

EUROPEAN ALCHEMY: SOME TRADITIONAL BELIEFS

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ABSTRACT

Three important doctrines of European alchemy are discussed: the Emerald Table of Hermes, the idea of transmutation, and the Elixir of Life. The analysis of these problems is focused on the 16th century, the epoch of the high flourish of alchemy in Renaissance Europe. As typical examples two works are chosen: the treatises of Jean-Pierre Fabre (1588-1658) and Alexander von Suchten (? 1520 - ? 1590). The arguments of these authors illustrate the ways how alchemists tried to defend their position in face of repeated failures. Just the 16th century stood in the sign of dramatic development of crafts, but, simultaneously, of growing interest in alchemy.

The invention of the printing press by Johannes Gensfleisch (he is known as Guttenberg, ? 1400 - 1468) in 1436 was on crucial changes that occurred on the European continent, because it dramatically increased the spread of information. There was no more necessary to rewrite tediously old manuscripts, but, instead, many copies of books were produced in a short time. The first prints were predominantly of a religious content, but very early alchemical works followed (1). This technical innovation thus contributed, among other influences, to growing interest in alchemy. This development became apparent in the subsequent century, and found its highest flourish in the Rudolfian era, the reign of the Austrain Emperor Rudolf II (1576 - 1611). Latin was the language preferred in the books of that time, but books in German represented only slightly less proportion of all alchemical books printed in this century. They were either translated from other languages or written by a

German speaking author. This fact documents lively interest in alchemy especially in the Central Europe, where German language prevailed. The aim of this paper is to touch a few points of European alchemy of the 16th century. Two sources will be used for this discussion, both written by physicians who were alchemists. The author of the first one was Frenchman Pierre-Jean Fabre (1588-1658); in this paper, however, the later German edition of his book (2) is used with comments by the German alchemist Conrad Horlacher (16? - 17?). The other one was written by German Alexander von Suchten (?1520-?1590) (3). A few examples from these books will illustrate the approach of alchemists to some key points of their science.

The Emerald Table of Hermes :

This nebulous text accompanied alchemy for centuries being considered an essence of the whole knowledge this science achieved. We will not discuss the

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full text, the English translation of which was published repeatedly (see for example Holmyard (4)). The attention will be paid to one sentence that was extraordinarily important, because it reflected the world of ideas of alchemists:

"That which is above is like to what is below, and that which is below is like to which is above, to accomplish the miracles of one thing."

This rather vague formulation is now accepted as the reflection of alchemical belief in unity of macro - and microcosm. In other words, our world was considered a reflection of the whole Universe, but this sentence allowed for more interpretations. Thus, the alchemist's laboratory could be a microcosm per se, where processes were reflected and performed that occurred as natural in macrocosm. In the first place it was "ripening" of metals, from their base form to gold, a process supposed to occur spontaneously in nature - macrocosm. But as microcosm even human being was sometimes considered, reflecting by his sole existence as a living being the life of macrocosm.

Hortulanus (5), one of the early commentators, explained the cited sentence as follows (6) : *"And this is the same as saying that the stone is divided into two principal parts by the magistry, into a superior part that ascends above and into an inferior part which remains below fixed and clear."*

Hortulanus further explained that the inferior part is earth, the superior part is the spirit. It is their union that makes miracles. The analysis of his comment is not easy. From the point of view of the laboratory activity, it reflected the volatile (spirit), and nonvolatile (earth) substances observed during experiments.

The Emerald Table remained influential over centuries, and, as said above, its interpretation varied. We can add now the version proposed by Fabre (7). When discussing "seed of metals" out of which all metals were supposed to grow, he referred to Hermes *"the very great expert of nature"* as to the supreme authority. Then, the Emerald Table attributed to Hermes was an unshakable authority to Fabre. He used just the sentence cited from the Table to support the alleged existence of seeds of metals. According to Fabre, all living creatures, be it animals or plants, produce seeds to multiply themselves. These creatures are on the surface of earth, in other words "above." On the other hand, however, the Emerald Table says that *"what is above is like to what is below....."* Likewise, to be in accord with the statement of the Table, there must thus exist seeds of matter that is below the earth's surface. Metals, like living creatures, must grow from seeds, too. Fabre's argumentation is a further example how the Emerald Table could be used to support of a key idea of alchemy. It was in time when, in spite of centuries-long efforts, no seeds of metals were revealed. Fabre, like many of his contemporaries, looked for support in the old text that allowed for various explanations. Yet it was the text that we can denote almost as sacred to alchemists.

Transmutation :

In Fabre's time alchemy already proceeded through centuries of failures - nobody made gold by transmutation of base metals (except fraudulent alchemists, of course). By that time we can find more often chapters in alchemical works that deal exclusively with the question whether transmutation is a possible process. Or,

more correctly - alchemists believed in its possibility, but in these chapters arguments were collected in favor of this claim. Sometimes they were alleged eyewitnesses of successful transmutations, as for example *Testimonia* by Helvetius, or van Helmont (8). In other cases there appeared another kind of argumentation based on observation explained so that it speaks for transmutation.

The problem of transmutation deserves broader discussion that would be beyond scope of this short contribution. Strictly speaking, scientists of the past should be divided in two groups: the first formed believers in transmutation, the second group were their opponents. What concerns the latter group, it should be remembered that already Ibn Sina (980-1037) was convinced that alchemists can only imitate precious metals, but cannot make them artificially from base metals (9).

They were, nevertheless, just chemical and metallurgical observations that, interpreted on the then existing level of knowledge, could have made false impression that base metal changed into precious one. There are more examples of this confusion: cupellation (10), whitening of copper by compounds of arsenic (11), or a quite simple deposition of metallic copper on an iron surface from the solution of cupric ions (12). These three examples belong among typical arguments alchemists used to support the possibility of transmutation.

Yet, transmutation was discussed also from other standpoint. The question was open which kind of process can be considered a transmutation. This was not unimportant, because the question stood, whether it is only a metal that can be transmuted. In the 13th century, Al-Iraqi

wrote (13):

"We say and maintain that two species of natural things which differ radically and essentially cannot be changed and converted one into the other by the Art (alchemy), as for example man and the horse. But these six bodies (metals) can be mutually converted..."

This formulation, however, limited significantly the argumentation for the benefit of transmutation, and in European Renaissance the process of transmutation is defined within substantially broader limits. Fabre's comment on this problem can be used as a typical example (14):

"And what I am working about further...what all humans found in themselves every day already 1000 years ago / and will find forever: That is to say the change of all foods and all humidities belonging among drinks / either fully into red human blood/ or, partly, in breast-feeding mothers ...in snow-white sweet milk. Is not from this (example) of almost endless change of so many foods and so numerous drinks / also apparent (the change) of metals into other beings (metallic) / ye, the orginial art and color of the red and white stone producing gold and silver?"

Fabre was not the only alchemist who explained natural metabolic processes as transmutations and he even compared the color of blood and milk with the red and white elixirs. Important is the fact that to Fabre any change of matter was transmutation and, therefore, he could attain much firmer position in argumentation against his opponents. Just because he extended the idea of transmutation on living matter he could conclude that, if transmutation works in a living matter, it should be the same with

metals. We should not forget that in alchemical speculations metals bore attributes of life - they could be killed and subsequently reborn, they had body, soul, and spirit.

This way of reasoning became appeared more often in Renaissance alchemy as illustrated on the famous van Helmont's experiment (15). This scientist kept a willow tree for ten years watering it only with rain or distilled water. Over this time he collected all dry leaves. Eventually he compared the weight of the tree, leaves, and earth in the pot with the weight at the beginning of his experiment. The increase in weight he explained as transmutation of water into wood.

These, in Fabre's case observations, in van Helmont's case experiment, represented an autonomous approach to the question of transmutation. This process was looked upon as any change in general and, therefore, it should be valid for metals as well. The task of an alchemist was to realize this change in his laboratory.

The Elixir of Life :

European alchemists working in laboratories focused their attention predominantly on transmutation of metals. The Philosopher's Stone was thus considered an agent that, added in a small quantity, could change a huge amount of a base metal into silver or gold. There were no exceptional cases when authors gave this "transmuting ratio." The other virtues of this mysterious substance were mentioned only sometimes. One of them was the effect of the Stone on human life, but here we can repeatedly find confusion, when this substance is called the Stone, if it should exert effect on metals, or Elixir, if it should influence human life.

Here, striking difference between

Chinese and European alchemy becomes apparent - Chinese alchemists tried to attain immortality as their ultimate goal, or prolongation of life at least. Ko Hung's encyclopedia (16) describes many way how to succeed in these attempts. The situation of European alchemy was rather delicate in this point due to the ruling Christian religion. According to Christian doctrine God himself decided about all - life, death, illness. Any attempt to change this state of things would be a serious sin, an intervention into God's will. In Europe, such activity could lead to the death at stake. Considered rigorously, alchemy also could be looked upon as this kind of intervention, because it promised prolongation of life, but even the promise of alleged untold riches was such intervention, too. Only God decided about material state of people. The influence of religion should be always kept in mind in any discussion of European alchemy. This science escaped the worst proclaiming itself to be *donum Dei*, the gift of God (17). Only those selected by God could achieve the highest knowledge.

The question of the influence of the Philosopher's Stone remained, nevertheless, open, and was discussed in the Renaissance as lively as before this era. Von suchten's treatise represents a characteristic example of these speculations as found in the chapter titled *Colloquium II* (18). It deals with the Tree of Life and with "*elemental bodies from which a stonrg medicine should be prepared that prolongs human life.*"

This chapter is written as dialogue between demogorgon (demiurge) who asks Ramon Lully (19) about this secret. The text is written in a typically nebulous language of alchemy so that only a few

points can be explained. Already the first question if demogorgon is, whether a medicine exists that could have prevented him before death, and different illnesses. Lully's answer is as expected:

"Don't you know that God has given an ultimate limit to everybody.....?" In the 16th century religious thinking was very strong; simultaneously, frightening effect of the witch-hunt should be considered.

On 24 pages of this chapter we can search in vain for any trace of a concrete recipe how to attain a longevity (contrary to Ko Hung, for example). The explanation appears, when demogorgon insists directly: *"Thou hast said in thine booke on Nature's Secrets (20) that this medicine should be extracted from wine....."* Therefore, so demogorgon, the medicine should be red, which hypothesis he supports further"..... *others said (that it should be extracted) from human blood."* Lully's answer is in a characteristic way alchemists wrote about their literature: *"..... thou thinkest that the scriptures of philosophers (alchemists) could be understood solely from their pages."* Then, Lully goes on to explain that the secret is not in words, but behind them. Both, wine and blood, represent only the color; in this particular case it symbolizes only that red color should appear twice in this process. There is, however, no further mention of this process, no detail, only negative answers. According to Lully, the "medicine" is neither of the vegetables, nor of mineral origin; it does not act itself, but must be taken with food. The entire text is full of expressions of this kind, and, eventually, it sounds grotesque when demogorgon thanks for valuable advice he was given.

There was nothing in von Suchten's Colloquium that could be used in medicine. This text represents one of the directions of European alchemico-medicinal literature.

There were yet other directions. One can be traced back to Arnald from Villnova (? 1235-1311/14) who tried to use chemicals in treatment of various diseases. In this way he was actually a predecessor of iatrochemistry brought finally to life by Paracelsus (1493/94 - 1541). Arnald, however, represented also the other direction in medicine, namely magical approach. He used different talismans that should have curing effect. In the European Renaissance this direction became very influential thanks to mystics like Agrippa from Nettesheim (1486 - 1535) (21). Eventually, the third direction was that illustrated on the example of von Suchten 'book - totally nebulous formulations. Nothing could be done on this basis, neither drugs, nor talismans. If talismans are denoted as blind alleys of European medicine, then the texts like von Suchten's were the blindest alleys.

In this paper three cornerstones of alchemy were discussed in brief: the Emerald Table, the doctrine of transmutation, and the Elixir of Life. They have one property in common - failure. It does not mean, however, that they should be condemned. Simultaneously they are excellent witnesses of human dreams, of belief that survived for centuries. In the time of Fabre and von Suchten these ideas could hardly find an opponent.

Remak : The original citations are in italics; the remarks of the present author are in square brackets.

REFERENCES AND NOTES

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[17] V.Karpenko, Alchemy as donum dei, HYLE 4, 63-80 (1998).

[18] Opt.cit., REf. [3], p.169ff.

[19] Raimundus Lullius (? 1323 - 1315/16) was a philosopher who did not believe in alchemy, but, nevertheless, numerous works on this topic appeared under his name. For details see A. Clericuzio : *Lullius, Raimundus, in Alchemie*. Lexikon einer hermetischen Wissenschaft, Eds. C.Priesner, K.Figala, C.H. Beck Verl., Munchen 1998, p.224.

[20] The work mentioned here is Pseudolullian treatise *De secretis naturae sive Quinta Essentia*, first printed in Augsburg 1518. See K.Ch. Schmieder: *Geschichte der Alchemie*, Halle 1832, p. 176. The allusion on wine stems from idea that this drink was said to contain "the fifth essence" (quinta essentia), that is nothing else than alcohol.

[21] Talismans are dealt with in detail in Agrippa's *De occulta philosophia* first printed 1531, and similarly in Pseudoparacelsian *Archidoxa magica* from 1567.

सारांश

यूरोपीयन रसायन विद्या-कुछ परम्परागत धारणायें

-वलाडिमिर कार्पेन्को

यूरोपीयन रसायन विद्या के तीन महत्वपूर्ण सिद्धांतों-हरमेस का एमराल्ड टेबल, रूपान्तर विचार तथा अमृत पर विचार-विमर्श किया गया है। इन तीनों वषियों का विश्लेषण १६ वीं शताब्दी पर केन्द्रित है जो कि नवचेतना युक्त यूरोप में रसायन विद्या के विकास का युग था। यहां विशिष्ट उदाहरणों के रूप में-दी ट्रीटाइस आफ जीनपेरे फेबर (१५८८ - १६५८) तथा एलेक्जेन्डर वोन सूचेन (? १५२० - ? १५९०) नामक दो का चयन किया गया है।