

Alchemy as *donum dei*

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Abstract: The view of alchemy as a gift of God is traced from her origin in the Hellenistic world through the Arabic world to Latin Europe. In the course of this history the attitude towards divine intervention changed; Hermes, the legendary (semidivine) founder of this science was not yet expected to intervene into the work of an alchemist. Already in the Hellenistic world alchemy became *donum dei*; the role of God graduated in the later cultures, and persisted surprisingly long in Latin Europe. Here, God was the decisive force presenting only selected people with his gift, the knowledge of alchemy. Crafts based on chemistry and metallurgy developed simultaneously in the same social and religious environment, but they took quite a different position - free access for people to learn all knowledge. Therefore, alchemy and crafts are to be compared also from the point of view of *donum dei*.

Keywords: *alchemy, religion, transmutation, donum dei, crafts.*

Introduction

Alchemy always took up an extraordinary position among sciences because she claimed to be able to intervene deeply into human affairs. This was proposed principally in two ways. The first was a change of the economic situation by artificial production of precious metals, the second was yet more an immediate influence on individuals by curing illnesses, not to mention the possibility to extend life. For the sake of simplicity these claims are presented here in the way commonly accepted by the broad public in the past, without attempts to go on the fine nuances of these proposals. The term 'science' is deliberately used for alchemy; according to a belief that survived for centuries, the same effects could be achieved in fully different manner by employing magical practices. A distinction should be made between these two approaches, because magic stood firmly on supernatural forces; it promised untold riches like alchemy, but it was to be done by calling good or evil spirits, depending on the type of magic. Alchemy, aiming in her exoteric directions at the transmutation of metals or the production of an elixir of life, was a laboratory activity which tried to perform real processes, of course within the limits of attained knowledge. These processes were chemical, metallurgical, or often a combination of both, so that in some cases we can speak in terms of twins, alchemy/protochemistry, which are, however, difficult to separate especially in the early

stages of alchemy. An analogous example is the pair astronomy/astrology, when the more or less correct data of the former were incorrectly interpreted by the latter. Generally speaking, alchemy included attempts to improve something, whether metals or humans.[1] Concerning the expected results, this science could be looked upon by some as an attempt to achieve divine power, especially in societies where religion was influential. Simultaneously, alchemy stood from the very beginning in the sign of repeated failures, the explanation of which was out of reach of the Masters of the Art. This state of matters called nevertheless for explanation and the most direct one that was ready at hand was supernatural. The idea of alchemy as *donum dei*, a gift of God, proposed a way out of this problem. As pointed out by Newman,[2] this idea was transferred to Latin Europe from the Arabic world. At a closer look, the picture turns out to be more complicated. This paper is an attempt to outline briefly the role of divine intervention in alchemy.

Alchemy and crafts

The first problem is the origin of alchemy as such; in this respect, the attempt of Hopkins [3] should be remembered. Without going into details that are beyond the scope of this paper, we can generally accept the view that alchemy originated in the Hellenistic world as a result of manifold interfering influences: Greek natural philosophy, Gnostic speculations, and practical knowledge collected by craftsmen.[4] The last mentioned group must be included into the present discussion, because both craftsmen and alchemists made use of similar, sometimes even identical techniques.[5] The difference was in their interpretation; for example, craftsmen considered the alloying of gold with copper as debasement of the precious metal, while alchemists interpreted the same process as transmutation leading to increased amount of pure gold. Moreover, alchemists and craftsmen should be compared the more, because they lived and worked in the same social and religious environment. As will be shown, their argumentation was often quite different.

Hellenistic world

In its highest flourish the Hellenistic world enjoyed marked religious freedom as compared with the later cultures in which alchemy appeared. This attitude is apparent from the two most important collections of chemical recipes, papyri Leyden X [6] and Stockholm [7] - in neither of them is any god called for help in the work. Not so in alchemy; divine influence stood already at her cradle. Legend has it that Hermes Trismegistos, identified later with Egyptian Thovt, was the founder of this science. The identity of this god is not as important as the fact that *he was a god* who allegedly described all the secrets of alchemy, and who supposedly performed successful transmutations of metals.[8] There is, however, a significant distinction between Hermes and later gods. Hermes was traditionally considered as the founder and inventor of alchemy, who formulated all the secrets of this science. It was the task of an adept to understand correctly the hermetically sealed text. But neither during study nor in experimental work was the intervention of Hermes himself expected. The divine author remained inactive. Not so in the later Arabic world, or in Europe: here God was not only an active partner of the work, he was the decisive force.

In the Hellenistic world particular attention should be paid to Mary the Jewess, one of the most influential personalities of this science. God appears in connection with her, but in a slightly different manner than later. To Mary, alchemy is *donum dei*, a gift of God; but this gift was given only to 'chosen people', Jews. She is reported to have said:[9] "Do not touch the philosopher's stone with your hands; you are not of our race, you are not of the race of Abraham." Thus alchemy was not for alchemists in general, but for the race of Abraham. Alchemy is presented here as the spiritual property of Jews. As pointed out by Patai, the singular form 'God' is used strictly in texts attributed to Mary, and this claim that alchemical secrets were revealed to her by God became a part of the medieval alchemical tradition about her. This case could have been one of the contributions that gave rise to the concept of alchemy as *donum dei* in later centuries, when stress was laid not so much on Jewishness as on God as such.

This motif appears markedly in later Byzantine alchemy; here the stress laid on 'chosen people' is already receded, and only the concept of God was left; in this case Christian God. The role played by the church in Byzantine empire is felt behind this attitude - the Emperor was the supreme ruler of the empire, the church, and the army. The strong influence of the church, which was not only a spiritual leader, but also exerted executive power, inevitably found its way into secular life. In alchemy, this can be documented in the lectures of Stephanos of Alexandria.[10] God appears here in two distinct types of references, and this approach continued later in Arabic alchemy as well. The first type of reference in which God appears is the introductory incantation of God, which is actually a formal recognition of the ruling religion. Stephanos writes: "Having praised God the cause of all good things and the King of all, and his only begotten son resplendent before the ages together with the Holy Spirit, ...". In this way, it is as if the treatise were consecrated. The second type of reference is already connected with the work itself; here, Stephanos states that "he [God] it is that furnishes all wisdom ... we receive from him the wisdom ...". The art of making gold becomes *donum dei*.

Arabic world

As outlined above, alchemical literature bears the outer seal of religiosity in systems dominated by the church, and such was also the case in the Arabic world. Typical of all kinds of literature from this region was the *basmallah*, the introductory verse of *Quran*: "In the name of God, the Compassionate, the Merciful". This is the Islamic equivalent to Stephanos' introductory sentence. Then, the motif of alchemy or of any other science as *donum dei* can be easily found. Should any work be successful, God's help was considered as a necessary condition. This is also apparent from Jabir's *Book of Stones*:[11] "God is our guide, ..." [6:10], "... so, seeking assistance from God, may He be exalted and glorified, we proceed: ..." [7:6]. One role of God was his assistance in the work. But the mere assistance of God was not enough. According to such a general formulation it could have appeared that God will assist anybody, but when Jabir explains why he intentionally corrupts his information he states [4:11]: "... And [yet], as always, we deliberately abrogate in one book what we say in another. The purpose is to baffle and lead into error everyone except those whom God loves ...". Here the idea of Mary's chosen people revives, with the difference that here they are not an ethnic group, but alchemists. Only the gifted among adepts can understand.

An interesting exception appears in an early Arabic source about alchemy. In the Tenth Discourse of his treatise *Al-Fihrist*, [12] An-Nadim (A.D. 987) writes, after the introductory *basmallah*, about the origin of alchemy [§ 1]: "The adepts of the Art of Alchemy, ... assert that the science of the Art

was first discussed by Hermes, the Sage, the Babylonian ...". The subsequent paragraph is fully devoted to the life of this alleged discoverer. In the introductory first paragraph, the other possibility is also mentioned: "Another group of Alchemists say that this [science] was revealed by Allah - May His name be exalted! - to some adepts of this Art; ...". The common point of both statements is divine, or in the case of Hermes semidivine (he is considered by An-Nadim to be a deified mortal), but, surprisingly, Allah appears as the second in this text. On the other hand, it is just in connection with Allah that the motif of '*chosen people*' [some among adepts] appears, while Hermes remains in the same position as in the Hellenistic world - the founder of alchemy. An-Nadim touches even the third possibility: "... whilst others say that it was revealed to Moses, ..."; God sends his message through his prophet. It should be remembered here that Mary the Jewess was said to be a sister of Moses. On the other hand, An-Nadim was not an alchemist, he only reproduced the information he obtained from alchemical sources. Nevertheless, the order of key figures, Hermes - Allah - Moses, can be slightly surprising.

As yet another example of alchemy as *donum dei*, Al-Iraqi's (active in the 13th century) *Book of Knowledge Acquired Concerning the Cultivation of Gold* [13] can serve. Here, Allah's will is a necessary condition of success: "Understand, therefore, the hidden things of the secrets of this Art, and thou wilt attain to a high degree, if Allah, the Most exalted, will" [Part I, Section 2, p. 25], or "... This is the Elixir of Silver, and forms the first part of the second operation. After this we will begin with the second part of the second operation, treating it completely and fully, if Allah be willing" [Part III, Section 1, p. 39]. An additional point appears here - God not only chooses among adepts, but also deliberates upon the success of the work. This statement leaves a backdoor open for the explanation of failures; in Al-Iraqi's time, alchemy had existed in Arabic world already for several centuries and, as in the previous Hellenistic and later Latin world, it did not fulfill the expectations.

Medieval Latin Europe

Because alchemy was transferred to Latin Europe from Arabic sources, it is not surprising that the oldest Latin treatise from this field, *A Testament of Alchemy* [14], copied slavishly from an Arabic original, including the introductory *basmallah*. In the course of a discussion between the teacher, Morienus, and the adept, Khalid [15], the idea of alchemical knowledge as a gift of God presented to chosen ones is clearly expressed: "For this is something which God gives into the sure keeping of his elected servants until such time as he may prepare one to whom it may be handed on from among his secrets. Thus it is only the gift of God, who chooses among his humble and obedient servants those to whom he reveals it." This formulation is a bridge between the Arabic world and Latin Europe: the idea already firmly rooted in Arabic alchemy is transferred to the new region. Alchemy is not only a gift of God, but God himself decides whom he chooses. From the Hellenistic Hermes, who only encrypted his messages, alchemy arrived at a point at which God selects among adepts; their obedience to him stands to reason.

A Testament of Alchemy, approximately from the mid 12th century, had its contemporary counterpart in a craftsman's manual *De diversis artibus* [16] attributed to a certain Theophilus Presbyter whom we will consider the author. In the Prologue Theophilus introduces himself as a humble priest and the servant of God who created everything and promoted humans above all creatures; humans could thus participate in the wisdom and skill of God. In accord with the Christian tradition, Theophilus continues that humans later fell in disgrace because of their

disobedience to God. But, "... nevertheless he [man] transmitted to the generations of posterity his distinction of knowledge and intelligence, so that *whoever devotes care and attention to task can acquire*, as by hereditary right, *the capacity for the whole range of art and skill*." The crucial idea of this passage is italicized. According to Theophilus, not only those chosen among people, but everybody, can attain the full skill of craftsmen. The divergence of the way of thinking between alchemists and craftsmen is obvious from yet another contemporary work, *Mappae clavicula* [17]. This manual containing short recipes bears similarities to the Egyptian papyri.[18] In the short Prologue tribute is paid to God only once: "I swear further by the Great God who has disclosed these things, to hand this book down to no except to my son, ...". Here, as in Theophilus, knowledge comes from God, but the adept is not chosen by God, but by a mortal. As was common, the secret was passed down from the father to his son.

Why did Masters of the Art characterize alchemy as the gift of God given to a selected group, when simultaneously, in the opinion of Theophilus, craft knowledge was the property of anyone willing to learn it? Alchemy was during her whole existence surrounded by a cloud of mystery, and supernatural intervention belonged to this picture. In Europe, however, more influences can be traced. As pointed out by Newman [2], the idea of alchemy as *donum dei* was transferred to Latin Europe from Arabic alchemy. The present paper shows, however, that traces go even further back to Byzantine alchemists. Yet, in Latin Europe, another not less important factor should be considered - the role of the church. It should be remembered that it was an institution with far reaching influence and power; the excommunication of the Emperor Henry IV by the Pope Gregory VII, and the subsequent Emperor's pilgrimage to Canossa in 1075 is an illustrative case. In this religious environment, the claims of alchemists concerning the transmutation of metals, not to mention the elixir of life, must have sounded like a direct attempt to attain divine power. Therefore, it was advantageous to accentuate alchemy as *donum dei* in order to not attract the unwanted attention of the church. It was a kind of mimicry, and as will be shown later, this attitude persisted for an unexpectedly long time. The problem of the relation between alchemy and medieval Catholic church is much broader, and for details Ganzenmüller's work [19] should be consulted. Here, as an illustration of this mimicry, it may be remembered that an alchemical treatise appeared even under the title *Donum dei* [20].

European Renaissance

This epoch brought both a dramatic development of crafts and technologies on the one hand, and a surprisingly new flourish of alchemy on the other (for a general picture *cf.* Boas-Hall [21]). The alchemical literature did not differ significantly from the style adopted in the past, and the doctrine of the Great Art as *donum dei* remained almost intact.

Simultaneously, the divergence between alchemy and crafts (particularly metallurgy) continued, although both activities took place in the same social and religious environment. As typical examples works of Vannoccio Biringuccio, and Georgius Agricola can be given. In his *Pirotechnia*, Biringuccio speaks of God in the Preface to the First Book Concerning the Location of Ores. When discussing how difficult it is to determine whether or not a mountain contains any ores, he mentions that some people make use of necromancy. The magic of the Middle Ages surfaces once again. For Biringuccio [22] "it is customary first to seek the grace of God, so that He may intervene to aid every doubtful and difficult effort; ...". It is the only moment when God's help is mentioned, and in the very next sentence even this support is left aside, since "... I think it better ... to choose the way

of using the signs that are exhibited to us through the benignity of Nature, founded on truth and approved by all experts because of their experience, ...”.

The call for reason echoes still stronger in Agricola's *De Re Metallica*. As a pious man, he finds it indispensable that miners should "worship God with reverence", but, simultaneously, "they should understand the matters". There is, so Agricola admits, divine influence, but most important is knowledge:[23] "It is decreed by Divine Providence that those who know what they ought to do and then take care to do it properly, for the most part meet with good fortune in all they undertake; on the other hand, misfortune overtakes the indolent and those who are careless in their work."

Particularly in the 16th century alchemy also began to undergo certain change: along with die-hard masters who clung to the old doctrines, there appeared such alchemists who believed in transmutation as the cornerstone of their science, but whose experiments were rationally-based and included more reasonable attempts of their explanation. A typical representative of these practitioners was Andreas Libavius (?1550-1616) whose *Alchemia* of 1597 is sometimes denoted as the first textbook of chemistry.[24] It is a matter of discussion if this optimistic judgment could be accepted completely, but the systematic approach chosen by the author yields the picture of a textbook. Keeping in mind that Libavius lived in the pious environment of Renaissance Europe, it is interesting to note that his views diverge in the same direction as those of Theophilus four centuries earlier. Libavius stands closer to Agricola than to his alchemical contemporaries. He does not deny the role of God: "Wir haben gewiß keinen Grund, Gottes Wirksamkeit in unserer Zeit für mehr beschränkt und weniger gerecht zu halten als in alter [Zeit] ..." He also accepts the supreme role of God, quite naturally in the 16th century, but relies on reason: "Mir wenigstens (mag es Dir auch ein wenig töricht klingen) sind Diktion und Prozeduren der Philosophen genugsam einleuchtend und klar." Libavius does not care whether or not he belongs among those selected by God, and claims proudly that he also understands the old recipes. Therefore, he feels to be called to explain these things that were kept secret by the ancients.

Just when speaking about this secret past, his attitude closes the diverging standpoints opened by Theophilus. Libavius thinks of the ancients, under which term he means alchemists, that "... wenn sie es so wollen, mögen sie ihre Arkana für sich behalten, nur sollen sie wissen, daß sich die Sonne nicht verdunkeln und die Welt nicht schlechter leben wird, wenn auch weder sie selbst noch ihre Arkana jemals ans Licht hervorkriechen". It is a revolutionary idea that secrets should better be disclosed. As the next sentences show, these secrets are *donum dei*, but should serve to all: "Wofern wir nur den rechten Gebrauch machen von dem uns Zugänglichen, des durch tüchtige Männer unter Gottes Führung deutlich aufgezeigt worden ist, so werden wir hinreichend die noch verbleibende Zeit zubringen. Was wird es nützen, wenn jene Arkana erst dann aufgefunden würden, wenn die Welt in Flammen aufgehen wird?" This direction of alchemy, of which Libavius was a typical representative, fused later with chemical practices founded by craftsmen into chemistry. In this line of evolution *donum dei* disappears.

The symptoms that alchemy was on the decline were felt much earlier; as a result, critical attempts to explain some aspects of alchemy as such were undertaken as early as 16th century. These works, or parts of them, dealt with general questions of alchemy: where she comes from, whether she is possible to be learned, etc. In this respect, an interesting chapter titled *Colloquium I* can be found in the collected works of von Suchten.[25] This Colloquium, under the title "Ein freundlich Gespräch zwischen einem Leyen und einem hocherfahrenen Artisten und Künstler", is written as a dialogue between an expert alchemist and a layman.

At the beginning, the introductory question is aimed at the crucial point: why is it that alchemy is on decline and fraudulent? The 'artist', expert alchemist, explains that common people think they will

do the same as can be done by God; they, however, rely on their own wisdom and skill. Because of this approach God punishes them so that they do not achieve anything. Here, Theophilus should be remembered with his claim that it is possible for people to learn everything - this is the gap between crafts and alchemy. In the subsequent explanation of von Suchten we encounter again the idea of alchemy as *donum dei*, commented upon at length by alchemist. The response of the layman only confirms this attitude: "... so ist besser / daß ich und meines gleichen davon still schweigen / und unseres Beruffs warten." Thus, the appropriate procedure is not an active search for alchemical secrets, but passive waiting for being called on by God.

Simultaneously, as the alchemist explains, he and his colleagues only follow God's will when they encrypt their texts - they thus avoid the desecration of their alchemical art: "... es müßte doch einer / der solche herzliche Kunst hätte / ein Thor seyn / daß er sie also geschwind ohn alle vertunckelte Wort an Tag geben wolt / ..." Masters of the Art will not reveal their secrets because they are afraid of divine punishment. In other words, as stated repeatedly, common people cannot learn the secrets of alchemy.

But, as the alchemist also says, the masters have always written the pure truth in quite an understandable form. The problem is that "... die menschen haben Ohren / und hören nicht / Nasen und riechen nicht / Augen und sehen nicht." This passage is a telling witness of the argumentation used by alchemists: they have to hide their secrets following God's will, but their texts, although encrypted, contain nothing but purest truth. Yet solely those selected by God are enlightened.

In *Colloquium I* one further important question appears: can the secrets of alchemy be bought? This is an allusion to aristocratic supporters and/or workers in alchemy, who spent whole fortunes in this activity.^[26] The answer is negative, it cannot be otherwise, because alchemy *is a gift of God*: "... ihr Schüler / die ihr machen wolt/ was Gott zuvor schon gemacht hat / ihr Eselkopf / ihr wollets kaufen / und Gott will es doch umbsonst geben." Not enough with it - "... wem es Gott günt / dem gib ers im Schlaff." Neither hard work in laboratory, nor hours spent studying books will help aspiring alchemist, because God brings this knowledge down whenever he wishes and to whom he wishes. According to von Suchten, there is no distinction between rich and poor. Anybody can achieve this knowledge provided that God decides and gives it *gratis*, as said already in *Revelations*.^[27] Here, as in many cases, The Holy Bible is called for support.

Von Suchten's treatise is a prelude to the defenses of alchemy that began to appear in growing numbers; two of these will be dealt with in the last section of this paper. There remained, nevertheless, the last 'hard-core' of convinced alchemists.

Some further reflections on religion in alchemy

The topic of the present work is to trace the concept of alchemy as a gift of God, both on the general level as a science, and as a whole, knowledge that was given to selected people. Sometimes, the mutual interaction of religion and alchemy goes into deeper details - religious argumentation often touches certain details, such as alchemical theories themselves. In order to illustrate this side of the problem at least some typical examples are shown.

A far reaching parallel between religion and alchemy appears in Paracelsus' *Book of Meteors* in which this Renaissance rebel argues ^[28] that all things are "made from three" [*tria prima*], because

this number is the expression of the Father, Son, and Holy Spirit. Yet, the idea of a triad was nothing new by that time; as pointed out by Jung [29], it appeared already before Christian dogma, and occurs as early as in Zosimos' treatise *Concerning the Art*. In this case it concerns Mercurius, whose unity is, according to Jung, simultaneously a trinity.

The formulation "three is one" became advantageous to alchemy in Latin Europe, because it brought this science into accord with Christian religion. It was especially important in the high Middle Ages, but did not lose significance later on. Perhaps the most famous example in this respect is the engraving of the Holy Trinity in alchemical *Rosarium philosophorum* (cf. e.g. Telle [30]).

The motif of the Holy Trinity remained popular as late as 17th century, when Jodocus Greverus [31] wrote that the opus, the alchemical work, "is not of this world", that it is "a gift of God, containing the secret of the undivided oneness of the Holy Trinity ...". Likewise, the German priest and mystical poet Angelus Silesius (his true name was Johann Scheffler; 1624 - 1677) included the reflection of the Holy Trinity into the whole of nature and, as did Paracelsus, identifies the divine with the natural, represented by *tria prima* as the constituents of matter:[32]

Die Dreieinigkei in der Natur
Daß Gott dreieinig ist, zeigt dir ein jedes Kraut,
Da Schwefel, Salz, Merkur in einem wird geschaut.

The identification of the Holy Trinity with mercury, sulfur, and salt was only one of applications of religious symbols in alchemy. There appeared, especially in the late Renaissance, further attempts to connect religion and alchemy. Sometimes, alchemical theories were supported using religious argumentation, which, simultaneously laid the limits of this science. Such an example can be found in the *Twelve Keys*, a treatise published under the name of the apparently nonexistent Benedictine monk Basil Valentine,[33] who, for sake of simplicity, will be considered as the author. He pays due respect to God and presents alchemy as his gift to selected people:[34] "For God never intended that it should become generally known. It should be rather regarded as a gift which He reserves for those favored few, who love the truth, and hate falsehood, who study our Art earnestly day and night, and whose hearts are open to God with full affection." So far, it is a classical *donum dei*. When, however, Basil discusses the question of creation, he stresses that "omnia enim Deus fecit ex nihilo"[35]. Nonetheless, he does not let himself enter into speculations how such a creation could have happened - the matter should be studied by philosophers.

In Basil's opinion, the Creator has endowed each creature with a seed, and it is only through this seed that the multiplication of humans, animals, plants, and metals can occur in order to preserve their existence.[36] But man, so says Basil Valentine, cannot become creator himself. It would be against the order of God for humans to produce new seeds: "To each creature God gave its own seed, in order to continue its kind, ...Man was not able to produce new seed: he was solely permitted to make new forms of life out of already existing ones. The creation of seed God reserved to himself, for if man could create seed he would be equal to the Creator." Here a strict limit to alchemy is drawn - only multiplication is permitted, but no new creation. On the other hand, this formulation helped alchemy in her mimicry: Masters of the Art, when multiplying metals, actually did nothing else than following God's command.[37] In this respect, they were his servants. The approach chosen by Basil was an excellent answer to the question of whether alchemical activity is an intervention into the realm of God or not. Secondly, this explanation supported alchemical practice; it explained why a 'seed', a small amount of precious metal should be added to the

reaction mixture to achieve its transmutation. From this seed, precious metals were supposed to grow.[38] Typically, the explanations of this kind were used for all processes that lead to the debasement of a precious metal added as the seed. Religious argumentation thus brings two effects.

The second author deserving attention is Michael Sendivogius (1566-1636), whose works were published almost simultaneously with those of the enigmatic Basil Valentine. In his *Novum Lumen Chymicum* [39], Sendivogius stresses, as did other alchemists, that gates of philosophy [alchemy] may be entered only by the permission of God. Again, we see a classical *donum dei*. In the Third Tract [40] of his treatise, Sendivogius writes about two primary matters of metals: the first one, called Mercury by alchemists, is the humidity of air mixed with heat and influenced by the Sun and Moon; the other is the dry warmth of earth, called Sulphur. One matter cannot create a metal without the other.

Sendivogius returns to this idea of the union of two in the Sixth Tract of his work, where he expounds his view that nothing grows without a germ. This condition goes for plants as well as for metals. His subsequent reasoning is important: no mortal may expect that it is possible to create a primary matter. The explanation lies in the fact that primary matter of human being is earth, and from earth nobody except God can create humans. But from the matter already made, Nature easily creates everything that already contains a germ. As in the previous case, limits to alchemy are set on a religious basis, but Sendivogius veils his reasoning into a more nebulous, mystical shape.

According to him, things finish in the same manner as they begin: from one, two are created; and from two, always one and "nothing more" is formed. Because, "one is God, and from this one Son is born. One gave two, two again one Holy Spirit, which originates from both." So the world was created and such will be its end. Once more the Holy Trinity appears in a passage which is, according to Bugaj [41], influenced by mysticism.

A quite extraordinary position takes the famous *Alchemical Mass* [42] attributed to Melchior Cibinensis or Nicholas Melchior of Hermanstadt [43], who should have lived in the 16th century.[44] This text was understood as a recipe for the philosopher's stone encrypted in the form of a mass.[45] In this text stress is laid not on alchemy as a gift of God, but on the process itself, which is described in very general and nebulous terms. There appears the motif of trinity, represented here by heavenly bodies, Moon, Mars, and Mercury, and also color symbolism of blackness stands for mortification of matter before its rebirth. The parallel between alchemical process and religious ceremony also appears in Khunrath's work; here the word-play Lab Oratorium is used.[46]

The Late European Alchemy

Alchemy continued well into the 18th century, and continued to exert important influence in Central Europe. Among alchemical works German books represent the second highest percentage after Latin prints.[47] In this last section, two German defenses of alchemy will be presented. (One of the last works defending alchemy is the famous *Geschichte der Alchemie* [48], which appeared as late as 1832.) There are numerous works of this kind;

their common feature is that they cite reputable personalities of the past and add their own commentary, or they gather stories of allegedly successful transmutations.[49]

The first book mentioned was written by Conrad Horlacher,[50] a German physician about whom not much is known. As an ardent adherent of alchemy he also commented on later editions of other authors.[51] As in many other cases, the role of God is discussed in the Preface to Horlacher's works. Here the author states that only thanks to God the forces of understanding were given to him. Thus, the intervention of God is traditionally presented as the necessary first step. Those who understand, or think that they understand, can nevertheless be lost in the labyrinth of chymical art. Then, "der unmittelbare Finger Gottes sonderlich vonnöthen zu seyn scheint / wann einer auf den rechten Weg zu gelangen wünscht."

While Horlacher limited himself to stressing God's finger as the leader through the meandering path of chemical experiments, the second book, anonymous work entitled *Die Edelgeborne Jungfer Alchymia* [52], is one of the last defenses of alchemy done on a broad scale. The first chapter of this book attributed to Johann Conrad Creiling (1673 - 1712), whom we will consider as the author, rebuts various objections against alchemy. The eighth paragraph of this chapter is entitled: "Der vierte Einwurf: GOTT hat alles vollkommen gemacht". Should it be indeed so, then alchemy would be useless - there would be nothing to improve when God has already made everything perfect.[53] It is rather surprising to read this thesis in a work from the 18th century, because a discussion like this would be seen more appropriate in the Middle Ages. It could have appeared dubious to improve something that was already excellent according to Christian dogma. Moreover, Creiling asks further whether it is a sin when gold is made of iron. His argumentation begins with the statement that iron, like other metals, is in its own way perfect, because it is able to serve people. Creiling, nevertheless, does not think that further improvement or perfection of iron would be sinful. On the other hand he admits that it would not be good if all iron were transmuted into gold, because then the metal suitable for production of everyday utensils would simply lack. In such a case, the reverse transmutation should be done to renew the 'normal' state of things. What's more, he reasons that transmutation is not a sin because nobody objects when beautiful red cinnabar is made from mercury and sulfur, or a deep blue color from black 'cobold'. This argumentation is a clear picture of confusion when a parallel is drawn between the real chemical reaction and quite imaginary transmutation. Simultaneously, it is surprising to find discussion of alchemy as a sin as late as 1730; obviously Creiling was not fully aware of better argumentation of his predecessors, such as Basil Valentine.

When the problem of sin is solved in this way, the role of God in the Great Art is stressed: "... Gott über dieses Werck eine besondere Vorsorge habe, und hier nicht lige an jemandes lauffen, wissen oder wollen, sondern allein an Gottes Erbarmen." In the final stage of alchemy God takes over the entire rule.

The motif of God appears once more in this book (p. 388), when the question is answered how one can learn the Great Art. The commentary is a mirror of centuries of failed experiments. As the author says, those who know the secret will not reveal it to the uninitiated. On the other hand, as stressed before in this book, alchemy is *donum dei*. Creiling thus asks: "Wann dann GOTT nicht unmittelbarer Weise einen erleuchtet, wie will er dazu kommen?" Hardly better picture of the agony of alchemy could be found. In the final stage, this science is presented as a closed circle which solely God can interrupt. It is not only a sign of religiosity, but rather the attempt to explain to the eighteenth century readers why alchemy did not fulfill any of her promises. Like a drowning man clutching to a

straw Creiling tries to explain that alchemy can be learned in miraculous way only. But the time was no longer ripe for miracles, and the years of alchemy as *donum dei* were already numbered by Creiling's time.

Conclusions

Alchemy was always connected in some way with divine influence. At the beginning, Hermes was considered to be the founder of this science, but his immediate intervention into the alchemist's work was not expected. Then in the Hellenistic world, alchemy gradually became a gift of God, *donum dei*, and this attitude became yet stronger in Arabic world and Latin Europe. Crafts based on chemical basis that existed parallel to alchemy took a different position, rather reserved with respect to the role of God. Although craftsmen accepted God as the supreme authority, they nevertheless laid stress on reason. This approach is particularly apparent in Renaissance Europe, where even some alchemists use similar argumentation. As was shown, in Europe alchemy tried to cover herself in order to avoid conflict with the church. This attitude, however, continued farther behind the simple statement that this science is *donum dei*, and religious motifs commonly became intertwined with alchemical speculations. The most striking example is the concept of the Holy Trinity as a symbol of *tria prima*. The end of alchemy in Europe is marked by attempts to defend this science; to hard-core alchemists God becomes the only and fully deciding force.

References and Notes

- 1 One of the problematic issues in alchemy is its definition. The most acceptable seems to be the one proposed by Sheppard [Sheppard, H. J.: 1986, 'European Alchemy in the Context of a Universal Definition', *Wolfenbütteler Forschungen*, Bd. 32, 13 - 17]: "Alchemy is the art of liberating parts of the Cosmos from temporal existence and achieving perfection which, for metals is gold, and for man, longevity, then immortality and, finally, redemption. Material perfection was sought through the action of a preparation (Philosopher's Stone for metals; Elixir of Life for humans), while spiritual ennoblement resulted from some form of inner revelation or other enlightenment (Gnosis, for example, in Hellenistic and western practices)."
- 2 Newman, W.R.: 1994, *Gehennical Fire*, Harvard Univ. Press, Cambridge (Mass.), p. 98.
- 3 Hopkins, A.J.: 1967, *Alchemy Child of Greek Philosophy*, AMS Press, New York.
- 4 Leicester, H. M.: 1971, *The Historical Background of Chemistry*, Dover Publ., New York.
- 5 Karpenko, V.: 1992, 'The Chemistry and Metallurgy of Transmutation', *Ambix*, **39**, 47-62.

- 6 'The Leyden Papyrus X' (trans. E.R. Caley), *Journal of Chemical Education*, **3** (1926), 1149-1166.
- 7 'The Stockholm Papyrus' (trans. E.R. Caley), *Journal of Chemical Education*, **4** (1927), 979-1002.
- 8 Lippmann, E.O.v.: 1978, *Entstehung und Ausbreitung der Alchemie*, reprint of the edition Berlin 1919, G. Olms, Hildesheim, p. 54ff.
- 9 Patai, R.: 1994, *The Jewish Alchemists*, Princeton Univ. Press, Princeton, p. 76.
- 10 Sherwood Taylor, F.: 1937, 'The Alchemical Works of Stephanos of Alexandria', *Ambix*, **1**, 116-139.
- 11 Syed Nomanul Haq: 1994, *Names, Natures and Things. The Alchemist Jabir ibn Hayyan and his Kitab al-Ahjar (Book of Stones)*, Kluwer, Dordrecht, pp. 166, 169.
- 12 Fück, J.W.: 1951, 'The Arabic Literature on Alchemy According to An-Nadim (A.D. 987)', *Ambix*, **4**, 81-144.
- 13 'Kitab al-'ilm al-muktasab fi zira'at adh-dhahab, Book of Knowledge Acquired Concerning the Cultivation of Gold by Abu'l-Qasim Muhammad ibn Ahmad al-Iraqi' (trans. E.J. Holmyard), *Hamdard*, **XX** (1977), pp. 7-68.
- 14 *A Testament of Alchemy being the Revelations of Morienus, Ancient Adept and Hermit of Jerusalem to Khalid ibn Yazid ibn Muawiyya, King of the Arabs of the Divine Secrets of the Magisterium and Accomplishment of the Alchemical Art* (trans. L. Stavenhagen), The Brandeis Univ. Press, Hanover 1974, p. 11.
- 15 Khalid ibn Yazid ibn Muawiya (?660-704) was according to An-Nadim (Ref. 11) the first Arabic alchemist.
- 16 *Theophilus: On Divers Arts* (trans. J.G. Hawthorne, C.S. Smith), Dover Publ., New York 1979. As the author Roger of Helmarshausen is supposed.
- 17 'Mappae Clavicula' (trans. C.S. Smith, J.G. Hawthorne), *Transactions of the American Philosophical Society, New Series*, **64** (1974), Part 4, 3 - 128.
- 18 For example the recipe 17 from the Leyden papyrus X (Falsification of gold) appears almost in the same form as recipe 26 in Mappae clavicula (A doubling of gold).
- 19 Ganzenmüller, W.: 1967, *Die Alchemie im Mittelalter*, G. Olms, Hildesheim.
- 20 *Pretiosissimum donum dei*, British Library M.S. Harley 6453; this work from the 15th century is an alchemical treatise in twelve chapters accessible on Internet: <http://www.levity.com/alchemy/donumdei.html>.
- 21 Boas-Hall, M.: 1994, *The Scientific Renaissance 1450-1630*, Dover Publ., New York.
- 22 *The Pirotechnia of Vannoccio Biringuccio* (trans. C.S. Smith, M.T. Gnudi), Dover Publ., New York 1990, p. 14.

- 23 Agricola, G.: *De Re Metallica* (trans. H.C. and L.H. Hoover), Dover Publ., New York 1950, p. 25.
- 24 *Die Alchemie des Andreas Libavius. Ein Lehrbuch der Chemie aus dem Jahre 1597* (trans. F. Rex), Verlag Chemie, Weinheim 1964, Introduction, pp. X, XI.
- 25 *Alexandri von Suchten, eines wahren Philosophi und der Artzneyen Doctoris Chymische Schrifftten, Alle / So viel deren vorhanden / zum ersten mahl zusammen gedruckt / mit sonderbahnen Fleiß von vielen Druckfehlern gesäubert / vermehret / in zwey Theile / als die Teutschen und Lateinischen / verfasst.* Franckfurt am Mayn 1680. Von Suchten lived approximately between 1520 and 1590.
- 26 There are many examples, among the most famous ones are Trevisanus and Penot (cf. Kopp, H.: 1971, *Die Alchemie in älterer und neuerer Zeit*, G. Olms, Hildesheim; reprint of the edition Heidelberg 1886, pp. 223, 253). Lesser known are cases from Rudolfian Bohemia, like Wilhelm from Rosenberg, the Highest Burgrave of the Bohemian Kingdom, who spent some 300 000 guldens in support of his court alchemists (Karpenko, V.: 1996, 'Bohemian Nobility and Alchemy in the Second Half of the Sixteenth Century: Wilhelm of Rosenberg and Two Alchemists', *Cauda Pavonis*, **15**, No. 2, 14 - 18).
- 27 *Revelations* 22.17 : "And let him that is athirst come. And whosoever will, let him take the water of life freely."
- 28 *Theophrastus von Hohenheim [Paracelsus]: Sämtliche Werke* (Ed. K. Sudhoff), R. Oldenbourg, München 1931, series I, vol. 13, pp. 134-6.
- 29 Jung, C.G.: 1983, *Alchemical Studies*, Routledge & Kegan Paul, London, p. 221.
- 30 Telle, J.: 1980, *Sol und Luna*, G. Pressler, Hürtgenwald.
- 31 *Op. cit.*, Ref. 26, pp. 275-6.
- 32 Gebelein, H.: 1991, *Alchemie*, E. Diederichs, München, p. 180.
- 33 The author of this and other treatises was apparently Johann Thölde; for details see Priesner, C.: 1986, 'Johann Thoelde und die Schriften des Basilius Valentinus', *Wolfenbütteler Forschungen*, **32**, 107 - 118.
- 34 *Dvanáct klícu bratra Basilia Valentina rádu benediktinu*, Trigon, Praha 1995 (Czech translation of Fratrís Basílii Valentini Benedictér Ordéns Tractat *Von dem Grossen Stein der Uhralten* ... durch Johann: Thölden/Hessum, 1612), p. 19.
- 35 *Genesis* 1.1: "In the beginning God created the heaven and the earth ..."
- 36 Here, belief in growth and ripening of metals appears; for details see Eliade, M.: 1971, *The Forge and the Crucible*, Harper & Row, New York, Chap. 4.
- 37 *Genesis* 1.2: "And God blessed them, and God said unto them, Be fruitful, and multiply, ..."

38 Sometimes a grain of a precious metal was actually added, but the original ancient idea of a 'seed' of metals was different. Its roots were in the concept of the 'growth' of metals in the bowels of Earth: as all in nature grows from seeds, so do metals as well. This idea can be found in Hellenistic alchemy, where a yellow 'seed', or ferment added to other metals should transmute them into gold. Later, the 'seed of gold' was said to be 'lodged in all metals'. In European alchemical literature this seed, called ferment, was often compared with yeast - small amount of it suffices for a large amount of the dough. This idea is shown as symbolic representation in the engraving VI of Maier, M.: 1618, *Atalanta fugiens*, Oppenheim. According to the accompanying epigram:

Die Ackerleut in die feist Erden sähen ihren Samen/
Wenn sie wol zermalmet ist mit eisenen Zänen/
Die Weisen abr lehren ihr Gold werffen in die Erden/
Den Blättern gleich ganz weiß das Gold darauß mag werden/ ...

39 Bugaj, R.: 1971, *Traktat o kamieniu filozoficznym*, Państwowe Wydawnictwo Naukowe, Warszawa, p. 154.

40 *Op. cit.*, Ref. 39, p. 164.

41 *Op. cit.*, Ref. 39, pp. 172-174.

42 The English translation based on *Theatrum Chemicum* [Vol. III, 1602, p. 853] is on Internet: <http://www.levity.com/alchemy/mass.html>.

43 Coudert, A.: 1980, *Alchemy: the Philosopher's Stone*, Wildwood House, London, p. 90ff. See also p. 91, n. 2: 'Addam et processum sub forma missae, a Nicolao Cibirensi, Transilvano, ad Ladislaum Ungariae et Bohemiae regem olim missum', *Theatrum Chemicum*, Vol. III, pp. 853ff., 1602.

44 *Op. cit.*, Ref. 32, p. 191.

45 In this way it was interpreted, for example, by Stolcius. See Stoltzius von Stoltzenberg: 1624, *Chymisches Lustgärtlein*, Lucas Jennis, Frankfurt; the epigram to the Fig. XXVI. *Melchior Cibirensis ein Unger*:

Melchior Cibirensis gnant/
Geboren ward in Ungerland:
Wiewol er Geistlich / zu der stett /
Jedoch ein güldne Kunst er hett.
In Gstalt der Meß hat er allein
Beschrieben diesen Edlen Stein:
Ob es also sey / magstu auch
Urtheilen nach der Künstler brauch.
Gleich wie ein zarthes Kindelein
Durch die Milch wird ernehret sein:
Also wird dieser Edle Stein
Mit reiner Milch zuspeißen sein.

46 *Op. cit.*, Ref. 43, p. 91: Heinrich Khunrath (1560 - 1601) - christian Kabbalist interpreted transmutation as a mystical process occurring within the adept's soul [the

engraving showing a laboratory with altar is from *The Amphitheatre of Eternal Wisdom* (1609), originally *Amphitheatrum sapientiae aeternae christiano-cabbalisticum, divino-magicum, nec non physico-chemicum*, Magdeburg 1598].

47 See Web site: <http://www.levity.com/alchemy/statists.html>; out of the total 4675 titles there are 1703 in Latin and 1667 in German.

48 Schmieder, Ch.: 1832, *Geschichte der Alchemie*, Halle.

49 Both types had their predecessors; popular was, for example, the tract of Edward Kelley that reappeared more than 100 years after the death of its author in the collection: *Johannis Ticinensis, eines Böhmischen Priesters/ Anthonii de Abbatia, eines in der Kunst erfahrenen Mönchs/ und Edoardi Kellaei eines Welt-berühmten Engländers vortreffliche und ausführliche chymische Bücher; Allen der geheimen und Hohen Kunst-Liebhabern zu Nutz und merklichen Unterricht in Teutscher Sprach übersetzt/ und herausgegeben durch einen/ der niemahls genug gepriessenen Wissenschaft sonderbaren Befohrderer. Mit einer Warnung-Vorrede wider die Sophisten und Betrüger*, Hamburg 1691. Alleged transmutations were described for example in famous Testimonia of Helvetius, and van Helmont [see Sherwood Taylor, F.: 1976, *The Alchemists*, Paladin, Frogmore, p. 133ff.]

50 Horlacher, C.: 1975, *Kern und Stern der vornehmsten Chymisch=Philosophischen Schrifften*, Akademische Druck- u. Verlagsanstalt, Graz; reprint of the edition Frankfurt 1707, unpaginated Introduction.

51 For example: *Die hell-scheinende Sonne Am Alchymistischen Firmament des Hochteutschen Horizonts. Das ist D. Petri Joh. Fabri, ...*, Nürnberg 1705.

52 *Die Edelgeborne Jungfer Alchymia, Oder: Eine durch Rationes, viele Exempla und Experimenta abgehandelte Untersuchung, Was von der Alchymia zu halten und vor Nutzen daraus zu schöpfen seye, Nebst einem Zusatz von der Medicina Universali, Universal-Process und einigen Kunst=Stücken aus der Alchymie*, Tübingen bey denen Gebrüder Cotta, 1730.

53 *Genesis*, 1.31: "And God saw every thing that he had made, and, behold, it was very good."

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