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SOCIAL AND HUMANITARIAN DIMENSION IN ACADEMIC CAREER OF ACADEMICIAN A. N. KRYLOV

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Abstract

The paper has a particular first-time focus on scholarly endeavours of Russian and Soviet Academician Alexey Nikolaevich Krylov to promote the development of cultural, civilizational and humanitarian values in society. A Turkic offspring, the son of a hereditary nobleman, A. N. Krylov in the 20th century became a 4-star general of the Russian Empire's fleet, an academician of the Academy of Sciences of Russia and the USSR. In his professional life, Academician Krylov was of the conviction that the infinite power of science should benefit mankind. Besides purely logical creative inputs that resulted from his theoretical developments, the founder of ship theory, Alexey Nikolaevich Krylov, stated new promising challenges, based on socially relevant feedback and even the bitter experience of ordinary people. According to most researchers, academician A. N. Krylov ranges among the most renowned scientists like Archimedes, Leonardo da Vinci, Pascal, Lomonosov, etc. whose scientific discoveries were geared to make a breakthrough that would improve human lives. In his professional activity, social and humanitarian dimensions stood out with great clarity in the development of general cultural issues in the history of science and technology; the invention of a number of naval machinery and devices designed to protect the life and health of sailors and passengers onboard; his humanistic values also resided in his support to the most optimal shipbuilding projects in terms of the safety and security of people onboard; the facilitation of the return of the Soviet country to the system of universal civilizational principles.

Keywords: Ship theory, humanistic ideas, international cooperation.

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1. Introduction

The relevance of the issue under study stems from the importance to accompany military-technical surveys with humanitarian messages and the need to use the wealth of professional and social experience gained by the academician and 4-star general of the fleet Krylov (2003) who provided theoretical background and practical organization for a number of scientific and technological breakthroughs, basic research, government programs in the field of shipbuilding and vocational education. The methodological heritage of the multidisciplinary scientist Krylov (2003) is of exceptional value today, due to the global crucial trend to strive for innovative, technological breakthrough and multicultural, humanistic forms of sociocultural human life.

In domestic and foreign historiography, there is an enhanced attention to the issue of the participation of tsarist regular and naval officers in the turbulent events of the early 20th century (Nazarenko, 2017; Tolz, 1997). There are a lot of articles, brochures and books geared towards some aspects of the life and career of Krylov (2003). However, this issue is still deemed insufficiently elaborated, as testified by a critical assessment of the book "Krylov" by Lipilin (1983), published in the famous series "Life Stories of Remarkable People": "... instead of a true biography of an eminent scientist and a noteworthy patriot, a patchwork, illiterate essay saw the light" (Melnikov, 1985, p. 3). Early scientific publications (1940s – early 1980s) substantively depicted the professional activity of Krylov (2003), but they merely focused on the reasons for Krylov's high achievements primarily driven by the triumph of socialism in the USSR and party leadership under the banner of Marxism-Leninism (Khanovich, 1967). The author believes that most scientific discoveries of the socialist regime were not objectively predetermined, since it was a subjective factor, the highest level of Krylov's (2003) scientific qualification, his dedicated service to science, naval duties, his commitment and loyalty that all contributed to their achievement. Captain 1st rank, Assoc. Prof. Varganov (2006) gave a professional gaze of a naval officer at the military service, scientific work, teaching and social activities of the shipbuilder, Krylov. Nevertheless, his publications contain some inaccurate biographical information and inconsistencies concerning the promising significance of some of Krylov's research.

An extremely rich historical and literary source for the study of this scientific issue is the memoir of Krylov (2003) himself "My Memories". To provide a reliable assessment of Krylov's scholarly endeavors, in 1936-1956 the analysis of his titanic scientific work was published by the Academy of Sciences of the USSR in the edition "Collected Works of Academician A.N. Krylov" in 12 volumes that consist of 18 books.

New facets of professional activity of Krylov are revealed in the contents of corporate websites of respective enterprises and organizations whose scopes of activity are intrinsically intertwined with the name of A.N. Krylov, with the navy, shipbuilding, research in mathematics, physics, hydro and aerodynamics, etc. (Balkashin, 2019; Fedotov, 2009; Great Russian inventors, 2019).

All in all, to date, the life feat of a brilliant scientist, a prominent patriot of Russia has not been exhaustively presented and thoroughly comprehended. The use of new historical sources contributes to relevant historical generalizations of the unique life and activities of the brilliant scientist A.N. Krylov, who combined his military-technical developments with humanistic messages for the safety of people.

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2. Problem Statement

A very important issue for historical science to address is the study of personal motives, organizational and social environment of research activities, particularly in the military-technical fields. Challenge related to the promotion of military shipbuilding and ship theory were the main direction of activity of Academician A.N. Krylov. Despite being interlinked with the armed forces and military equipment, Alexey Nikolaevich made his discoveries and inventions for peaceful purposes, as well, to ensure safety of life and health through a no-harm approach. Many theoretical works of the academician were devoted to the development of general scientific, socio-cultural, rational and ideological solutions and humanistic values. An important motive for combining the technical developments of A.N. Krylov with humanitarian ideas and promises was the desire to engage scientific and technical achievements effectively for sociocultural development of the country, for the benefit of humanity.

3. Research Questions

The subject of research is: Krylov's analytical work to identify the causes of shipwrecks in different seas due to technical imperfections; development of theoretical problems in shipbuilding and their mathematical applications; cooperation with practical seafarers to determine ways to prevent the death of sailors and passengers; use of scientific discoveries and inventions of A.N. Krylov in the shipbuilding industry of different countries including England, France, etc.; contribution of academician Krylov to the development of universal culture and scientific knowledge through the translation and new interpretation of the ideas of Isaac Newton, Leonhard Euler, Karl Gauss and other great scientists; humanistic, internationalist and non-technical incentives behind the research activity of Alexey Krylov; historical continuity in the patriotic activity of academician A.N. Krylov, regardless of changes in the socio-political structure of the country.

4. Purpose of the Study

The paper aims to identify the mental and sociocultural foundations used by A.N. Krylov to support military-technical developments with humanistic rationale, both in his own scientific research and in scientific-organizational activity and teaching. The objectives of the paper are to define the humanitarian significance of A.N. Krylov's research works, to study the historical conditions and reasons for Krylov's involvement in the management of scientific institutions, to study his main approaches in scientific and organizational activities, and to highlight the international assessment of the discoveries and inventions of academician-shipbuilder A.N. Krylov.

5. Research Methods

The scientific diversity and richness of shipbuilder A.N. Krylov calls for a comprehensive study of his personal events, scientific and creative work. All facts and phenomena in the paper were addressed in a consistent manner in order to reveal the individual integrity of the investigated hero and to obtain a single theoretical picture adequate to the objective historical reality. The use of comparative, typological and

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structural-functional approaches in the compilation of the material for the research and evaluation of the creative path of academician Krylov contributes to a reliable description of humanistic creative ideas and practical activities of A.N. Krylov.

6. Findings

A major concern for naval scientists is the theoretical substantiation and technical support for the safe navigation of ships. During his studies at the Naval College (1878–84), midshipman Krylov expressed interest for the idea of improving ship navigation devices that at that time had an iron casing and metal equipment thereby distorting the compass outputs. In many countries around the world, people remembered the tragedy that happened in Ireland in 1862 when over 200 people died as a result of collisions with the coast of two passenger steamers laying off the course according to distorted compasses. The invention of the world's best dromoscope – a device for automatic calculations of deviation (deviations of the compass needle) – was credited to the twenty-three year old midshipman A. N. Krylov. Krylov's dromoscope, being the most precise and cheap, was installed on naval vessels of the Russian fleet, received a number of awards including the gold medal of the World Exhibition in Paris (1900), the gold medal of the Fleet Update League (1908), etc.

On September 1870, the English ship Captain capsized in the Adriatic Sea and sank with the loss of around 532 lives due to the fact that stability requirements – ability to float in water – were not incorporated into the design and construction of the vessel. For the same reason, in 1893, the English battleship Victoria keeled over in the flat calm Mediterranean Sea and sank with 500 sailors onboard due to the loss of stability caused by a hull breach from an accidental collision with another ship of the squadron. In addressing ship stability in case she gets a breach of the hull, associate professor of the Maritime Academy A.N. Krylov endorsed the idea of Vice Admiral S. O. Makarov to reach ship stability due to intentional flooding of hold compartments. As far back as early 19th century, Alexey Nikolaevich managed to make mathematical calculations to determine certain areas of the hull that should be flooded for the stability of a watercraft. Krylov's floodability tables very soon showed their salutary effect during the Russian-Japanese war when the battleships Tsesarevich and Orel, reconstructed upon the Krylov's idea of ship floodability, even after receiving hull breaches, remained afloat and kept the sailors alive.

In 1895 the calculations to determine the maximum allowable depth for a ship moving in shallow water made by staff captain A.N. Krylov helped to protect the honor and dignity of the commander of the imperial yacht Polar Star. The calculations were made upon the requests from the Marine Technical Committee following the commander's refusal to transport Tsar Nicholas II from Libau (Liepāja) to St. Petersburg due to the insufficient depth of the canal in the Port of Libau. The scandal could turn into a severe punishment to the commander for disobeying the royal order, but A. N. Krylov proved with his calculations that if the boat rolled and pitched on a big wave, it would be likely to hit the bottom of the channel thus threatening the life of the young emperor.

On March 1896, at the English Society of Ship Engineers A.N. Krylov gave a report on his "theory of oscillating motions", after which he was elected to this world-renowned society. When Alexey Nikolaevich was awarded the diploma of an honorary member of the British Society of Shipbuilding Engineers in 1944, British Ambassador Sir A.C. Kerr said: "Academician Krylov, like many of his famous

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compatriots headed by Peter I and Lomonosov, is a living example of a versatile personality of a genius" (USSR Academy of Sciences, 1944).

The theoretical works of A.N. Krylov on interpreting, tailoring and explaining the scientific ideas of the great scientists including Isaac Newton, Leonard Euler, Karl Gauss, and others are of great importance to favor human truths and natural scientific knowledge, especially in Russia. Krylov confirmed the evidence of I. Newton's theory on the world order, using in his computation the basic methods to determine the orbits of comets and planets and comparing the methods of Newton, Laplace, Olbers and Gauss. In 1936, the Academy of Sciences of the USSR published a translation from the Latin of the fundamental work of I. Newton "Mathematical Principles of Natural Philosophy" by A. Krylov, which stated the law of universal gravitation and the three laws of motion recognized as the foundation of classical mechanics. Krylov performed the work "with extraordinary thoroughness and love [...], and we received the greatest work of human genius in exemplary translation in excellent Russian with magnificent drawings" (Chaplygin, 2003, p. 169). This work was also of great value because Alexey Nikolaevich included his 207 notes, comments, as well as a conclusion on perturbed motion, resulting from Newton's geometric considerations. Russian scientists believe that thanks to the works of A.N. Krylov, Newton's ideas "have had rebirth and become accessible to a contemporary reader" (Khanovich, 1967, p. 15). In the same year, a translation of the German manuscript of K.F. Gauss "Theoretical Astronomy" was published as part of the 6th volume of the Collected Works of Academician A.N. Krylov ("Astronomy"). In 1937, the USSR Academy of Sciences published another volume of Krylov's works, which contained his translation into Russian of two books by L. Euler "The Theory of Moon Movement" with Krylov's additions and notes on 130 pages.

Specifying his ideas on the theory of the ship, A.N. Krylov invented 30 instruments, among which is a device for the automatic integration of differential equations. Creating his calculating machine, reflecting on physical and mathematical applications to the research of I.M. Sechenov, A.S. Popov, academician Krylov contributed to the preparation of the scientific basis for the creation of computers, cybernetics and electronics – integral parts of modern IT technology.

Alexey Nikolaevich was a prominent figure in that he greatly contributed to the creation of a decent image and recognition of domestic science abroad. In March 1921, A.N. Krylov, on behalf of the Soviet Government, as part of the academic commission, went to Europe to renew scientific ties with foreign scientists, to acquire new scientific literature, physical instruments and other equipment for laboratories and other departments of the Academy of Sciences and universities of the country. One of the breakthrough solutions of Alexey Nikolaevich during the period of foreign scientific business trips of the period 1921–1927 was the restoration of business ties with the Paris Academy of Sciences – with the oldest academy worldwide, which became a model for Peter I in the organization of the Russian Academy of Sciences (by Decree of January 28, 1724). The French looked with interest at the Russian academician Krylov on account of the fact that he had been elected to the French Maritime Society in 1897.

The development of trust-related British and Soviet scientific networks was promoted by the fact that A. Krylov was a full member of the Royal Astronomical Society of England from 1924, and since 1896 – a foreign member of the English Society of Ship Engineers. At a special meeting in London dedicated to

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the anniversary of the Soviet Academy, British scientists approved the resolution expressing "deep respect for the great work performed by the Academy to enrich the knowledge and culture across the world."

In Europe, A.N. Krylov secured the execution of the will of the famous Russian collector A. Onegin (Otto) by returning from Paris the Onegin Museum, a unique collection comprised of manuscripts and various editions of A. S. Pushkin, letters of the great poet and to him, portraits, the original of his death mask, documents related to the duel of the poet and many other valuable monuments of Russian culture, for various reasons ended up abroad. All his work in a foreign mission served to cement the intercultural, trade relations of the USSR with European countries. Given the vast experience of Alexey Nikolaevich in the field of ship affairs and his encyclopedic knowledge, he was also entrusted with government tasks for the purchase and construction of ships abroad and transporting them to the USSR. Alexey Nikolaevich effectively put his knowledge and skills of an experienced shipbuilder to good use to take technical control over the construction of steam timber vessels and speedboats in France and Norway, the design and construction of oil tankers in France. A wide erudition in shipbuilding allowed him to quickly and accurately identify errors in ships under construction abroad commissioned by the USSR.

Upon his return to the USSR, the 65-year-old A. N. Krylov with even greater diligence continued research, teaching and organizational activities thereby bringing a new stream of humanitarian and sociocultural values into society. His pedagogical talents always admired his colleagues, and in Soviet times they were unlocked in new dimensions. As head of the Maritime Academy (1919–1920), he occasionally delivered brilliant lectures on advanced mathematics in the course "Theory of the Ship" in front of almost illiterate students, barely familiar with four arithmetic operations.

Such devoted and unselfish efforts to raise the educational and cultural level of "homespun" people were due to the rational acceptance of the new government established in the country. Being one of the eminent domestic thinkers with the broadest erudition, he clearly recognized the pressing problems of his Fatherland. The mental basis for Krylov to continue his scientific and creative activity in the new environment was his awareness of the fact that he was the heir of the centuries-old dynasty of patriots of Russia. His heart and soul were full of responsibility for the historical fate of his homeland.

7. Conclusion

The mental representations of academician Krylov about serving the beloved work, science and the navy coincided with the ideas and programs of the modernization of the country. In his professional activity A.N. Krylov was guided by the principles of humanism, the aspiration of a civilized socio-cultural arrangement of the country. Many ships created under the supervision of academician Krylov played an important role in achieving victory over the German fascist aggressors and in asserting the ideals of humanism and freedom during World War II. The evidence of historically continued socio-economic significance of A.N. Krylov participating in the creation of the Northern Sea Route are modern statements by the US leaders about the desire to participate in its operation as a strategic resource for the development of the world market. The rich experience of A. Krylov who combined his professional activities with the consistent promotion of the humanity and spiritually rich relations in society is today a vivid example and motivation for serving humanistic ideals and cultural and civilizational values. Modern modernization

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challenges require the use of historically approved ways of enhancing the socio-humanitarian role of scientists in the process of technological, global and economic transformations.

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