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The Hero and the Martyr of the Russian Enlightenment

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Addressing the ups and downs of life and to labyrinths of creative work of such personalities as Lomonosov and Mendeleev, who are generally titled Encyclopaedist scientists, a researcher should be ready to permanently face the following three phenomena: the phenomenon of eternal "loose end," when the abundance and greatness of plans do not coincide with real achievements, the phenomenon of profetism, i.e. transfer of a situation to the expected future, and the phenomenon of "searchlight," when the light is the brighter the more remote the light source and the dimmer the closer the light source. Such is Lomonosov, but Russia is such, too.

The following achievements are traditionally put in the domestic historical scientific literature to the credit of Lomonosov as a chemist (here we restrict ourselves to what is presently called the "basic research").

(1) Lomonosov gave a new definition of chemistry, which "opened up wider perspectives in the development of this science" [1], compared to previous definitions. It was therewith noted in the literature that "naming chemistry a science, unlike the majority of chemists who considered chemistry an art, Lomonosov, to substantiate his postulate, offered a new formulation of the primary goal of chemistry, namely, exploring changes that occur in mixed bodies (chemical compounds)."

(2) Lomonosov offered his own interpretation of the concept "physical chemistry," namely: "Physical chemistry is a science giving, based on physical principles and experiments, an explanation to what occurs on mixing bodies as a result of chemical operations. It can also be named chemical philosophy, but in a sense radically different from that philosophy, where not only explanations, but even operations in themselves are usually made in a secret manner" [2]. In other words, unlike other chemists, as well as his predecessors and contemporaries, by "Chemia physica" Lomonosov meant "not a theoretical chemistry in general, but an independent scientific discipline," explaining on the basis of physical postulates and experiments phenomena that occur in mixed bodies on chemical operations " [3].

(3) Admitting that Lomonosov was highly influenced by the "corpuscular philosophy" of R. Boyle (1627–1691), many domestic historians point out that the Russian scientist "raised the corpuscular concepts to the scientific level reached by chemists only in XIX century." Therewith, it is commonly underlined that "the atomic corpuscular doctrine of Lomonosov was based on its materialistic outlook," due to which he came "to theoretical conclusions which formed the basis of the development of physics and chemistry" [1].

(4) It is considered that one of the main scientific achievements of Lomonosov is the discovery of "the law of conservation of matter." Sometimes this is expressed in other words: Lomonosov, having repeated Boyle's experiments on calcinations of metals in sealed glass vessels, discovered "the law of conservation of body mass in chemical reactions" [2].

(5) It is underlain that Lomonosov distinguished two types of dissolution ("we suspect that metals dissolve in acid alcohols (i.e. acids, the authors) differently than salts in water").

Some authors wrote that Lomonosov "was the first to differentiate an element and a simple and a complex substance" [1], which is unequivocal evidence showing that he misunderstood the very problem. Other authors pointed to his important contribution "in the development of pneumatic chemistry" [4], but provided no detailed information on this issue.

Strictly speaking, the list is fairly modest for the status of a great chemist. However, probably, the matter is not the number of discoveries and new ideas, but their importance for further development of science? Let us consider the above list and comment each item.

Definition of Chemistry. Strictly speaking, the definition of chemistry given by Lomonosov, was not new. By the well-founded opinion of B.N. Menshutkin, it in many respects coincides with the definitions given before by G.E. Shtal' (1659–1734) and especially G. Boerhaave (1668–1738) [5]. This is natural, since, after all, Lomonosov studied chemistry by their books. However, B.N.Menshutkin, and, after him, many other researchers of the Lomonosov's work noticed that the Russian scientist called chemistry a science, unlike his predecessors, who called it an art.

He hoped to manage to explain all chemical phenomena by means of scientific principles which had by this time been in the possession of physics [2]. However, in XVII century some authors called chemistry a science.

Thus, for example, N. Lefevre (1610–1669), answering in the textbook "Cours de chimie" the question: Whether "it is necessary to consider chemistry an art or a science" came to a conclusion that chemistry can be defined as "a practical or active science," since it possesses features of an art (when one deals with operations with substances) and a science (when one turns to contemplative cognition of bodies and their transformations) [6].

The definition of chemistry, given in the article of G.F. Venel (1723–1775) "Chimie" in the Encyclopedia of Diderot and d'Alembert does not differ in essence from Lomonov's [7]. {By the way, Lomonosov was by no means the first to initiate liberating chemistry "from the yoke of medicine and pharmaceutical art;" moreover, this process was initiated far before Lomosonov's epoch.

As early as XVII century, K. Glezer (1615–1678), the French chemist and pharmacist, court druggist of Louis XIV and the Duke of Orléans, wrote that only the "noble art" of chemistry "gives us the most effective medicines for the most extensive-stage and hardly treatable diseases and often compensates for the drawbacks and imperfections of the medicines used by a usual (*vulgaire*) pharmacy" [8]}.

However, more important is another issue: Such definitions played the role of declarations on intentions of a kind. They described an ideal to which chemistry should aspire in its development. And Lomonosov realized this: "When chemical facts will be united by a more strict method, and it will become clear to what extent one fact can be explained or deduced from another, chemistry in itself will become a science."

One more important circumstance is that the chemical views of Lomonosov were at times rather far from this ideal. Thus, for example, he wrote in the dissertation titled "About Metal Shine" (1745): "More concentrated phlogiston, coloring more precious metals, stronger sticks to them;" therefore, if somebody, "quite versed in the chemical art, possesses the most concentrated and thoroughly purified phlogiston, we believe (underlain by the authors) that he will be able, having expelled the dirty shine, to precipitate and transform lower metals into the noblest one" [9].

Such reasoning is quite alchemical in spirit. By the way, the type of the corpuscular theory of substance, Boyle and Lomonosov adhered to, by no means contradicted the idea of metal transmutation. And, finally, the most important thing: The period from the beginning of the XVII century to at least middle of the XVIII century was the time of divergence of alchemy from then forming scientific chemistry, and whatever definitions the authors gave, they were virtually unable to free themselves from alchemical, iatrochemical, and sparigic traditions in one jerk.

And for Lomonosov, overloaded with diverse businesses unrelated to chemistry and not aware of what had happened in this science over the last 15 years of his life, was more difficult to do that than for many of his colleagues in the Western Europe.

Actually, what was the scientific baggage of Lomonosov, when he started to work in the field of chemistry? He obtained this knowledge not only from lectures of Prof. Ch. Wolff and Prof. J.G. Duising, but also as a result of studying the contemporary physical and chemical literature (which was favored by his excellent knowledge of the Latin language): To see that, to look at the list of books he purchased in Marburg, at numerous references to them in his works, and at latent citing would suffice.

Lomonosov was familiar with works of the founder of a new experimental science, an outstanding British scientist and philosopher F. Bacon, and shared many principles of his declared New Science. Here are certain of them: Science should comprehend the real reasons of phenomena, it should rationally interpret experimental facts, and conclusions should be based on concepts obtained by their methodical generalization or the induction based on an analytical understanding of the experiment.

Therewith, one should pay attention to those cases which contradict the generalization and require its revision. According to Bacon, materialistic understanding of nature is based on the concept that matter is composed of particles and nature is composed of bodies endowed with diverse qualities, and motion (later, after Boyle, not only mechanical) is an immanent property of matter. A lot of examples can be provided, when Lomonosov followed these principles almost literally.

However, both during his systematic chemical exercises and later Lomonosov had almost no communication with European chemists; he confessed once that he knew nobody of them. Moreover, taking into account that there were almost no chemists in the Academy of Sciences in that period (Lomonov's predecessor in the Chair of Chemistry I.G. Gmelin spent a long time in the Kamchatka expedition and then studied the flora of Siberia), we can state that in his chemical work he based exclusively on the knowledge and experience acquired before he returned to Petersburg.

Undoubtedly, the absence of professional scientific environment inevitably affected the chemical activities of Lomonosov. According to the fair statement of P.L. Kapitsa, "in the Academy of Sciences Lomonosov was left virtually alone in his physical and chemical work. He had to trace the development of science by the literature (scarce in that time) and had no personal contact with prominent scientists. Lomonosov never went abroad, and foreign scientists never came to Petersburg to meet with him, since the Academy of Sciences presented no interest in that time" [10].

Definition of Physical Chemistry. Lomonosov believed that, with time, chemistry would become an integral part of physics. Thus, he wrote in the report for 1753 that "he did new physical and chemical experiments to turn chemistry, as far as possible, to philosophical knowledge and make it a part of basic physics" [11]. In the program of research he intended to perform in the Chemical laboratory, Lomonosov mentioned: "I not only found in different authors, but also was convinced by my own art that chemical experiments, being combined with physical, show peculiar actions" [12].

First of all we would like to note that the word combination "physical chemistry" can be found in the works of a number of authors of XVIII century, who did not have any information on Lomonosov's works and views, for example in the treatise of I.G. Vallerius (1709–1785) "Chemia physica" (1759). Lavoisier, making comments on the article of the Berlin chemist J.T. Eller (1689–1760) about the nature of chemical elements, entitled his … communication (1766) "Physical Chemistry, About Elements, About Fire, Water, and Air."

At the same time, Lavoisier's colleague L.B. Guyton de Morveau (1737–1816) entitled one of his works "Essai physico-chymique sur la Dissolution et la Crystallisation" (1772). Even though R. Boyle did not use, as far as we know, the term "physical chemistry," contributed much into the application of physical methods in chemical research, which is evident, in particular, in the subtitle of its known book "The Sceptical Chymist, or, Chymico-Physical Doubts and Paradoxes …" (1661).

By the way, Boyle is often considered as the founder of physical chemistry (or, at least of what P. Duhem named "embryonic physical chemistry" [13]), since it was just he who tried to introduce into chemistry the concepts of mechanical atomistics, considering all chemical processes as combinations of corpuscles "in small groups of various orders and their reverse separation." Lomonosov was well familiar with Boyle's works and followed his ideas in many respects.

Possibly, Lomonosov, to distinguish "his" physical chemistry from previous ones, named it … *true*. However, he published no one dissertation specially devoted to his physical and chemical findings. Mikhailo Vasil'evich explained this fact as follows: "… to accomplish [all my system of physical chemistry] and present it to the scientific world is prevented by my love to the …. Russian word, to glorification of Russian heroes, and to authentic research on achievements of our Fatherland" [14].

But whether his understanding of the term "physical chemistry" actually essentially differed from what some of his predecessors and contemporaries interpreted as the method of consideration of chemical phenomena in the light of physical (more exactly, mechanical) concepts and representations, whatever term they used?

By Lomonosov's definition, the "physical chemistry" is a science explaining on the basis of physical postulates and experiments phenomena that occur in mixed bodies on chemical operations. It can also be called the chemical philosophy, but in a sense radically different from that philosophy, where not only explanations, but even operations in themselves are usually made in a secret manner [2].

As seen, by physical chemistry Lomonosov meant a theoretical chemistry. He wrote: "… the goal of chemistry is to investigate both the structure of bodies accessible to feelings and what, which originally forms compound bodies, namely basics. What ways and what chemical means and physical aids are needed to reach it …" [2].

Unfortunately, the "Introduction …" discontinues there where, according Lomonosov's plans, he would pass to description of these problems. However, what had already been written is enough to make sure that his understanding of the goals of chemistry was analogous to that of, for example, the prominent French chemist of XVIII century P. Macquer who wrote "Over the past one and a half centuries physics has made a greater progress than over one thousand years. But this relates even to a greater extent to such *part of physics* (our italics, the authors) as chemistry" [15].

Or another, chronologically earlier example. Boyle addressed chemical research primarily aiming at substantiating his "mechanical philosophy," since, in his opinion, it was "chemistry" that could provide the most convincing evidence in favor of this philosophy.

Generally, the idea to make chemistry a part of physics grasped minds of many natural scientists as long ago as the second half of the XVII century and became quite widespread in the XVIII century. The convergence of physics and chemistry was promoted, among other reasons, by the character of academies and scientific societies appeared in the XVII century, whose meetings were attended by representatives of different disciplines.

Corpuscular theory, experiments on calcinations of metals, and the law of conservation of matter (mass). We have united here these three thematic blocks, since they proved to be closely interconnected in Lomonosov's mind. According to P.L. Kapitsa, "the experimental proof of "the law of conservation of matter" was the most important achievement of Lomonosov. The Lomonosov's discovery of the law of conservation of matter is well studied, and his priority in this discovery is completely established" [10].

Let us begin with the repetition by Lomonosov of Boyle's experiments on metal calcinations in sealed glass vessels.[1]

In 1672 Boyle found that the weight of a retort containing a metal increased after strong heating (the sealed retort was weighed before heating). Clearly, the weight gain resulted from that the oxygen of the air contained in the retort had oxidized the metal and, after the vessel had been unsealed, the external air came in. However, Boyle had a different opinion.

He considered pure air as a special form of substance, whose chemical activity is, owing to its elasticity, extremely low and, therefore, air could not, like solid and liquid substances, enter chemical compounds. Therefore, interpreting the results of experiments on metal calcination in sealed glass vessels, he assigned the weight gain of the retort to… penetration into the vessel (through its glass) of "a fiery matter" and its combination with the metal.

Having repeated in 1756 the Boyle's experiment but not opening the vessel after heating, Lomonosov made sure that "…the opinion of the nice Robert Boyle is false, since if one does not let the external air in the weight of the burned metal remains in one measure" [11], i.e. the weight of the sealed retort with metal remains unchanged, and, therefore, no "fiery matter" got into the vessel.

Thereby Lomonosov obtained one more evidence in favor of his suggestion which he shared with L. Euler as far back as 1748: "Particles from air continuously flowing onto the calcinated body, mix up with the latter and and increase its weight." Further on he mentions the "experiments in a closed vessel (but does not specify which specific experiments are meant; the authors) which, too, result in weight gain of the calcinated body" [2].

According to quite a plausible reconstruction of events, offered by Dorfman, Lomonosov in 1756 decided to calcinate metals in an evacuated sealed. Actually, we can read in his report for this year:

[1] This episode of the chemical work of Lomonosov was considered in detail in an excellent article of Ya.G. Dorfman "The Law of Mass Conservation in Chemical Reactions and Physical Views of Lomonosov" [16] which we will refer to in the given section of the present article.

"Chemical experiments using an air pump were undertaken" [11]. Even though no reports on these experiments remained, one can easily imagine Lomonsov's results. According to Dorfman, Lomonosov found that after calcination in a vacuum the weight of the metal scale was higher than the weight of the initial metal sample.

However, actually, the pump at his disposal allowed the air pressure to be decreased at best to 1/50 atm, i.e., as we know now, the remaining oxygen was quite sufficient to oxidize (at least partially) such metals as lead or zinc. However, Lomonosov, who believed that the air had been completely pumped out from the retort, considered the obtained result paradoxical: The metal weight increased without adding an extraneous matter, which contradicted the law of conservation of mass and "quantity of matter."

But Mikhailo Vasil'evich found a way out. In his opinion, "the force of fire" perfectly detaches linked (in a calcinated or burnt body, the authors) particles from each other and thus facilitates the subsequent possible addition of foreign bodies" [2]. Further on he made use of his concepts of the nature of gravitation, which, according to the fair characteristic of P.L. Kapitsa, presented "the major Lomonosov's mistake in one of the basic questions of physics" [10].

Considering the nature of gravitation in the early work "About Insensitive Body Particles" (1743–1744), Lomonosov stated: "Bodies are set in motion by only one push" [9]. Differently, he believed that motion is transferred from one body to another only through a direct contact (collision of bodies).Thus, the serious mistake of Lomonosov consisted in that he imparted a universal character to his concept of collision-induced transfer of motion. He denied the possibility of action at a distance (gravitational or electrical), arguing that the Newton's concept of "pure attraction" is inconsistent with the law of conservation of motion.

Actually, the nature of gravity was one of the tender points of the mechanical picture of the Universe, created by Newton. What is the physical nature of this force? Newton in himself gave seemingly quite different, even opposite answers on all these questions. In particular, he also addressed an ancient-rooted concept of world ether.

However, this had not met with success, since, whatever modified the mentioned concept would suggest that the space occupied by the ether is almost empty, and that would mean abandonment of the idea of a mechanical corporal gravitational ether. This circumstance predetermined Newton's position in public discussions about gravitation: It should be spoken about in no other way as "strictly and geometrically." And, in general, "the reason … for the properties of gravitation" was impossible "to deduce from phenomena," and, as Sir Isaak assured contemporaries, he was not content, to his excuse, to extemporize hypotheses and to take part in loose altercations.

Certainly, "*hypothesis non fingo*" is no more that a front of the Newtonian methodology, behind which there was a vigorous activity on "fabrication" of diversy hypotheses. In fact, Newton had to admit that planets move in an empty space and simultaneously admit the presence of force interaction between them. Irrespective of the methodical pose he would assume, the contradiction remained, since the secret of *actio in distans* still remained unsolved. Newton had to leave the search for the "mechanisms" of gravitation deeply in the interior of his work and to declare that the reasons for this phenomenon are unclear, and it is "enough to know that gravitation actually exists and acts according to our stated laws" [17].

Lomonosov, in fact, associated himself with Newton's opponents. As a counter to the Newtonian theory, he put forward theories a "shock" gravitation theory (basic ideas of this theory can be found in the works of a number of natural philosophers of XVII and early XVIII centuries, such as N. Fatio, R. Descartes, F. Redeker, G.-L. Le Sage, etc.; it was propagandized by Wolff, the teacher of Lomonosov): "The weight of bodies is independent on any attracting force; rather it depends on an attracting matter … It should be admitted that there is a certain matter which pushes, due to its motion, attracted bodies to the center of the Earth" [2]. As a result, Lomonosov, not accepting "the poor basis of gravitation" [11], came to denying a universal relationship between the weight and mass of bodies.

He applied these views to describe the above-mentioned chemical experiments on metal calcination. Therefore, the weight gain upon calcination did not eventually prove a problem that prompted Lomonosov to further research, whereas Lavoisier, with an almost same physical and chemical information in hand, could go forward, mostly because he accepted the Newtonian theory of gravitation, admitting relationship between body mass and weightweiw between weight and body weight and thinking out no "mechanisms" of gravitation.

The French researcher gave up with Boyle's program (unlike Lomonosov), a program aimed at explaining the physical and chemical properties of bodies in terms of the kinematic and geometric properties of their corpuscles. This step had an impact on the subsequent development of atomistics, which, after Lavoisier's chemical revolution, could develop productively in the context of a new-type elementarism.

Dorfman was absolutely right, criticizing those historians who neglected the results of the second Lomonosov's experiment, which led some of them to a conclusion as if in his first experiment the Russian scientist not only ruled out Boyle's opinion, but also proved that "a substance is not created and does not disappear on chemical interaction." As an example, Dorfman presents the article entitled "Lomonosov's Law" in the second edition of the Great Soviet Encyclopedia. However, until now, this nonsense is reproduced in high-school and school textbooks, and, especially, on the Internet. At the same time, according to Dorfman's fair comment, Lomo-nosov nowhere and never formulated such a law.

As to the fact that Lomonosov distinguished different types of dissolution of substances in water, it was mentioned by Boyle, Macquer, and many others. This issue is well documented in the contemporary historical chemical literature. For the reasons of space, we restrict ourselves to references to certain most significant and respectable researches [18].

It is easy to expect an objection which can often be faced in the literature: One should not evaluate the natural-science (including chemical) views of Lomonosov too critically; they should be considered in the context of his epoch. This statement in itself does not cause objections (though the tendency, even tradition, to attribute to Lomonosov nonexistent merits, too, should be considered in the context of corresponding epochs).

However, this, we will repeat once again, formally indisputable position involves, as far as it concerns such personalities as Lomonosov, slyness to some degree. First, evaluating his works in the context of the epoch, one should know distance in considering purely speculative ideas of Mikhailo Vasil'evich (like "kolovrat" motion of corpuscles) which, as turned out about a century later, had something in common with more recent concepts; therefore, one should not fit the solution of a task into a known answer.

Second, it is desirable to consider not only the circumstances of time, but also the circumstances of places, i.e. the Russian conditions in which our hero worked, "having disdained the gloomy fate" of the domestic cultural and mental specificity. And thirdly, one should have courage to admit that it is the consideration of works of Mikhailo Vasil'evich, who was a younger contemporary of I. Newton and an older contemporary of A. Lavoisier, in the context of the global science of the Enlightenment Century (and even the previous century) makes his speculations, conclusions, and statements the most vulnerable for criticism.

Surely, Lomonosov the chemist contributed much, say, into the technology of production of stain glasses, but this had no concern to his basic research. He created no working nonspeculative chemical theory like the oxygen theory of Lavoisier, did not discover any unknown chemical reaction, any new chemical compound or a simple body, etc. For comparison, his younger contemporary K.V. Scheele discovered a lot of acids: tartaric, lactic, oxalic, cyanic, fluosilicic, and arsenic, as well as glycerol, molybdenum and tungsten oxides, chlorine, etc.

But what to say about Scheele! These are oversea, foreign issues! By the number of concrete chemical discoveries Lomonosov even ranks below another Petersburg academician J.T. Lowitz. We can agree with the characteristic of these personalities, given by D.N. Trifonov: "It goes without saying, by the Hamburg account," Lomonosov and Lowitz are non-commensurate figures. What means the activities of great Encyclopaedist scientists Russia does not require any comments.

But, being impartial, it is hard to recall a concrete chemical discoveriy of Lomonosov, which did not find its place in the chronological annals of chemistry. The achievements of Lowitz in this chronology would occupy some obvious positions ".[2]

It will be remembered that Lowitz discovered the phenomenon of adsorption (absorption) with charcoal of substances from solutions and applied it for purifying various products (medicines, drinking water, grain vodka, honey and other sugary substances, saltpeter, etc.); he was among the first in the world to initiate systematic research on crystallization processes; he can be considered a pioneer in studying

[2] http://www.chem.msu.su/rus/elibrary/trifonov/tobias-lovitz.html.

the mechanism of crystal formation from solutions, he introduced the terms “supersaturation” and “supercooling,” isolated caustic alkalis as crystals, prepared glacial acetic acid and, having treated it with chlorine, observed formation chloroacetic acid, and, finally, he obtained a water-free alcohol (“the purest alcohol”), was the first in Russia who got interested in the chemistry of sugars and revealed a difference between honey and reed sugars, offered a procedure for qualitative determination of substances by their crystal form, discovered, independently of the Scottish researchers A. Crawford and W. Cruikshank, a new chemical element strontium in heavy spar, and, knowing nothing about the discovery of chromium by the French analytical chemist L. Vauquelin, Lowitz almost simultaneously with him isolated this element from the mineral crocoite, etc.

Considering the ways of development of chemistry in the XVIII and early XIX centuries as a whole, one can state with assurance that the subsequent progress of chemistry (including physical chemistry) would be hardly imaginable without the “chemical revolution” accomplished by Lavoisier, whereas Lomonosov’s ideas of the “kolovrat” corpuscular motion, “attracting fluid,” and other similar speculations, as the science history showed, was what everything might well go without. And to say with delight than one can recognize a forerunner of later concepts in those or other speculative Lomonosov’s ideas is as naive as to recognize in the alchemical idea of metal transmutetion a forerunner of insights into nuclear reactions.

This historical scientific hagiography (“raised corpuscular concepts to the scientific level reached by chemists only in the XIX century,” “put forward new ideas, developed new theories which later formed a basis of a new science and the starting point of its further development” [1], “created foundations of a new chemical science, … [he] should be acknowledged as the brightest predecessor of revolutionary changes in chemistry in the end of the XIX century” [19], etc.) bears a spicy smack of anachronism. To guess and to predicts are far from being the same.

Nevertheless, the aforesaid is only one facet of the issue “Lomonosov the Chemist” (and, in general, “Lomonosov the Natural Scientist”). Our characteristic of Lomonosv’s work would have been extremely one-sided, and, therefore, unhistorical, had we disregarded those conditions the Russian scientist worked in, since they founded many of his mistakes and inconsistency.

“**He was a God, he was your God, Russia**.” The aim of the above critical remarks concerning the chemical views of Lomonosov is by no means aimed at somehow belittling or “discrediting” his contribution to science. The case in point is different. The main merits of Lomonosov lie not at all in the chemical (even though he considered himself first of all as a chemist) or physical spheres, but in that he was “a cultural hero” of Russia during the contradictory epoch of the Russian Enlightenment and its associated modernization of all facets of domestic life.

In a country, where after half a century after Lomonosov’s death, Acad. G.I. Hess complained that “the greatest lack of chemical knowledge is faced everywhere, but even an obvious prejudice against this science is not an infrequent case” [20], Mikhailo Vasil’evich formed a cultural space in which the major place was given to sciences (including chemistry).

He defined his mission in a known poetry line: “Where there are neither rules nor law, there a temple is based on wisdom.” It will not be forgotten that Lomonosov lived and worked not in England or in France, which featured powerful natural-science traditions, but in Russia, where natural sciences and, broader speaking, enlightening transplanted in the traditionalistic society under the decree of the Emperor, could not for a long time enter into a modernized Russian life.

The society tore away or transformed beyond recognition, sometimes to a grotesque, not only the West European traditions of professional research into the nature, but also the very image of science generated in fine interaction the Protestant, Catholic, rationalistic, occultistic, and other discourses. Upon the very first acquaintance to the western science, the Russian society fell in doubts: Whether this science is safe, whether it will preserve the purity of belief and customs, etc.

In this situation, chemical research at all was perceived as a sorcery and charlatanism. The grandiose plan of Lomonosov: “to unyoke chemistry of medicine and pharmaceutical art by transforming it into a physical and chemical science,” was doomed not only for intrascientific, but also for sociocultural reasons. After 1758 Lomonosov withdrew from the management of the Chemical laboratory he created with a huge effort (its foundation in 1748 should be considered as the starting point of the history of Russian chemistry), and chemical research started to acquire a narrowly utilitarian character, bringing to the forefront “metallurgical chemistry,” “assay art,” etc.

The country required for people capable of building a basis for a new culture. The services of Lomonosov on this way are so huge that there is no need to make him artificially a great physicist or chemist. On the background of that he became a hero and, in a sense, a martyr of the Russian Enlightenment, the question whether his corpuscular theory was good enough in a country, where the mentality of the not numerous national elite was primarily humanitarian and where any scientific theory was perceived with suspicion, was of relatively secondary importance.

Indeed, speaking about Lomonosov the Scientist one should admit with honesty that his achievements in the field of natural sciences look rather modestly, and his ideas either are not new or are speculative (this first of all relates to his corpuscularistic hypotheses, whatever “aprioristic and aposterioristic evidences” in favor of these hypotheses he spoke about and whatever good they looked like from the retrospective viewpoint).

However, the fact that a lot of opinions of the nice Mikhailo Lomonosov opinions were false by no means belittles another fact, more important for Russia of that time: He was the first Russian chemist who set up the country’s first research and educational Chemical laboratory. He made use of all his accessible means (scientific communications, poetry, publicism, correspondence, face-to-face meetings) for familiarizing the Russian society with values of science in general and chemistry in particular. Lomonosov, thinking highly of the role of science in a society, was undoubtedly a westerner. In his view, the world subordinated to natural and mathematical laws is governed by the principle: “*Omnia quae in natura sunt, mathematice certa et determinate*” (“Everything in the nature is mathematically exact and is determined” [9]). And it is not his fault that not all turned out how it was originally conceived.

This short sketch is pertinent to conclude with the remarkable words of the major domestic historian of science V.P. Zubov, written almost half a century ago and, alas, in many respects rather actual today: “… Isolation of (Lomonosov from the nearest historical environment, the autors) together with modernist interpretations of separate statements, led to “heroization,” which is radically opposite to a real historical interpretation.” The miracles of priorities as little advanced the knowledge about Lomonosov as old-fashioned panegyrics to military and state leaders favored progress of historical science [21].

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