

Soviet Metallurgy through the Eyes of American Metallurgists: Second Half of the 1950s

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Abstract—The article discusses a small stage of development of metallurgical science and technology in the Soviet Union, namely, the history of establishing scientific contacts between American and Soviet metallurgical scientists in the second half of the 1950s. By the mid-1950s, the successful recovery of the Soviet economy after WWII ended with a scientific and technological breakthrough in the field of nuclear and rocket and space technologies. This significantly strengthened the political and humanitarian authority of the USSR in the eyes of the world community, making the country attractive for scientific and technical cooperation. The successes of the Soviet nuclear and rocket science would not have been possible without high achievements in the basic economic sectors, such as metallurgy. The United States and its Western European allies developed an understanding of the potential of limited scientific and technical cooperation with the USSR and the unproductive policy of its isolation. Establishing scientific and business contacts with Soviet metallurgical enterprises, research institutes and academic institutions and forced Americans to reconsider their own achievements in the industry.

Keywords: metallurgy, science, industry, engineering, Soviet-American relations, research institutes, higher technical education

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INTRODUCTION

The process of development of historical science in recent decades has led to an increase in the importance of such a direction as “living history”. The essence of the direction is to study the practices of interpreting historical processes from the point of view of ordinary citizens, rather than professional historians. In this regard, an interesting case is the study of the perception by American metallurgists of the achievements of Soviet metallurgy in the mid-second half of the 1950s, when despite geopolitical contradictions, cooperation in this area between the USSR and the United States began again.

This was reflected in a whole series of publications by American metal-makers and metallurgists who visited our country and published their articles in American technical journals. Such publications reflected the current technical and technological level of Soviet metallurgy, gave a description of training engineering personnel and the activities of metallurgical science in order to objectively compare the experience of the Soviet Union and the United States. The authors con-

sidered it interesting and useful for the current stage of development of domestic metallurgy to reproduce these reviews in this article with the appropriate comments.

The matter is facilitated by the fact that in the Soviet Union there was a system of abstract journals that translated the most interesting scientific articles in various fields of knowledge from leading foreign journals. This also applied to metallurgy. Translations were prepared by important state bodies, in particular the Central Scientific and Technical Library of the Central Research Institute of Ferrous Metallurgy, whose activities were supervised by the Central R&D and Design Agency of the State Planning Committee of the USSR. The library included a group of professional translators who selected and translated analytical articles from foreign journals. One of these translations¹ were used by the authors to illustrate the under-

¹ Translation No. 4161. Department of Bibliography. Central Scientific and Technical Library of the Central Research Institute of Ferrous Metallurgy. Central R&D and Design Agency of the State Planning Committee of the USSR. Translator N.A. Smolyaninov. p. 76.

standing of American engineers regarding the level of Soviet metallurgy in the second half of the 1950s. This paper presents the impressions of American metallurgists taken from an article published in the *Journal of Metals* [1]. The article was written on behalf of the editors.

RESEARCH TECHNIQUE

The research methodology is based on the problem-chronological approach, which, based on the cited source, makes it possible to reliably recreate the picture of scientific and technical cooperation in metallurgy between the United States and the USSR in the second half of the 1950s and interpret it retrospectively. The work is based on the recognition of the objectivity standards, which is the basis of the approach to interpreting the cause-and-effect patterns of historical events and phenomena, as well on the document and scientific literature evaluation.

RESULTS AND DISCUSSION

The authors of the report note the most interesting moments. First of all, this is the further construction of ferrous metallurgy enterprises. They note in the next five years that a metallurgical plant with a full production cycle will be built in Western Siberia. The enterprise will build five 1.530 m³ blast furnaces each with a capacity of 1 million tons of pig iron per year. Six 500-ton open-hearth furnaces are also planned for construction. The productivity of a steel rolling plant will have to reach 3.7 million tons, and the number of employees should be 30 thousand people.

Furthermore, the document describes Soviet plans for developing steel production mainly in the east of the country, where there were promising iron ore deposits, up to 75% of explored coal reserves and 80% of potential hydroelectric energy. Attention is paid to the production of manganese stainless steel in the USSR (using oxygen), while pointing to the development of continuous steel casting, as well as plans to revive the Thomas process of redistribution of liquid iron using ores containing a large amount of phosphorus.

In an editorial article by Starrat, editor-in-chief of the magazine, and his deputy Burke, attention was drawn to the attitude in the USSR to technical information from other countries. The authors claim that reproductions of articles from a number of other American journals on metallurgical issues were distributed in the Soviet Union under the cover of their *Journal of Metals*. Moreover, it was the untranslated photo-offset reproduction, made by the Soviet authorities for distribution in the USSR. This journal was only one of hundreds of similar American and other foreign journals that were reproduced and widely distributed in the Soviet Union for official use.

As noted by American colleagues, this (reproductions of Soviet metallurgical journals) could not be seen in American libraries. The main reason, in their opinion, was the ignorance of the Russian language by US metallurgists. As stated below, and reflected in the pages of this journal issue, when American metallurgists visited the USSR, they were amazed at the exceptional knowledge of American technical literature in the Soviet Union. Thus, W.R. Hibbard reports that the Russian scholars he interviewed had “a good translational knowledge of the English language” and he was surprised by their “detailed familiarity with American literature”, which he said was “phenomenal”.

The opinion of the Soviet side, according to the authors, was to use the engineering thought of any country, regardless of political differences. Soviet engineers, as noted by the Americans, were always ready to apply foreign technical achievements. This position was achieved by attention brought to schools for studying foreign languages, starting from the fourth grade. The Americans were amazed that engineers in the USSR had to pass a foreign language test in the form of a written translation of up to 500 words per hour. Foreign technical literature was available to anyone in the collections of specialized libraries. It was noted that in the Soviet Union there was a large centralized organization for the distribution and translation of technical information.

However, the American authors lost sight or did not know that most industrial enterprises had their own technical libraries, and the Soviet state published a large number of industry abstract journals in all branches of science and industrial production.

As the authors of the article noted, the results of the comparison with the United States were striking. Lack of attention to foreign languages in general, and until recently to the Russian language in particular, has led to the fact that only a few American scientists and engineers were able to distinguish Russian letters, not to mention familiarization with the content of engineering articles from the USSR.²

According to the authors, until the mid-1950s, in fact, there were no translations of Russian technical literature in the United States, and the Americans were almost completely unaware of the technical achievements of the USSR. Soviet advances in space forced the United States to turn its attention to other branches of science, which led to an absolutely stunning change in attitude. Prior to this, it was widely believed that Soviet industry was incapable of anything other than reproducing outdated, by Western

² Subsequently, the United States resolved the issue not by additional study of foreign languages, especially Russian, in universities, but by “buying brains” in other countries, including the USSR and the CIS countries, encouraging the emigration of scientists and specialists from them in 1980–1990s. As a result, according to some data, up to 80% of modern scientists in this country came from other countries, i.e., foreigners.

standards, technical solutions. The launch of Sputnik dramatically changed narratives: America came next after the Soviet Union.

It should be noted that the Americans drew the appropriate conclusions and the situation began to improve. Thus, libraries, engineering societies, and private organizations in the United States began to expand their services to their readers and members by providing translations of articles from Soviet scientific and technical periodicals. American engineers began to make extensive visits to the Soviet Union, which gave them more information about the results achieved there in specific areas of science and technology. The authors of the article assumed that if research managers, librarians and officials of leading corporations had to deal with steady demand, then in the future such translations could be performed constantly, in increasing volumes.

According to American metallurgists, the current situation indicates a chink in their education system. The authors insist that in order to achieve greater success in the development of American metallurgy in the future, it is necessary that persons who received higher professional education in the United States be able to at least read technical literature in one or more foreign languages. In this case, they are talking about the Russian language, but other countries, such as Germany and France, have also advanced in various fields of technology. It is emphasized that it was precisely the inability of local metallurgists to receive information directly in the original language that prevented the study of foreign achievements in the United States.

In conclusion of their reasoning, the authors claim that now “the doors are open” and call for expanding the translation of Russian technical literature and multiplying the visits of American engineers to the Soviet Union. It was proposed to consolidate this trend by increasing the number of engineers who can read technical literature in foreign languages. Quite logical conclusions are drawn that these measures will not only help the American steel industry and science keep up with scientific achievements on the other side of the Iron Curtain, but will also help reduce the distrust separating the peoples of the two countries.

The following is the story of how the US-Soviet scientific exchange began. The beginning of the exchange was laid in the autumn of 1956, when Professor A.M. Samarin from the Institute of Metallurgy of the Academy of Sciences of the USSR accepted the invitation of American colleagues and made a presentation at a conference on titanium at New York University. In turn, this university’s professor D.P. Nielsen was invited to visit the metallurgical scientific institutions of the USSR. This made it possible to invite professors A.M. Samarin and R.A. Karasev to a conference on vacuum metallurgy organized by New York University, where they made two presentations. The second stage of the exchange included the invita-

tion of professors D. Chipman and N.D. Grant from the Institute of Technology (Massachusetts) to visit educational institutions and metallurgical enterprises in Moscow, Leningrad, Sverdlovsk and Magnitogorsk.

The third exchange cycle took place at the end of 1957, when the exchange of delegations of metallurgists was organized between the Moscow Institute of Steel and New York University. The delegation led by Professor D.P. Nielsen from New York University included ten members of the American Institute of Mining, Metallurgical and Petroleum Engineers: D.D. Carney, M. Cohen, K.D. Getzel, D.D. Hanawast, W.R. Hibbard Jr., T.W. Lipper, L.L. Siegl, D.W. Spretnak and D. Stone. In accordance with the program, they visited five institutes in Moscow: the Moscow Institute of Steel, the Central Research Institute of Ferrous Metallurgy, the Central Research Institute of Engineering Technology, the Moscow Institute of Non-Ferrous Metals and the Gold and Institute of Metallurgy. In Leningrad, they visited three institutes: the Leningrad Polytechnic Institute, the All-Union Institute of Aluminum and Magnesium, and the Leningrad Mining Institute. Two enterprises in Zaporozhye: the Dneprospetsstal metallurgical plant and the Zaporozhye Ferroalloy Plant. There were three institutes in Kiev: the Institute of Physics of Metals, the Kiev Polytechnic Institute and the Institute of Chemistry. The Magnitogorsk Iron and Steel Works and in two institutes in Sverdlovsk: the Institute of Physics of Metals and the Polytechnic Institute. Thus, the American delegation visited a total of 16 research institutes, universities and enterprises.

In November 1957, a Soviet delegation made a return visit to the United States and participated in the World Metallurgical Congress in Chicago, and then visited a number of American research institutes, universities and metallurgical enterprises. Of the most famous metallurgical scientists, the delegation included: academician G.V. Kurdyumov, prof. I.N. Kidin, P.I. Polukhin, I. Belov, and A.M. Dymov. According to the results of their speeches in front of Congress, two articles by professors I.I. Kornilov and A.M. Samarin were translated into English.

In its own way, the perception of the Soviet way of life by Americans is interesting according to their reviews of Moscow at that time. They write that the main squares of Moscow are vast, and the boulevards and streets are wide and clean. Five-ton trucks on the streets of the city were, apparently, as numerous as cars. All the cars they observed turned out to be Soviet-made, as it was rare to find a foreign car. Americans who visited the USSR described Soviet cars as “reminiscent of Chevrolets, Buicks and Packards produced 15 years ago”, noting that “copies of 1951 Fords” are currently rolling off Soviet assembly lines. Street traffic in Moscow was assessed as light, “about the same as in American cities at 7 am on Sundays, far

from Moscow, traffic is much less, and there are more trucks than cars.”

In the capital, ordinary Soviet citizens showed some interest in socializing with Americans, in restaurants and outdoors. In front of the hotel, they were surrounded by boys asking for souvenirs, and the Americans emphasized that this was not alms for the needy, but only a desire to receive chewing gum or a coin. In small and larger cities far from Moscow, Americans were met with indifference. In their opinion, the reason lies in the fact that in cities like Sverdlovsk and Magnitogorsk, people are still cautious, while in Moscow, fears have been replaced by more unreserved curiosity. Moreover, the members of the delegation add that they never met any impoliteness anywhere, and any short-term meeting with Soviet citizens was always pleasant. Their remark “would a Russian say the same about a similar trip to the US?” is also of interest.

The authors of the article express a desire to further develop the practice of scientific exchanges and contacts between the metallurgists of the United States and the Soviet Union. Indeed, the expansion of such contacts in subsequent years contributed to the development of metallurgical science and technology in both countries. It should be recalled that it was then, on the crest of the scientific and technological revolution, that the USSR achieved colossal, breakthrough achievements in science and technology, which led to the fact that the Soviet Union in the 1960s and 1970s came to the forefront in the development of metallur-

gical science and technology in the world, and the foundation for these achievements was laid exactly in the 1950s.

CONCLUSIONS

In modern conditions, the metallurgical cluster within Russian industry and science is developing most effectively. This is happening as a result of our country’s entry into the market economy in the 1990s, which contributed to the expansion of Russian metallurgy beyond national borders. However, the system of political and economic sanctions of recent years violates market relations and hinders the development of science and technology in all countries. A big drawback in modern conditions is the reduction or even cessation of contacts between metallurgists and metal-makers, the lack of programs for cooperation between educational institutions in Russia and other countries in the field of metallurgy. However, past examples show what a synergistic effect in the development of science and industrial technology can provide by such contacts that should be restored and expanded.

REFERENCES

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Translated by A. Kolesin