

# In memory of the first Russian scientist<sup>1</sup> (1711–1911)

P N Lebedev

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**Abstract.** The article below was written by Petr Nikolaevich Lebedev in 1911 to mark the bicentenary year of the birth of Mikhail Vasil'evich Lomonosov. P N Lebedev's words about the sad fate of Russian science and Russian scientists (as exemplified by M V Lomonosov) unfortunately remain true in many respects today.

*"I realize that soon I have to die but retain the peace of mind in the face of death; I only much regret not to have accomplished all that I have undertaken for the benefit of my Homeland, the advancement of sciences, and the glory of the Academy, and now, at the end of my life, I have to see that all of my good undertakings will vanish with me."*

From Lomonosov's conversations with Stelin<sup>2</sup>

Two hundred years ago in the far north, Mikhail Vasil'evich Lomonosov, whose talent, life, labors, and fate gave us the prototype of a Russian scientist possessing all the features inherent in the nature of the people and environmental conditions, was born into the family of a prosperous fishery businessman.

The description of the first part of his life, including the years of learning, reads like a fascinating story: escape from home, hungry existence in Moscow in the Zaikonospasskaya Academy. Lomonosov himself describes this living as that of "unspeakable poverty: having an allowance of one altyn (a three-kopeck piece — *Translator's comment*) of the pay per day, one could not spend on food more than a half-kopeck coin for bread, a half-kopeck coin for kvass, the rest being spent on paper, footwear, and other needs." In Moscow, for five years he was taught not what his natural talent drew him to, but what he was supposed to learn: Latin prosody, rhetoric, theology, etc. Lomonosov's attempt to find true



Mikhail Vasil'evich Lomonosov<sup>3</sup>

teachers and real science in Kiev did not meet with success, either, and it was an accidental coincidence of circumstances that gave him what he was looking for: Baron Korf decided to send capable young men to study abroad. Following his directions, the Academy of Sciences asked the Moscow Zaikonospasskaya Academy for a list of recommended seminarians, and Lomonosov was sent abroad to learn philosophy, physics, and mining engineering.

In Marburg, under the direction of the then famous philosopher Wolff<sup>4</sup>, he learned for the first time what current real-life science is; he pounced on the study of natural sciences and amazed his teacher, both by his surprising progress in the sciences and by the equally surprising rashness of his student life. After the five years spent in Germany, Lomonosov was quite prepared for independent

<sup>1</sup> Published in *Russkie Vedomosti* (Russian Gazette) newspaper, No. 257, on 8 November 1911, on the occasion of the 200th anniversary of the birth of M V Lomonosov. The article is of obvious autobiographical significance (for P N Lebedev — *Usp. Fiz. Nauk Editor's comment*) in the part about the sorrow of a scientist who has no own laboratory, about the perishing of 'scientific seedlings', etc. The original of P N Lebedev's manuscript bearing numerous alterations is kept in the Archive of the USSR Academy of Sciences, Fond 293, Opis 1 [1, 2]. (*Comment by Ed. of Ref. [2].*)

<sup>2</sup> Jakob Stelin (1709–1785), member of St. Petersburg Academy, expert in engraving, and Lomonosov's friend. (*Comment by Ed. of Ref. [2].*)

<sup>3</sup> This portrait was drawn by the first editor-in-chief of the *Uspekhi Fizicheskikh Nauk* (*Usp. Fiz. Nauk*) journal Petr Petrovich Lazarev (P N Lebedev's pupil and successor) for the publication of P P Lazarev's speech delivered to the General Conference of the Academy of Sciences on 13 September 1925, dedicated to the 200th anniversary of foundation of the Russian Academy of Sciences (for more details, see Ref. [3]). (*Usp. Fiz. Nauk Editor's comment.*)

<sup>4</sup> Christian Wolff (1679–1754) — philosopher and physicist, professor, Lomonosov's teacher (worked in Marburg and Halle). For his *Wolff's Experimental Physics*, which was translated by Lomonosov, see the first volume of *Polnoe Sobranie Sochinenii Lomonosova* (Complete Works of Lomonosov) (Moscow–Leningrad: Izd. AN SSSR, 1950). (*Comment by Ed. of Ref. [2].*)

scientific work: due to his exceptional abilities, during this relatively short learning period he managed to look into the then prevailing scientific trends, master the methods of investigation, and gain a wealth of positive knowledge, while his clear and inquisitive native mind suggested to him a long series of highly interesting scientific problems. His stay in Germany broadened his horizons in yet another direction. By the example of his teacher Wolff, Lomonosov could see that fruitful scientific activity depended not only on the personal studies of a scientist, but also on the establishment of a school for preparing learned workers; it became clear to him in Marburg that the scientific power of a German university lay precisely with the continuity of knowledge.

Quite prepared for independent scientific activity, vital, robust, with an aspiration to use his abilities in the broadest possible way, 30-year old Lomonosov returned to his homeland. In Saint Petersburg, he found that scientific and educational activities were in a very poor state: as before, members of the Academy were primarily Germans, who dissociated themselves from the rest of Russia on their island<sup>5</sup>; with few exceptions, they were mediocre people:<sup>6</sup> at the best, they were punctual employees, at worst they were making fortunes in various ways. From the first steps of his Petersburg's activity, Lomonosov, passionate and enthusiastic, declared war on the established tenor of their academic ways: being a commoner by birth and having gone through the painful experiences of learning in Russia, he could not limit himself only to scientific investigations, as did his foreign academy colleagues. He was facing a different task, which Russian life set before him: to open the door to and make possible research work in Russia.

The learning aids which were at the disposal of the Academy of Sciences were limited to *kunstkameras* and museums, which were intended for the personal studies of academicians and for making demonstrations to high-ranking visitors, but even these scanty learning aids were not in the reach of adjunct Lomonosov who was charged with 'studies in chemistry'. Lomonosov was compelled first of all to obtain the means for his work, and decided to set up Russia's first scientific laboratory in which he would be able to carry out his investigations and would also furnish an opportunity for entry-level young researchers to work under his supervision. Lomonosov's application is kept in the Academy archives: "In January of the past year of 1742, I, your humble and obedient servant, applied to the Academy of Sciences and put forward a suggestion about setting up a chemical laboratory, which has never existed under the Academy, where I, your humble and obedient servant, could labor at chemical experiments for the benefit of the Homeland; however, no decision has been made concerning the above application of mine. Not only am I, your humble and obedient servant, able to make chemical experiments for the betterment of the natural sciences in the Russian Empire and compose journals and discourse in Russian and Latin, but I am capable of teaching physics, chemistry, and natural

history to others. And so, I, your humble and obedient servant, have an earnest and zealous desire to benefit my Homeland by way of science, to incessantly exercise chemical practice and theory in chemical labors with the involvement of physics and natural mineral history, and to teach those who so desire." This application bears the resolution: "Adjunct Lomonosov's request denied."

It was not until 6 years after the first application that Lomonosov, at last, had at his disposal a small, scantily furnished chemical laboratory,<sup>7</sup> where he could begin teaching and working. But there, in the laboratory, he encountered another, even greater, difficulty, which prevented him from entirely devoting his time to scientific investigations and insistently called for a solution: those who worked in the new chemical laboratory were seminarians (and Lomonosov once was a seminarian himself) sent by theological seminaries on the request of the Academy of Sciences. And it was not only their inadequate scientific grounding provided by scholastic religious schooling that caused insurmountable difficulties for the head of laboratory, but also the accidental nature of their appointment to go in for sciences. Lomonosov saw only one way out of this situation: a secular school had to be established after the model of German gymnasias, which would provide adequately prepared students. Apart from other obstacles, consideration had to also be taken of the general poverty of Russian students. Lomonosov gives evidence that "gymnasium scholars and students received a mere pittance, and on sharing it with their poor parents they were undernourished and were mostly dressed in rags and tatters, with the effect that they utterly lost interest in studies."

The disadvantages of the educational organization which gradually developed from the teaching of seminarians attached to the Academy of Sciences were quite clear to Lomonosov as a person who was closely acquainted with the students: under this organization, neither the country nor the students received what could be given by correctly organized systematic studies into the sciences. Lomonosov stood up for the establishment of universities and specially insisted that in Russia "it would be beneficial if the University and the Academy, after the example of foreign ones, were vested with certain liberties and particularly were relieved of police obligations." It is well known what part was played by Lomonosov when Shuvalov<sup>8</sup> "intended to establish Moscow University after the example of foreign ones, which is gratifying to see," and that Shuvalov took advantage of "the advice of those who not only saw the Universities, but also learned for several years there, and who conceived clearly and vividly, like a picture, their organization, statutes, ceremonies, and traditions." In this case, too, Lomonosov was especially concerned with the organization of preparatory secondary education: "Under the University there should be a gymnasium, without which the University is like a plowed field without seed."

Lomonosov realized the same idea when establishing St. Petersburg University and the gymnasium under it, and he actively participated in their life as their immediate supervisor.

<sup>5</sup> Here — Vasil'evskii Ostrov (Island) in St. Petersburg, which was the locus of the *Kunstkamera* (Cabinet of Arts and Sciences, later known as Cabinet of Curiosities) — the first building of the Academy of Sciences (see, for instance, Ref. [4]). (*Usp. Fiz. Nauk* Editor's comment.)

<sup>6</sup> This characteristic must be regarded as an underestimation of the Academy of those days. It will suffice to mention that Delisle, Epinus, Euler, and Richman were simultaneously members of the Academy, and Daniel Bernoulli had been its member somewhat earlier. (*Comment by Eds of Ref. [2] and Usp. Fiz. Nauk.*)

<sup>7</sup> As ascertained by N M Raskin's and V P Barzakovskii's works, M V Lomonosov's laboratory could in no way be termed 'small' and 'scantily furnished'. (*Comment by Ed. of Ref. [2].*)

<sup>8</sup> Count I I Shuvalov (1727–1797) — a statesman who founded, together with M V Lomonosov, Moscow University. (*Comment by Ed. of Ref. [2].*)

Now it is beyond all calculations how much labor and effort Lomonosov had to spend when setting up Russian universities and gymnasia. Lomonosov himself indicated what obstacles were put in his way by his influential learned colleagues, apart from others: “‘What do you want all these students and secondary-schoolboys for? What shall we do with them and how shall we employ them?’” These words were frequently said by Taubert<sup>9</sup> in the Academy Office, although it is known for certain that in our country there are no native Russian pharmacists, too few physicians, mechanical engineers, skilled mineworkers, attorneys, and other educated persons, not even native professors in the Academy itself and other places. Neglecting this, Taubert would say and try to convince other people: What do you want all these students for? From his point of view Taubert was right, of course: he did have no need of them at all.

Having set himself the seemingly modest task of establishing the school of Russian chemists, when endeavoring to fulfill this task Lomonosov had to progressively broaden its initial scope and gradually, step by step, implanted the secular secondary school—the gymnasium—and the Higher School—the university. Estimating Lomonosov’s enlightenment activity, it is valid to say that there is hardly anyone after Peter the Great to whom Russia owes its cultural progress more than to Mikhail Vasil’evich Lomonosov. And, of course, it is through no fault of the brilliant pioneer of the European enlightenment that after his death “all of his good undertakings vanished with him.”

Being a reformer of Russia’s cultural order, Lomonosov could not lean upon his indisputable authority as an outstanding scientist—he gained the necessary support from the general admiration with which he was welcomed as the originator of the resonant literary Russian language.

That quite exceptional position which Lomonosov justly holds in the history of Russian language and literature is also due to the innate qualities of a naturalist: embarking on the study of the Russian language, Lomonosov would not follow the path of a learned scholastic-philologist. Instead, in this case, too, he applied the methods of a naturalist: he would lend his ear to the living Russian language used to talk, swear, and joke by the people around him. To his joy, he found that this language had all the vocabulary required to easily express the most complex ideas. For Lomonosov, the living spoken Russian language was a natural phenomenon, and its grammar had to do nothing but observe and describe the laws that governed the language and not prescribe for this free language some invented obligatory rules laying restraints on it. Lomonosov had the courage to start writing in a living plain language, and his contemporaries were amazed by the beauty and flexibility of that very language which they had constantly used in everyday practice. Lomonosov, as a naturalist, merely discovered the language which had existed long before him. Beside this language, the contemporary Latinized bookish language suddenly became quite unnecessary, superfluous, and odd; the delight with which Russia welcomed Lomonosov’s works of literature stemmed not only from the unexpected beauty of Lomonosov’s language, but also from the awareness, perhaps not always expressed explicitly, that the new literary language is accessible without tedious learning.

For Lomonosov, the language by itself was not the objective: for him it was merely a mighty tool which he always used to enlighten and teach Russian society. In his works of literature, Lomonosov invariably remained a scientist: in all of his odes, commissioned and written in a pseudo-classical style, as was de rigueur at that time, he invariably formulated certain propositions and then logically elaborated on them and proved them. Having a perfect command of well-sounding verse, Lomonosov fascinated his contemporaries and, taking advantage of this ardor, he steadily pursued his principal goal of educating Russian society and making it ponder new ideas alien to it.

Lomonosov’s public activity as a reformer of the entire cultural life of the country and of its language came to fruition and would be deeply appreciated by future generations. Quite different was the fate of his scientific activities, for which he had followed a difficult path from a fishing boat to the Chair at the Academy of Sciences: they did not yield even an insignificant fraction of the outcome which would be naturally expected of them—they only became a prototype of the tragic life of a scientist in Russia.

All contemporaries who were acquainted with Lomonosov—with Euler, a man of genius, among them—expected extraordinary scientific investigations from this person of natural gifts. It seemed that all the prerequisites for such activity were fortunately combined in him: the enormous innate talent of a naturalist, a clear and independent mind, a broad outlook, a huge stock of knowledge, indomitable will power, perfect health, and a desire to devote his life to his favorite cause. However, Lomonosov was fated to work under purely Russian conditions, whereat no scientific talent could help him, although he was in the seemingly optimal position as an adjunct in scientific service, and later a professor of the Academy of Sciences. If we restrict ourselves to only the name ‘scientific service’, the unproductiveness of Lomonosov’s scientific activity will remain an enigma forever. However, it will not call for further explanation if we only list his official duties, namely: perfect attendance at academic sessions, writing numerous reports to the office concerning the little nothings of teaching practice, teaching and examining students in chemistry, physics, history, poetics, and rhetoric, technochemical analyses, translation, censorship and proofreading of books published in the academic printing-works, composing odes and tragedies, elaborating plans for fireworks on various ceremonial occasions, etc. No special talents are required to fulfill all these duties, but when Lomonosov, Professor of Chemistry, was enjoined, in addition to all other duties, “to write the history of Russia in his author’s manner,” i.e., to take up a task which was in essence new and alien to him, Lomonosov “spoke to a professors’ meeting that he, having the task of writing the history of Russia, does not hope to work freely in chemistry, and if a chemist is called for in this case, he recommends landarzt Dachritz.” Furthermore, when it is considered that six years—maybe the best years of Lomonosov’s life—at the commencement of his scientific service were lost for work, since he had something even less than bad laboratory, we comprehend the hopelessness of the position of the first Russian scientist-martyr and the tragic state of his mind, which he had to experience.

No one who becomes familiar with Lomonosov’s scientific works can help painfully and bitterly feeling and thinking how enormous a talent was uselessly lost for science! Everywhere—in chemistry and mineralogy, in physics and

<sup>9</sup> I I Taubert—Counsellor of the Office of the St. Petersburg Academy, opponent of Lomonosov’s ideas and all his initiatives. (*Comment by Ed. of Ref. [2].*)

nautics<sup>10</sup> — Lomonosov demonstrates at times flares of brilliant ideas; invariably seen is a keen sensitive observer, who states issues boldly and broadly, in many cases issues of paramount importance, which only later acquired primary importance for science on being treated by Western scientists; in his reasoning and experiments concerning the indestructibility of matter in oxidation he anticipated the thoughts later expressed by Lavoisier, and he was a century ahead of time in his reasoning about the kinetic theory of gases in connection with the mechanical conception of the nature of heat and the eternity of energy. However, all these works of Lomonosov bear the imprint of that insufferable environment in which they were conceived: in the majority of cases their elaboration terminated at an interesting point of research soon after its commencement. It is clear that the interruption was caused by unknown external reasons rather than the disappointment in the problem or in his own abilities. And in front of our eyes there involuntarily arises the huge tragic figure of the scientist, who could not but realize that he could not make even a small contribution to science which was made by an ordinary Western scientist working in normal conditions.

Being exhausted and moribund, Lomonosov took to heart the fate of Russian science and remained concerned about its future, and the Russian reality showed that his apprehension was borne out — that which would be monstrous and quite impossible in the West did happen: 50 years after his death he was forgotten in his homeland, in the city where he lectured and worked. In Saint Petersburg at the beginning of the past century<sup>11</sup>, Russian treatises on navigation, mineralogy, and geology were published, which made no mention even of Lomonosov's name, despite the fact that he had achieved and published much more in these areas than these Russian textbooks contained.

Lomonosov's dearest brainchildren — universities — had no luck, either: brought to life by a true scientist, intended by him to serve as scientific centers and bulwarks of research work in Russia, in the hands of his successors, who might well be honestly mistaken about the significance and demands of science, they turned into modest educational institutions, in which the residence of science was not indispensable, and if allowed at all, only in one's spare time.

Lomonosov felt and believed

*That sage and native Platos  
And quick in mind Newtons  
Will spring from Russian land.*

Life showed that his vision was borne out: Russia gave rise to Mendeleev, Mechnikov, Pavlov, Timiryazev, and brought their works to the depository of human learning.

Lomonosov gave his heart and soul to the cause of establishing the conditions in Russia whereat these native Platos and Newtons could come into existence, evolve, and work — however, in this respect Russia has not made major strides over 200 years. When we familiarize ourselves with the work of our outstanding scientists, we are led to conclude that in most cases they made major investigations in spite of the conditions of their work in Russia, rather than owing to them: the personal features of their character or a favorable juncture of circumstances helped them to gain a victory, and only the names of these few winners, their thoughts and merits, have come to be known in wide circles of Russian society. One need

only ask those who are closely familiar with the conditions under which Russian scientific investigations are conducted (these conditions are similar to those which Lomonosov had to face) and against which the Russian scientific school has to fight for survival, to realize how many interesting ongoing investigations are being abruptly terminated, likewise in Lomonosov's time, and how many obvious talents are wasted for science and for the country — these numbers *are horrendous*.

If Russian society, reminiscing about the heritage of the reformer of its language and its intellectual culture, wanted to express its appreciation to the memory of Lomonosov by deed rather than word, it could do this by realizing the cherished hope of the first Russian scientist: by establishing and maintaining in Russia centers of our research work wherein this work could go on without hindrance. These scientific centers would undoubtedly produce a number of important and useful works, and their very existence would have a beneficial effect on the life of society by enhancing its consciousness and standards of culture. By concerning itself with the progress of science, society will take care of itself: weighing every word, thus spoke not a poet easily carried away but a mature thinker, who had done a great deal of thinking and had experienced many emotions:

*The sciences would nourish youngsters,  
And bring some comfort in old age,  
Protect us from an evil fortune,  
Embellish life in happy days.*

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<sup>10</sup> Nautics (from Greek ναυτική): the skill of navigation. (*Usp. Fiz. Nauk Editor's comment.*)

<sup>11</sup> That is in the 19th century. (*Usp. Fiz. Nauk Editor's comment.*)

<sup>12</sup> This impressive paper was published when terminating the galley proof reading of an English version of this issue of *Usp. Fiz. Nauk*. We recommend it to English speaking readers who want to know some more about "A giant of the Russian Enlightenment" as the cover of *Physics Today* tells the readers. (*Usp. Fiz. Nauk Editor's comment.*)