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Scientific Producer - Economic Interpretation

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Abstract

Traditionally, science in Russia does not develop independently, but in financial, substantive and organizational dependence on the state. The solution to the problems that have accumulated over the centuries of such dependence can be scientific production.

More than half a century of experience in scientific activity has led the author to very deplorable conclusions about the state of domestic science, its total nationalization, social uselessness, and catastrophic lagging behind world science. The way out of the situation, according to the author, lies in the launch of scientific production and the acquisition of financial and organizational sovereignty by science.

Keywords: Theories; Schemes; Hypotheses; Models; Layouts; Reductions

Introduction

The current state of Russian science: A small introduction

In 1966, after graduating from the Faculty of Geography of Moscow State University, I was the only one out of 175 classmates who was assigned to work at the Institute of Geography of the USSR Academy of Sciences. It was considered and is still considered the best workplace. Here I did not immediately, but I realized that science is not at all a creative force, as posters and newspapers shouted about it, it does not produce new knowledge and new scientists, but it is not busy searching for truth, as scientific romantics still dream of (these philosophers and theologians are mainly engaged in searches). Science is, first of all, a field, an economy, where the leading process is reproduction, rather aimless, focused on intellectual and scientific values, and not at all on the needs of the state and society. Later, I had the opportunity to cooperate with many other institutions and organizations: academic, industry and university, Moscow, St. Petersburg and provincial, as well as with Polish, Spanish, Ukrainian and American colleagues, in order to be convinced of the dominance of reproduction processes in scientific activity.

Before sharing my many years of experience, I would like to formulate some fundamental provisions, without which it is possible to live in science, but it is boring and incomprehensible. These are my principles and therefore I will describe them on my own behalf.

A) I trust the mind that lives in me. But I only trust, and do not blindly believe in it, so I always and at every step check it for defects (am I the last fool? Have I lost my mind?) - This is called reflection. This means that one should look at oneself not from above, but from the inside out - so you will know something about yourself that no one will ever see.

B) I do not need anyone's help, but if God helps (and He helps), then He does it completely disinterestedly, and not in exchange for my prayer, obedience and slavery. He needs me free, just like Himself. And from here - and in science one must act disinterestedly: it's good if they pay, but if they don't pay, then even better.

C) Do not be afraid to shock others. Know that if your idea or theory does not cause an ontological shock that shakes the foundations, then you are not producing anything new: someone's or even general non-recognition is a sign that you are on the right track.

D) Honesty is always needed, especially in failures. Honesty gives courage, sometimes even desperate, and the courage to make disadvantageous, but honest decisions. Today, honour is even rarer than conscience - conscience makes you bow your head, honesty

allows you to keep it proudly raised. Look around: how many are bent around and how few walking with a proud gait.

E) Science, like any other mental activity, is collective, but here everyone is responsible for himself and for the whole process as a whole, everyone works mostly alone and should value solitude as their most precious resource.

E) A professional is not one who knows what to do, but one who knows what not to do. In science, it is permissible to make mistakes and err, but you cannot lie (geographers say: what I don't see, I don't write, I don't write, I don't see). You cannot manipulate or hide the facts - although they may not know. Sometimes such mistakes take on the character of a tragedy: academician Galazy, then director of the Limnological Institute on Baikal, signed an examination allowing the water to rise in the lake by half a meter for the needs of the Irkutsk hydroelectric power station, since rises in the level of Baikal were recorded by three, and even five meters. But he did not know that these were not seasonal (spring), but centuries-old fluctuations. Thus, the golomyanka, the Baikal goby, whose spawning coincided with the rise in water level, almost perished: the eggs on the narrow Baikal shelf did not warm up enough because of this rise. Galaziy then lamented all his life and experienced his mistake. Here, it seems, and all my principles, you can go to the heart of the matter. Galileo argued that man is a unique being capable of idealizing, that is, transferring the visible, sensual into ideas and ideals: theories, schemes, hypotheses, models, layouts, reductions. Actually, science is built on this ability.

Problems of modern science

A feature and at the same time the most acute problem of science and culture in many countries, including Russia, is the monopoly of the state, sometimes one hundred percent, on science and culture. In fact, science and culture in Russia have never developed independently, and therefore reflected all the vices and crimes of the Russian state. It is curious that from the very beginning, science and culture were considered by the state as something unified: on the initiative of Emperor Peter I, on January 26, 1724, the Academy of Sciences and Arts was established by decree of the Governing Senate. Only in 1803, during the educational reform of Speransky, science was separated from the arts and fine arts - this is how the Imperial Academy of Sciences arose. In 1917, in connection with the abolition of the monarchy, it was renamed the Russian Academy of Sciences, in 1925 - the Academy of Sciences of the USSR, and after 1991 it again began to bear the name of the Russian. This division had a very beneficial effect on Russian culture. In the field of literature, painting, music, theatre, it - much more independent of the state than science - from an imitative one quickly became independent, caught up with the advanced countries of Europe and stood on a par with the culture of France, Germany, England, acquiring the status of a truly global one. In the 20th century, having received such a powerful run-up, it retained its positions, despite the most powerful press and repressions from the state. Russian science, unfortunately, remained in a position of catching up (of course, there were remarkable exceptions, for example, Dmitry Mendeleev, Lev Mechnikov and Ivan Pavlov), but it should be noted that world-class engineering was formed in the country, especially in the field of transport: in the 20s years, Russian aircraft engineers were undoubtedly the best in the American aircraft industry (Sikorsky and Seversky, for example). It is extremely important that the academy of that time was, according to the statutes, an institution designed to be a meeting place for scientists, and not a place for scientific research - they were concentrated in universities. Only after the revolution of 1917 did the absolute majority of academic institutions appear, called upon to conduct fundamental scientific research in accordance with the state assignment, leaving university science as an aid to pedagogical and educational activities. It should be noted that practically in parallel with the creation of the subject-territorial structure of the Academy of Sciences (in scientific subjects), the territorial-sectoral structure of the country's economy and administration was formed. This discrepancy between the grounds for structural division, on the one hand, emphasized the independence of fundamental science from the direct service of the economy and management, on the other hand, it almost completely coincided with the university structure, and on the third hand, it served as the basis for the formation of industry science and industry universities, which were actually freed from educational functions and aimed almost exclusively for vocational training. In the 1930s, in connection with accelerated industrialization, a need arose for mass design activities. This need was met by the introduction of American technology and the organization of the design business. It was at this time that numerous branch research and design institutes arose, both centralized and with branches, which, in fact, covered the entire territory of the country. The successes of the state monopoly relied mainly on the successes of the atomic and space projects, the foundations of the country's military-industrial complex. However, we should not forget that both of these areas were largely rep o rational: documents and developers were either military booty in Germany or illegally exported from the United States. In all other areas, the gaps between fundamental, applied (sectoral) research, design, university education and professional training in sectoral (departmental) institutions became more and more dramatic and led to the formation of peculiar castes and closed territorial communities:

- Academic science received an indulgence to "search for truth", that is, to carry out unnecessary work for very modest money.
- Sectoral science has become an engineering and bureaucratic appendage of the relevant ministries and departments.

- Prototype design according to available samples, often foreign ones, clearly prevailed here.
- University education concentrated on self-reproduction, the creation of "schools" (the phenomenon of inbreeding, "scientific incest"), as described in the article "Provincial and native science" [1].
- Branch vocational training in departmental universities was only slightly concerned about the development of professions, concentrating its efforts on training professional personnel for the already existing set of specialties.

Overclocking and exporting scientists

The vast majority of scientists and professors, to their credit, did not accept the Bolshevik government. The rarest exceptions include Pavlov, Timiryazev and some others. Many left the country on their own. The flight continued until the early 1930s (the last in this series was the theoretical physicist Gamow). In addition to Seversky and Sikorsky, the inventor of the TV set Zvorykin (1919), the theoretical physicist Kapitsa (1921), the economic geographer and economist Vasily Leontiev, and many others left. Libraries, funds, knowledge, and schools also went abroad.

Philosophical steamboa

In 1922, all important philosophers were expelled from the country by two steamships: the Oberbürgermeister Haken (September 29-30) and Prussia (November 16-17), which delivered more than 160 people from Petrograd to Stettin. Philosophers were gathered all. Over the country. Among them were N.A. Berdyaev, S.L. Frank, I.A. Ilyin, S.E. Trubetskoy, B.P. Vysheslavtsev, A.A. Kizevetter, M.A. Ilyin (Osorgin) and many others, the flower of Russian philosophy. This is still lucky - they were thrown into Europe. The rest were sent to Siberia.

Sovietization of science

At the same time, the process of nationalization and Sovietization of science began.

Naturally, historians and other humanitarians suffered the most. The Bolsheviks began history with themselves, qualifying everything that had gone before as prehistory, not worthy of attention and interest. Through the efforts of Lunacharsky (Ministry of Culture) and Krupskaya (Ministry of Education), such words as “patriot”, “motherland”, “fatherland”, “fatherland” were excluded from the Soviet lexicon - outdated bourgeois concepts.

A significant part of the technical intelligentsia was destroyed during the First World War. She largely made up the officers of the Russian army and technical services in the navy, aviation and automobile troops, and also emigrated en masse from the country due to the incredible scale of the Red Terror unleashed by the Bolsheviks.

The earth sciences proved to be in high demand, especially geology. The geologist Karpinsky was appointed the first president of the Academy of Sciences of the USSR, the most famous scientists in the country were not physicists and, of course, not the humanities, but geologists: Obruchev, Fersman, Gubkin and others. The country immediately positioned itself for complete self-sufficiency in natural resources, primarily for minerals, for mineral and raw material sovereignty, and even for putting pressure on other countries with its natural resources. Actually, this strategy has been preserved to this day, for a whole century. In this respect, the USSR–RF is a typical colonial empire, as A.A. Zinoviev: an ordinary empire is an export of culture and finance, but an import of resources and people, and the USSR-RF is an export of resources and people, but an import of culture and finance. Russia, as a purely agrarian country, has traditionally been oriented towards agricultural sciences. Timiryazev, Michurin, Chayanov, Chizhevsky, Prince Kropotkin, Rakitnikov I found this “last Social Revolutionary” at Moscow State University and many other agricultural scientists, understanding the food situation in the country, were almost the first to cooperate with the new government, especially since most of them were politically oriented towards the Social Revolutionaries, who were ideologically close to the Bolsheviks. Unfortunately, agriculture turned out to be a favourite springboard for social and political experiments. Architecture, architecture and urban planning received special development. The victorious Soviet power, like fascism that arose a little later, gravitated towards monumentality, which is characteristic of ephemera, pygmies and tyrannies at all times. Architecture was entrusted with an unusual social task - the formation of a new type of person, homo collectivus or what is later A.A. Zinoviev will call homo Sovieticus. These factors and circumstances most beneficially fell on the Russian architectural avant-garde, a protest against the eclecticism and decadence of Russian modernity.

It is important to emphasize that the issues of urban communal services and urban self-government, having received worthy development in the works of Velikhov, Gurevich, Chayanov and others, were severely suppressed, since this entire complex was subordinate to the KGB, which also carried out such a state terrorist act as a housing tax in kind 1922, which gave rise to housing psychosis and total domestic squealing. The thirties passed as industrialization and accelerated militarization of the country's economy and people's consciousness. This happened with the most powerful assistance of European countries and especially the United States, which, among other things, came out of the Great Depression in this way. The largest contribution was made by Albert Kahn, the "father" of Detroit. Between 1929 and 1932, the American firm of Albert Kahn in the USSR designed from 521 to 571 industrial facilities, organized the supply of equipment for the enterprises under construction, and thus created almost the entire

Soviet military industry. The main merit of A. Kahn in the USSR is the creation of a standard design system. In the second half of the 1930s, by a special decree of the Central Committee of the All-Union Communist Party of Bolsheviks, all design activities, except for standard design, were prohibited: the Communist Party completely usurped the right to see the future and work with it. As the country and its economy militarized, science also militarized. Scientific special developments were either defensive, or espionage, or other military in nature, in any case inhumane and unsuitable for civilian life. Funding for science directly depended on its involvement and importance for the military-industrial complex: nuclear scientists, rocket scientists, aircraft designers and the like were not denied even the most incredible amounts of funding, the rest were on starvation rations. Ideologies both science and higher education to the maximum. Ideological subjects formed the basis of children's, school and higher education. These areas were generously funded, had the maximum possible circulation of publications, but were also controlled and censored in the most strict way. Here, discussions and discrepancies familiar to science were completely excluded. The bouquet of ideological sciences, mandatory for study in all higher educational institutions without exception, consisted of:

- History of the CPSU.
- Historical materialism.
- Dialectical materialism.
- Political economy of capitalism.
- Political economy of socialism.
- Scientific communism.
- Scientific atheism.

In addition, there were both regular and mandatory

- Political studies.
- Single political day.
- Circles of political literacy.
- Days of the agitator and propagandist.

The Industrial Academy, the Communist Academy, the Military-Political Academy, a cluster of social science institutes, the Institute of Marxism-Leninism, higher party schools, Komsomol schools - this is not a complete list of the leading institutions of the ideological front.

Institutionalization of Academic, Industry and University Science

In the Soviet period, there was a fairly stable division of science into three areas: academic, branch and university.

Academic science

Academic science is concentrated in the largest cities and research centers in their vicinity, tending to territorial concentration. Regional academic centers are independent and competitive in comparison with the capital ones, institutions of various directions are generally inclined to cooperate with each other. Work in the academic field has always been considered the most prestigious and accessible only to the best, although funding and salaries here were the most modest. Compensation for financial losses was a free work schedule and extended vacations, but the main incentive, of course, was the opportunity to do "real" science.

Branch science

It completely repeats the sectoral structure of the centralized management of the economy. All this science received orders for development exclusively from its ministry or its enterprises. Branches and the head institute were closely connected both by developments, and methodically, and personnel. It was common practice to appoint an aged or fined ministerial top manager as the head of a branch of science. The main drawback of branch science is its closeness and secrecy, and hence the noticeable lag behind world achievements. We have specially developed equipment and technologies that are not compatible with Western ones. You can't win the competition without stepping into the ring, hiding behind the ropes of secrecy. The most important reasons for the inevitable loss of the sectoral science of the USSR in competition with the West (the West was understood as the East represented by Japan, and the South represented by Australia, and the North represented by Canada) were**:**

- almost complete absence of intra-industry competition
- a high degree of bureaucratization of science, which made a lot of things meaningless and harmful

Here, as a rule, there were high salaries (depending on the category and significance of the ministry), but strict discipline and work schedule, which is incompatible with scientific activity. In this regard, the bulk of people employed in industry science, if it is not the military-industrial complex, simply patiently hatched out their pension.

University science

Typically, research conducted at universities, oriented both to the Ministry of Education and to their city or region, is fictitious, demonstrative or qualifying in nature (writing candidate and doctoral dissertations). In any case, science in universities was seen as a kind of obligatory burden for teachers. This was also reinforced by the fact that most universities produced school teachers and doctors, for whom scientific activity is alien and incomprehensible. University science, in contrast to sectoral and academic science, is extremely hermetic: moving from one university to another, moving from one city to another under Soviet feudalism is exotic. This is how family, semi-family and quasi-family clans were formed, mainly on the scale of the department, where the selection was not based on abilities and achievements,

but on the level of loyalty - to the leader or university. That is why party and Komsomol activists, informers and seksots (secret collaborators) settled in the universities, introducing the traditions, policies and customs of sneaking and intrigue. Rectors of universities were mostly aged or fined regional top managers. If branch and academic science after the collapse of the USSR shrank and folded to a state close to zero, then university science, having become almost the only form of organization of science, is almost flourishing.

This "almost" is expressed in:

- Flourishing inbreeding
- Rampant corruption
- Flourishing fictitious demonstrativeness
- Flourishing snitching and intrigue
- Flourishing senselessness and bureaucratization.

Corporate Science and Education

10-15 years of the existence of only university science led to the realization of the need to restore / renew industry science in the form of a corporate one.Corporate universities and research and design institutes are formed on the ruins and fragments of industry structures, sometimes on the scale of former ministriesUnfortunately, corporate science and education have combined the worst features of industry and university science.

- secrecy and lack of communication
- subservience and personal devotion
- firm rejection of competition
- Offspring and succession.

However, it should be recognized that corporate science demonstrates a much higher efficiency than previous Soviet forms of organization. As for the state, it is now interested in only two areas of science: ideology and weapons. This was not even in the era of Hitler-Stalin.

Militarization and classification of science

Germany and Russia were the first to classify scientific developments and their results: the USSR introduced strict censorship and secrecy after 1927, Germany after Hitler came to power in 1933. The decision to classify the nuclear subject by the countries of the anti-Hitler coalition was taken only in 1940. In all scientific institutes and higher educational institutions, secret departments and units were established to monitor the movement of scientific information and prevent any possible leaks. Of course, this immediately led to the factual impoverishment of science, the cessation of interdepartmental exchange of information, and the pupation of scientific institutions and teams.

Science and the Gulag

Many and perhaps the best Soviet scientists went through the Gulag, exile and prisons: N.I. Vavilov, S.P. Korolev, A.N. Tupolev, P.L. Kapitsa, L.D. Landau, I. Pavlov, A.F. Losev, A.A. Baev, D.S. Likhachev, N.V. Timofeev-Resovsky, and A.D. Sakharov the list is almost endless. In most cases, these scientists continued their scientific activities, but in completely different conditions, conditions of captivity, coercion and barracks discipline, which is in principle incompatible with science and creativity. Sometimes impossible fantastic tasks were set before scientists, one of which is described in the novel “In the First Circle” by A.I. Solzhenitsyn (personal identification by voice in the phone). Cut off from their families and familiar surroundings, from colleagues and communication with the professional community, including the world, deprived of the opportunity to publish, scientists prisoners, like any other prisoners, “driven bullshit”: science and slavery are incompatible. The traditions of “bullshit” penetrated all of Soviet science, and they still persist today: clichéd scientific reports, year after year rewriting of the same texts with minimal transformation of research topics and titles, etc. The nature of the Gulag is described not only in fiction (Solzhenitsyn, Shalamov, Dombrovsky, Aleshkovsky and others) and memoirs (Losev, Baev and others), but also in documentaries, for example, [2]. In this work, it is documented that arrests and terms were appointed not just like that, but at the request and requests of ministries, departments and leaders of major construction projects, often even indicating the professions and specializations of the required prisoners. Naturally, this practice extended primarily to scientists and engineers, specialists of the highest categories. Closed administrative-territorial formations, secret cities for military-industrial purposes: nuclear (Dubna, Obninsk, Protvino, Sarov, Snezhinsk, Seversk, Balakovo, Kurchatov, Dimitrovgrad, Lesnoy Bor, Belushya Guba and others, part which is now open and declassified), rocket (cosmodromes Baikonur, Plesetsk, Vostochny), biological weapons (Akhtubinsk, Obolensk, Gus Zhelezny, etc.), and other profiles. In principle, these are all the same "sharashki”, but family and superior comfort. As a rule, all of them are located in comfortable natural and climatic areas.

Self-Isolation of Soviet Science

The self-isolation of Soviet science and technology had several meanings and goals

- For military reasons; the iron curtain was erected when the Trotskyist idea of world revolution and world domination was forced to be abandoned - the entire outside world began to appear hostile and aggressive, even the countries of the so-called people's democracy.
- For technological reasons: the USSR deliberately went for the incompatibility of domestic and world technologies and standards.

- For political reasons: we invented our own inventors of everything invented in the world and even composed our own scientific terminology.
- For reasons of prestige: we did not want to admit our obvious backwardness in many branches of science, primarily in the humanities.
- In order to avoid leakage of brains and information.

Contacts with Western science had a ceremonial character, and therefore they did not go beyond the lobbies. International scientific cooperation was purely demonstrative and decorative.

Import of brains and technologies: USSR and USA

Self-isolation of science was accompanied by illegal or semi-legal import of brains and technologies. The brightest scandalous examples of this import are the atomic bomb and rocket technology. Atomic research in the USSR began even before the war, but only after the testing and use of the atomic bomb in the summer of 1945 did an intensive solution of the atomic problem begin, not scientific, but espionage. No wonder the nuclear project was headed by the Minister of the Ministry of Internal Affairs / KGB Beria. At the cost of 400 agents (they were sentenced by an American court to different terms of imprisonment), the atomic secrets of the United States and Great Britain were stolen (the scandalous "trial of four hundred" in Canada) [3,4.5], and in 1950, Enrique Fermi's student Bruno Pontecorvo was stolen. The role of academician Kurchatov in the atomic project is highly doubtful, but the principal role of Soviet spies in the United States, the Mukaseevs and the Cohens, is undeniable and is now officially recognized. However, the decisive role was played by the German baron von Ardenne [6,7]. His secret laboratory was guarded by an SS regiment. The Soviet troops would have needed to lose three divisions to storm this facility - without a chance to receive documentation and intact (not blown up) equipment, but in April 1945 the laboratory was transferred to the Soviet side - obviously not without instructions from above. The entire staff of scientists agreed to cooperate with the USSR, handed over all the equipment, including a uranium centrifuge, documentation and reagents, including 15 tons of uranium metal of German purification quality. Von Ardenne travels to Moscow with his wife, taking a magnificent piano, an SS dress uniform and a full-length oil painting from the Fuhrer's personal artist, where he hands him oak leaves to the Knight's Cross - the highest award of the Reich. More than 200 prominent physicists, radio engineers and rocket scientists are traveling with him. Among them are the Nobel laureate, the creator of the V-3 rocket, Professor Gustav Hertz, Werner Zulius, Günter Wirths, Nikolaus Riehl, Karl Zimmer, Dr. Robert Doppel, Peter Thyssen, Professor Heinz Pose and many others.

The best equipment of the Berlin Kaiser Institute and von Ardennes's own institute, Berlin- Lichterfelde -Ost, travels in echelons to the USSR. There are even German transformers. There is documentation and reagents, stocks of film and paper for recorders, photo recorders, wire tape recorders for telemetry and optics... A peculiar and very comfortable concentration camp is being built in Moscow on Oktyabrsky Pole. Now it is the Kurchatov Canter. The Germans also brought worked-out schemes for an industrial nuclear reactor and a breeder reactor. After all, it was they who were the pioneers in the nuclear field, on the island of Rügen in the Baltic Sea the first test mini-bomb was detonated, in Pomerania - the second, with a capacity of about 5 kilotons. During these tests, about 700 Soviet prisoners of war, "guinea pigs", died. Each German was assigned 5-6 Soviet apprentice engineers, often German-speaking. Boris Kurchatov, the brother of the physicist Igor Kurchatov, was assigned to the institute from the Ministry of Internal Affairs. At the same time, plutonium was obtained in the industrial reactor of the Chelyabinsk-40 facility for the first Soviet atomic bomb, after testing it, the German doctor N. Riehl became a Hero of Socialist Labour. The period of mass production of warheads and industrial volumes of purification of radioactive uranium began. Then von Ardenne was transferred to Sukhumi, where a new scientific canter was built on the shore of the bay, a centrifuge for the purification of uranium isotopes. The object bore the code "A", then A-1009 of the Ministry of Medium Machine Building. Baron von Ardenne was the scientific director of this institute. The Austrian radio engineer Dr Fritz also played an important role. For this work, the baron received a second Stalin Prize in 1953, and in 1955 he was allowed to return to his homeland, but only to the GDR. At the end of the war in 1945, Germany had jet engines and mass-produced jet aircraft, the first anti-aircraft missiles, the first air-to-air missiles, had its own nuclear program that competed with the Anglo-American, had infrared tank sights and gyroscopic stabilization of naval guns, Radar and interference selection stations, excellent direction finders. There were aircraft sights and gyro-stabilized submarine navigation devices, "blue" optics and 1.5 volt radio tubes the size of a pinky nail, cruise and ballistic missiles. All this went to the USSR. Having pushed the USSR against the USA and Great Britain in the arms race and the escalation of the Cold War, Germany, and after it Japan, among other things, got a chance and in a short time got up from its knees, turning into the second or third power in the world in terms of economy. In 1937, von Braun launched the first V-2 ballistic guided missile (weight - 13 tons, engine thrust - 25, flight range - 300 km). On October 3, 1942, the V-2 exceeded the speed of sound; on February 17, 1943, it rose to a height of 190 km and thus became the first space object of terrestrial origin. The German priority in space is recognized throughout the civilized world, including the United States. The rocket project was also not without espionage. Today, the merits in this field of the Zarubin spouses, who were sent to Europe, and

after the start of the war in the United States, Soviet spies, are officially recognized.

Von Braun and his closest assistant Dornberger were taken prisoner by the Americans. Von Braun openly led the American space program, including astronaut flights. After the end of the war, documentation, samples of the V-2 and rockets " Reintochter ", "Reinbote", " Wasserfall ", "Typhoon", engines, technological equipment arrived in the Soviet Union (on an even larger scale - in the USA, England). The first Soviet ballistic missile R-1 is a complete analogue of the German V-2 missile, only created according to domestic drawings and from domestic materials. In the very first days of peace, the Soviet command, puzzled by the results of the study of parts of huge ballistic missiles found at the Polish training ground in 1944, began the hunt for German specialists. One of the first "skull hunters" was B. Chertok (later S. Korolev's permanent deputy). It turned out that in the Soviet zone of occupation there was a missile canter - "Nordhausen", an underground factory where prisoners of concentration camps worked. They found important material there. To study them, the Rabe Institute was created. B. Chertok became the head of the institute, and one of the employees of the German rocket canter became the director. But they really lacked a specialist who owns the whole problem. And soon they found him - he turned out to be Helmut Grottrup. Grottrup, in turn, attracted leading German specialists, professors and doctors of sciences to work. The study of our future luminaries went so successfully, such prospects for improving the V-2 opened up that it was necessary to significantly enlarge the organization. The project was headed by the organizer of rocket artillery Lev Gaidukov, S. Korolev was appointed his deputy, whom Gaidukov, bypassing Beria, released from the Kazan "sharashka". In the summer of 1946, about 500 leading German specialists with their families were sent to the USSR on a voluntary-compulsory basis, where some of them (about 150 people) were placed in strict isolation on the island of Gorodomlya in the middle of the picturesque Lake Seliger. To guide rocket development in the USSR, NII-88 was created, headed by L. Gonor. It was the "Soviet" Germans under the leadership of G. Grottrup, ahead of the "American" Germans, in the projects of "their" missiles, who gave the world technical solutions that are now a textbook for all rocket scientists in the world - detachable warheads, carrying tanks, intermediate bottoms, hot pressurization of fuel tanks, flat nozzle heads of engines, thrust vector control using engines, etc. Incorporating a galaxy of world-famous scientists, primarily such as Hoch a leading figure in control systems, died in the USSR under mysterious circumstances - “from appendicitis”, Magnus (a specialist in gyroscopes), Umpfenbach, Albring, Rudolf Müller, it is not surprising that they won all government competitions for the creation of the USSR missile shield. They completed projects of ballistic missiles with a flight range of 600, 800, 2500 and 3000 km, for intercontinental range (analogue of R-7), an aerodynamic scheme for astronaut flights to the Moon was proposed (later used in the N-1 project). Conical compartments were a trademark of German ... and Soviet rocket scientists until the early 60s. The Germans also managed to lay a solid foundation for Soviet anti-aircraft and cruise missiles (G-5 or R-15 with a range of 3000 km). (Sudoplatov, 1999). The scheme of work with German specialists quickly acquired a peculiar character. At the scientific and technical councils, the Germans made a detailed report on the next rocket project. The opponents spoke. The report was comprehensively considered and discussed. They acknowledged his victory. Then Soviet specialists came to the island, clarified the nuances, and took away the documentation, in many cases not even bothering to reprint it, limiting themselves only to erasing German surnames. And most importantly, the “guests” were not allowed to experience anything, explaining this by the fact that all stands were busy. As a result, having squeezed out everything that was possible from the German rocket scientists, creating unbearable conditions for them and their leadership for further work, the Germans were returned to the GDR, without even resolving the issue of their employment. To compensate for the "exodus of the Germans" in 1954, four independent rocket design bureaus were created, including the Dnepropetrovsk one. Later than others, in August 1956, the Design Bureau of S. Korolev was created. The last, as befits a leader, at the end of 1953, G. Grettrup left the USSR. Chertok notes that, out of shame, he could not look Helmut in the eyes.

Taboo sciences

It is considered a generally accepted and even banal assertion that thought, progress and science cannot be stopped, however, both in the USSR and in modern Russia, this is not only possible, but also widespread. There is a fairly wide range of sciences, primarily the humanities, for a long time (up to the present day), tabooed at the state level.

True story revolutions of 1917, the true history of the CPSU, the true history of the Second World War, even the true history of the Russian state are under the strictest ban, strictly censored, heavy criminal penalties are provided for research, archives are kept secret, information is carefully concealed and even destroyed. History itself is repeatedly rewritten and deliberately distorted. True, things have not yet reached the point of rewriting newspapers, as was done in J. Orwell's novel "1984", but the newspaper fund of the INION library was destroyed by a non-random fire, the newspaper fund of the Lenin Library in Khimki is no longer replenished with local regional, city and district newspapers and that's all less available.

Genetics for a long time, even in post-Stalin times, she was fiercely called the "corrupt girl of imperialism." The German scientist Mendel was stubbornly called the Austrian obscurantist monk (after the amnesty of genetics, he began to be called the great Czech

scientist). The names of Weisman, Morgan, as well as domestic geneticists and breeders Schmalhausen, Vavilov and others were anathematized and forgotten. Domestic genetics, having wandered along the false path of Nesmeyanov - Lysenko, lagged behind the world for decades. And even N. Dudintsev's novel "White Clothes" was shelved for many years.

Cybernetics also turned out to be taboo, although N. Wiener emphasized that his teaching is applicable only to technical systems and does not work in social ones.

Economy - all the "bourgeois" theories, modern and previous centuries, could only be criticized without reading. As such, there has been no economy in our country for more than a century, neither as a practice of relations between economic entities, nor as a science - there is only political economy dictated by the state.

All **philosophy**, except for Marxist-Leninist, which was not a philosophy, was tabooed to one degree or another, modern philosophy was totally banned. Despite such names as Ilyenkov, Mamardashvili, Oizerman, Losev, Asmus, Takho-Godi and others, in general, Soviet philosophy was a set of quotations, incantations, spells and worships of people who were philosophically deeply ignorant and illiterate. Unfortunately, many of them are still alive and continue to form a significant echelon of Russian philosophy.

Sociology was also banned for a long time, as if it did not exist and was considered a harmful, unnecessary science, something like enfan terribly demographic. Behind this was the deep conviction of the authorities that the masses are a dark element that does not have the right to their opinion, a kind of human material from which anything can be molded - and this was and remains true.

Psychology and psychiatry were among the taboo sciences. Psychology, along with logic, was removed from school curricula in the mid-1950s. The Faculty of Psychology of Moscow State University was restored as a faculty only in 1960. Soviet psychiatry was banished from the world community with a bang for the forced detention of dissidents in psychiatric hospitals with a sacramental diagnosis of STS (sluggish schizophrenia) as a politically motivated "disease". Nevertheless, it was psychology in the USSR that turned out to be one of the most productive and advanced sciences: Vygotsky, Leontiev, Davydov, Elkonin, Luria, Shchedrovitsky, Lefevre are certainly world names.

Linguistics, both as an educational and as a scientific subject, at the behest of the state, proceeded from the postulate that all foreign languages are the languages of enemies, and therefore focused mainly on written translation. Fluency in foreign languages was allowed only to Chekists, journalists, representatives of foreign trade associations and diplomats (also Chekists) working abroad. Such a “truncated” both socially and thematically, linguistics could not develop normally, and therefore in our country it acquired bizarre forms.

Political science and related elitology, conflictology, regional science, urban plan so frightened the party and scientific leadership of the country that they were not even discussed or condemned. They just didn't exist.

Nature protection and ecology had a very bizarre content. For a long time, scientific articles and dissertations on ecology belonged almost exclusively to philosophers who diligently translated and commented on foreign works on this topic. Biologists, geologists, geographers and other representatives of the natural sciences began to deal with environmental topics only in the second half of the 60s. The urban planning theory and practice of the mutual placement of residential areas and industrial zones focused more often and more on the transport factor than on the environmental one.

All environmental and environmental information was of a strictly closed, secret nature, the disclosure of which was punished more than severely. Environmental crimes were either hushed up or their significance was greatly underestimated. The suppression of the environmental situation and environmental crimes is still preserved in the practice of the media, the practice of power and in the practice of scientific research. The nature protection objects themselves, first of all, nature reserves and sanctuaries, have long been turned into hunting grounds for power elites of all calibers.

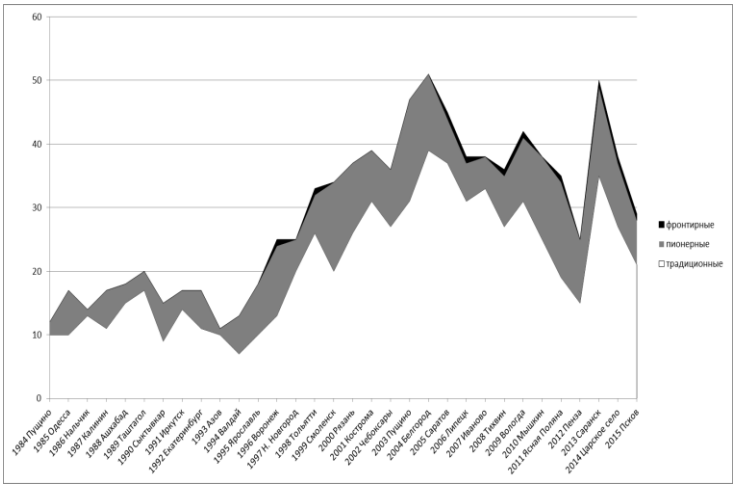

Figure 1: *Scientific novelty of works.*

Pseudo-scientific activity

Para scientific activities are quite legally flourishing in domestic science.

Privatization in science

It is gratifying that privatization in science has taken place: many scientists have finally taken up what they wanted to do, new, unusual and previously impossible topics and studies have appeared, for example, the studies of P. Polyan. Private scientific associations and institutions appeared, for example, in geography - the Laboratory of Regional Studies and Municipal Programs, the scientific and consulting firm Geograkom V.N. Bugromenko. Unfortunately, at the same time and in parallel, numerous VTKs

(temporary labour collectives) began to appear, the main activity of which was to transfer non-cash money into cash. Due to the mass exodus of professionals in science, a lot of swindlers, impostors, swindlers and those who are sincerely mistaken in their professional affiliation have appeared. All sorts of psychologists rushed into regionalism and urban studies, plumbers and certified engineers into psychology, acrobats and clowns into management, everything into commerce, politics and economics. Professional scientists in this chaos began to pupate and build impregnable castles out of unnecessary research, new scientists - to grab onto everything that lies badly and is well paid.

	academic	***Industry***	***University***
Main content	Fundamental research	Applied Research	Qualifying scientific papers
Openness of publications and international communications	Moderate	Limited	Significant
Accommodation	isolated but contact	Regionally organized	isolated
Financing	budgetary	Industry	budgetary
Economic efficiency	Moderate	High	Minimum
prestige	High	Moderate	Moderate
Main customer	Central government bodies	Ministries and enterprises	City and region

	candidate		Doctoral		The ratio of doctoral to candidate
	Total	%	Total	%	%
All sciences	168993	100	22125	100	13.1
Medical	26322	15.58	4458	20.15	16.9
Technical	27429	16.23	3432	15.51	12.5
Economic	26254	15.54	2836	12.82	10.7
Physical and mathematical	9479	5.61	1924	8.70	20.3
Biological	9974	5.90	1644	7.43	16.5
Pedagogical	13614	8.06	1227	5.55	9.0
Philological	10257	6.07	1125	5.08	11.0
historical	5788	3.42	952	4.30	16.4
Legal	10353	6.13	708	3.20	6.8
philosophical	3632	2.15	688	3.11	18.9
Chemical	5213	3.08	662	299	12.7
Agricultural	4395	2.60	603	2.73	13.7
Sociological	2858	1.69	305	1.38	10.7
Psychological	3762	2.23	288	1.30	7.6
Geological and mineralogical	1286	0.76	278	1.26	21.6
Political	2561	1.52	268	1.21	10.5
art history	1379	0.82	177	0.80	12.8
Veterinary	1289	0.76	168	0.76	13.0
Geographic	1240	0.73	146	0.66	11.8
Culturology	845	0.50	121	0.55	14.3
pharmaceutical	806	0.48	96	0.43	11.9

Architecture	257	0.15	19	0.09	7.4

Table 1: *The structure of the new dissertation array of the Russian Federation.*

Provincial and native science

The article by M. Sokolov and K. Tutaev “Provincial and native science” gives a fundamental conceptual difference [1].

- Native science is sure that it is the most advanced and, in a certain sense, the only science in the world, while everything else is rotting and decaying in the bud (such was, for example, almost all of Soviet science).
- Provincial science is saturated with its own inferiority complex, and therefore timid, innocent in the worst sense of the word and does not pretend to anything (the mainstream of current scientific moods and impressions).

Modern geographical works are monotonously empty and meaningless, although sometimes meaningful. Here is the thirty-year dynamics of publications of MARS association conferences according to the criterion of novelty [11] White colour depicts "traditional", background works that are not of interest, gray - "pioneer", with novelty and black - frontier , ensuring the development of new directions. The structure of modern Russian degree science is interesting. The statistical series covers the period for 8 years, from 2007 to 2014, when nothing significant happened. Modern science rests on three pillars

- Medicine (15.58% of all candidate and 20.15% of doctoral).
- Technical sciences (16.23% candidate and 15.51% doctoral).
- Economic sciences (15.54% candidate and 12.82% doctoral).

In total, these three directions concentrate 47.35% of candidate and 48.48% of doctoral, almost half of all domestic science. Moreover, it is in these three directions that our lagging behind the world level and the front is especially acutely felt.According to these data, all "sciences" can be divided into ambitious (where the ratio of doctorates to PhDs is higher than the average of 13.1) and non-ambitious.The least ambitious are lawyers (6.8), architects (7.4), psychologists (7.6) - people who are practice-oriented, they have no time to deal with theory and absurdity, they need to earn money or at least look for it, as well as teachers (9.0) (also a very dubious, but very widespread “science”), represented primarily by pedagogical universities and school directors.The most ambitious were geologists (21.6), whose science is creeping materialism and empiricism, physical and mathematical sciences, where traditionally there has always been a lot of science and costs for it (20.3), as well as philosophers (18.9).

The Nobel Prize winners are Russia's place

Of course, a country's place in the world can be measured in square kilometers, but at the airport in Tel Aviv, the capital of the tiny state of Israel, there is a gallery of prominent Jews who have entered modern world history - an impressive list. The number of Nobel Prize winners is perhaps the most accurate indicator of any country's place in the world community. And here the role of Russia is very modest.

Number of Nobel Prize winners

1. USA - 375
2. UK - 131
3. Germany - 108
4. France - 69
5. Sweden - 32
7. Japan - 27
8. Canada - 26
9. Switzerland -- 26
10. Russia/USSR - 25

Source: [12]

The United States has more Nobel Prize winners than the next five countries combined, they are in the lead by a huge margin in all categories, even in the Peace Prize, and only in literature on a par comes the UK. But the gap in the economy is especially large: 51 laureates! Britain has 10 of them, and all other countries have no more than one or two. When did America embark on the path to scientific leadership? From the first step. Ubi universitas, ibi Europa - where there are universities, there Europe, the proverb says, but the colonists sailed from there, from Europe. So on September 8, 1636, just 16 years after the arrival of the Mayflower, when there were no more than 35-40 thousand of them, they founded the New college (future Harvard): "To seek knowledge and transfer it posterity, but let those who are afraid of this path continue ignorantly to hope in the miracles of the Church. In Russia at that time there were no higher or secondary educational institutions at all. In the USA, colleges arose one after another: William and Mary (1693), Yale (1701), Pennsylvania (1740), Princeton (1746), Columbian (1754), Brownowski (1764), Rutgerowski (1766), Dartmouth College (1769). By the beginning of the 19th century, there were 9 institutions of higher education (there are only three in Russia). There are now more than 4,000 universities and colleges in the United States and more than 19 million students. In the top ten best universities in the world six American, and in the first hundred there are about forty. In modern Russia, science is clearly not in favor, if we compare the costs of it in different countries. The top five countries in terms of investment in research and development (R&D) in absolute terms are the United States, China, Japan, Germany and South Korea. However, when R&D spending is considered as a percentage of GDP, the

world leader is the Republic of Korea (4.3%), followed by Israel (4.1%), Japan (3.6%), Finland and Sweden. In the US, these costs are 3%. In China, the average annual growth rate R&D spending has reached an exceptional level of 18.3% and although spending account for only 2% of GDP - this means that the country annually invests approximately 369 billion dollars in this sector! Well, the Russian Federation, the heiress of the country, once a great scientific power, now lags far behind with a miserable 1.2% (27th in the world), and this figure is steadily falling every year. Russia will soon be overtaken by Brazil. It is obvious that it is necessary to attract other, non-state sources of funding, comparable to state ones, in order to remain in the clip of world science.

So:

1. For a century, domestic science has been living a dependent life, under the powerful pressure of the state, which dictates not only the goals, topics and directions of research, but even their course and their results. Science has been deprived of initiative for too long a period.
2. Science is hampered by all sorts of regulations, norms, standards that leave no room for scientific creativity and research, creative and venture activities. As a result, scientific research is becoming more and more closely related to qualification works that have clearly defined results.
3. Domestic science lags more and more behind the backlog of world science, turning into a secondary - native or provincial - science, producing products "on the shelf". This circumstance is exacerbated by the direct or covert export of scientists, the "brain drain" that has been going on for more than 30 years, which the state machine at least does not prevent.
4. The "market" nature of science is massively understood only as its venality. In reality, the market for scientific research in the country has not developed: there is no competition, no marketing of scientific works, promotion, free pricing and independent funding.
5. One of the means of overcoming these shortcomings and problems of domestic science is the development and implementation of the institute of scientific production. We will talk about this in the next lecture.

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