seen that it presented anything worth mentioning, let alone wonderful.

It was much more frequently “shown that it was downright harmful”. This “miracle oil so splendidly highlighted” is “not worth a damn” [60] and: “Those who love their lives should leave the stuff out and get rid of it.” [61] Before that he had briefly remarked that “it is very often distilled from ox meat or ox blood”. In order to keep it colorless, it has to be distilled several times from potash (K_2CO_3), possibly also from burnt lime (CaO). The work was “mad and tedious”. So the commentator, who knew Dippel and his animal oil well, hardly had a good word to say about this mixture of substances.

The commentator also knew Dippel’s “so highly and much praised light and fire *principium*”. However according to him, Dippel “basically” did not “know and understood” this principle by himself, for otherwise

he would never have done such chymic things, and would have presented something far more real and useful to the world. [62]

DIPPEL’S FLIGHT FROM THE NETHERLANDS TO HAMBURG AND ALTONA AND HIS TIME THERE (1714-1719)

In September 1714, Dippel fled head over heels by ship from the Netherlands to Altona, which at the time was part of the Danish dominions in northern Germany. [63] He stayed there and in the much larger neighboring Free Imperial City of Hamburg until 1719. It is not yet known why he left the Netherlands. But there were rumors in Germany that

he had to flee Holland not only because of a few very unfortunate cures, but also because through many expensive alchemical operations which ended in vain he had accumulated great debts to a certain great lady. [64]

In Altona, Dippel was a protégé of the Danish governor Christian Detlev Graf von Reventlow (1671-1738). Not much is known about Dippel’s chymical activities at that time, but it is clear that he was also working in the laboratory. Christoph Heinrich Dornemann (1682-1753) from Hamburg, for example, mentioned in a letter from May 1715 to the Pietist professor Johann Heinrich May (1688-1732) in Giessen that Dippel was very

busy with laboratory work. ... I suspect that he is searching for gold, although he found a medicine lately, and our gentlemen pastors are also looking for the same with him [65]

These were, in particular, Messrs. Heinson, i.e. Johann Theodor Heinson (1663-1726), senior pastor of St. Peter’s Church and Winckler, i.e. Johann Friedrich Winckler (1679-1738), senior pastor of St. Nikolai Church, who “did their utmost to find the *lapidem*”. If that were to be true, these people interested in alchemy would have been the two most important Lutheran-Orthodox preachers in the Free Imperial City of Hamburg.

Heavy disputes between Dippel and the various local authorities in Altona and the surrounding Danish controlled region (e.g. Glückstadt, Pinneberg) began in 1717. In early 1719 Dippel fell also out with his protector Reventlow and in the course of the affair he was imprisoned in May 1719 and eventually sentenced to life imprisonment in September of the same year. [66] He had to serve this on the Danish island of Bornholm.

DIPPEL IMPRISONED ON THE DANISH ISLAND OF BORNHOLM 1719-1726

On the island of Bornholm, Dippel was imprisoned in the mighty fortress of Hammershus on the North-western corner of the island. Today a picturesque ruin, it was still an impressive and functional fortification in Dippel’s time. But Dippel was the last prisoner who was incarcerated in Hammershus. After his release the decay of the building began.

Not much is known about Dippel’s nearly seven years in Hammershus, but close reading of the preface of one of his books, [67] the study of some letter’s in the Dippel-letter collection of Count August zu Wittgenstein and of some entries in Senckenberg’s diary give us at least an impression of his chymical activities there. So in

1732, Dippel reported to his visitor Senckenberg in Berleburg that in Hammershus he

was only able to do little or next to nothing in *chymicis* in his prison, and only built a furnace for simple *extraction*. [68]

In mid-1725, the last year of his imprisonment had begun, Dippel was visited by Christian Pagencopen from Hamburg, an emissary of Count August zu Wittgenstein. For Dippel's book *Eröffnete Muhtmassungen und Merckwürdige Gedancken* (= *Opened Conjectures and Remarkable Thoughts*) Pagencopen wrote the preface signed with his initials C.P. only, but since Pagencopen also wrote several preserved letters on the same subject to Count August, we know that it was him who wrote the preface. In a letter dated Hamburg, September 5, 1725 [69] Pagencopen reported Count zu Wittgenstein about his visit of Dippel in his arrest on Bornholm. From the preface of the book and from this letter we learn that Dippel lived in a small detention room



Figure 7. Ruin of the mantle tower of Hammershus on the Danish island of Bornholm. Dippel was imprisoned here on the top floor for about seven years. (source: Photo by the author 2019).

on the fifth floor of the central mantle tower of the fortress. However, he was allowed to prepare his own meals in the hall in front of his cell and also to produce medicines there himself, which he would distribute to patients who came to him frequently. Dippel's visitors were always accompanied by a senior officer and a non-commissioned officer, with the latter remaining in the hall while the other went into the small detention room together with the visitor. Figure 7 shows the ruin of the mantle tower as it appears today.

Although Dippel the chymist could obviously only produce some medicine during his time on Bornholm the Danish royal court was also interested to receive more information about Dippel's gold making attempts. This can be shown by a letter from Dippel from February 1724, in which he answered questions from the governor of Bornholm Niels Madsen West (1666-1752) about his gold making. Dippel wrote:

Meanwhile, I can say so much *in general* that the *productum* will far exceed the cost, but whether it will turn out 10,000, 100,000, or 1,000,000 remains to be seen.

Regarding the cost of carrying out the experiments, Dippel replied: "600 *Reichsthaler*" and the duration: "one and a half years". Whether the gold produced is good ducat gold?: "The gold must not only be ducat gold, but far better...". [70] So in this case, too, we see Dippel's typical exaggerations when he wrote about his chymical knowledge. And there is no evidence that royally sponsored gold-making experiments with Dippel's recipes actually took place in Denmark.

In June 1726, Dippel, sentenced to life imprisonment, was released from prison on condition that he had to leave Denmark immediately and never to set foot in Danish lands again. He had been in the Hammershus prison for six years and ten months.

DIPPEL'S SWEDISH PERIOD 1726-1728

Dippel next went from Bornholm to Sweden and stayed in that country for almost two years until March 1728. Ironically, after his release from prison, Dippel actually wanted to return from Bornholm to his native Germany. But since the shipping connections via southern Sweden (Skåne) were better, he first traveled to Ystad in Sweden in order to get to Germany from there. But then he followed the invitation of a Swedish Pietist merchant Johan Hoffmeister (1699–1744) from Kristianstad and accompanied him to that place, where he lived for the next few months. Here Dippel became a center of the Swedish Pietist movement.

It is interesting to note that the Swedish king at that time was a compatriot of Dippel from Hesse, Fredrik I (1676-1751, king of Sweden from 1620), the son of the landgrave of Hesse-Kassel. This Swedish king invited the physician Dippel, meanwhile an international celebrity, to come to Stockholm. After some hesitation Dippel finally moved to the Swedish capital and arrived there in mid-January 1727.

Not much is known about the chymical work done by Dippel in Sweden. About one episode he informed Senckenberg. According to him, he had

given Count Frölich in Sweden an opportunity to work on the phosphorus, and he completely distilled ☉ mixed with it into a ☿ium, which the *comes* held very highly [71]

This Count Frölich is probably one of the descendants of Carl Gustav Frölich (1637–1714), a general in the Swedish infantry, perhaps Count Bengt Frölich (1684–1744), a Swedish follower of Dippel.

Elsewhere it was reported that

various bigwigs in Sweden held Dippel for a great gold maker and tried to learn this art from him; but finally found themselves deceived in their opinion. [72]

This may have happened in Stockholm, where Dippel lived in the house of the wealthy Elias von Walcker (1660-1733). Dippel must have impressed Emanuel Swedenborg (1688-1772) as well. Swedenborg, an inventor and scientist, later also a mystic theologian, was perhaps among the guests of Dippel in von Walcker's house. Alfred Acton (1867-1956) wrote

Swedenborg's intercourse with Dippel was probably and perhaps exclusively on the scientific or rather the chemical side of his learning, and among other things, on his claim to make gold – not exactly, as it would seem, a claim totally to transmute metals, but to draw gold from them. [73]

Swedenborg's words concerning the "Dippelian Experiment" according to Acton were:

When Dippel was staying in Sweden, he preached his process as a sure argument for the transmutation or augmentation of gold from metals; for he promised by this art and process to extract more gold from copper than can be done by any common way. [74]

Swedenborg also recorded this in one of his books as an "*experimentum quoddam Dippelianum*": According to this, one part of copper is mixed with 2 parts of saltpetre, placed in a crucible, which is closed and heated in

the reverberatory fire. After cooling, the obtained mass is pulverized in a mortar and placed in a flask together with *spiritus vini rectificatus*. This flask is then kept in mild heat for a day, during which time the *spiritus vini* turns red. Put this red *spiritus vini* in another flask. The leaching of the red color from the mass is repeated. The red spirits are combined and distilled into a recipient. A *materia rubra* or *sal rubrum* remains behind in the flask. This *sal rubrum* is mixed with half the amount of silver lime and placed in a crucible. After melting and cooling, you get a *regulus*, which after separation with aquafort gives quite a lot of gold lime. [75]

This recipe reminds on Dorothea Juliana Wallich's (1657-1725) theory of extracting the colouring soul (*anima tingens*) or tinging sulphur out of several materials, among them copper, and introduce this soul into silver to produce gold. She had published this in her book *The Mineral Gluten* in 1705. [76] This was a so-called particular recipe, not a process description for the philosophers' stone. So, Dippel used essentially the same procedure as Wallich, although details of the process may be different. Interestingly, in Sweden, a country with huge copper mining industry, Dippel tried to impress people with a chymical recipe for extracting *anima tingens* from copper to transmute some silver into gold.

But if we look at this recipe with the eyes of an chemist, it seems to be very dubious. If you add copper metal to a saltpetre (potassium nitrate KNO₃) melt, blue-green copper nitrate will be produced, accompanied by red fumes of nitrogen dioxide. Copper nitrate can be dissolved in ethanol, but this is also a blue-green solution not a red one. And if we distill off the ethanol from this solution, a blue-green solid will be found, not a red salt. A red copper compound would be copper(I) oxide Cu₂O, but this should not be produced by the process described by Dippel. Maybe this is the reason why the Swedish bigwigs felt themselves deceived by the chymist Dippel.

But much more important for Dippel's fate in Sweden were the quarrels around his theological writings. Their content and the fact that he found a substantial number of followers in Sweden led the Swedish clergy to work on his extradition from this country. Finally, Dippel was forced to go. He left Stockholm in early December 1727, and Sweden in March 1728.

DIPPEL AND THE TINCTURE MADE FROM PHOSPHORUS

So what about the phosphorus that Dippel introduced to Graf Frölich in Sweden? From some entries in the Senckenberg diary, from several other documents

in the Senckenberg collection and from a recipe which was found in the manuscript collection of the State and University Library in Hamburg it is now established knowledge that Dippel wanted to produce the philosophers' stone from phosphorus. He pursued this idea for more than three decades, from at least 1701 until his death in 1734.

Dippel's first acquaintance with phosphorus as a raw material for the production of the philosophers' stone seems to have been an alleged transmutation in 1701 in Frankfurt am Main. Dippel must have been very impressed. He reported about this to his visitor Senckenberg in Berleburg in 1732:

Back then, the projection happened at Saltzwedel's, and he had the laboratory work done at his place ... in *phosphoro*, ... and that's what it was supposed to be, ... at that time you could almost smell the *operationis ex stercore et urina* [operations from feces and urine] in Ff. [Frankfurt am Main] on every street, ... he always had the laboratory workers collect the human feces in baskets. [77]

According to Johann Conrad Creiling's (1673-1752) collection of transmutation stories, this transmutation was carried out by a journeyman apothecary named Godwin Hermann Braun from Osnabrück in the Apothecary shop At the Swan in Frankfurt in the presence of the owner Nikolaus Saltzwedel (1651-1726) and other distinguished persons, and "a lead ball weighing 2 lots and otherwise also lead and *ꝑum* turned into good gold with his tincture". A "principal piece of the tincture" was "*Phosphorum ... ex regno animali ...*". [78] So the tincture for the Frankfurt transmutation was made from phosphorus, which in turn was derived from human urine and feces.

In the archived collection of Senckenberg's writings and correspondence there is also a "*copia* of Mr. Saltzwedel's process which tinges h in \odot ": [79]

Recipe, 14 bowls of human excrement without urine, put them in the sun so that they get a thick black crust on top, take this off and put it in a flask ... whereupon is a blind helmet, put it in the sun again until you get the *Spiritus phosphori* made from this (which will be so strong that one can light powders with it), with this *spiritu* extract the *TR* [tincture] from the crusts, when all is out put the *TR* in a circulating glass, and leave it well circulating in the \odot [sun], but then pass it over *per alembico*, the *TR* left in *fundo* tinges h in \odot , but there must be a large phosphorus addition and it must be dissolved in the *TR*, so that it is in digestion for 4 days, if it is not tinging yet, some *phosphoro* is to be added until 4 drops transform 1 quint h into good \odot . *NB.* in May, June, and July the matter must be collected.

Senckenberg's copy of a letter from Dippel to him takes the same line. Senckenberg had noted:

Author J. C. Dippelio / You must know that I still have no other experience with the tincture than from *phosphoro* with which \odot or D is dissolved and also sublimated by appropriate manipulations, afterwards dissolved and abstracted in ∇ *Rect.* and you have an *Elixir tingens* within a few weeks ... [80]

So there it is, the tincture made from phosphorus! – Dippel then continued:

Just because phosphorus requires a lot of effort and trouble and its handling is very dangerous for someone who has not learned the right laboratory techniques well and has not seen them with his own eyes, I have not yet been able to resolve to give part of it, but now I am well provided with it.

A corresponding recipe is the "*Dippelii Tinctura Universalis*" found in the manuscript collection from the Hamburg State and University Library. [81] Let's take a closer look at this process description now:

Dippel described that at first three preliminary works have to be carried out, namely:

- i) to prepare *Vitriolus Martis* (iron vitriol = iron sulphate FeSO_4)
- ii) to prepare *Spiritus Luminosus* and *Phosphorus* in stock, and
- iii) to prepare a sublimated *Regulus Antimonis et Martis* resulting in *flores* that shine like diamonds.

The *Regulus Antimonis et Martis* should be an alloy of the metals antimony and iron, we also know about iron vitriol and phosphorus, but what is *Spiritus Luminosus*? A glowing or shining spirit? – If we use the analogy to the early modern terms: *Spiritus vini* = distilled wine = ethanol, *Spiritus salis* = distilled common salt NaCl = hydrochloric acid (HCl), *Spiritus vitrioli* = distilled vitriol salt, e.g. FeSO_4 = sulfuric acid (H_2SO_4), *Spiritus nitri* = distilled saltpetre (KNO_3) = nitric acid HNO_3 , and continue with *Spiritus Luminosus* = distilled luminous matter, i.e. phosphorus = phosphoric acid (H_3PO_4)?

Back to the recipe of *Dippelii Tinctura Universalis*. Figure 8 displays the reaction scheme of this process description. According to this, A.) one part of the ominous *spiritus luminosus* is mixed with iron vitriol and sublimated to obtain a homogeneous sublimate, then B.) purified phosphorus is dissolved in the second part of the *spiritus luminosus* and purified by *cohobationes*, whereby one would obtain a *phosphorus liquidus*.

What could Dippel mean by *phosphorus liquidus*, a liquid phosphorus? In his chemistry textbook *Einlei-*

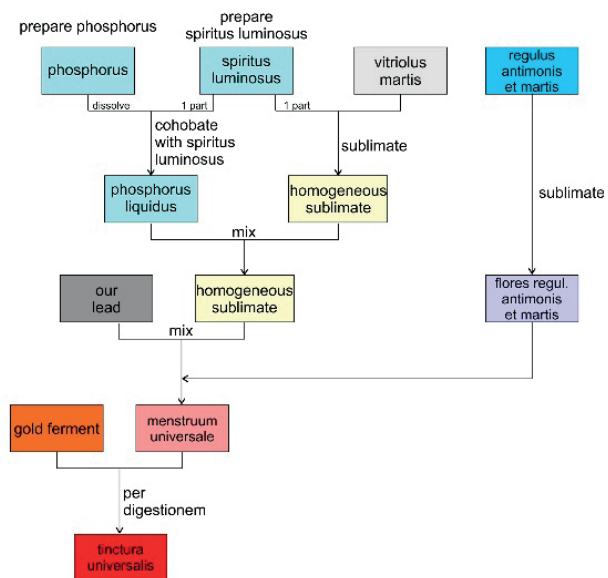


Figure 8. Reaction scheme of *Dippelii Tinctura Universalis* from the Hamburg State and University Library.

tung in die Chymie (= *Introduction into Chymistry*), [82] Hieronymus Ludolf (1708-1764) also described the production of “liquid phosphorus”, which was said to be of great benefit. He further claimed: “This liquor shines brightly when you rub your hand with it and it doesn’t do you any harm.” Of course, this can by no means be real phosphorus, because it causes serious injuries when it comes into contact with the skin. Ludolf also remarked: “I haven’t been able to do it yet because of its length, but I think it’s practicable”. At this point, Ludolf brought a recipe that he had not yet tried out himself.

He had never seen *phosphorus liquidus* himself, and maybe Dippel hadn’t either?

The melting point of pure white phosphorus is 44.2°C. If it is contaminated, it may melt at a slightly lower temperature, so that a chymist could easily obtain liquid phosphorus, but of course not with the properties described by Ludolf. Ultimately, what was meant by *phosphorus liquidus* at this point in the recipe must remain open.

In the next step C.) the *phosphorus liquidus* should be conjugated with the sublimate obtained under A.), which also results in another homogeneous sublimate. With this D.) “our lead” is dissolved. In addition, it should be noted that the adjective “our” before a substance in the alchemical arcane language of the time often meant that, as in this case, it was not lead, but something else that was then called “our lead” but its actual nature remained open. In step E.) you had to mix this mixture with the diamond flores. A steaming crystal, the *menstruum universale* would be created. This heated with gold ferment, results in the *tinctura universalis*. This recipe remains difficult to understand because some intermediate products cannot be identified. This includes the *spiritus luminosus* and *phosphorus liquidus*.

In the Senckenberg collection, too, there are several phosphorus recipes in connection with records of Dippel. The process description “*De Phosphoro*” is particularly interesting. This is much more detailed than what has just been discussed and the process is also very different. Figure 9 shows the corresponding reaction scheme.

According to this process, phosphorus is produced following the Kunckel method from putrefied urine with the addition of sand and purified by rectification (Figure

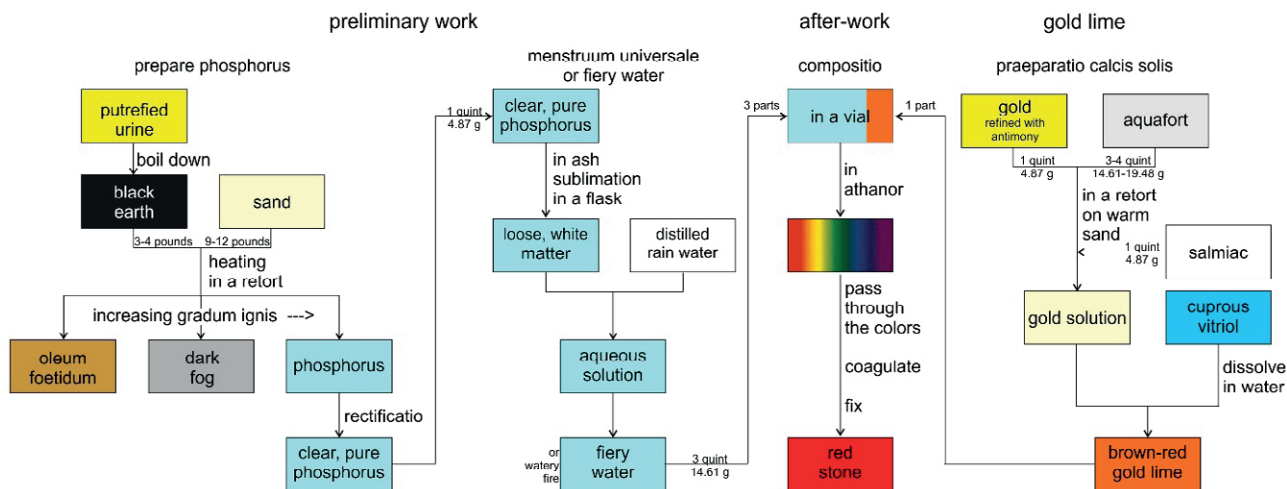


Figure 9. Reaction scheme of *De Phosphoro* from the Senckenberg collection.

9, left column). The “*menstruum universale* or the fiery water and watery fire of the philosophers” is then to be produced from this phosphorus (Figure 9, 2nd column from the left). For this purpose, “a quint of *phosphoro*” is gently heated in a glass flask with a helmet in an “ash oven” in such a way that the phosphorus does not over-distill and the vapors “always roll around in the flask”. Over time, a “loose matter white as snowflakes” would build up on the bulb wall. This fluffy white matter can be interpreted as phosphorus pentoxide P_4O_{10} , which is formed as the phosphorus vapor circulates as a result of the reaction with the oxygen in air. The phosphorus pentoxide is then dissolved in distilled rainwater and some water is distilled from it. One then obtains the “fiery water and watery fire.” That’s the recipe. The “fiery water” can be interpreted as a more or less concentrated phosphoric acid solution H_3PO_4 in water.

A gold lime was then required, the production of which was described in the section “*Praeparatio Calcis Solis*” according to the right-hand column in Figure 9. In the alchemical literature, gold lime was usually understood to mean very finely distributed gold, not a gold compound, but still elemental, metallic gold. [83] To do this, purified gold (“poured through the antimonium”) should be dissolved in aquafort (HNO_3) to which some salmiac NH_4Cl was added. Nitric acid containing chloride dissolves gold. At a certain concentration ratio, this mixture is also called *aqua regia* because it dissolves the king of metals, gold. An aqueous solution of venereal vitriol, i.e. $CuSO_4$, should then be added to this gold solution, “this is how a beautiful brown-red and very subtle gold limestone precipitates”. It would have to be tested experimentally whether gold is really precipitated. But gold can be precipitated very easily from an acidic solution of gold chloride if a suitable reducing agent is added.

In any case, with the “fiery water” and the gold lime, the starting materials for the next process step of the *compositio* were now available. To do this, one should put one part gold lime and three parts “of the *menstruo philosophico* or fiery water” in a vial, “melt the glass shut, set it in an *athanorum*, and let it ... pass through the colors, coagulate and fix into a red stone.” That is probably the philosophers’ stone, the *Lapis Philosophorum*.

If you compare this entire reaction sequence with other alchemical process instructions for the production of the philosophers’ stone, then the process from urine to the “fiery water” corresponds to the preliminary work for the production of the *menstruum universale* and the dissolution of the gold lime in the *menstruum universale* and the subsequent steps of going through the colors in the *athanor*, coagulating and fixing is the after-work.

The *multiplicatio* and the *fermentatio* are also briefly mentioned in the process description. The *multiplicatio* is again typically alchemical, you take the result of the preliminary work, the “fiery water”, three parts and add one part of the result of the after-work, the red stone and let it go through the colors, coagulate and fix. The *fermentatio* refers to the 12th key of *Basilius Valentinus*. In contrast to the Hamburg process description, this recipe from the Senckenberg collection can be followed and understood in every single step. The question would of course be at which point in the process description the actual chemical reaction is different from the one described. This should be the dissolution of the gold lime in the “fiery water”, for gold does not dissolve in phosphoric acid.

There are several other process descriptions in the Senckenberg collection that use phosphorus as an important ingredient. However, we have discussed the most important of them. But there are of course other references in original sources that point to the importance of phosphorus for Dippel’s chymical path to the philosophers’ stone:

Among the Dippeliana in the archive in Bad Laasphe we also find a letter by Amsterdam apothecary Albertus Seba (1665-1736) to Count August zu Wittgenstein from January 1717. [84] From this letter we learn that “*Dippelius*” bought 20 ounces of “phosphorus” from Seba at a price of 22 guilders per ounce. This price would have been very cheap, wrote Seba, and he only sold it so cheaply for his “old friend”. But even at that price, based on weight, phosphorus was more expensive than gold! It is somewhat surprising that Dippel as an experienced chymist would have preferred to buy the very expensive phosphorus rather than produce it by himself.

Dippel himself mentioned phosphorus already in his doctoral thesis *Vitæ Animalis Morbus et Medicina* from 1711:

... the so strange fruit of the noble art of chymistry, namely the so-called phosphorus ... which can be prepared from all liquid parts of the animals by the greatest power of fire, if they have been properly putrefied beforehand. ... This phosphorus, no matter how well it is sealed in the jar and only aroused by the slightest heat, immediately bursts into flames; even if it is held under water, it still does not stop spewing flames and spreading them over the water... [85]

The latter is not true, because phosphorus burns in air but not under water and is therefore also stored under water.

DIPPEL'S CHYMICAL EXPERIMENTS IN LAASPHE
AND BERLEBURG IN THE TWO COUNTIES OF
WITTGENSTEIN

Eventually being expelled from Sweden, Dippel finally returned to Germany via Copenhagen in mid-1728. On the way, Dippel had repeatedly received letters from Count August zu Wittgenstein, who urged him to come to the county of Wittgenstein. Dippel then replied in a letter dated June 25, 1728 from Copenhagen to the count's representative Pagencopen and asked for "100 ducats to my travel". [86] The count would "find contentment for this and for everything else on my arrival" in Wittgenstein.

The first stop during Dippel's return to Germany was the Free Imperial City of Hamburg. In November 1728, Dippel wrote to Count August zu Wittgenstein again, thanking him for the 100 thalers he had sent. From Hamburg he went via Lauenburg, Lüneburg and Celle to Liebenburg near Goslar in the Prince-Bishopric of Hildesheim. A letter dated September 7, 1729 states that Dippel stayed there to "complete some chymical experiments on medicine and other curiosities in solitude". [87] When he was finally expelled from the Prince-Bishopric of Hildesheim, Dippel went to the counties of Wittgenstein, where he arrived in December 1729.

A few days after his arrival in Berleburg in the County of Sayn-Wittgenstein-Berleburg, a carriage brought Dippel from Berleburg to Laasphe in the County of Sayn-Wittgenstein-Hohenstein. For the first few months of 1730, Dippel was a guest of Count August zu Wittgenstein at the Wittgenstein castle near Laasphe. However, around mid-April 1730 he returned to Berleburg where he stayed the next four years.

What has happened, that Dippel left his old friend and supporter Count August zu Wittgenstein? We may find an answer to this in a letter that Dippel sent to Count August on December 24, 1731 from Berleburg:

Hope with God that the annoyances and *criante* incidents between Your Excellence and your subjects were once resolved and brought to a good end, so I could, without hurting my conscience and without angering others, cultivate closer correspondence, and restore the old trust to Your Excellence. [88]

And on September 25, 1732 he wrote to Count August that he "finds the Wittgenstein Castle too restless and annoying to advance my affairs there". [89] Dippel also said to his young admirer Senckenberg:

Count August in Wittgenstein, when he was still in Berlin, was much nicer than now, when he lives brutally with his children and harasses his subjects. [90]

To summarize, Dippel rejected the count's dealings with his subjects. During this time, the count tried to reduce the largely free peasants, who were only obliged to a little forced labor, to the status of serfdom. As a result, the count was widely hated. And that also affected the family, servants and friends of the count. Those who worked for him were despised by the population of the county.

In the four-year period that now followed, Dippel tried to create an opportunity to work out his chymical universal recipe in a suitable laboratory. With Count Casimir in Berleburg, where he now lived, he found no interest in it. He therefore remained in contact with Count August zu Wittgenstein and also resumed the old contact with his former sovereign, Ernst Ludwig von Hesse-Darmstadt (1667-1739), who was known for his passion for hunting and also as a keen alchemist.

First, Dippel tried to convince Count August to finance a laboratory in the small village of Schwarzenau, which belonged to the county of Sayn-Wittgenstein-Hohenstein but was closer to Berleburg than to Laasphe. The negotiations went through August Frensdorf (1693-1755), a councilor of the count. In the end, this failed because he asked the count for too much money and because he did not want to reveal too many details of his process to Count August.

Therefore, Dippel now turned to the Landgrave of Hesse-Darmstadt. In September 1732, they met in Breidenbach in Hesse-Darmstadt near the border with the counties of Wittgenstein. [91] The negotiations resulted in various draft treaties. First, Johann Conrad Dippel offered the landgrave his "*Arcanum chymicum*" for 100,000 thaler, to be paid from the income of the work with 5% interest. As the negotiations progressed, Dippel gave up the money and now wanted Frankenstein Castle, where he was born, as a fief for himself and the Dippel family. Namely "along with all dependencies, subjects and justices". Details about the *Arcanum* were not given in the documents, only that it

should yield as much revenue ... as the whole amount when the property should be sold according to the ordinary *taxa* and this with easy effort, without art and dangerous work, and with the help of only 3 to 4 people.

But the landgrave did not agree to this and the project was not carried out.

During Senckenberg's second visit to Dippel in Berleburg in 1732, Dippel also showed him "a D regulus, which also contained some gold". [92] He "had dabbed the D underneath with aquafort, there you could see the yellow O ." [93] Dippel also described the corresponding particular process to Senckenberg: According to this, 2

parts of mercury with one part of silver and a certain menstruum should be placed in a closed vessel in the fire. From letters [94] exchanged between Dippel and August zu Wittgenstein it becomes clear that this certain menstruum was “*olij vitrioli*” i.e. concentrated sulfuric acid H_2SO_4 . This mixture of mercury, silver and sulfuric acid had to stand in the fire for 14 days. Thereafter, the vessel had to be opened and all liquid to be distilled away. Now fresh sulfuric acid had to be added to the remaining material and this had to be placed in a closed vessel in the fire again and so on. This process had to be repeated 10 to 12 times until everything would be fixed. Dippel thought that during these 140 to 168 days of heating the light and fire principle would move through the vessel walls into the reaction mixture. Mercury and *oleum vitrioli* would help this principle to enter the silver and transform some of the silver into gold. According to Dippel as noted by Senckenberg, this

particular sample of ☽ and ☉ is very lucrative, without much headache, to force ☿ into ☉ and ☽, the yield is more than 200,000 thalers each year, but he doesn't know how to find a place to do it. [95]

So we have learned that besides his universal process based on phosphorus Dippel also worked in Berleburg on a particular process for the transmutation of parts of the silver used into gold. Senckenberg also noted about Dippel that

he offered me that if he had a laboratory and I wanted to be with him for a while, I could do it ... when he has set up the *Laboratorio*, I should come to him for a few weeks and leave happy. [96]

DIPPEL'S DEATH

After hesitating for a few years, the 60-year-old Dippel finally went to Count August at Wittgenstein Castle in April 1734 to carry out chymical experiments together with the count. He arrived at the castle on April 12, but Count August had once again traveled to Wetzlar to the German Imperial Chamber Court. Dippel began to prepare the planned chymical experiments, but since “the most important *praeparata* ... were locked away ...” he could not continue the work. Was that the phosphorus he couldn't get hold of during the count's absence? In the last letter to Count August dated April 13, Dippel asked August zu Wittgenstein to give him or his son Count Friedrich permission to use these *praeparata*. [97] We do not know of a reply from the count to this letter. Twelve days later, early in the morning of April 25, 1734,

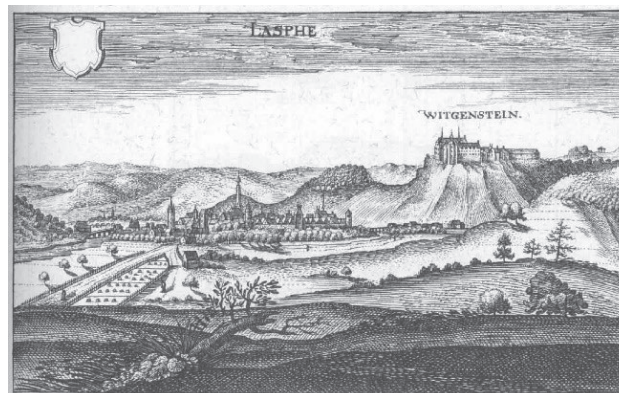


Figure 10. View on Laasphe and Wittgenstein Castle. Engraving by Matthäus Merian (1593-1650) published in *Topographia Hassiae*, Matthäus Merians Erben, Frankfurt am Main, 1655. (source: Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Laasphe_De_Merian_Hassiae_144.jpg, last access 10.4.2023).

Dippel was found dead in his bed in the living room provided for him. The count, who was still or again staying in Wetzlar, was immediately informed of Dippel's death. Dippel's belongings were sealed, his living room locked and a sentry posted in front of it.

Figure 10 shows Laasphe and Wittgenstein Castle high above the small town. Dippel died in the castle and was buried in the town church of Laasphe. A few days after Dippel's death, Count August zu Wittgenstein began to receive letters in which various people to whom Dippel owed money were trying to get their money back. These included Johannes Hummel (1700-1769) from Elberfeld and the “protection jew” Joseph Schmul from Marburg. Hummel had, as can be seen from the letters, also worked together chymically with Dippel. In addition, Johann Christoph Dippel from Grünberg, a son of Dippel's younger brother Johann Albert (1678-1717), reported to the count on behalf of Dippel's heirs. But since Dippel also owed the count a lot of money himself, none of the petitioners received anything.

On August 27, 1735, about 16 months after Dippel's death, Count August David zu Sayn-Wittgenstein-Hohenstein died at his castle above Laasphe at the age of 72. – An interesting note from October 1737 can also be found in Senckenberg collection. [98] It says about phosphorus: “But Count zu Wittgenstein has several pounds of the same and gives it cheaper” than the phosphorus from the “*Laboratorio*” of Godfrey in London, where it was sold at 50 shillings per ounce. Since Count August had already died in 1735, it must be his son and successor as regent, Count Friedrich zu Sayn-Wittgenstein-Hohenstein (1708-1756). Perhaps Count August had phosphorus produced or bought in larger quantities in order

to obtain the philosophers' stone according to Dippel's instructions? And now that both Dippel and Count August had died, did Count Friedrich at least try to sell the phosphorus to make some money from it?

CONCLUSIONS

Many new archival sources connected with Johann Conrad Dippel have been found in the last 15 years. Combined with a close reading of some of Dippel's books they give a new account of Johann Conrad Dippel's life as a chymist. This closes a gap in the research of the biography of this important German theologian, physician and chymist from the turn of the 17th and 18th centuries. We learned that Dippel was a chymist with broad range of interests, spanning from recipes for medicines to transmutation processes by use of phosphorus. He also developed his own special chymical theory based on what he called the light and fire principle. This account shall serve as a starting point for the research community to explore the life of this popular figure more deeply to draw an accurate picture of this man and to refute the many wild speculations which are distributed on the internet.

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