

## ALCHEMY OF THE RENAISSANCE TODAY: SCIENTIFIC-EDUCATIONAL AND SCIENTIFIC-HISTORICAL APPROACH

**Associate Prof. Dr. Vladimir Vinokurov** Lomonosov Moscow State University,  
Russia

**Associate Prof. Dr. Marina Vorontsova** Lomonosov Moscow State University,  
Russia

### ABSTRACT

The scientific-educational approach, combining the educational point of view with the scientific criticism of the educational approach, was formed, oddly enough, in the study of alchemy, and views the latter as a stage in the development of chemistry. It is this approach which combined the ideas of the Enlightenment with natural science and its history and became the basis for the formation of a classical view of the Hermetic tradition. This approach is based on the reality of the object of alchemy, proving that it is indeed real, and that behind the curtain of illusions and allegories lies the 'solid body' of chemical transformations and very unusual experiments of physics. This approach is focused on desacralizing the content of ancient and medieval 'dark' texts, to identify in them a scientific component and reformulate in modern scientific language the problems they solve.

In this text the rational components of alchemy are considered from the point of view of the history of thermodynamics. One can give a 'thermodynamic' interpretation of the alchemical fragments of 'Atalanta fugiens' (EMBLEMS III, IV, V).

Describing the stages of the Great Work, alchemists widely use metaphors, legends and various forms of allegory. The alchemists knew that thermal effects almost always accompany chemical changes.

It is shown that the basis for a number of alchemic experiments is the correct scientific idea of the thermodynamic effect of a chemical reaction.

**Keywords:** alchemy, scientific approach, history of science, history of chemistry, history of thermodynamics

### INTRODUCTION

The topic of alchemy in the history of culture and religion and its significance in the modern world, as already shown above, attracted the attention of representatives of various fields of knowledge. As a result of this work, different approaches were formed, and each achieved significant results. Each direction creates an image of alchemy from its own point of view, from its own perspective. Together they form a class of studies of the alchemical tradition and, accordingly, can be classified and partly structured on the basis of their approach. The research further on is presented within the framework of the 'approach-object' double coordinate system, therefore, any study is presented as a function of  $f(x, y)$ . Thus, understanding what is the philosopher's stone and the elixir of immortality depends on what practice one calls alchemy. All the approaches see their

subject as a projective image, that is, from a certain point of view. 'The Philosopher's Stone' is a phenomenon including an imaginary component that completes 'what we see' up to 'what we understand'.

The following basic approaches to the study of alchemy can be distinguished: first approach is denoted by the word 'traditional' (Fulcanelli [1], Baulot, Canselier [2], D'Ygé [3]). The traditionalist approach is represented by the works of René Guénon [4] and Julius Evola [5], Gershom Scholem, Henri Corbin. First one needs to look for an alchemist dedicated to the Tradition of Alchemy, and then for the philosopher's stone. The scientific-historical approach represents the development of the scientific-educational approach, supplementing it with archaeological and textual research. The classical approach to alchemy is formed on the basis of educational, scientific and historical approaches, but is complemented by the philosophical idea of the objective development of religion, history, society and science. The educational-hypothetical approach is a complex synthetic inversion of the scientific-historical and educational approaches. A clear artistic illustration of the application of this approach is Dan Brown's bestsellers. The natural-scientific approach develops, first of all, in the context of scientific revolutions of the 17th and 20th centuries. Transmutation involves nuclear transformations. The psychological interpretation of C.G. Jung [6] occupies a special chapter in the historiography of alchemy. According to Jung, a true understanding of alchemy can be achieved, first of all, if one abandons its chemical interpretation. The phenomenological approach makes it possible to single out, as an object of study, the legend of the alchemist and the philosopher's stone. The magical-erotic and sensual aspects of the imaginative approach to alchemy are presented on the basis of work with the documents of the 'Golden Dawn' by Israel Regardie [7].

## DISCUSSION AND RESULTS

The enlightenment approach in the field of alchemy is evident in the works of the medieval scholar Georgius Agricola (1494-1555), in the writings of the French enlighteners of the XVIII century Voltaire and Diderot, Ernst Mayr, N.A. Figurowsky. The Enlighteners considered alchemy, astrology, magic the result of the delusion of some and the deception of others. This approach remains quite popular today, although it does not agree with the scientific study of Hermetic phenomena. From the point of view of modern research, a part of the historical phenomenon here stands out for the whole: pars pro toto (i.e., there is a logical error: 'Part instead of the whole'). In any case, the enlightenment approach is far from indiscriminate criticism and relies on common sense and natural science.

The scientific-educational approach, combining the educational point of view with the scientific criticism of the educational approach, was formed, oddly enough, in the study of alchemy (it would seem that astrology is closer to this intention), and views the latter as a stage in the development of chemistry. It is this approach which combined the ideas of the Enlightenment with natural science and its history and became the basis for the formation of a classical view of the Hermetic tradition. It was revealed in the writings of R. Boyle, MS Khotynsky, M. Berthelot, M. Giua. This approach is based on the reality of the object of alchemy, proving that it is indeed real, and that behind the curtain of illusions and allegories lies the 'solid body' of chemical transformations and very

unusual experiments of physics. The authors do not reject the fraud of magic, but in a number of cases see deeper grounds for occult phenomena.

In this connection, the position of the founder of chemistry Robert Boyle is typically characteristic. He tried to carry out an alchemically inverse transmutation, that is, not to turn lead into gold but, on the contrary, gold into lead. Naturally, such operation could not bring financial dividends in the form of gold bars and the resulting wealth. From a financial point of view, this enterprise is useless. The value of the reverse 'transmutation' for science and for the scientist blocked the meaning of wealth, but the nature of metals could neither be improved nor worsened.

The works of this direction in the study of magic reveal that a number of cases referred to as 'magic miracles' are not a question of conscious fraud and deception, but of sensory illusions and the use of unusual phenomena created by the laws of acoustics and optics, that is, in fact, about the experimental comprehension of these phenomena. One hardly dub a charlatan the person mastering the possibility of focusing the sound signal in a place different from its actual source ('ventriloquism'), and at the very best having an extremely vague idea of the laws of acoustics, if none at all. This person would themselves (if such an experience occurs spontaneously) that someone else, invisible and unknown, spoke to them. It is equally difficult to imagine that one can lower your hand into molten iron and remove it unscathed, and yet such trick has a rigorous scientific basis and was well studied in the 19th century [9].



Fig 1. EMBLEMA V. Appone mulieri super mammas bufonem, ut ablactet eum, & moriatur mulier, fitque bufo grossus de lacte. (Put a Toad to the Woman's breast, that the may suckle him till' the die, & he become gross with her milk.) [10].

This approach is focused on desacralizing the content of ancient and medieval ‘dark’ texts, to identify in them a scientific component and reformulate in modern scientific language the problems they solve. Rational and scientific components of alchemy are considered from the point of view of the history of thermodynamics in a collective monograph devoted to the history of teachings on chemical processes, where it is shown that the basis for a number of alchemic experiments is the absolutely correct scientific idea of the thermodynamic effect of a chemical reaction [11].

One can give a ‘thermodynamic’ interpretation of the following alchemical fragment. Describing the stages of the Great Work, alchemists widely use metaphors, legends and various forms of allegory. XVI-XVII century alchemist Michael Maier in ‘Atalanta fugiens’ (1618) characterizes the first stage – nigredo – by the following allegory: "Put (a cold – V.V.) toad on a woman’s breast so that she fed it; the woman will perish, but the toad will grow mighty" (Fig. 1) [12].

The alchemists knew that thermal effects almost always accompany chemical changes, so the absorbed heat of the woman must make some ‘chemical’ changes in the toad's body, as the toad remains cold until all the warmth of the woman has passed to it. The reaction in the toad’s body means a chemical reaction that takes place in a closed vessel with heat absorption, which, as it were, is condensed, is collected inside the vessel, from the outside it passes inwards. This is how the Philosophical Sulfur is formed, from which they prepare the Elixir. If the frog's body does not heat up, and the heat continues to be absorbed, it means there is chemical or biochemical synthesis inside it.

An analysis of the two preceding emblems shows that this interpretation is not arbitrary.



Fig. 2. EMBLEMA III. Vade ad mulierem lavantem pannos, tu fac similiter. (Go to the Woman Washing Clothes & do after the same Manner.) [13]



DISCOURSE III. «For, as the Rosary of the Philosophers [Rosarium Philosophorum] saith; "The Inner Clothes Prince Divinick, being soiled by sweat, are to be washed by Fire & burned in Waters, so that Fire & Water seem to have interchanged their mutual Qualities, or else the Philosophic Fire is not to be supposed of the same kind with the common Fire;" & the same thing is to be said of the Philosophic Water" [p. 63]. It is about acid and alkali (or water), about «brother and sister» (Fig. 3). Their reaction is accompanied by the release of heat (Fig. 2).



Fig. 3. EMBLEMA IV. Coniunge fratrem cum forore & propina illis poculum amoris: (Join the Brother & the Sister & drink to' em in the Bowl of Love.) [13]

## CONCLUSION

Describing the stages of the Great Work, alchemists widely use metaphors, legends and various forms of allegory. The alchemists knew that thermal effects almost always accompany chemical changes.

C. Jung wrote: "Had he only asked himself whether the chemistry of alchemy was authentic or not, that is, whether the alchemists were really chemists or merely spoke a chemical jargon, then the texts themselves would have suggested a line of observation other than the purely chemical. The scientific equipment of the chemist does not, however, fit him to pursue this other line, since it leads straight into the history of religion" [14]. Jung's approach emphasizes the subjective component, understanding it as a component of the psychological. The latter, in turn, is represented by the individual and collective properties of the subject, within which the archetypal ones are distinguished, which represent the object within the subject.

Historical research allows us to formulate a different point of view. The scientific-educational approach is based on the reality of the object of alchemy, proving that it is indeed real, and that behind the curtain of illusions and allegories lies the 'solid body' of

chemical transformations and very unusual experiments of physics and thermodynamic. One can give a 'thermodynamic' interpretation of the alchemical fragments of 'Atalanta fugiens' (EMBLEMS III, IV, V).

The language of alchemy was an individual language. This feature of the language of alchemy is to be explained.

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