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# Translation

## SOVIET SCIENCE AND TECHNOLOGY POLICY

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# SOVIET SCIENCE AND TECHNOLOGY POLICY

This non-serial report contains selected translations of Russian articles on the planning and administration of Soviet research and development and the introduction of scientific achievements into industry.

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# REPLACING EMBARGOED INSTRUMENTS SUBJECT OF ACADEMIES' COORDINATING COUNCIL SESSION

Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 11, 1980 pp 32-37

[Report of the 37th Session of the Council for the Coordination of the Scientific Activities of the Union Republic Academies of Sciences, Alma-Ata, with introductory remarks by Academician A. P. Aleksandrov, president of the USSR Academy of Sciences, and a report by Academician Ye. P. Velikhov, vice-president of the USSR Academy of Sciences: "On the Coordination of Projects in the Field of Scientific Instrument Building by the USSR and Union Republic Academies of Sciences"]

[Text] The 37th Regular session of the Council for the Coordination of the Scientific Activities of the Union Republic Academies of Sciences, which is subordinate to the Presidium of the USSR Academy of Sciences, took place in Alma-Ata from 20 to 23 May. Taking part in the work of the session were officials of the USSR Academy of Sciences and of the union-republic academies of sciences and also of affiliates and scientific centers of the USSR Academy of Sciences, and officials of the CPSU Central Committee, the Kazakhstan Communist Party Central Committee, the Council of Ministers of the republic, and the USSR State Committee for Science and Technology.

Opening the session, the council chairman, Academician A. P. Aleksandrov, president of the USSR Academy of Sciences, gave the floor to the chairman of the Kazakhstan Council of Ministers, B. A. Ashimov, who welcomed the session's participants and wished them success in their work on behalf of the Kazakhstan Communist Party Central Committee, the presidium of the republic Supreme Soviet, and the republic Council of Ministers.

## Aleksandrov's Introductory Remarks

In his opening remarks, A. P. Aleksandrov briefly characterized the aims and tasks of the session, after pointing out the great importance of conducting yearly Council sessions in the union republics, because this aids the more rapid exchange of experience and of the results achieved in the course of research and their general improvement. He especially emphasized the urgency of further strengthening work in the field of scientific instrumentation, the scale of which is constantly growing within the USSR Academy of Sciences and for which there is a need to attract the republic academies. Our advanced science, said the president, must be supplied with the very latest laboratory equipment and the most perfect instruments.

A. P. Aleksandrov turned attention to the fact that instruments being obtained from abroad in many instances are to a certain degree obsolescent or on the verge of obsolescence. The problem is that from the beginning of their development to entry into serial production it is usually three to five years and, by the time the Soviet Union has the opportunity to buy these instruments, they have already existed for almost ten years. The same is true at times with technological processes that are being purchased abroad. Moreover, the purchase of foreign equipment is frought with great complications, especially right now, when certain capitalist states generally are holding up the sale of their technology to the Soviet Union.

Today, in the year of the 110th anniversary of the birth of V. I. Lenin, continued A. P. Aleksandrov, it must be remembered that after the October Revolution, at a very severe time in our country, V. I. Lenin addressed the question of developing the Soviet economy and Soviet science. From the first years of Soviet rule, he posed the question of independence from Western countries in the development of our science and our economy and he took practical steps to train our own manpower, to develop education, and to open new educational and scientific institutions. It was at that time, for example, that the Leningrad Physico-Technical Institute was organized.

The question of the independent development of Soviet science and economy has been made an important issue up to now in connection with the complications in international relations being created by U.S. ruling circles who, in order to make the development of our economy and our science more difficult, have introduced all kinds of prohibitions on the transfer to the USSR of imported equipment, apparatus, and technology. A. P. Aleksandrov recalled that such prohibitions also took place in the past. This was also planned to put pressure on our country not only by curtailing the delivery of new instruments but also spare parts for many types of equipment that we already had bought. The situation is the same with certain types of raw materials and chemical reagents. A. P. Aleksandrov expressed the opinion that a definite share of responsibility for failures in the supply of scientific research in our country with up-to-date instruments and equipment also belongs to our scientists who casually agree to purchase apparatus abroad and put too little effort into replacing foreign purchases of such apparatus with their own developments. It is now necessary to strengthen work in this direction, because it is the level of scientific instrument building that in large measure determines the level of experimental science and the results of scientific research and, at this session, the Council for Coordination must give serious attention to it.

A. P. Aleksandrov expressed thanks to the Kazakhstan Communist Party Central Committee, to the Kazakhstan Council of Ministers, and to the Kazakhstan Academy of Sciences for providing the opportunity to conduct the present session in Alma-Ata, and he also expressed thanks to the organizational committee responsible for the session's preparations for the creation of good conditions for the session's work.

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Participants at the session heard and discussed reports by the following speakers: Academician Ye. P. Velikhov, vice-president of the USSR Academy of Sciences, on the coordination of work by the USSR Academy of Sciences and the Union republic academies of sciences in the field of instrument building; Academician N. N. Nekrasov, deputy academician-secretary of the Department of Economics of the USSR

Academy of Sciences, on ministerial and geographical economic planning and related tasks of the union republic academies; and A. M. Kunayev, president of the Kazakh Academy of Sciences and corresponding member of the USSR Academy of Sciences, on the study and complex utilization of mineral raw material resources of Kazakhstan. Appropriate resolutions were adopted in response to each report.

Velikhov's Report

At this session of the Council for the Coordination of Scientific Activities of Union Republic Academies of Sciences, the question has been brought up that concerns the creation of instruments and automated equipment for scientific research. The importance of this question for the academies of sciences and for the scientific institutions of practically all ministries and agencies in the country is generally well-known. At the present time, scientists' labor productivity is determined to a significant degree by the quantity and, especially, the quality of scientific equipment.

Unfortunately, the needs of our scientific institutions for research instruments are not being satisfied fully.

However, even greater are shortcomings in the composition of the pool of available instruments. The share of instruments especially developed for scientific research in our institutes is, on the average, 5 to 8 percent of the total volume of expenditures for scientific equipment instead of the desired 25 to 30 percent. For the remaining share of laboratory equipment, even experimental models, we can and must use general-purpose industrial instruments.

The experimental facilities of academy institutes and also of industrial enterprises in many instances respond well to unique orders and requirements for individual pieces. We are speaking not only of such equipment as, for example, unique telescopes or tokamaks, but also of relatively small-scale laboratory instruments. Today, the difficulties are related to the production of those types of instruments for which the demand in our country is measured on the average by hundreds of pieces a year. There are hundreds of types of such instruments where the cost of each item wavers between tens of thousands and several hundreds of thousands of rubles; from the economic point of view, it is these that constitute the fundamental mass of instruments for scientific research. It is not possible to build them and set them up for serial production without having a design capability of a high level and of high technology and without having complete sets of documentation which guarantee qualitative reproducibility. On the other hand, series production of hundreds of units a year and, even more, tens of units a year, are economically "awkward" for industry.

I will limit myself to these few reasons for the difficulties being discussed, although there are, of course, more of them.

During the last two or three five-year plans, the management of the USSR Academy of Sciences, supported by the USSR State Committee for Science and Technology, has several times tried serious initiatives with the aim of improving the situation by means of appropriate partial reorientation in capital investment and in the variety of products in the instrument-building industry. Enterprises for the manufacture of

instruments for scientific research were created (or specially rebuilt) in industry. To a noticeable degree, under the influence of the needs of science, a portion of industrial enterprises for the production of computer technology have gone over to the manufacture of so-called measurement and computer complexes, which are useful to us. Planning and planning control have been strengthened; the line "instruments for scientific research" has appeared in the state economic plan. This year, the output of instruments for scientific research considered by the USSR State Planning Committee and the State Committee for Science and Technology are reaching significant amounts. (The speaker provided further analysis of a number of economic indicators.)

For the development of scientific instrument building, a number of useful steps also have been taken in the field of relations with socialist countries. The Committee for Scientific and Technical Cooperation of CEMA assumed as a basis for 1981-1985 and for a longer period, the Long-Term Program for Cooperation Among CEMA Member Countries in the Field of Scientific Instrument Building and the Automation of Scientific Research. The academies of sciences of socialist countries concluded the Agreement for Multilateral Cooperation in the Field of Scientific Instrument Building and the Automation of Scientific Research, and a corresponding developmental program has already begun to operate. We anticipate that, as a result of these measures, the flow from these countries of instruments for scientific research will increase.

Nevertheless, a definite shortage of scientific equipment persists. Only part of the designated enterprises have been built or rebuilt.

In the next three five-year plans, according to the position of the Complex Program for Scientific-Technical Progress and Its Long-Range Social and Economic Consequences to the Year 2000, we are obliged to increase several times the production of instruments for scientific research. This is forcing us to come up with new initiatives with relation to various instrument-building ministries and agencies of the country.

But, at the same time, the Presidium of the USSR Academy of Sciences has not considered it possible that the USSR Academy of Sciences would find itself in the position of an agency that only uses instruments. It is that the great growth in variety of instrument building and the volume of tasks being accomplished with the aid of instruments long ago caused the majority of ministries and agencies to do their own instrument building. Besides the chief instrument-building ministries that are manufacturing scientific equipment for the whole country, many ministries and agencies are producing supplementary instruments, basically for their own use.

In academy institutions, many scientists have worked or are working, who "feed" ideas and scientific results to practically all branches of instrument building in our economy. Small shops and design sections of a large number of institutes, especially those that operate on the cost-accounting principle, and relatively large design bureaus of a number of scientific institutions, in essence are instrument-building organizations (it is true that a significant number of these instruments are hand-crafted, but these are also necessary).

All this has led the Presidium of the USSR Academy of Sciences to the decision to develop its own network of design bureaus and enterprises with a sufficiently high level of design and technology, the chief task of which is to manufacture instruments just for scientific research being conducted in academy institutes themselves.

Permit me to review briefly the organizational measures that have been introduced in the USSR Academy of Sciences during the last two or three five-year plans for the development of its own scientific instrument building in both small-volume and medium-volume series. This review is not meant to provide an absolute model for republic academies, because the size of each academy and its history and specific nature, of course, impose and will impose their own peculiarities on the character of such activity. But, in the first place, the management of many academies has asked for such information and, in the second place, the draft prepared by representatives of our academies for decision by the present session has considered to a noticeable degree the experience of the USSR Academy of Sciences.

The measures for the creation of series production of scientific instruments in the USSR Academy of Sciences consist, basically, of the following:

1. Organizations which develop and manufacture instruments operate on the cost-accounting principle.

2. Some of them, as in many republic academies, are connected with institutes, but some of them, which are very important for the development of experimental models for series and their production, have entered the Scientific and Technical Association of the USSR Academy of Sciences. (The speaker introduced further detailed data on the structure and enterprises of the Scientific and Technical Association.)

In addition, owing to certain organizational and economic measures, another seven design bureaus connected with institutes are developing instruments and manufacturing them in small series for the needs of the academy as a whole, for which they use about 16 percent of their capacity.

According to the 1980 plan, the system as a whole will produce a noticeable, although insufficient share of all instruments being used for the needs of the USSR Academy of Sciences and, in part, those of the republic academies.

Every year, the Presidium of the USSR Academy of Sciences provides for a centralized fund for the development of instruments. From this fund, means are purposefully distributed to one or another institute for ordering appropriate developments on a cost-accounting basis. From this fund, about 44 percent of the yearly volume of the developments designated above are financed. From our point of view, the role of this fund is exceptionally important, since it permits, on the one hand, the direction of the activities of instrument builders in the interests of the academy as a whole and, on the other hand, the participation in the creation of instruments and in the obtaining of experimental models by smaller institutes whose own budgets usually are insufficient to order a development with a cost, typical today, of several hundred thousand rubles.

An important feature of the adopted system is the approval by the Presidium of the USSR Academy of Sciences of the "Plan for Especially Important Scintific Research and Experimental Design Work and Assimilation of the Production of New Instruments of the USSR Academy of Sciences Being Done by the Scientific and Technical Association of the USSR Academy of Sciences, by Organizations Subordinate to It, and by Design Bureaus Operating on a Cost-Accounting Basis that are Subordinate to Insti-

tutes of the USSR Academy of Sciences" and the "Plan for Production and Delivery of Sets of Experimental Models of Instruments of the Scientific and Technical Association of the USSR Academy of Sciences, of Organizations Subordinate to It, and of Design Bureaus Operating on a Cost-Accounting Basis that are Subordinate to Institutes of the USSR Academy of Sciences." Projects being financed from the central fund go into the first of these plans. This raises their prestige and makes it possible to encourage the performers with supplementary bonuses.

The Presidium of the USSR Academy of Sciences has two councils related to scientific instruments: the Council for Scientific Instrument Building and the Council for Automation of Scientific Research. The first of these considers trends and prospects for scientific instrument building and after careful examination comes to an agreement for expanded technical tasks for all developments that are included in the cited plan for especially important work. The Council for Automation basically is concentrated on the development of concepts for applying computer technology to the automation of scientific research. Without approval by the Council for Scientific Instrument Building on the technical tasks for a development, it cannot be put into the plan for especially important work. Without the approval of the Council for Automation, an institute cannot obtain a computer or, even more, an up-to-date measurement-computer complex.

According to tradition, instrument construction in the USSR Academy of Sciences comes under the vice-president of the USSR Academy of Sciences who heads the Section for Applied Physical and Mathematical Sciences. When a change of section chief takes place, this function after a while passes to the new section chariman. Therefore, at various times, the post has been held by Academicians B. P. Konstantinov, M. D. Millionshchikov, V. A. Kotel'nikov, and A. A. Logunov. After the election of the new presidium staff, this function was accordingly given to me.

The president of the USSR Academy of Sciences has given a large amount of attention to scientific instrument building.

Instrument building in the Academy, naturally is not fenced off from industry by some barrier. For example, of 21 types of instruments with full documentation developed in the organizations of the Scientific and Technical Association from 1976 to 1979, series production of 16 types has been assimilated by factories of the Ministry of Instrument Making, Automation Equipment, and Control Systems.

A significant role in scientific instrument building is also played by many republic academies. The total volume of small-series production of scientific instruments in republic academies is substantial. The USSR Academy of Sciences sends a certain share of instruments produced by its organizations to the republic academies. A number of important scientists of republic academies participate in the cited councils of the USSR Academy of Sciences. At the same time, both the productive forces attracted to scientific instrument building and the coordination work among the academies leaves room for improvement.

In preparing for the present session -- with an understanding with the managers of the republic academies -- we counted on attracting all of the union republic academies to the creation of scientific instruments and to substantial improvement in coordination among them, with the aim of increasing serial production everywhere possible, and on implementing the principle of specialization in development and production.

A preparatory meeting of vice-presidents of union republic academies of sciences was held. From the representatives of the union republic academies, a working group was created under the chairmanship of Corresponding Member V. L. Tal'roze; the group prepared the draft decision for this session on the given subject. This draft was handed out to session participants, with certain additions received after the completion of the group's work. Especially substantial additions were made by Academician V. A. Koptyug, chairman of the Siberian Department of the USSR Academy of Sciences and a vice-president of the USSR Academy of Sciences.

The draft decision considers questions of the creation of new production and development organizations, the coordination of plans, and the exchange of information. In it are contained proposals for creating appropriate councils (where there are none) and centralized funds. (The speaker further elaborated in detail the subject of developing the productive forces of the academies.)

In the draft is an assignment to the appropriate administrations of the USSR Academy of Sciences, to the Scientific and Technical Association, and to the councils, to develop a General Outline for the Development and Housing of Instrument Building Organizations of the USSR Academy of Sciences and Union Republic Academies of Sciences for 1981 to 1985 and for the Long Term to the Year 1990. Naturally, all this calls for capital investments, and the republic academies especially (according to estimates by the drafters) will need to attract significant additional sums for the 11th Five-Year Plan.

In conclusion, I will note that, having examined the problem and made a positive decision, we will have made, it seems to me, a very important strategic step in the development in our country for both fundamental science and for science as a whole.



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UZBEK, USSR ACADEMIES ON SIBERIAN RIVER REVERSAL PLAN

Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 11, 1980 pp 3-13

[Report on USSR Academy of Sciences Presidium discussion of work of Uzbek SSR Academy of Sciences; "Main Directions and Development Prospects of the Uzbek SSR Academy of Sciences' Scientific Research"]

[Text] Created 37 years ago, the Uzbek SSR Academy of Sciences is now the republic's major science center. Its seven departments unite 35 scientific research establishments where more than 13,000 assistants work. The Karakalpak branch is also incorporated in the academy. Guided by the decisions of the 25th party congress and CPSU Central Committee plenums and the propositions and conclusions contained in the reports and speeches of Comrade L.I. Brezhnev, general secretary of the CPSU Central Committee and chairman of the USSR Supreme Soviet Presidium, the Uzbek SSR Academy of Sciences is currently making an appreciable contribution to the republic's economic, social and cultural progress.

The USSR Academy of Sciences Presidium discussed at its meeting the results of the activity of the Uzbek SSR Academy of Sciences.

The report was delivered by Academician A.S. Sadykov, president of the Uzbek SSR Academy of Sciences. He observed that thanks to the assistance of all our country's peoples, primarily the Russian people and Russian scientists, the academy had made an appreciable contribution to the development of Soviet science in the 37 years since it was founded.

Each republic academy, A.S. Sadykov emphasized, develops its own problems which are specific to its republic together with the solution of general fundamental problems. The specific features of the Uzbek SSR Academy of Sciences' scientific research are conditioned by the singularities of the structure of the republic's economy. The sectors incorporated in the cotton complex occupy a large proportion of Uzbekistan's economy. Uzbekistan is the country's principal cotton center. Cotton production, A.S. Sadykov said, is our people's basic international duty.

Scientists of the Uzbek SSR Academy of Sciences (for the first time in world and national breeding science) discovered and used in research as a genetic donor a wilt-resistant wild form of Mexican cotton plant which is relatively immune to verticilliose disease. An original procedure of breeding new wilt-resistant, high-yield cotton-plant varieties (the "Tashkent" variety, for example, which secured

five strain changings thereof) were developed. Twenty new promising cotton-plant varieties which are successfully undergoing tests have been created with the aid of distant hybridization methods, methods of the supplemental pollination and close-relative and graduated cross pollination of geographically distant forms and also the impact of radioactive phosphorus, gamma rays and chemical mutagens. The AN-402, AN-Uzbekistan-3 and AN-Samarkand-2 varieties have already been zoned.

Farming systems leading to a considerable increase in the fertility of irrigable land and also a complex of agrarian methods connected with the use of the new strains have been developed and scientifically substantiated. Large-scale measures for irrigation and land reclamation have been implemented and new types of dams and canals, hydraulic engineering terminals and vertical and horizontal drainage systems have been developed.

The academy's scientists have created and extensive use is now being made in all the republic's cotton-sowing regions of composite nitrogenous-phosphorus fertilizers --ammoniated superphosphate--and also fertilizers incorporating microelements of copper, zinc and other metals (in accordance with the soil-climate singularities of the republic's various regions). UDM low-toxic defoliants, Butylcaptax and others (in place of the highly toxic [butifos; Butylphosphorous (?)]) and also the pesticides Uzgen and Olgin are undergoing tests. The solution of this problem is particularly important in connection with the need to organically combine the task of the further development of cotton growing with the protection of the environment and man's health.

Uncovered cotton-plant seeds are employed extensively in the sowing of the republic. Special machines have been created for their sowing which have helped to secure a fivefold saving of the seeds sown and a considerable increase in the cotton growers' labor productivity. Methods of stimulating seed growth have been developed in physics, biology and chemistry institutes and introduced in practice: lasers, wetting in a solution of succinic acid, in chlorella suspension and the influence of the polymer preparation A-1. Instruments to determine the parameters of cotton fiber, a mechanized line for sorting and calibrating the seeds and so forth are being created.

Research is being conducted connected with the use of cotton waste and the products of its ginning. Growth substances and effective peptizing agents for the production of boracic solutions and construction materials have been obtained. The Uzbek SSR Academy of Sciences Institute of Microbiology in conjunction with the All-Union Academy of Agricultural Sciences imeni V.I. Lenin [VASKhNIL] has shown the possibility of obtaining fodder for livestock by way of the fermentation in silage trenches of cotton-plant stalks with the enzyme [trichoderm lignorum]-19.

Biological methods of fighting cotton-plant pests are being applied successfully after having been developed in conjunction with VASKhNIL's Central Asian Department.

Research into current problems of the theory of probability and mathematical statistics, particularly into asymptotic theorems and stochastic process theory, has been further developed in the Uzbek SSR Academy of Sciences Department of Physicomathematical Sciences.

Theoretical representations concerning the process of the anomalously high atomizing of the surface strata of nonconductors and semiconductors upon bombardment with highly charged ions have been elaborated. A photoelectric generator on a single "Fotovol't"-type multicrystal sublayer has been developed by the ion implantation method. A new type of ion-electron emission called "stimulated electron emission" has been discovered in nonconductors of the ion crystal type. The theory of this phenomenon has been developed.

Radiation processes in silicon depending on the composition of the admixtures, the type and energy of radiation and its intensiveness and on the integrated flux and temperature of the sample at the time of its irradiation have been investigated.

A comprehensive geochemical study of the plutonic composition of the Earth's core and upper mantle for ascertaining the regularities of the location of Uzbekistan's minerals is being conducted. Theoretical and applied research is being conducted in the sphere of seismology. The Uzbek SSR Academy of Sciences Institute of Seismology and the USSR Academy of Sciences Institute of Earth Physics imeni O. Yu. Shmidt are the authors of the discovery of the phenomenon of the change in the content of [rodon] and certain other elements in the composition of subterranean waters. A great deal of work is being performed on the seismic zoning of the republic's territory.

The theory and practical recommendations and normative material on the seismic stability of surface and underground installations were elaborated in the Uzbek SSR Academy of Sciences Department of Mechanics and Control Processes. They were the basis for the construction of the subway in Tashkent, tunnels on the Baykal-Amur Main Railroad, the Ragunskaya GES and so forth.

The "Kibernetika" Science-Production Association has handed over the first stage of the republic ASU and is developing the draft of its second stage.

Among the research in the biology sphere mention should be made of the development of methods of the use of chlorella in the feed rations of agricultural animals and also local silkworm, which is considerably increasing the animals' weight gains and the weight of the cocoons. Botanists have substantiated methods of phytomelioration and increasing the productiveness of desert and semidesert pasture. Biochemists have obtained fractions with proteolytic activeness from viper venom which stimulate blood coagulation thanks to their effect on fibrinogen and prothrombin. The [ionofornyy; iontophoresic (?)] effects and complex-forming characteristics of new synthetic cyclopolyesters distinguished by the dimensions of the macrocycle and also the structure of the substituents have been investigated.

A Red Book of rare animals of Uzbekistan has been created and measures formulated for the protection and reproduction of rare animals and plants.

A fundamental scientific field--investigation of the chemical aspects of the mechanism of the regulation of genetic information--has evolved and is developing in the Institute of Bioorganic Chemistry. Work is being performed in close contact with the USSR Academy of Sciences Institute of Bioorganic Chemistry imeni M.M. Shemyakin. The immunodepressors [patrigen] and [mikosen] and also antivirus preparations such as elements of [kossepol], for example, have been created for the

first time in national practice. An inductor for the production of interferon in the human organism has been created on the basis of vegetable matter.

The Institute of the Chemistry of Vegetable Matter has determined the regularities of the correlation of the composition, reactivity and pharmacological activeness of a number of diterpene and quinazolene alkaloids. Several medical preparations have been created.

The Uzbek SSR Academy of Sciences' humanities establishments are performing a great deal of work in the social sciences sphere. Research is being conducted in close contact with the corresponding institutions of the USSR Academy of Sciences, the academies of sciences of the republics of Central Asia and Kazakhstan and with departments of Uzbekistan's VUZ's.

Economists are formulating the main directions of the republic's socioeconomic development, forecasts of the growth of its population and labor resources and methods of forecasting capital investments and determining the economic efficiency of scientific research and design work. Questions of optimizing cotton growing and the sectors of the republic's economy connected with this occupy a special place in their activity. This research is being conducted in conjunction with the USSR Academy of Sciences Central Economico-Mathematical Institute. The republic's economists participated actively in the elaboration of the "Comprehensive Program of Scientific-Technical Progress and its Socioeconomic Consequences for the Long Term up to the Year 2000." Questions connected with the development of economic and social problems of diverting part of the flow of Siberian rivers to Central Asia have been studied.

The Institute of Philosophy and Law is studying questions of the theory of materialist dialectics and scientific cognition, the theory and practice of the noncapitalist path of development of the peoples, the history of the social-philosophical thought of the peoples of Central Asia and the foreign East and also the experience of the emergence and development of the statehood of the Central Asian peoples.

The Institute of History and the Institute of Oriental Studies are studying the history of the preparation and realization of the socialist revolution in Turkestan, the nature of the fundamental socioeconomic transformations in the region in the course of socialist building and under the conditions of mature socialism and the history of the countries of the Near and Middle East. Archaeological exploration is being carried on extensively. There have been considerable successes in study of the questions of the antique culture of the peoples of Central Asia and Kazakhstan.

The Institute of Language and Literature imeni A.S. Pushkin has studied questions of the theory and history of Uzbek literature and the role of Russian in the rapprochement of the socialist nations. An Explanatory Dictionary of Uzbek has been compiled, and the most important historical written monuments of Uzbek literature have been published. Significant results have also been obtained in the sphere of study of the history, language, literature and art of the Karakalpak people from the most ancient times to our day.

Scientific research and experimental design work is performed for the needs and upon the requests of individual sectors of the economy. It is essential to examine the following questions for a further improvement in the organization of this work at the time of the formulation of the academy's research plan for 1981-1985: the forms of relations between clients, chief performers and coexecutants; an increase in mutual exactingness and responsibility in obtaining the final results of this activity; the creation of a procedure of determining the efficiency of work; an improvement in the system of its financing and material-technical support; a reasonable reduction in accountability; and an improvement in the system of stimulating this work.

A.S. Sadykov went on to speak about the scientific establishments incorporated in the Uzbek SSR Academy of Sciences, their activity, the numerical growth of scientific assistants, the problems of financing scientific research and developments, the increased volume of economic contract work and the development prospects of this form of activity. He requested of the USSR Academy of Sciences Presidium assistance in the solution of the question of financing economic contract work. A.S. Sadykov emphasized particularly the positive experience of the Ukrainian SSR Academy of Sciences and the USSR Academy of Sciences Siberian Department in the introduction in practice of contracts on creative collaboration with related institues, VUZ's, enterprises and design offices and noted the great influence of these contracts on the introduction of the results of scientific research in the economy, science and culture. The total savings from the introduction of the results of the scientific research of Uzbekistan's scientists, A.S. Sadykov said, will amount to approximately R1 billion in the 10th Five-Year Plan, and many developments of the republic's scientists are being applied extensively at enterprises of the Soviet Union.

Since 1976 the academy has been working on 13 comprehensive programs connected with the solution of many urgent problems of the development of the republic's economy--cotton growing, the mineral-raw material base, the creation of effective fertilizers and pesticides and others. Eleven academic and 10 sectorial institutes, 15 design and planning organizations and 6 plants are participating in the implementation of these programs. The number of comprehensive programs will rise to 30 in the 11th Five-Year Plan.

The increased prestige of the Uzbek SSR Academy of Sciences and the further development of its scientific relations are evidenced, in particular, by the increased number of scientific fora conducted in the republic: 26 conferences were held here (including 12 international conferences) in 1978-1979 alone; the academy received 163 foreign scientific delegations in 1979. Scientific cooperation is being exercised with the CEMA countries on 31 scientific subjects.

The academy's publishing activity has been further developed. Approximately 500 monographs and single-subject collections have been published in the 10th Five-Year Plan; 42 books have been awarded honorary diplomas at international and all-union competitions. Ten scientific journals (two of which--GELIOTEKHNIKA and KHIMIYA PRIRODNYKH SOYEDINENIY--are all-union journals) and the FAN VA TURMUSH popular science magazine, whose circulation is over 500,000 copies, are published. Publication of the Uzbek Soviet Encyclopedia (13 of 14 volumes have appeared) is being completed.

There are, of course, certain shortcomings and unsolved questions in the activity of the Uzbek SSR Academy of Sciences. The chief ones are the academy's inadequate performance of the role of coordinator of all the republic's science, inadequate relations with the sectorial scientific research institutes, VUZ's and large-scale production associations and the insufficient amount of joint work with union and republic scientific establishments, ministries and departments. The question of the creation of sectorial laboratories has not yet been solved. Not all branches of learning are yet fully staffed with specialists with high qualifications (doctors of sciences).

The republic academy presidium and other executive authorities are adopting certain measures to rectify the existing shortcomings. Draft regulations governing a republic council for coordinating scientific research and its composition have been submitted for examination. The council's principal task is the settlement of questions connected with determination of the subject matter of research, the period of its performance and the introduction of the results of the research in practice.

Questions of strengthening the Uzbek SSR Academy of Sciences' relations with the republic Ministry of Education have been examined. Corresponding decrees of the Uzbek SSR Academy of Sciences Presidium and the republic ministries of higher and secondary specialized education, geology and health have already been adopted on these questions. It is essential to step up supervision of the unswerving fulfillment of all clauses of these decrees.

The business of organizing relations with the sectorial institutes (particularly the union institutes) is more complicated. The union ministries still do not coordinate the plans of the scientific research activity of their institutes with the Uzbek SSR Academy of Sciences, which frequently leads to the duplication of work and other undesirable phenomena. I believe that it would be advisable to formulate general regulations for the entire union on coordinating the plans of scientific research of the sectorial and academic institutes.

Nor has the question of the organization of sectorial laboratories yet been fully solved. Only seven such laboratories have as yet been created. A fixed procedure of their financing has not been determined. The ministries and departments which have agreed to create these laboratories may pass on the necessary resources to the academy, but without wage funds and labor ceilings; the academy itself, on the other hand, does not have a chance to apportion these ceilings. We need help in the solution of these questions.

The Uzbek SSR Academy of Sciences is taking certain steps to increase the number of highly qualified scientists (particularly in the sphere of physicomathematical and technical sciences). The number of candidates and doctors of sciences in these branches of learning is increasing. The USSR Academy of Sciences renders our academy great assistance in training scientific personnel: more than 50 candidates and doctors of sciences were trained in its scientific establishments in the period 1975-1979, and approximately 100 scientists are currently involved in graduate work or serving their qualification apprenticeship within its walls.

Concrete measures are being adopted to improve the work of the design subdivisions. The Central Planning-Design Bureau of Scientific Instrument Building, the Design-Engineering Bureau of the Physicotechnical Institute imeni S.V. Starodubtsev and the Institute of Electronics imeni U.A. Arifov operate within the system of the Uzbek SSR Academy of Sciences. A special design bureau of the republic ASU, an experimental-testing plant of the "Kibernetika" Science-Production Association and also the "Radiopreparat" Experimental Enterprise of the Institute of Nuclear Physics have been created. More than 50 different instruments, small series of which will be supplied beyond the republic, have been and are being created in these organizations.

But the physical plant of the design bureaus and experimental works is still inadequate. We request assistance from the USSR Academy of Sciences in fitting out these subdivisions with modern equipment, batching components, instruments and transport facilities. It is essential to solve the question of the construction of a scientific instrument-building plant here to accelerate the development of scientific instrument building in the republic.

The republic's leading party authorities have adopted a number of measure to assist the Karakalpak branch of the Uzbek SSR Academy of Sciences. The branch is allocated premises, equipment and motor transport. The main areas of its scientific and scientific-organizational activity have been determined. The Uzbek SSR Academy of Sciences Presidium plans to conduct an out-of-town session in the very near future to determine the directions of the further development of its branch. We request that the Regulations Governing Branches of the USSR Academy of Sciences be extended to the Uzbek SSR Academy of Sciences Karakalpak branch.

The acceleration of the development of scientific-technical progress is confronting the Uzbek SSR Academy of Sciences with increasingly new tasks. It is essential for their successful accomplishment to examine certain scientific-organizational questions.

One of the main ones is the complex of problems connected with the further development both of cotton growing and the entire farming of the republic as a whole, which are caused by the increased shortage of water for irrigating the fields. A computation and evaluation of the land and water resources of the Central Asia region have shown that considerable areas of vacant land cannot be used owing to a water shortage. It has been determined that regulating the flows of the Amudar'ya and Syrdar'ya and also measures to improve the irrigation network will not help in fully solving these problems. The question of conducting scientific research and the implementation on its basis of a planned study connected with the problem of diverting part of the flow of northern and Siberian rivers to Central Asia, Kazakhstan and the Volga basin was raised in timely fashion at the 25th CPSU Congress. We believe that it is essential to return the Institute of Water Problems to the Uzbek SSR Academy of Sciences for an in-depth and comprehensive analysis and solution of these global problems.

The speaker then dwelt on certain concrete organizational questions connected with the creation of machinery for cotton growing and other sectors of the agriculture of the region, the further development in the republic of mining and smelting research, development of the problems of power engineering, the creation of a science-production association and a number of experimental production enterprises, the

more clear-cut specialization of certain scientific establishments, the organization in Central Asia of a special institute of the economics and politics of foreign oriental countries and an improvement in the structure of the management machinery of the Uzbek SSR Academy of Sciences.

The decisions of the 25th party congress and the CPSU Central Committee November (1979) Plenum and the instructions and conclusions contained in the reports and speeches of Comrade L.I. Brezhnev, general secretary of the CPSU Central Committee and chairman of the USSR Supreme Soviet Presidium, A.S. Sadykov emphasized in conclusion, mobilize us for a further increase in the level of scientific research, scientific-organizational work, discipline, personal responsibility, bold criticism and the decisive rectification of the shortcomings in our work.

Academician V.A. Kotel'nikov, chairman of the commission which familiarized itself with the activity of the Uzbek SSR Academy of Sciences and vice president of the USSR Academy of Sciences, observed that members of republic academies--A.A. Keerna, member of the Estonian SSR Academy of Sciences, and A.V. Drumya, corresponding member of the Moldavian SSR Academy of Sciences--had been enlisted in participation in the work of the commission for the first time. This had positive results and, in particular, contributed to an exchange of experience between the republic academies. This practice should be continued.

The commission unanimously concluded that the level of activity and the qualifications of the scientific personnel of the Uzbek SSR Academy of Sciences were sufficiently high and that research is being performed at a modern scientific level. The equipment of the institutes of the republic academy as a whole is satisfactory.

The academy's scientists have done much for their republic and the economy of the entire Soviet Union. Particularly important and valuable research is, naturally, being conducted in the sphere of cotton growing. It is also important that the academy's scientists attach great significance to the practical use of the results of their research in instrument making. The shortcoming here is the almost total lack of coordination between the republic's instrument-building organizations and the USSR Academy of Science's production association and also coordination of the plan of work and mutual assistance. This is more due to the inadequate work of the central rather than the republic authorities. It is essential that the question of coordination be discussed very soon at a session of the Council for Coordinating the Scientific Activity of the Union Republic Academies of Sciences attached to the USSR Academy of Sciences Presidium.

V.A. Kotel'nikov emphasized that it is necessary to study in depth and extensively utilize the Uzbek SSR Academy of Sciences' positive experience in the organization and activity of the "Kibernetika" Science-Production Association, which is engaged in introducing modern computers and monitoring this process in the republic's scientific establishments.

A basic shortcoming (which is primarily attributable to the central authorities) is the inadequate coordination of scientific research. This, among other things, may be seen in the example of the work with respect to microelectronics--the basis of computers. There are highly qualified persons in Uzbekistan, but the unreservedly useful tasks which they are performing are determined mainly by the small-scale assignments of various industrial organizations. And this, naturally, is diverting

the scientific forces from the master line of development of the work with respect to perfecting computers. To a considerable extent this is the fault of the scientific councils and other coordinating bodies of the USSR Academy of Sciences. It is essential that the USSR Academy of Sciences Department of General Physics and Astronomy increase the coordination of scientific research and point the scientists of all the republic academies in the direction of the development of the main directions in the sphere of microelectronics and computers.

Another example is work in the Maydanak region. This group of high mountains attracts astronomers with its very dry climate and light winds (and, consequently, absence of turbulence and the slight "erosion" of the image connected with this). Radio astronomers of the Uzbek, Lithuanian and Estonian SSR's and also Moscow and Leningrad state universities wish to begin the construction of observatories in this area. The USSR Academy of Sciences Department of General Physics and Astronomy should discuss this question with the Astronomical Council and adopt measures for the creation of a single plan of the construction of an astronomical township in this area.

Certain other questions are in need of a centralized solution. In particular, inadequate use is as yet being made of the possibilities of the USSR Academy of Sciences in the training of the republic's scientific personnel. The question of patents has been insufficiently developed, and the pace of construction is still slow, but here we hope for effective assistance on the part of the republic party and soviet authorities.

Having dwelt on the question of the diversion of part of the flow of Siberian rivers to Central Asia and Kazakhstan, V.A. Kotel'nikov stressed that the main problem here is not only how to divert this water but whether it can be drawn off and to what this will lead. We are as yet studying this problem only in a very small way. If, on the other hand, we now elaborate merely the engineering solutions and the business is thus advanced, we will at some point find ourselves incapable of answering the main questions: is it possible (and is it necessary) to do this in principle and if so, in what volume? For this reason it seems to me that these questions should be studied persistently not only in the republic but in the USSR Academy of Sciences also.

V.A. Kotel'nikov observed in conclusion that the number of scientific workers in our country is no less than in any major capitalist country. Therefore the main path of an improvement in the quality of scientific work and its productiveness is not only an increase in the staffs of the scientific research establishments but their provision with modern instruments, computers and other equipment. The automation of research and the cooperation of exploratory work must also play a big part.

A.K. Kuchkarov (Uzbek Communist Party Central Committee), who spoke in the debate, emphasized that examination of the question of the activity of the Uzbek SSR Academy of Sciences at a session of the USSR Academy of Sciences Presidium is a big event not only in the scientific but also in the economic and political life of the republic. The material of the work of the prestigious commission, which is headed by Academician V.A. Kotel'nikov, vice president of the USSR Academy of Sciences, will be program documents for Uzbekistan's scientists in increasing the level, efficiency and quality of their activity.

The republic's scientists constantly perceive the fraternal assistance of the USSR Academy of Sciences Presidium, the central academic institutes and all scientists of the Soviet Union. Major international and all-union conferences are exerting a fruitful influence on the development of science and an improvement in the quality of ideological education in the republic. A.K. Kuchkarov conveyed to the USSR Academy of Sciences Presidium big gratitude from Sh.R. Rashidov, candidate of the CPSU Central Committee Politburo and first secretary of the Uzbek Communist Party Central Committee, and his wishes to the USSR Academy of Sciences' scientists for further success in their activity to the glory of Soviet science.

In accomplishing the tasks set by the 25th CPSU Congress, A.K. Kuchkarov observed, the Uzbek Communist Party Central Committee relies constantly on the assistance of the Uzbek SSR Academy of Sciences, supports all its useful initiatives and contributes to the strengthening of its physical plant, an increase in the efficiency of scientific research and the training and education of personnel. In recent years alone the republic Communist Party Central Committee has examined questions concerning the main areas of scientific research in the 10th Five-Year Plan in the light of the decisions of the 25th CPSU Congress, the development of genetic science, the activity of the Institute of Seismology and the Institute of Geology and Geophysics, assistance to the Institute of Nuclear Physics, an increase in the efficiency of the introduction of the results of the academy's scientific research in practice, the activity of the Uzbek SSR Academy of Sciences' Karakalpak branch and many others.

Permit me to express certain wishes connected with an improvement in the activity of the Uzbek SSR Academy of Sciences. We request an acceleration in the solution of the question of the creation of institutes of mechanical engineering and mining and smelting in the system of the republic academy, which is connected with the increased proportion of these sectors in the republic economy and the need for fundamental research in these problems. We thank the USSR Academy of Sciences Presidium for the assistance in the solution of the question of the transfer of the Institute of Power Engineering and Automation to the Uzbek SSR Academy of Sciences. We request that we also be supported on the question of the creation of a scientific instrument-building plant in the republic. In turn, we promise in the future to step up the pace of housing construction for the scientists' needs.

I would like to say a few words about the diversion of part of the flow of Siberian rivers to Central Asia. The study and solution of this problem is a political and social question. It is connected with the development of a huge area embracing the territory of more than just our republic and with the destiny of the millions of people who live there. This directive of the 25th party congress is supported by all the Central Asian republics.

The question of the creation of an institute of the economics and politics of foreign oriental countries is important. Now, under the conditions of the growth of the ideological struggle, we should give thought to stepping up our work and to a comprehensive investigation of foreign oriental countries--social, economic, political and cultural problems and questions of religion (primarily Islam).

Visits to the republic by members of the USSR Academy of Sciences and top Soviet scientists are of great assistance in the further improvement of the activity of the Uzbek SSR Academy of Sciences and its scientific establishments and scientists. I

would like to express the wish for such visits and assistance to the republic's scientists locally to be more regular and plan-based. The participation in our work of scientists of other republic academies is also rendering us great assistance.

For a further improvement in the comprehensive "Cotton" program it would be advisable to set up a coordinating council under the USSR Academy of Sciences, which would also deal with the research work of the scientific establishments of the country's ministries and departments.

In conclusion A. K. Kuchkarov gave the assurance that the republic's scientists would make a worthy contribution to the development of Soviet science and that they would receive reliable support here on the part of the Uzbek Communist Party Central Committee.

Academician P.N. Fedoseyev, vice president of the USSR Academy of Sciences, observed that the question of the inadequate coordination of scientific research arises each time there is a discussion of the activity of the republic academies or branches of the USSR Academy of Sciences. The role of the USSR Academy of Sciences as the country's coordinating scientific center was recorded by the decisions of the 25th CPSU Congress, but this proposition has not yet been recorded officially or enshrined on a general legal level. The USSR Academy of Sciences Institute of State and Law has prepared certain provisions with respect to regulating the legal aspect of the organization of scientific research activity in the country. We expect to examine and discuss these proposals in the USSR Academy of Sciences Presidium.

P.N. Fedoseyev drew attention to three main areas of the activity of the Uzbek SSR Academy of Sciences in the social sciences sphere. The first is the analysis and collation of the experience of the transition from patriarchal and feudal relations to socialism. All foreigners visting the republics of Central Asia can clearly see the impressive successes of the peoples of this region. Another aspect of this question is how this process occurred and with what forces and resources and, what is most important, at what scientifically substantiated rate. Research needs to be developed and experience collated in precisely this area. Many developing countries of a socialist orientation are in acute need of such experience. Haste in socio-economic transformations is not always beneficial. Complex problems and tasks require a sufficient length of time for their conclusive and correct solution. It is known, for example, that the accomplishment of such a complex task as water-land reform took several years in Uzbekistan (right up to 1924-1925). Then agricultural cooperation lasted a further 10 years and more.

The second area is the analysis of the history and nature of the different forms of oriental ideology and culture (particularly Islam, whose political galvanization is being manifested particularly in our time). It should be emphasized that Uzbekistan's scientists are studying this problem in earnest. Uzbek scientists are also making an in-depth study of the experience of the formation of socialist, internationalist ideology.

And, finally, the problem of linguistic construction. Uzbekistan's scientists have done much to propagandize study of Russian in the national schools and, altogether, for the further spread of Russian. This is a very important international and political question. Work in this area should be approved and actively supported.

Academician N.P. Fedorenko described the practical assistance of the institutes of the USSR Academy of Sciences Department of Economics in the training of scientific personnel for the Uzbek SSR Academy of Sciences. He supported the proposal for the creation in Uzbekistan of a coordinating council for the "Cotton" problem and noted the urgency of the tasks confronting the scientists engaged in investigation of the problems of cotton growing (improvement of the processes of the mechanized harvesting of cotton, processing of the raw material, the struggle against losses and others). These problems affect the interests of all the Central Asian republics, N.P. Fedorenko emphasized, and therefore reprsentatives of all the Central Asian academies should be included in the coordinating council.

V.P. Shcheglov, member of the Uzbek SSR Academy of Sciences and director of the Uzbek SSR Academy of Sciences Institute of Astronomy, described the changes in the correlation of fundamental and applied research being conducted on the basis of economic contracts. He emphasized the need for the development of such fundamental problems as solar physics, continental drift and others.

In his closing remarks Academician A.P. Aleksandrov, president of the USSR Academy of Sciences, noted the usefulness and fruitfulness of the visits of USSR Academy of Sciences Presidium members and top scientists to the republic academies and supported the proposal for the creation of an instrument-building plant in the republic.

In its decree the USSR Academy of Sciences Presidium approved the scientific and scientific-organizational activity of the Uzbek SSR Academy of Sciences aimed at the development of science, acceleration of the rate of scientific-technical progress and solution of the problems of the further development of the republic's economy and culture and also the main areas of Uzbekistan's scientists' scientific research.

To put an end to existing shortcomings the USSR Academy of Sciences Presidium recommended that the Uzbek SSR Academy of Sciences adopt measures to improve the planning and financing of scientific research on the basis of the program-goal method for the purpose of concentrating the main scientific forces and resources in the most urgent areas, bringing the structure of individual scientific establishments into line with the principal areas of scientific research and formulating regulations for strengthening the academy's management machinery;

improve work on the training of highly qualified scientific personnel, make more extensive use of specific-purpose graduate study and the attachment of qualification apprentice-research assistants to scientific establishments of the USSR Academy of Sciences and increase the demands made on the quality of the dissertations;

increase the coordination of research in the sphere of the natural and social sciences between academic and sectorial institutes and VUZ's of the republic and also with respect to the collective use of unique equipment and instruments;

increase the work connected with environmental protection. The USSR Academy of Sciences Scientific Council for Problems of the Biosphere should render the Uzbek SSR Academy of Sciences' scientific establishments the necessary assistance in the organization of this research and also formulate with the appropriate ministries,

departments and scientific establishments joint plans for the chemicalization of agriculture, protection of the biosphere and irrigation of the soil in the Uzbek SSR for the 11th Five-Year Plan; and

improve work on inventions, patenting and licensing and production efficiency in the republic's scientific establishments and create a patent-licensing department under the auspices of the Uzbek SSR Academy of Sciences Presidium.

The decree also deals with the need for the further development of the material-technical and scientific-experimental base of the Uzbek SSR Academy of Sciences and the expansion in the 11th Five-Year plan of planning-construction work and other measures connected with a further improvement in the activity of the scientific research establishments of the Uzbek SSR Academy of Sciences and the strengthening of their scientific and material-technical base and with the optimization of the organizational forms of assistance to the scientists of the republic academy on the part of departments of the USSR Academy of Sciences.

Supervision of the fulfillment of the decree is entrusted to the USSR Academy of Sciences Council for Coordinating the Scientific Activity of the Union Republic Academies of Sciences.



8850
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LITHUANIAN CC CREATES COMMISSION ON SCIENTIFIC-TECHNOLOGICAL PROGRESS

Vilnius TRUDY AKADEMII NAUK LITOVSKOY SSR, SERIYA A in Russian No 3(72), 1980 pp 116-117

[Decrees summarized by M. Rimkyavichene and Y. Samaytis: "Improvement in the System of Coordinating Scientific-Research and Experimental-Design Projects (Resume)"]

[Text] On 10 September 1979, the Presidium of the Lithuanian Academy of Sciences held a meeting at which there was a discussion relating to the fulfillment of a 13 August 1979 decree by the Lithuanian Communist Party Central Committee and the Lithuanian Council of Ministers, No. 280, "On Further Improvement in the System of Coordinating Scientific-Research and Experimental-Design Projects in the Republic."

The Presidium of the Academy of Sciences adopted decree No. 260, "On the Fulfillment of the 13 August 1979 decree No. 280 of the Lithuanian Communist Party Central Committee and the Lithuanian Council of Ministers," in which it was stated that the cited document notes insufficient cooperation in scientific-research and experimental-design projects being conducted by higher educational institutions and by institutes of applied research, that union institutes located in the republic are rarely enlisted in research on scientific-technical problems, that republic coordination councils do not give needed attention to the introduction of scientific results into practice, and that the activities of these bodies are inadequately coordinated.

The Lithuanian Communist Party and the Lithuanian Council of Ministers have created the Republic Commission of Scientific-Technical Progress, which is headed by A. Drobnis, deputy chairman of the Lithuanian Council of Ministers and chairman of the Lithuanian State Planning Committee (commission chairman), Yu. Matulis, president of the Lithuanian Academy of Sciences (deputy commission chairman), and A. Deynis, chief of a section of the Lithuanian State Planning Committee (scientific secretary of the commission). The Commission includes another 20 members -- well-known scientists and specialists, managers of large institutions of science and technology, higher educational institutions, and planning and administrative bodies of the republic.

In the approved Statute on the Republic Commission on Scientific-Technical Progress, it is stated that the Commission is a body of the Lithuanian Communist Party Central Committee and the Lithuanian Council of Ministers for the coordination of principal problems in the development of scientific-technical progress in the republic.

The basic tasks of the Commission are the following: the preparation of proposals reflecting the basic trends in science and technology and the increase of effectiveness in integrating science and production in the republic; and improvement of the system of bodies for coordinating the scientific-technical and social-economic development of the republic.

In its activities, the Commission relies on the republic councils for coordination of the Academy of Sciences, the State Planning Committee, the Committee for Construction Affairs, the Ministry of Agriculture, the Ministry of Health, and other republic coordinating bodies.

The Commission organizes the study of the scientific and technical levels of production, the explanation of the most important republic scientific and technical problems, and the preparation and implementation of complex problems:

it studies problems in the forecasting of science and technology and establishes tasks and basic lines of development for scientific research and experimental-design work;

it establishes the most important tasks and measures to support the more effective integration of science and production;

it discusses problems relating to the improvement in the network of scientific-research, project-design, and experimental organizations;

it prepares and implements measures for the improvement of the system of coordination bodies for the solution of scientific-technical and social-economic problems; and

it discusses long-range plans for the training of scientific and engineering personnel in accordance with forecasts of scientific-technical developments for civil production.

The Commission is given the right to charge republic coordination bodies, ministries, agencies, and scientific-research, project-design, and other republic organizations with the study of individual problems and with the preparation of measures in accord with basic problems of science and technology; to create expert groups for the study of urgent problems of science and technology and the preparation of design proposals for their implementation; and to receive information and to hear accounts and reports by managers of republic coordination councils, ministries, and agencies, on the work of coordination bodies and research on the most important problems of science and technology.

The Lithuanian Communist Party Central Committee and the Lithuanian Council of Ministers have decreed that new republic councils for coordination are to be created with approval by the Republic Commission for Scientific-Technical Progress;

they have charged the Council for Coordination of Scientific-Research Work in the Fields of Natural and Social Sciences of the Presidium of the Academy of Sciences with the coordination

of fundamental scientific research in the fields of natural, technical, and social sciences, and have decreed that the Council is responsible for rational utilization of the scientific potential of higher educational institutions and of other scientific organizations for research in fundamental problems;

they have charged the Republic Council for Scientific-Technical Problems of the State Planning Committee with the coordination of the most important industrial research and experimental-design projects for the study of the most important republic inter-agency scientific problems and with fulfilling the function of a methodological center, for preparing and implementing scientific-technical programs;

they have charged the Ministries of Higher and Secondary Specialized Education, Agriculture, Health, and other ministries and agencies with determining and refining the basic lines of scientific development for higher educational institutions and for ministerial institutes;

they have charged the State Planning Committee, the Academy of Sciences, the Committee for Construction Affairs, the Ministries of Agriculture, Health, Education, and other ministries and agencies with the examination and affirmation of the statutes and the composition of republic coordination councils, problem councils and commissions, after having foreseen more goal-directed and complex solutions by these bodies that have been tasked by them and an assurance of more agreement in the system of activities of coordinating bodies; and

in the State Planning Committee, they have established a Section for Scientific-Technical Problems, having charged it with the provision of organizational and technical service to the Republic Commission for Scientific-Technical Progress and to the Republic Council for Scientific-Technical Problems of the State Planning Committee.

The Presidium of the Academy of Sciences has decreed that the Council for the Coordination of Scientific-Research Projects in the Fields of Natural and Social Sciences of the Presidium of the Academy of Sciences must coordinate fundamental scientific research in the fields of natural, technical, and social sciences throughout the republic;

it has charged the Council for Coordination through established procedures to prepare and make proposals for refining the system, composition, and statutes concerning the Council for Coordination and its problem councils; with the exercise of concern for the expansion of cooperation between institutes of the Academy of Sciences, higher educational institutions, and ministerial institutes; and with the systematic analysis of of scientific problem councils and with taking measures for raising the effectiveness of their activity.



9645
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INTEGRATION OF SCIENCE AND INDUSTRY SUBJECT OF VILNIUS CONFERENCE

Moscow VOPROSY EKONOMIKI in Russian No 1, 1980 pp 151-152

/Article by A. Deynis and V. Logachev, Vilnius: "Modern Ways to Integrate Science and Production"/

/Text/ In April 1979 in Vilnius a conference was held on "Modern ways to integrate science and production". The conference was organized by the Scientific Council of the State Committee for Science and Technology on the "Organization and economics of scientific-technical research and designs" and by the Lithuanian SSR Gosplan.

The conference got underway with a report by the Deputy Chairman of the Lithuanian SSR Gosplan B. A. Zaykauskas. He detailed the promising, in his opinion, forms for integrating science and production: the further development of the system of production associations, the raising of the level of complexity of scientific-research organizations and production associations.

At present the scientific-production association (NPO) is the basic form of uniting the achievements of science and production. However, up until now there have been difficulties in planning the work of the NPOs, particularly of the individual structural elements that comprise the NPO. Planning in the NPO by types of activity (research, designing and series production), it was noted in the report of B. Motorygin (State Committee for Science and Technology), prolongs the rates for adopting the results of science. The adoption of the "matrix structure", which makes it possible to rationally combine the functional and subject sectoral structures of management in the sectors, is becoming very important.

In the report of A. Deynis (Lithuanian SSR Gosplan) particular attention was devoted to the problem approach to managing scientifc technical progress, to experience and ways for improving

the system of coordinating scientific-research and experimental design work (NIOKR) at the level of the union republic. One of the effective organizational measures for integrating science and production in conditions of the Lituanian SSR is coordination in the development of science, which has the following aspects: the coordination of the activity of the scientific-research institutes, design bureaus, institutions of higher learning and other republic organizations; and using scientific-research institutes and design bureaus of republic subordination that are located in the republic to solve republic problems. Responsibility for the coordination of work on intersectorial scientific-technical and economic problems has been placed upon the Lithuanian SSR Gosplan. In the republic there are more than 10 specialized coordinating organs for individual scientific-technical, organizational and social problems, the membership of which includes the managers of several production, planning and other republic organs.

The inadequate efficiency of program-target methods, in the opinion of Doctor of Economic Sciences D. Bobryshev of the All-Union Scientific Research of Sanitary Testing (VNIISI), can be explained by the lack of an appropriate methodology. The basic task for today is to come up with a methodology for selecting the most important scientific-technical problems. It is very important not only to compile optimal plans for realizing the programs but also to skillfully manage over a 5 to 10 year period the process of their realization. It is necessary to concentrate attention on the development of a system of management of the realization of scientific-technical achievements on the part of the scientific-research institutes.

Doctor of Economic Sciences V. Baranuskas discussed the work experience of the "Sigma" production association.

Also speaking at the conference were Doctor of Economic Sciences K. Taksir (Institute of Economics of the USSR Academy of Sciences), Candidate of Economic Sciences P. Sedlov (Institute of Economics of the USSR Academy of Sciences), A. Kvedaravichyus (RSNTO, Lithuanian SSR), Candidate of Economic Sciences S. Sterkin (All-Union Institute of Economics imeni V. I. Lenin), and Candidate of technical Sciences Yu. Krivonosov (Central Scientific Research Institute of Ferrous Metallurgy).

In the recommendations that were approved by the conference the main trend in the integration of science and production was considered to be the further development of production associations. It is necessary to improve the mechanism for managing the comprehensive renovation of production on the basis of the latest achievements of science and technolgy. Moreover, all stages of scientific-research, planning and designing, technological and experimental work, series and mass production, the technological improvement of the production apparatus must be

embraced. The scientific-research institutes of the Lithuanian SSR Academy of Sciences and the sectoral institutes that are located within the republic and which specialize in specific fields of scientific and scientific-technical development, must perform the functions of lead organizations. The ministries (departments and associations), scientific-research institutions and institutions of higher learning of the republic are advised to switch away from short term contracts in favor of long-term contracts, which call for the study and comprehensive solution of important long-term scientific-technical and social-economic problems on a sectoral scale (the production complex). The production associations (enterprises) must more extensively practice the creation of special topic-planning groups and comprehensive brigades (researchers, designers, experimental and series production workers, adjusters and other specialists) for carrying out measures to speed up the realization of scientific-technical programs.



8927
CSO: 1814

INDUSTRYWIDE FINANCING OF SCIENTIFIC-TECHNICAL PROGRESS

Moscow VOPROSY EKONOMIKI in Russian No 8, Aug 80 pp 31-39

[Article by K. Kedrova]

[Text] Important changes have been made in the system for financing scientific-technical progress by the decree of the CPSU Central Committee and USSR Council of Ministers entitled "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality." Especial emphasis should be put on the new approach to the mechanism for supplying financial resources for scientific-technical development of production, which is manifested in enhancement of the cost-accounting motivation of collectives of enterprises (associations) and scientific-technical organizations to speed up scientific-technical advance and to make efficient use of the funds assigned to creating, putting into production and applying new technology. Paramount among the measures envisaged by the decree are the transition to financing scientific-technical progress in the industrial sector with the resources of the industrywide unified fund formed from the profit of subordinate industrial enterprises. In that fund are pooled the industry's resources for scientific research projects, the resources of the fund for putting new technology into production, and also budget appropriations to develop that industry's science.

Among the shortcomings of the present method of financing scientific-technical progress we should mention first of all the lack of an effective linkage of the industrywide mechanism for financing the "science--technology--production" cycle with profit, which constitutes one of the principal forms of the final economic result of utilization of scientific-technical achievements in production. Creation of the unified fund for financing scientific-technical progress in the industry so as to unify the various sources of funds for financing new technology will make it possible to link together the stages in the "research--production" cycle into a unified financial-economic complex, to mobilize all moneys earmarked for that purpose and on that basis to conduct a more flexible financial policy in the sphere of the industry's scientific-technical development.

The transition to profit as a source of supplying financial resources for industrywide projects of creating, putting into production and applying new technology makes it easier to establish a direct relation between industrywide expenditures for development of science and technology and the economic benefit obtained by enterprises from the production and application of the new technology in the form of additional profit. The planned expenditures related to the industry's scientific-technical development will now circulate within the limits of the industry's profit.* This method of financing scientific-technical progress in the industry will make it possible to increase the effectiveness of feedback in the "science--technology--production" system.

It is especially important to creating stable economic conditions for development of science and technology and for application of their advances to production that the transition envisaged by the decree be made to the methods of long-term financing of measures for scientific-technical development of production and that the principle be implemented of "pooling" the funds annually allocated by the industry to develop science and technology. The resources of the unified fund are earmarked, and should they not be used in the current year (5-year period), they are not confiscated, but are carried over to the next planning period. This ensures not only stability, but also high maneuverability of the financial mechanism for management of the industry's scientific-technical development.

The effectiveness of financing scientific-technical progress is determined not only by the economically sound sources for financing the development of science and technology, but also by such factors as selection of the base used in formation of the targeted financial funds, establishment of the quantitative value of the rate of transfers to the targeted funds so as to guarantee the necessary money resources required to develop the industry's science and to realize its advances in production, and also selection of the method by which the transfers are to be made to the special-purpose fund.

Selection of an economically sound normative base for formation of the YeFRNT [Unified Fund for Development of Science and Technology] has fundamental importance to enhancing the effect of the financing mechanism on speeding up scientific-technical progress and on raising the efficiency of

* Planned outlays for development and application of new technology will not be included in the production costs of industrial output. Nevertheless, it must be taken into account that at industrial enterprises the planned sources for financing measures under the head of new technology are not the only sources for reimbursement of actual outlays to put into production and apply new technology (not covered by the budget for placement of the resources of specific funds). As a rule these outlays are covered from the funds of the principal activity (working capital), from centralized capital investments and from other sources.

social production on that basis. An analysis conducted in the machine-building industries into the quantitative relationship and dynamic behavior of the principal cost indicators of development of industrywide science and the indicators of the development of production (commodity output, sales, normative output, net output, profit, wages, the value of fixed capital) has shown that the indicators displaying the closest economic relationship are the volume of outlays for R&D [literally "scientific-research and experimental-design developments"] and the volume of commodity output. To ensure the organic unity and stability of the indicators of the volume of outlays for science and the indicators of the volume of financing of scientific-technical projects, one and the same indicator should be adopted as the normative base for formation of the YeFRNT.

Departure from this unity has an adverse effect on the effectiveness of managing the processes of the development of science and technology and realization of their achievements in production. In 1969 in the electrical equipment industry, for example, the volume of commodity output was selected as the basis for planning the volume of R&D, while the volume of industrywide profit was taken as the basis for financing those projects, and the result was disruption of the stability of the planned rate for financing scientific-technical projects. In essence only one planned standard was in effect--the standard volume of R&D. The standard of the size of the YeFRNT (13 percent of profit) adopted at the outset of the experiment subsequently lost the status of a standard and was "pushed up" to meet the necessary amount of financing because of the instability of the indicator of the volume of industrywide profit as a normative base.

The quantitative value of the standard used to determine the amount of R&D and the standard for determining the amount of resources of the YeFRNT will differ, since some of the R&D is covered by financial resources received from other industries and departments under business contracts.* At the same time a portion of the resources of the unified fund are assigned to reimburse the cost of putting scientific-technical advances into production.

The prospects for development of industrial production by manufacturing efficient new types of technology and applying advanced manufacturing methods and highly productive equipment should be taken into account in determining the quantitative value of rates governing transfers to funds for financing the industry's scientific-technical development. The rates should reflect the specific nature of the development of science and technology in the industry and of realization of its achievements in physical production as well as progressive shifts in the technical facilities furnished to science in the industry that enhance the efficiency with which research and development is carried on. The method of making transfers to the YeFRNT, then,

* Under a decision of the USSR State Committee for Science and Technology and the USSR Ministry of Finance, especially important scientific research projects requiring sizable outlays may be financed from the state budget.

should be such as to guarantee stable economic motivation of industrial enterprises to systematically raise the technical-and-economic level of production by manufacturing efficient forms of technology whose adoption as products and whose manufacture are in turn possible thanks to the introduction of highly productive and efficient technology and equipment.

The size of transfers to the industrywide fund for development of science and technology should in our opinion be made directly dependent on the scientific-technical level and quality of the product the enterprise produces and the distribution of its commodity output among quality categories in order to strengthen the cost-accounting motivation of enterprises to speed up the technological development of the industry. The industry's average rate of transfers from profit to the unified fund for development of science and technology is the principal planning standard used as the basis for calculating the total amount of contributions to the unified fund for development of science and technology for each VPO [all-union industrial association].

When the system of differentiated transfers as a function of quality, efficiency and the scientific-technical level of the product is being worked out, it is indispensable that the value of the rate be set for each group of products of the VPO. The sum total of transfers from profit to the YeFRNT should be distributed among the particular groups of products produced in the subindustry (by quality categories and the year when production commenced) in such manner that the highest percentage of transfers will be made for products in the second-quality category. Combined with the present procedure of deductions from the price of such products, this will make it possible to erect a reliable barrier to the manufacture of outdated and low-efficiency technology (which not uncommonly is highly profitable to the manufacturer).

The lowest rate of transfer should be set on products in the superior category bearing the quality emblem in order to encourage its expanded production. Products in the superior category which the enterprise is putting into production for the first time in the USSR and also highly efficient products created by using inventions should in our opinion be exempted from contributions to the YeFRNT for the first 2 years after series production begins. Products bearing the quality emblem which have been put into production by the enterprise but which are already manufactured elsewhere in the country might be exempted from the contributions only for the first year after series production is organized. This system of financial benefits to be granted both to the VPO as a whole and also to enterprises actively participating in the technical development of the entire national economy will make it possible to create infective incentives for speeding up the industry's scientific-technical development.

The actual size of the total amount of transfers and their differentiation by categories of products within the VPO (industrial associations) and within individual enterprises (associations) should be calculated so as to

take into account the peculiarities of technical progress in the subindustry and the economic conditions under which the given economic complex operates. This method of forming funds earmarked for financing NTP [scientific-technical progress] in the industry affords the possibility, in our view, of fuller realization of the fundamental principles of the decree on strengthening the influence of the economic mechanism on increasing production efficiency.

We have developed sample scales of deductions to the YeFRNT for a number of machinebuilding industries so as to take into account their specific features with a view to realizing this method of forming the fund. We give below scales for enterprises in the industry of construction, road and municipal machinebuilding.

Sample Scale of Rates of Transfers From the Enterprise (Association) to the YeFRNT (in percentage of commodity, net and normative output)

| | Years Product Has Been Produced Since It Was Put Into Production | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1st | 2d | 3d | 4th | 5th | 6th | 7th | 8th |
| Products bearing the quality emblem | 0 | 1 | 2 | 2 | 2 | 3 | 3 | 3 |
| Including: | | | | | | | | |
| Products based on inventions | 0 | 0 | 2 | 2 | 2 | 3 | 3 | 3 |
| Products put into production for the first time in the USSR | 0 | 0 | 2 | 2 | 2 | 3 | 3 | 3 |
| Products in the first-quality category | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Products in the second-quality category | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |

Calculations at enterprises which have converted to the new conditions for financing have shown that the use of the scale proposed here makes it possible to redistribute transfers to the YeFRNT within the limits of the total amount in order to stimulate renewal of products being produced. The interconnection between the technical level of the product produced and the size of transfers to the industrywide fund for financing scientific-technical progress in 1978 can be followed for the enterprises of the Ministry of Construction, Road and Municipal Machinebuilding (in percentage):

| Enterprises | Relative Share of Products Produced First Put Into Production in 1976-1978 Period | Transfers to YeFRNT* Under Present Conditions: Relative to Commodity Output | Under Present Conditions: Relative to Profit | According to Proposed Scale: Relative Commodity Output | According to Proposed Scale: Relative to Profit |
|---|---|---|---|---|---|
| Metallorukav Production Association | 14.4 | 2.30 | 21.3 | 2.5 | 23.0 |
| Fan and Ventilator Plant | 19.3 | 0.18 | 1.9 | 1.0 | 13.0 |
| Stroymash Production Association | 37.7 | 2.20 | 12.9 | 2.0 | 10.8 |
| Machinebuilding Plant imeni M. I. Kalinin | 9.2 | 1.90 | 6.0 | 5.0 | 16.2 |
| Pnevmostroymashina Plant | 4.1 | 2.30 | 7.7 | 8.0 | 28.9 |

* The volume of commodity output was the indicator taken as the base for calculating the volume of the YeFRNT, since in the industries where the calculations were made net output standards had not yet been devised for the entire list of products produced.

As we see from the figures in the table, the transfers to the unified fund on the basis of this scale were barely a third as much for the Stroymash Association, where the relative share of high-quality new products was 37.7 percent, as it was for the Pnevmostroymashina Plant, where the relative share of new products was 4 percent. By setting up the system of differentiated rates of transfers to the YeFRNT as a function of the progressiveness of the products the enterprises produce will make it possible to furnish financial benefits to enterprises actively participating in the technical revamping of the entire national economy. The system of differentiated rates of transfers from profit makes it possible to implement the principle of forming funds earmarked for financial stimulation of scientific-technical progress not "according to the base," but as a function of the technical-and-economic level of production the enterprise has achieved. These financial norms will thereby have a stronger effect in speeding up rates of renewal of productive capital. "The purpose of a standard," S. Sitaryan has observed, "is to ensure a constant rise in the motivation and responsibility of all enterprises in the industry to improve the qualitative indicators of their performance."*

* S. Sitaryan, "Finance and the Economic Mechanism," SOTSIALISTICHESKAYA INDUSTRIYA, 17 May 1980.

In drafting measures to improve the mechanism for financing NTP it is important to take into account that the unified fund for development of science and technology should be transformed from a money "tank," which to a certain degree arbitrarily stores up the financial resources of the industry as a function of factors which have no bearing on encouragement of new technology, into an active financial lever for managing scientific-technical progress.

In the industry's conversion to the new conditions for financing scientific-technical progress it would be wise, in our view, to distinguish the following stages: 1) determination of the industry's average rate of transfers to the YeFRNT and its total size for the planning period (5-year period, year) on the basis of the aggregate need for money to develop the industry's science and technology and to apply scientific-technical advances (on the basis of report data and taking into account the necessary growth of expenditures); 2) calculation (on the basis of the industry's average relative size of the YeFRNT) of the planned amount of resources of the unified fund earmarked for the all-union industrial association so as to take into account the technical-and-economic level of development of the subindustry in the planning period; 3) distribution of the planned amount of funds transferred to the YeFRNT at the level of the subindustry (VPO) among enterprises as a function of the rate of renewal of products being produced and their technical-and-economic level.

The methods of forming the YeFRNT should be improved simultaneously with improvement of the procedure for targeted use of this fund's resources. This necessitates developing both a methodology and also methods specific to the various industries for devising scientifically sound norms governing distribution of the financial resources by purposes and stages of the "research--production" cycle so as to take into account the shifts forecast in development of the technical capability being developed by the given industry and adherence to definite proportions between the various purposes of technical progress and stages in the "research--production" cycle. Observance of this optimum relation on the basis of scientifically sound distribution of financial resources will make it possible to guarantee the industry's scientific-technical development it conformity with plans and proportionality between the development of science on the one hand and the development of production on the other.

The effectiveness of the mechanism for financial management of scientific-technical progress depends in large part on working out in advance the financial requirements for various purposes or groups of expenditures (research, development, putting scientific-technical advances into production) and on their linkage to allowances for financing with the resources of the unified fund for development of science and technology. One might take as an initial basis for working out the system of standards governing earmarked financing of the industry's scientific-technical development the actual relationship in amounts of financing from various sources that have been formed in practice (before formation of the YeFRNT: 1) budget funds

previously allocated to finance exploratory theoretical research, to create the scientific-technical backlog and for projects on new topics; these projects are mainly related to development of the industry's science, which determines the prospects for technical progress in the industry over the following 10-20 years; 2) the funds of the industry itself (deductions from production costs) for scientific research projects appropriated for applied research and for product and process design and development with prospects of being put into production over the following 5-10 years; 3) resources of the fund for organizing the production of new technology, which are assigned to experimental design and process development to create new types of products (new technology) and also for work related to preparing and organizing series production of a new product over the planning period--the 5-year period.

As the measures envisaged by the decree are carried out, it is indispensable to take into account those adverse factors which could arise if a formalistic approach is taken to forming the YeFRNT and to the use of its funds, resulting from a mere mechanical pooling of differenc sources of funding for this purpose. As an analysis of the initial stages of conversion of the machinebuilding industries to the new conditions for financing NTP has shown, in certain of them this was the reason for a reduced amount of financing of projects to put scientific-technical advances into production and also of a reduced share of projects to build up the scientific-technical backlog. At the same time there was an increase in the volume of development projects never introduced and never completed.*

The planned financing form of managing the processes of creating and applying new technology (job orders), which is operative in the machinebuiding industries, does not entirely embrace as yet the stage of organizing series production of new types of technology and the stage of organizing their regular production in general. Thus the final stage of the "research--production" cycle often remains "left out." Yet the greatest difficulties arise in those final stages of the cycle because of the growing technical and technological complexity of the new means, instruments and subjects of labor created as well as because of the conditions of the economic passage of the experimental prototype from the sphere of science to the sphere of physical production.

There are objective reasons (in a number of cases the lack of reserve production capacities, the necessary materials or components, or inadequate level of skills of the labor force) why in the stage of putting scientific-technical advances into production a gap occurs in the unified process of creating and applying the advances of science and technology in production. At the same time the industry and the enterprises possess the necessary financing to ensure continuity and to speed up processes in the cycle of the "creation, production and application of new technology." An analysis of

* P. A. Sedlov, "Economic and Legal Problems of Planning and Encouraging Scientific-Technical Progress," VESTNIK AN SSSR, No 1, 1980, pp 37-38.

the use of special-purpose funds for financial stimulation of scientific-technical progress has shown that in those industries where there is a fund for organizing production of new technology and where unified funds have been created, their resources were underutilized year after year in a number of ministries, whereas assignments for creation and application of new technology were not altogether fulfilled.

Many enterprises were not motivated to use funds from the YeFRNT* and preferred either to "lay the burden" on the production cost by diverting their own working capital to reimbursement of the costs of putting new technology into production (wherever the level of production costs was not high) or to reduce the amount of new technology put into series production so as to reduce the adverse effect which the processes of putting new products into production has on the enterprise's cost-accounting indicators. All this evidenced the need to strengthen the connection between financial-and-economic methods of managing scientific-technical progress and the economic mechanism of industrial enterprises, which indeed was envisaged by the new decree. It is above all a question of enhancing the role of cost-accounting elements in the mechanism of financing scientific-technical progress.

The decision which has now been made to include in the total volume of output the value of projects of an industrial nature to put new technology into production and to apply new technology financed from the unified fund for development of science and technology eliminates the contradiction between the indicators used to evaluate the results of the economic performance of associations and enterprises and their right to spend centralized funds to put new technology into production.

The decree on improving planning and perfecting the economic mechanism has envisaged a strengthening of the influence of the benefit to the national economy of technology produced, taken as an indicator, on the mechanism for building up financial funds earmarked for technical development of production in the industry. A certain share of the economic benefit from the new technology created in the industry is to be assigned to reinforce the unified fund for development of science and technology as a portion of the sum total of incentive supplements for the manufacture of highly efficient types of new technology (15 percent). For instance, for the 11 machine-building ministries the proportion of the unified fund for financing scientific-technical progress resulting from transferring this part of the total amount of supplements for planned output of products bearing the quality emblem could increase to 3.5 percent of the total amount of resources in the YeFRNT in 1980.

Establishment of an economic connection between the mechanism for financing scientific-technical progress and the indicator of the national economic benefit from the creation of new technology and the cost-accounting

* Enterprises mainly use funds obtained from the YeFRNT to pay for development projects performed by other organizations under business contracts.

indicators of the benefit of using production resources in the given economic entity that reflect reduced costs on the basis of use of new technology, will make it possible to strengthen the influence of the financial mechanism on the effectiveness of scientific-technical progress.

The indicator of the national economic benefit of new technology is now being used in a number of industries to evaluate the effectiveness of using money allocated for the industry's technical development.* It is essential to strengthen the mechanism whereby this indicator exerts a planned influence in the stage of compiling financial plans, that is, when money is distributed from industrywide funds for development of science and technology among individual VPO, and also among particular directions of scientific-technical progress. In our opinion it would be wise if the indicator of the benefit from use of new technology (in the form of reduced expenditures of materials, energy and fuel for production of output) were taken into account when financial funds are allocated to enterprises and associations for purposes of technical improvement of production. This will also contribute to better orientation of the mechanism for management of scientific-technical progress toward the final national economic results of applying new technology and toward achievement of savings by using technically new means, implements and methods of labor.

It would help to guarantee that the indicator of the national economic benefit from use of technology has a real significance if a close connection were established between calculations of the indicator of the actual economic benefit and the indicators of reduction of standard costs and standard rates of consumption for all types of resources (labor, physical and financial) by virtue of application of new technology. This would serve as the basis for connecting the mechanism of furnishing financial resources to projects involving new technology in the "research--production" cycle and the indicators of the effectiveness of each group of expenditures to conduct scientific-technical projects relevant to the particular directions and stages of scientific-technical progress.

The transition to payment for R&D projects completed and accepted by the customer will contribute to further development of cost-accounting relations in the sphere of scientific-technical progress. A temporary lack of funds to perform scientific and technical development projects will be covered with money borrowed on the basis of credits from USSR Gosbank, which will unquestionably make it possible to enhance the economic responsibility of scientific organizations for effective use of financial resources. This transition is to be accomplished in all industries during the 11th Five-Year Plan.

Strengthening cost-accounting levers in the domain of creation and application of new technology imposes higher requirements on the economic soundness

* V. Astaf'yev, "System of Incentives for New Technology (Experience, Results and Prospects)," VOPROSY EKONOMIKI, No 1, 1980, p 53.

of compilation of cost budgets for each topic and specific programs, which serve as the basis for shaping plans for financing scientific-technical progress. Sizable departures of the outlays planned for the various projects (estimated cost) from actual outlays on the side of falling short of the planned amounts indicate that calculations of the standards used in planning outlays for R&D are not on a sufficiently high level. This in turn weakens the financial mechanism for managing NTP because financial resources are "frozen" and because the industry's financial resources "leak out" because they are partially confiscated into the budget in the form of the surplus of "income" over expenditures under budgets for performance of scientific research projects in scientific organizations.

The specific nature of scientific-technical activity in each stage of NTP must be taken into account in working out the system of financial standards used for management in the sphere of scientific-technical progress. Setting up a system of rigid standards for financing outlays for each type of project is not possible because of the specific nature of creative work and of the product of scientific-technical activity. At the same time the work standards in effect in the science of the industry pertaining to the conduct of standard projects make it possible to devise a system of consolidated financial standards for performance of projects in particular directions and stages of development of the industry's science and technology--on the basis of groups of expenditures. It would be wise if the financial standards were developed by groups of expenditures for the aggregate of projects of the same kind (scientific research projects, experimental design projects, and organization of the production of new types of technology). In determining departures of planned outlays for scientific-technical developments from actual outlays the calculation should also be made for the entire group of projects of the same kind. In our view this procedure would create a real basis for applying economically sound standards.

The absence of a system of planning calculations of the financial requirement of specific purposes tends in practice to disrupt the proportional relationship in development of particular stages and directions of scientific-technical development in the industry. At the level of the industry (and subindustry) there are no data on full costs in a breakdown into research, process design and development, product design and development, and production engineering conducted by scientific research organizations, design organizations and process engineering organizations. Figures of this kind are also lacking for research and development in the sphere of so-called "plant science." There are no precise figures on full actual costs for measures under the head of new technology at the enterprises of the industry. The procedure in effect for recording costs and the reporting forms in the sphere of financing scientific-technical progress do not even afford a possibility of discovering at the level of enterprises the full amount of expenditures related to the particular directions of scientific-technical progress, including funds under capital investments.

To work out standards for financing specific purposes will require appropriate organization of comprehensive recording and analysis of costs in the sphere of scientific-technical progress. Adoption of this kind of accounting is being held back not only because the methodology is lacking, but also because the personnel of scientific research, project planning and design, and process engineering organizations and industrial enterprises do not have a material incentive or full and reliable reporting on actual outlays for performance of scientific-technical measures. One of the reasons for the lack of this motivation is the existence of a secret mechanism of "self-insurance," which results from the factor of financial and economic risk.

Inadequate use of the capability of the planning mechanism to provide the financial guarantee against the risk related to the effect of the factor of indeterminacy results in a substantial discrepancy between figures on the estimated cost and the actual outlays to perform various R&D projects. The reason for this is that reliable data are lacking on full actual costs to conduct specific measures related to new technology at industrial enterprises.

In our opinion creation of earmarked financial reserves has great importance to increasing the effectiveness of the mechanism for financing scientific-technical progress, provided that normative methods of managing the processes of creating and applying new technology are strengthened. On the one hand this is a financial guarantee for coverage of an overrun of planned costs to carry out the measures of scientific-technical progress, and on the other it is a source of financing to cover outlays on measures whose need has arisen during the current period. The latter is related to the need to expand the interindustry exchange of scientific-technical advances and their application.

As a result of this interindustry exchange of highly effective scientific-technical solutions a sizable saving of financial resources can be achieved in the borrowing industries (thanks to economy in the conduct of research, experimental design, and so on). To encourage a strengthening of interindustry exchange of completed technical solutions and their application it would be wise to establish financial benefits and create economic advantages for enterprises and scientific-technical organizations of industries actively involved in making transfers of scientific-technical advances to other industries and rendering assistance in their application.

The transition to normative methods of financing scientific-technical progress, which presupposes not only the existence of economically sound norms for formation of industrywide funds for development of science and technology, but also application of a system of standards used in distribution of the resources of those funds among specific purposes (including incentive standards) so as to take into account the indicator of the benefit of the technology developed, will make it possible to strengthen the influence of the financial mechanism as a management tool on the processes of creating and applying new technology.



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