

CONCEPTUAL APPROACHES TO THE STUDY OF THE STATE SCIENTIFIC AND TECHNICAL POLICY OF THE USSR IN 1950-60S.

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ABSTRACT

Based on the analysis of scientific literature and previously unpublished archival documents, the paper reveals various conceptual approaches to the study of the problem on the evolution of the state scientific and technical system during the reforms of N.S Khrushchev, approaches to the definition of the sources of technological breakthroughs and the reasons for the slowing down of modernization processes at that time. The results of the research and conclusions are presented for discussion. In particular, the conclusion is drawn that a powerful scientific and technical potential has been created in the USSR, but an insufficient attention to the introduction of scientific achievements outside the defense complex, to working out the implementation mechanisms themselves has been a clear mistake of the state economic and scientific and technical policy of this period, that eventually predetermined the lag in a number of directions.

Keywords: scientific policy, technical policy, USSR

INTRODUCTION

At a new stage of Russian modernization and the critical importance for Russia of a technological breakthrough, we consider it important and urgent to rethink the mechanisms for the implementation and results of the state scientific and technical policy (SSTP) in the USSR. Estimates of the results of both state economic policies in general, and policies in the scientific and technical sphere carried out from the mid of 1950s to the early 1960s are sometimes diametrically opposed. Meanwhile, the need to accumulate the entire positive from the domestic experience for the development of an accurately and scientifically verified development strategy of the country today is extremely relevant to further study of this problem and the introduction of certainty into the disputes that are currently under way.

MATERIALS AND METHODS

The basic theory for our research was the theory of modernization, its multi-line model, the features of which are the recognition of the possibility of modernization on one's own path, and the significance of external, sociocultural, subjective factors. [1] A significant part of the researchers call among the main features of the historical path of Russia the spasmodic type of modernization, overcoming the technical and technological backwardness with the help of mobilization methods, concentrating of limited resources on priority areas. This lag and the results of efforts to ensure the next breakthrough were determined to a large extent by accuracy of the chosen strategy in the scientific and technical sphere. In turn, the results of the state scientific and technical policy stipulated the success or deceleration of this or that stage of modernization. [2] We believe that the published and previously unpublished documents and materials that we have studied allowed us to fully substantiate this conclusion by the example of the evolution of state scientific and technical policy during the "thaw" period. Among the most controversial subjects was the definition of precise data on the economic growth observed at that time, the sources of technological breakthrough and the reasons for the deceleration that was emerged then.

RESULTS

We believe that the researchers rightly point out the impossibility of being guided at the present time by the data of official Soviet statistics which shown that during the decade from 1950 to 1960 the average annual growth rate of the USSR national income was 10.1%, and industrial production – 11.9%. According to the calculations of the CIA, to which researchers often refer (V.M. Kudrov, M.V. Slavkin, and others), the annual growth in 1955 actually amounted to 8.6%, in 1956 - 9.5%, in 1957 - 2.0%, in 1958 – 7.5%, in 1959 - 4.9%, in 1960 - 3.2%, in 1961 - 5.7%, and in 1962 - 2.7%. In 1963 there was a decline - 2.3% [3] According to Western Sovietologists, the average growth rate in machine building in the period from 1950 to 1965 was 7.3% [4] According to archival documents declassified now and studied by us, in particular, quoted in a closed report of the CPSU Central Committee and the Council of Ministers of the USSR on August 28, 1964, the average annual growth rate of industrial output in the USSR for 1954-1963 was amounted to 10.5%. [5] Long-term studies of highly classified archival documents that were sent to the Central Committee of the Communist Party, allow us to speak about sufficient objectivity of data intended for official use only.

Such documents also make it possible to state that the specialists that have filed them had very high qualifications and a precise awareness of the current situation and the prospects of the country's scientific and technological development So, for example, the report on technical progress in industry prepared by the State Scientific and Technical Committee in January 1958 and sent to the Engineering Department of the Central Committee of the Communist Party, was of interest to us and studied by us in the Russian State Archive of Contemporary History [6] with the purpose to recreate a true picture on the results of the industrial management reorganization, to assess its effectiveness and the results of the introduction of new models in production in the second half of the 50's Along with the listing of really significant achievements (the atomic icebreaker "Lenin", the production of superfast jet and turboprop passenger aircrafts, the construction of an atomic power station, the creation of the world's first intercontinental ballistic missile capable of reaching any given target, the most powerful in the world nuclear particle accelerator - synchrophasotron; the real triumph of Soviet science and technology was the launching of two artificial earth satellites Only in 1957 it was possible to produce more than 1500 most important new types of machines, of which more than 350 were mastered in mass production), at the same time they pointed to the facts of the failure of industrial enterprises, research institutes and design and engineering organizations to fulfill the plans for implementation of new equipment Among the reasons, there was rightly called the focus of the heads of ministries, departments and industrial enterprises mainly on fulfillment of the tasks for the production of certain volumes of industrial output, the absence in the plans of corresponding indicators targeting the introduction of new technologies

Considering the sources of rapid economic recovery in the post-war period and significant growth in the 1950s, a number of researchers associate them with the use of adopted technical solutions from Western (mostly German) scientific and technical achievements, arguing that the massive deliveries of foreign equipment, in fact, were a repetition of the practice of the 1930s However, there was no need to pay for post-war reparations [7] The archived documents studied by us partially confirm this conclusion. Thus, in a note on the state of science in the Sixth Five-Year Plan sent to the Central Committee of the Communist Party by V. E. Elyutin, V. A. Malyshev, and A.N. Nesmeyanov, it was recognized that in the previous period, the main efforts of scientists were aimed at adoption of foreign technical achievements by the Soviet industry At the same time, it was pointed out that a number of developments of domestic scientists were introduced more quickly abroad than in their own country. [8] That is, preference was given to the already tested variant of adoption: it is faster and more reliably to implement the machinery already tested, and more often this solution is cheaper.

Studies of recent years and published archival materials allow us to determine with a high degree of accuracy the nature and size of these adoptions. So, for example, back in 1945 a special commission

headed by the chief of the Ukhta integrated plant of the NKVD, Lieutenant-General Burdakov, planned to relocate the Belen and Treglik hydrogenation plants from Germany to Ukhta. [9] Thus, whole plants, technical documentation and specialists were exported, indeed.

We believe that the post-war geopolitical situation and the need to restore the economy demanded that the government take pragmatism to use all available resources, including "adoptions" which played a significant role in the development of a number of industries and the military-industrial complex to ensure parity with the US.

Meanwhile, a significant number of experts are right, in our opinion, when they believe that the country's own scientific potential in those years was quite high: they have managed to realize many things by themselves, supplementing the technologies created in their own by foreign developments which played a more catalytic role in the development of the nuclear, radio-electronic industry, in rocket engineering and aircraft engineering. At the same time, a significant number of domestic developments were used during the period under investigation in the oil industry, machine building, electric power, metallurgy, and shipbuilding. The development of rocket engineering, nuclear power engineering, and production of communication equipment, radar equipment, electronic computers, and aviation was under way mainly on domestic basis. E.T. Artemov believes that in the mid of 50s the transition from an imitation model of scientific and technological development started [10]. A. M. Sudarikov confirms this conclusion: the nuclear industry, the radio electronic industry, aircraft construction, and rocket science, being knowledge-intensive industries, depend on the results of fundamental research conducted on an ongoing basis. [11]

We beg to differ with the authors who believe that "the achievements of Soviet science and technology until the early 1960s utilized the scientific and technical potential of tsarist Russia" Moreover, A. G. Fonotov, V. V. Kiseleva, and S. V. Kozyrev argue: "NEP, the weapon of victory in the Second World War, the nuclear shield and successes in space exploration have grown up in the field of Russian science of the XIX-XX centuries. As subsequent generations moved away from this wealth, falling into the midst of a "new" socialist culture with its maniacal "adherence to the cause of the communist party," there were growing tendencies to suppress an open and honest view of the problems of the Soviet society development creating an atmosphere of moral and ethic disorientation". [12]

By no means detracting from the achievements of the Russian Empire in the late nineteenth and early twentieth century (we wrote about them more than once) [13], we consider such assessments to be characterized as excessively one-sided. The political, ideological and administrative pressure of the state, deformed the scientific ethos, indeed, but it seems wrong to assert that in the period under consideration in this section there was defined the general trend that "a conformist came to replace an independent, self-consistent researcher, the spirit of opportunism reigned instead of organized skepticism". Both during the Great Patriotic War and in the post-war period, the scientific and technical intelligentsia fully demonstrated the patriotism, a sense of duty, and social justice traditional for the Russian intelligentsia. It seems to us that in the post-war period, along with conformism, formalism, percentomania, gigantomania, etc., those characteristics prevailed; representatives of the Soviet scientific and technical intelligentsia had the essential features inherent to the Russian intelligentsia, i.e. they were aimed at creative activity, introduction of the pathos of creation, preservation and dissemination of the achievements of science and technology. The memoirs of Academician N. N. Moiseyev lend evidence to that: "In general, the fifties and the first half of the sixties were a very bright time for our scientific and technical intelligentsia. Its energy, its abilities, its skills, all this was necessary for the people, the country, the state. The reasons for that are well known, they were known to us, but this did not reduce our labor enthusiasm in the least. On the contrary, we felt our involvement in the formation of the Great State. What can be compared with a sense of relevance, need in ourselves? But the symptoms of trouble appeared even then, more than thirty years before the beginning of perestroika. We saw them very early, but they hoped that they still did not talk about the fatal illness and believed that there was a hope that they could be gradually eliminated by

the will of those on whom the fate of the country depends"[14]. As the conservative tendencies deepened, the intelligentsia increasingly disagreed with the authorities, this led a part of the scholars to the dissident movement, and, on the whole, conformism and apoliticality increased. But we cannot agree with categorical statements that the scientific and technical intelligentsia was professionally disqualified and demoralized, its connection with the people was lost. The conclusion about "the growing processes of archaization in the organization of the scientific community, what has resulted in the deepest recoil into the past, to the situation that took place a couple of centuries before" also seems to be an exaggeration [15]

It is wrongful to reproach the Soviet intelligentsia, in our opinion, on passivity in the conditions of a rigidly and totally operating repressive apparatus. We tend to think that a significant part of the Soviet intelligentsia, in fact, could no longer exist between myth and reality, it craved truthful information, demanded action, freedom and was in euphoria during the collapse of the USSR. Despite forced de-industrialization, demodernization, plundering of the country in the 90s, scientific base, education, and a part of the defense complex and industry, were saved. May I ask, by whom? By demoralized and low-skilled pessimists? We believe that, first of all, by a significant part of the scientific and technical intelligentsia, graduates of the Soviet higher school of the 50s and 60s, who thought about the destinies of the country and received brilliant special training. It was during this period that the formation of human resources for the scientific and technical complex of the country became one of the priority and effective areas of the state scientific and technical policy of the USSR, a cult of technical education was created.

In the 1950's and 1960's, the Soviet scientific school was rightfully considered one of the most authoritative in the world. Thanks to this circumstance and the correct choice of priorities in the field of the development of science and technology, the USSR was able to successfully overcome the first stage of the scientific and technological revolution, implement real technological breakthroughs, and ensure high economic growth rates. What else was the cause for such a breakthrough after the ruinous war years? We believe that Victory in many respects, the presence of a nationwide project, social optimism, and a political "thaw".

The implementation of large-scale national projects depended to a large extent on the state scientific and technical policy being implemented at the time. So, in the years 1955-1965 average annual rate of expenditure on science averaged 15% (at the level of expenditure in the US of 12.5%) [16]. In the structure of the state budget of the USSR, the research and development costs without specifying the scope of scientific and technical activities amounted to 1 billion rubles in 1950 (1.3%), in 1960 – 3.9 billion rubles (3.2%), 1965 – 6.9 billion rubles (4.2%) [17]. The documents studied allow us to state as a result the positive dynamics of growth for the scientific and scientific-pedagogical staffing in scientific organizations and institutions of higher education in 1950-1960. Thus, as of January 1958, 2870 scientific institutions and 750 higher educational establishments were engaged in research work [18]. The number of scientists in the country as a whole has more than doubled, from 162,508 up to 354,158 people, in the Russian Soviet Federated Socialist Republic (RSFSR) – from 111699 people up to 242,872 people. The growth in the number of employees in the scientific institutions of the USSR amounted from 70,462 people up to 200,071 people, in the RSFSR – from 52,586 people up to 145,403 people. In higher educational institutions this growth was correspondingly: in the USSR – from 86,542 people up to 146,915 people; in the RSFSR – from 54,863 people up to 92,025 people [19]. Let us compare: in 1913, one scientific worker accounted for 1264 workers and employees, in 1940 - for 317, in 1956 - for 210, in 1959 - for 188 [20]. At the turn of the 1950s – 1960s in the country there were operated more than 3,000 research institutions and universities which employed more than 300 thousand scientists, and in pre-revolutionary Russia there were less than 400 scientific institutions and universities and 10 thousand scientists. [21]

However, which factors caused the slowdown of modernization processes? V.M. Kudrov believes that "...Soviet investments never were of an innovative nature, if to exclude the sector of the military industrial complex..." [22] According to the researcher, in general, "STP in the USSR was largely imitative, because it was practically not set by marketable solvent demand in accordance with real public needs, but by technical progress going on in the West, and, first of all, in the USA. The task was simple: not to be left behind. Such STP character condemned the USSR to backwardness already by its very definition". [23]

Indeed, the bulk of archival documents show that the main argument for the authorities in favor of the development of certain technologies, and for the introduction of innovations into the production was references to the corresponding activity in the United States.

Some researchers are sure that the reason for the backlog was the MIC which required colossal funds and their redistribution in the budget not in favor of the social sphere [24]. Others believe, comparing the administrative-command management under Khrushchev and Stalin, that at the time of the latter, the system had an important reserve: it could restore the disturbed balance in economic development by sharply squeezing consumption of the population and unquestioning submission to the will of the leader. Already the first populist actions of the so-called "Collective Leadership", have gradually brought such an opportunity to naught. Simultaneously, V.A. Shestakov, in our opinion, rightly believes that Khrushchev's model of territorial management was not such a futureless endeavor. No doubt that there was a rational kernel in the idea of regionalization of governance, most consistently embodied in the Sovnarkhoz system, but the reform did not concerned the economic mechanism, the system of interests and incentives. As a consequence, the national economy continued to develop extensively, its overall efficiency was decreasing, labor productivity was constantly decreasing, while parochialism and the desire of regions to use resources for their own purposes increased. The fall in economic growth rates since the early 1960s became a reality, as accrescency of power of the party and state machinery did, which in those years realized its interests and power and, in essence, blocked the further implementation of the socioeconomic reforms initiated by N.S. Khrushchev. [25] The Plenum of the Central Committee of the Communist Party on November (1962) adopted a decision to return to the sectoral scheme for the management of the scientific and technical sphere [26].

DISCUSSION

We believe that the developed management system allowed at the time to concentrate resources in priority sectors, but significantly hampered production processes and complicated the relationships between enterprises and the external environment. The effectiveness of non-economic methods (rigid labor discipline, constant ideological control, frequent personnel reshuffles, agitation campaigns, etc.) was narrow. These problems, as well as the situation in agriculture and in the social sphere mobilized to another reorganization of the management system, the main purpose of which was to make the existing power structures more efficient for overcoming the problems, but the mechanisms chosen for this by Khrushchev predetermined the outcome of the struggle (not with the system in general, as some authors believe [27]), but with bureaucracy, and with departments that have many years of experience of adaptations both to various kinds of restructuring, and to blocking innovations. The system as a whole, for its own preservation and stability, created restraints, squeezed out its troublemakers and raised people who could not destroy it. And, as it seems, it was not by chance that the successors of Lenin and Stalin, according to the description given by A. Volkogonov, were "dwarves" [28]

The dogmatism of the country's leadership and the insufficient level of the general culture, the fetishization of the rates and volumes of economic development, limitations of the party and state system formed in the pre-war years, the prevalence of the interests of individual departments did not allow building exact strategies adequate to the requirements of the world development of that period - all that caused the contradictoriness of the state scientific and technical policy in the 1950s-1960s.

We must not forget about the heavy burden of the arms race at the time. So, in his memoirs in the summer of 1971, N. S. Khrushchev wrote: "We received an aftermath from Stalin. The country was ruined. The country was brought to the limit by incessant investments in military complex. The military industry developed both in breadth and depth. A large army pressed on the budget. It cost a lot of material resources. Numerous human resources that could be used to develop a peaceful economy were diverted. In the West, it was seen and even more intensively developed the arms race, so that the "horse" of the Soviet economy could not stand this race and died on its own. The West also hoped to provoke discontent among our people, which would lead to an internal weakening of the socialist system". [29] At the same time, we note that Khrushchev tried to adjust the foreign policy course, reduce defense spending. According to N. S. Simonov, a reduction in the strength of the armed forces in 1955-1958, made it possible to reduce the share of expenditures on the Ministry of Defense in the state budget, and to reduce the purchase of arms. Until the early 1960's underload of enterprises of defense industries were observed. Along with the reduction in the number of personnel of the armed forces, this situation was explained by the incompleteness of the development of new types of weapons, and the reluctance of the military heads to purchase obsolete equipment in large quantities. But, since 1959, defense industries have begun to supply the army and navy in large quantities with the most modern types of weapons. [30] It was in this year that a new kind of armed forces was created, strategic missile forces. The program for the development of military shipbuilding, and nuclear submarine fleet was also developed, what required very considerable funds. This again required colossal means and their redistribution in the budget, not in favor of the social sphere

CONCLUSIONS

Thus, in the 1950s of XX century Soviet society entered the initial stage of the deployment of scientific and technological revolution. A powerful scientific and technical complex was created in the USSR. At the same time, we consider it possible to formulate the conclusion that a clear misjudgement of the state economic and scientific and technical policy in this period was insufficient attention to the introduction of scientific achievements outside the defense complex, to the development of the implementation mechanisms themselves, which ultimately predetermined a backlog in a number of areas. Both managing bodies and executors were fully aware of the presence of blocking factors, their List was already obvious.

Nevertheless, the growth and the achievements were very significant. They were conditioned not only by state support, but also by a powerful incentive capable of consolidating and inspiring people to create large-scale national projects, and to social optimism. However, in this period domestic science developed in accordance with the extensive model, unfortunately, largely due to a significant increase in scientific personnel (6-8% or more per year), directive management, formalization of scientific and technical policy, and increase in centralized provisions. Meanwhile, it was required: coordination of the research institutes and design institutes; integration of industry, science and education, overcoming departmental barriers; creating a system and conditions that ensure the implementation of projects and single samples in a serial production. The result of the inadequate priorities of the NTP was the deceleration of research work in a number of critical areas; inter-sectoral themes have being developed in an extremely inadequate degree; sectoral research institutes often turned to non-domestic academic developments rather than to domestic ones. Eventually, only 60% of the scientific research outcomes completed by the Academy of Sciences of the USSR in 1956, was introduced into the national economy [31].

In general, the distinguishing features of the state scientific and technical policy at this stage of its evolution included not only ensuring, first of all, the needs of the military-industrial complex in order to achieve military-strategic parity with the United States, and also supporting by the authorities the expansion of the range of scientific research; the opening of new research centers in the East of the country; formation of cities of scientific research profile, later, already in the post-Soviet period, called science cities; an increasing number of specialists in the field of engineering and technology and very

high-quality of their training (with the simultaneous disparity with modern world requirements for the nomenclature of specialties). The implementation of nuclear, space, rocket and other nationwide projects became real evidence of the technological breakthrough of the USSR and, as a whole, the effectiveness of state scientific and technical policy.

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