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Research by M.V. Lomonosov on the Arctic and the Concept of Creating an Electronic Database “Digital Lomonosov” in Russian and Chinese

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Abstract. Currently, against the background of sanctions from the West, Russia and China should strengthen cooperation in all sectors, especially in scientific research and resource development in the Arctic, as well as in combating problems associated with climate change and the use of the Northern Sea Route to enhance mutually beneficial trade activities between the two countries. The digitalization of Arctic culture should become a paramount branch of cooperation between universities in Russia and China, which cannot be done without considering and disseminating the scientific works of M.V. Lomonosov on the North and the Arctic. In China, Lomonosov was a completely understudied Russian scientist from all sides of his achievements in the sciences. The article gives an overview of M.V. Lomonosov’s contributions to the development of the Russian North and the Arctic, describes the processes of shaping his scientific interests in the study of Arctic spaces, analyzes his main theoretical positions on the phenomenon of Arctic lights and the natural conditions for the development of Arctic spaces, reveals his historical views on the role and importance of mastering the Arctic for the language possession of small peoples in this region against the background of the spread of world civilization and culture, which still has not lost its importance. Moreover, the relevance of creating an electronic database “Digital Lomonosov” in Russian and Chinese in parallel for the development of modern Lomonosov’s science and translation studies on the scientific achievements of Lomonosov in China is considered, the main concept of the Project development and specific stages of digitalization of Lomonosov’s works in two languages by joint efforts of scientists from NArFU and CHU are analyzed.

Keywords: joint development of the Arctic space, digital Lomonosov in Russian and Chinese

Introduction

Russia and China currently attach particular importance to the joint development of the Arctic. Cooperation between the two countries in this area is considered as an integral part of the conjugation of the Greater Eurasian Partnership and the Chinese “The Belt and Road Initiative” [1, Zhuravel V.P., p. 70]. China actively cooperates with Russia in the development of the Arctic; according to Chinese experts, China looks at the NSR as a potential branch of its “Silk Road” [2, Li Q., Zhang Ch.; 3, Sun S.]. President of Russia V.V. Putin, during a meeting with Chinese representatives, said: “The silk way reached the North. Let’s unite it with the Northern Sea Route, and there will be that is necessary, and the Northern Sea Route will be made Silk”¹. Against the background of China’s rapidly growing demand for natural gas and the increasing dependence of energy consump-

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¹ Putin poobeshchal sdelat’ Shelkovym Severnyy morskoy put’ [Putin promised to make the Northern Sea Route Silk]. URL: <https://news.myseldon.com/ru/news/index/179567153> (accessed 07 February 2023).

tion on foreign countries, Russian LNG projects in the Arctic seem very attractive to China. According to the Sputnik agency, on May 18, 2022, Doctor of Political Sciences, Professor of the Russian Academy of Sciences, Professor of St. Petersburg State University Yana Leksyutina, while participating in the Valdai International Discussion Club, said that “Russia and China can successfully open cooperation in the Arctic, especially in the field Northern Sea Route. Within the framework of political sanctions from the West, the French and Japanese partners are gradually withdrawing from the Arctic LNG-2 project, and we fully expect opportunities for increased investment in this project from the Chinese partners. Cooperation in the Northern Sea Route will bring successful results; in particular, we will be able to increase the volume of hydrocarbon transportation through this route”². According to Deputy Prime Minister of the Russian Federation, Presidential Plenipotentiary Envoy to the Far Eastern Federal District (FEFD) Yuriy Trutnev, Russia is leading in a number of areas related to the development of the Arctic. These include the development of the Northern Sea Route, science and technology, and environmental protection. International cooperation can give a new impetus for developing existing and launching new scientific projects, promoting university-level collaboration between Russia and China, and strengthening partnerships between the business communities and economic ties between the two countries³.

As part of its chairmanship of the Arctic Council in 2021–2023, Russia has begun implementing its plans for cooperation with the countries participating in the intergovernmental forum in four priority areas: the population of the Arctic, including the indigenous peoples of the North; protection of the Arctic environment, including climate change; socio-economic development of the region and strengthening the role of the Arctic Council as the main platform for multilateral cooperation in high latitudes⁴. In 2022, Russia continued to implement the two-year action plans, the main theme of which was the responsible management of the Arctic. For the implementation of the goals and plans, 43 events were organized. Since May 2021, as a country chairing the Arctic Council, Russia for the first time organized forums to discuss issues of protecting the intellectual property of indigenous peoples, the social responsibility of entrepreneurs and public-private partnerships for the sustainable development of the indigenous peoples of the North. Many projects and initiatives have been put forward in such areas as the digitalization of the national culture and languages of the indigenous peoples of the North, the development of creative industries and traditional Arctic medicine, the creation of an international Arctic scientific research station based on carbon-free energy, ensuring biosecurity in the Arctic, the creation of a unified platform for digital museums⁵. Among these tasks, the digitalization of the Arctic culture cannot do without the con-

² Mnenie eksperta: Rossiya i Kitay v nastoyashchee vremya mogut uspešno razvivat' sotrudnichestvo [Expert opinion: Russia and China can now successfully develop cooperation]. URL: <https://sputniknews.cn/20220518/1041453702.html> (accessed 07 February 2023).

³ News. Russian Government. URL: <http://government.ru/news/42186/> (accessed 07 February 2023).

⁴ Ibid.

⁵ Russia, as the leader of the Arctic Council, successfully organizes more than 40 important events related to the Arctic in 2022. China.org. URL: <http://zjnews.china.com.cn/yuanchuan/2022-12-28/363870.html> (accessed 07 February 2023).

sideration and dissemination of scientific works on the North and the Arctic by M.V. Lomonosov.

At the same time, the creation of an electronic database “Digital Lomonosov” in Russian and Chinese will become one of the important tasks in understanding the history of Arctic exploration, so the implementation of the project in order to digitize the Arctic culture has become more relevant than ever for joint research and humanitarian cooperation between China and Russia, and in the perspective in all other areas as well.

Review of M.V. Lomonosov’s contribution to the development of the Russian North and the Arctic

The founder of the northern and Arctic geostrategy of Russia was the great son of the Pomor land M.V. Lomonosov. The Russian North and Lomonosov are two phenomena inseparable from each other. The North, where Lomonosov spent his childhood and youth, had a great influence on his scientific interests. The north, hitherto motionless and almost unknown, was an integral part of Lomonosov’s poetry and science⁶. At that time, the features of the socio-economic and cultural environment of the Russian North, its unique historical and cultural wealth played a leading role in shaping the personality of M.V. Lomonosov [4, Butorina T.S., pp. 8–13]. In the North he formed patriotism, honesty, collectivism, a humane attitude towards others, courage, having absorbed folk traditions, the culture of the region and spiritual values [5, Lukin Yu.F., pp. 275–302]. He made a huge contribution to the study of the northern lights, the nature of cold and heat, the features of sea ice, the possibility of conducting northern sea expeditions, the conditions for moving through the Arctic Ocean and a number of other issues related to the development of the Arctic territories [6, Shirin D.A., pp. 3–7].

He began to study and observe the northern lights from 1743 and continued this topic until his death. Despite the fact that he did not complete the theory of atmospheric electricity, in his works “A word about aerial phenomena occurring from electric force”, “On observations confirming the electrical nature of the northern lights”, “Testing the cause of the northern lights and other similar phenomena”, “A brief description...” he convincingly wrote about the electrical nature of the northern lights, which was confirmed only in the 20th century [7, Eliseev A.A., p. 519, 583–584]. In his poem “An evening meditation on God’s greatness on the occasion of the great northern lights”, he also described the most majestic phenomenon of the North — the northern lights⁷:

⁶ Markov N.F. *Russkiy sever v proizvedeniyakh M.V. Lomonosova: Rech', chitannaya v torzhestvennom sobranii «Vologdskogo obshchestva izucheniya Severnogo kraya» v den' chestvovaniya 200-letiya pamyati Lomonosova 8 noyabrya. 1911 g.* [The Russian North in the works of M.V. Lomonosov: Speech read at the solemn meeting of the "Vologda Society for the Study of the Northern Territory" on the day of honoring the 200th anniversary of the memory of Lomonosov on November 8, 1911]. Vologda, 1912, 17 p. URL: lomonosov.niv.ru/lomonosov/kritika/markov-russkij-sever.htm (accessed 08 February 2023).

⁷ Mikhail Lomonosov – *Vechernee razmyshlenie* [Mikhail Lomonosov – Evening meditation]. URL: <https://rustih.ru/mixail-lomonosov-vechernee-razmyshlenie/> (accessed 07 February 2023).

Лице своё скрывает день;
Поля покрыла мрачна ночь;
Взошла на горы черна тень;
Лучи от нас сокрылись прочь;
Открылась бездна звёзд полна;
Звездам числа нет, бездне - дна.

Песчинка, как в морских волнах,
Как мала искра в вечном льде,
Как в сильном вихре тонкий прах,
В свирепом как перо огне,
Так я, в сей бездне углублён,
Теряюсь, мыслями утомлён.

Уста премудрых нам гласят:
Там разных множество советов;
Несчётны солнца там горят,
Народы там и круг веков:
Для общей славы Божества
Там равна сила естества.

Но где ж, натура, твой закон?
С полночных стран встаёт заря?
Не солнце ль ставит там свой трон?
Не льдисты ль мешут огонь моря?
Се холодный пламень нас покрыл.
Се в ночь на землю день вступил,

О, вы, которых быстрый зрак
Пронзает в книгу вечных прав,
Которым малый вещи знак
Являет естества устав
Вам путь известен всех планет;
Скажите, что нас так метет?

Что зыблет ясный ночью луч?
Что тонкий пламень в твердь разит?
Как молния без грозных туч
Стремится от земли в зенит?
Как может быть, чтоб мёрзлый пар
Среди зимы рождал пожар?

Там спорит жирна мгла с водой;
Иль солнечны лучи блестят,
Склонясь сквозь воздух к нам густой;
Иль тучных гор верхи горят;
Иль в море дуть престал зефир,
И гладки волны бьют в эфир.

Сомнений полон ваш ответ
О том, что окрест ближних мест.
Скажите ж, коль пространен свет?
И что малейших доле звёзд?
Несведом тварей вам конец,
Скажите же, коль велик Творец?

The day has turned its face aside;
With dusky night the fields are spread;
Upon the hills black shades abide;
And far from us all lights are fled;
The void has opened, stars abound;
Stars numberless, and void profound.

Within a wave as grain of sand,
Or spark in ice from ancient days,
As speck of dust in whirlwind and
Like feather in a raging blaze,
So by this void am I devoured,
I'm lost, with thoughts I'm overpowered!

From lips of wisest men we learn:
Out there shine lights in multitude;
There suns uncountable must burn,
Folk, too, with histories imbued:
That God's great glory is to flourish
There also nature must He nourish.

But, nature, what is this you've done?
At midnight see a dawn arise!
Have you set throne there for the sun?
Is fire trapped in floes of ice?
This frozen flame suffuses sight!
This places day on earth in night!

If any, whose revealing gaze
Into the book of truth can see,
To whom in things the smallest trace
Shows charter of reality,
To whom is known the planet's way
That which so confounds us — say!

Why trembles clear light in the dark?
Why can a thin flame strike the earth?
Without dark clouds how does the spark
From land to zenith issue forth?
And how does frozen steam aspire
In winter to conceive a fire?

There water battles darkling haze
Or shine forth beams of sun, rays bright,
Aslant through air to our gaze;
Or cloudy hills in fire alight;
Or Zephyr blows at sea no more
And smooth waves beat on airy shore.

Your answers will not doubt disperse,
These questions neither hard nor far.
Tell then how large the universe?
And what is past the smallest star?
You know not what for us is fated?
How great then He the world created?⁸

⁸ Lyrics Translations. URL: <https://lyricstranslate.com> (accessed 08 February 2023).

The poem is an ode by genre, iambic in size with cross and adjacent rhymes, 8 stanzas. The poet reflects on God's greatness, observing the northern lights. In this poem, Lomonosov called the strikingly beautiful northern lights "great", this reflects the deep consciousness of God's majesty of the scientist and poet himself⁹. His own hypothesis about the electrical nature of the phenomenon is woven into the poem: *waves beat on airy shore*.

Lomonosov's contribution to the exploration and development of the Arctic territories is significant. As a true Russian northerner, M.V. Lomonosov understood the strategic role of exploration of the northern spaces for the future development of the Russian economy and geopolitics in international relations. In many of his literary works, M.V. Lomonosov touched upon the development and settlement of the Arctic [8, 9, 10], substantiating the great importance of the discovery of the North and the use of the Northern Sea Route to strengthen the power of the country and to develop international trade relations.

M.V. Lomonosov is the ideological inspirer and official scientific leader of the first Russian transarctic expedition. He considered expeditions to be an effective way to explore the Arctic territories, for which he seriously prepared for a long time and which he called a necessary condition for their successful implementation [6, Shirin D.A., p. 6]. At the time of his appointment as the scientific leader of the expedition, he had extensive geographical knowledge, literary sources and information obtained from personal communication with sailors, merchants and industrialists, and he had already developed several options of the transarctic crossing routes from Arkhangelsk to the Pacific Ocean along the coast of Siberia, and at that time, he was the most informed in the field of Arctic navigation studies scientist with personal experience of Arctic voyages [11, Lisnichenko V.V., p. 40]. Navigation along the Siberian coast showed that, to the north of the coastal ice fields, vast areas of water free of ice are formed during the warm period, suitable for navigation. According to the most conservative estimates, young Mikhail Lomonosov travelled more than 7000 nautical miles on small fishing vessels in the Arctic seas [ibid., p. 42]. Before expressing his main ideas about the passage of the Siberian Ocean to the east, he studied the theoretical possibility of such a voyage. Therefore, long before the generally accepted scientific theories were formed, M.V. Lomonosov had already formulated many provisions of modern polar oceanography and related areas of geographical science [12, Ogorodov S.A., Romanenko F.A., Solomatin V.I., p. 11].

In the reports of the Academy of Sciences for 1754–1756, Lomonosov's attention was drawn to the problems of the Arctic for the first time. The report for 1754 stated that M.V. Lomonosov investigated the waters of the Arctic Ocean to determine the conditions of their freezing

⁹ Markov N.F. Russkiy sever v proizvedeniyakh M.V. Lomonosova: Rech', chitannaya v torzhestvennom sobranii «Vologdskogo obshchestva izucheniya Severnogo kraya» v den' chestvovaniya 200-letiya pamyati Lomonosova 8 noyabrya. 1911 g. [The Russian North in the works of M.V. Lomonosov: Speech read at the solemn meeting of the "Vologda Society for the Study of the Northern Territory" on the day of honoring the 200th anniversary of the memory of Lomonosov on November 8, 1911]. Vologda, 1912, 17 p. URL: lomonosov.niv.ru/lomonosov/kritika/markov-russkij-sever.htm (accessed 08 February 2023).

[13, Lomonosov M.V., p. 391]. In 1755, he compiled a “Letter on the northern passage to the Ost-India by the Siberian Ocean”, the contents of which he used in a work written 8 years later: “A brief description of various voyages in the northern seas ...”, in the chapter “On the possibility of navigation in the Siberian Ocean to the Ost-India” [7, Eliseev A.A., p. 603]. During the period from 1757 to 1759, Lomonosov studied natural resources of the North, icebergs, complexity of ship navigation and factors affecting the safety of travel by sea and the reliability of observations of the instruments of that time. In his treatise “On the layers of the Earth” and in his speech “Discourses on the great accuracy of the sea route” at the General Meeting of the Academy of Sciences (May 8, 1759), M.V. Lomonosov touched upon the topic of navigation and methods of nautical astronomy. In his work “Discourse on the origin of icebergs in the north seas” (published in the Proceedings of the Royal Swedish Academy in 1763), he discussed the origin and movement of icebergs “floating in the north seas”, explaining that their formation and movement were subordinated to the sea currents [6, Shirin D.A., p. 3]. In the paper “Discourse on the origin of ice mountains in the northern seas” (1760), M.V. Lomonosov tried to explain this phenomenon by the fact that in the spring, the great Siberian rivers throw a huge amount of ice into the ocean, which accumulates near the coast. Further to the north, there should be less ice, and the conditions for navigation are more favorable [14, Lisnichenko V.V., p. 441].

From 1761 to 1765, in the last 5 years of his life, M.V. Lomonosov prepared and published his works on the possibility of northern sea expeditions and conditions for advancement on the Arctic Ocean. He also wrote about the Russian North in many of his poetic works, for example, he touched upon the Arctic/northern themes in such poems as “Ode on the accession of Elisaveta Petrovna” (1747), “Ode on the accession of Elisaveta Petrovna” (1748), “A praise to Elisaveta Petrovna, the Sovereign of All Russia, spoken on November 26, 1749” (1749), “Ode in which Her Majesty is thanked from the writer for the highest mercy shown to him in Sarskoe Selo on August 27, 1750” (1750–1751), “Ode on the accession of Elisaveta Petrovna” (1752), “Ode on the birth of Pavel Petrovich on September 20, 1754” (1754), “Dedication to the Brief Russian Chronicler” (1760), “Peter the Great”, heroic poem (1760), “Ode to Petr Fedorovich on the day of accession to the throne” (1760) [12, Ogorodov S.A., Romanenko F.A., Solomatin V.I., pp. 12–13].

It should be noted that all of the above mentioned works were preparatory for the writing in 1763 of the work “A Brief description of various voyages in the northern seas and an indication of a possible passage of the Siberian Ocean to East India”, which occupies a special place in the study of M.V. Lomonosov. This work is, in fact, the first scientific project for the development of the Northern Sea Route, containing the rationale for one of the important state objectives [6, Shirin D.A., p. 4].

In this work, Lomonosov noted the great importance of increasing the population in the Arctic. He considered the population as the most important component of the economic potential of the state. According to M.V. Lomonosov, the demographic situation depends on the migration mobility of the population. He recommended creating more favorable living conditions and easing

taxes. Lomonosov regarded immigration of foreign subjects to Russia as a positive phenomenon [15, Okunev Yu.P., p. 88]. Moreover, he saw the significance of the Northern Sea Route in the opportunity to strengthen Russia's trade relations with Europe, Japan, China, India, America and to achieve state unity on a vast territory stretching to the Pacific Ocean [6, Shirina D.A., p. 4].

Later, relying on the Pomors' reports on climate, time of sea ice clearance, fogs, and new reports on the northern coasts of America, he wrote "Addendum on northern navigation to the east along the Siberian Ocean" (1764), "Second addendum, compiled by new reports of industrialists from the American Islands and on the issue of the Tobolsk merchant Ilya Snegirev and the Vollogda merchant Ivan Burenin" (1764), "Notes on equipping the expedition" (1764), "Sample instruction for marine officers, sent to search for ways to the east by the Siberian ocean" (1765) [14, Lisnichenko V.V., p. 436]. M.V. Lomonosov found "sufficient space" for the ship's passage northwards to Japan and the Ost-India in the tales of Siberian industrialists and speechless animals [Ibid., p. 478; 480–481]. Moreover, M.V. Lomonosov put forward the theme of developing native language and culture. According to him, language, being the basis of culture, is also the basis of the spiritual unity of people [16, Arapov O.G., p. 18]. He believed that the development of the Arctic would expand the horizons of knowledge of Russian national culture. "Judging by time, we see that the Russian language from the reign of Vladimir to the present century, more than seven hundred years, has not been changed so much that it was impossible to understand the old one: not as many peoples, not learning, do not understand the language, which their ancestors wrote for four hundred years, for the sake of its great change, which happened after that time" [17, Lomonosov M.V., p. 402].

So, M.V. Lomonosov is known in Russia and in the world as a scientist of all branches, he managed everywhere and brought something new, unexpected, progressive. The range of branches of science with which his discoveries are associated is wide and varied. However, he is known in China mainly as a scientist of natural sciences, while his research in various specific branches of sciences, including the Arctic exploration, was little known. The state of Lomonosov studies in China was described in detail in our article "Lomonosovvedenie in the People's Republic of China: Current State and Development Trends" [18, Wang Q., Wang Ch.].

The concept of creating an electronic database "Digital Lomonosov" in Russian and Chinese

The legacy of the great scientist should be widely studied, discussed and disseminated by Lomonosovists both in Russia and in other countries of the world. Digitalization of such a world scholar as M.V. Lomonosov through the translation and dissemination of his scientific achievements in different languages is very significant. At present, the compilation of the electronic database "Digital Lomonosov" in parallel in Russian and Chinese and the popularization of his scientific works on the Arctic by means of information technology in China are of particular relevance to deepen the research spectrum of Lomonosov studies and the comprehensive introduction of his thoughts to promote modern science in China.

In order to achieve the goal of popularizing M.V. Lomonosov in China, databases of all his works of art and scientific researches should be created both in Russian and Chinese. These works never lose their relevance for the study of modern sciences. The creation of the “Digital Lomonosov” database in Russian and Chinese is also due to the unprecedented need to learn the history of science, to foster patriotism among modern young people, to strengthen scientific cooperation between Chinese and Russian scientists in different fields.

The works of Lomonosov in China have been very little studied and very rarely translated into Chinese, except for some natural science axioms [18, Wang Q., Wang Ch., p. 127]. Little attention has been paid to the analysis of his odes in terms of the theory of the “three styles” and the variation of Church Slavonic and Old Russian, the contribution of Lomonosov to the development of philosophy, philology, literature and translation studies, pedagogy and other humanities, and his views on the development of the Arctic and the historical development of Russia have been underestimated. His correspondence with his contemporaries on the discussion of all important scientific issues has not been studied at all in the Chinese scientific community. Besides, scientific works of Russian authors on Lomonosology form large gaps in China. Few scientists, humanists, linguists, historians and translators in China pay attention to the works and thoughts of Lomonosov in different fields of science, and especially few discuss his achievements in the exploration of the Arctic. We see the great relevance of creating the “Digital Lomonosov” database by the joint efforts of scientists from Russia and the world. This project becomes real and possible with the comprehensive development of information technologies.

Nowadays, any science and technology cannot develop without the support of information technology. The digitalization of Lomonosov’s scientific achievements refers to the use of modern computer and network technologies in traditional research. It is related both to the digitalization of the subject of research itself and to the intellectualization of research methods, which implies multidisciplinary participants in the research team, high speed in information dissemination and in cultural exchange [19, Zhang Sh., p. 56].

The main goal of digitalization of Lomonosov’s achievements was to integrate modern information technology with the scholar’s research results.

Digitization of Lomonosov’s heritage is a synthesis of digitization, informatization, management and data analysis of the author’s achievements. All these processes are a transition from information coding to conventional notation. The processing of text codes of Lomonosov’s scientific achievements is the technical basis for using data on the Internet and creating information links [20, Ouyang J., p. 68]. As a scientist from Zhejiang University Jiang Wentao pointed out, “Digitalization of scientific achievements reflects the typical intersection of the humanities and natural sciences, changing the traditional ways of researching scientific results oriented on paper sources and careful studying of paper texts” [21, Deander J.W., Zhao W., p. 26]. With the help of text codes, all informational knowledge relating to different languages of different nations can be linked to each other by a single public digitalized language, which will lead to a significant change

in the acquisition of knowledge, information and research paradigms.

Digitalization of Lomonosov's works means using modern computer and network technologies for a quick search and access to all materials on the research and work of Lomonosov in all sciences in Russian and Chinese, as well as for conducting research on Lomonosology. The creation of the Lomonosov database on the basis of digitalization changes the forms of knowledge acquisition, ways of marking, comparing, interpreting, sampling, as well as re-creating and transforming his scientific results through design, calculation, analysis and visualization [22, Berdick A.J., Drucker P. p. 3]. Digitization of scientific works and ideas of Lomonosov is closely linked to numerical computing, data networking, statistics, text recognition, subject classification, mathematical modelling, information preservation and other types of information technology. Digitization of scientific results of Lomonosology in Russia and other countries will guarantee the intellectualization of Lomonosov's research methods, high speed of search and distribution of information about his ideas and contribution to various aspects of the humanities and natural sciences and thereby popularize him among modern Russian and Chinese Internet users and researchers [19, Zhang Sh., p. 56]. This process requires, first of all, bringing all available works of art and scientific papers written by Lomonosov himself and documents in which his main ideas on relevant issues were recorded into electronic format. This requires the involvement of professionals in the field of translation and information technology.

The works of M.V. Lomonosov and the literature on his scientific and creative activity in the database should be presented in Russian and Chinese in two parallel headings of each web page. To create the database, all materials should be grouped by type of publication: books, articles from journals and newspapers. Information about publications will be arranged in alphabetical order of authors and titles for each category of sciences. The list should begin with information on books in a particular science, followed by information on publications in periodicals.

The multidisciplinary of the joint research team from Changchun University and Northern (Arctic) Federal University will provide gradual steps for joint work of the Project participants. First of all, it is necessary to gather all materials and all translators and to distribute tasks in order to perform quality translations of all Lomonosov's works and articles from journals and newspapers in Chinese. In this process, there will be many difficulties for the Chinese translators to understand the texts of the 18th century correctly. To resolve this issue, it is necessary to organize a consulting group of Lomonosov researchers in various areas of science to help Chinese translators. Without proper understanding, there can be no question of adapting the materials and adequately reflecting them in Chinese. The stylistic and genre features of Lomonosov's work also create great difficulties for conveying the content and thought of Lomonosov in the form of a version in Chinese.

At the second stage of creating the "Digital Lomonosov" database, after the translation of all his works and scientific articles about his work into Chinese, it is necessary to introduce digital technologies for intelligent text processing, formatting data, pictures and audiovisual resources explaining his viewpoints and ideas in the cultural background of the 18th century in order to re-

vive and clarify Lomonosov's thought to compare the historical development of different sciences with the contemporary research results. Moreover, it is necessary to constantly improve and process the databases with the help of computer and network technologies.

When digitizing all Lomonosov's works and writings in Russian and Chinese, it is also important to use pictures, video and audio with additional comments on cultural background knowledge to help Chinese readers to understand Lomonosov's translations in Chinese. Diversification of professions among the Project participants from the Russian and Chinese sides will increase the field of research on Lomonosov and extend the influence of the developed database in Russia and in China for more in-depth research on Lomonosov and his ideas in all fields in the future. In addition, to carry out the "Digital Lomonosov" database project, a specialized translation, dissemination and research site should be created to attract more scholars to participate in the joint research and dissemination of Lomonosov in China. Further, after the digitalization of all data regarding M.V. Lomonosov, it is necessary to develop research software, to make multilateral statistics of digital data, their classification, analysis, comparison of texts, to analyze data, to create metaknowledge contained in Lomonosov's works, to reveal his core thoughts and concepts, regularly holding conferences and forums online and offline, as well as to create consulting teams in Lomonosology to serve native speakers of Russian and Chinese. Moreover, forums and conferences should be held regularly to collect new questions for further research, supplement data resources and enhance the exchange of research experience, as well as to develop cultural dialogue between researchers. The created databases of "Digital Lomonosov" should be open and shareable among all researchers and translators with the aim of long-term training of young scientists and involving them in a comprehensive study of the Lomonosov phenomenon in China and in the world.

Conclusion

The ideas of developing the "Digital Lomonosov" project require every possible effort on the part of Russia and China in order to strengthen the joint development of natural resources in the Arctic, and expand scientific and humanitarian cooperation between both countries in the future.

M.V. Lomonosov, as a scholar-encyclopedist, should be given more attention among scientists of the humanities and natural sciences. The digitalization of his scientific works and studies will ensure the expansion of the influence of his ideas in the international scientific community and the dissemination of his scientific thoughts and achievements throughout the world. The "Digital Lomonosov" project will undoubtedly open up new directions of cooperation in the development of the Arctic space and the Northern Sea Route between scientists from Russia and China. At the same time, the digitalization of all his works will expand the horizons of researchers of Chinese Lomonosology and create new fields of connections in the development of Russian philology, literature, rhetoric, history, philosophy, and will also increase Lomonosov's influence on the modern

development of sciences in general. Digitalization of scientific works of M.V. Lomonosov in Russian and Chinese requires the Project participants to have multidisciplinary knowledge and information technology, which is the challenge and difficulty of the Project.

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