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Science & Technology

***USSR: Science &
Technology Policy***

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Science & Technology

USSR: Science & Technology Policy

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Text of Draft Law on State Science, Technology Policy

917A0220A Moscow FIFTH SESSION OF USSR SUPREME SOVIET in Russian 19 Jun 91 pp 3-19

[Report to the Fifth Session of the USSR Supreme Soviet "On the Question of the Draft of the USSR Law on State Science and Technology Policy"]

[Text] **Conclusion of the Committee of the USSR Supreme Soviet for Science and Technologies on the Draft of the USSR Law "On State Science and Technology Policy"**

The Committee of the USSR Supreme Soviet for Science and Technologies has considered the draft of the USSR Law "On State Science and Technology Policy," which was submitted by the USSR Council of Ministers on 26 October 1990 to the USSR Supreme Soviet.

The Committee generalized the suggestions and remarks on the draft law, which were received from the Supreme Soviets and governments of the republics, as well as departments, organizations, and the scientific and technical community.

When modifying the draft law its structure was changed, a number of provisions were eliminated, and additions, which are aimed at the coordination of the draft law with the draft of the Union Treaty, which is being prepared, and at the specification of the subjects who are responsible for the formulation and implementation of state science and technology policy, were made.

The prepared draft law specifies the fundamentals of state science and technology policy in the USSR and the procedure of its formulation and implementation in the interests of the development of science and technology, the preservation and strengthening of the intellectual potential of the country, the radical transformation of physical production and the social and spiritual spheres, and the achievement of a qualitatively new state of society.

The Committee considers it possible to pass the USSR Law "On State Science and Technology Policy" at the first reading.

[Signed] Deputy Committee Chairman S. Ryabchenko
19 June 1991

Draft

THE USSR LAW "ON STATE SCIENCE AND TECHNOLOGY POLICY"

This Law specifies the fundamentals of state science and technology policy in the USSR, the procedure of its formulation and implementation, and the conditions of

the development of science and technology in the interests of the preservation and strengthening of the intellectual potential of the country, the radical transformation of physical production and the social and spiritual spheres, and the achievement of a qualitatively new state of society.

Section I. GENERAL PROVISIONS

Article 1. The Legislation on State Science and Technology Policy

The legislation on state science and technology policy consists of this Law, other laws of the USSR, laws of the republics, and other acts of legislation.

Article 2. State Science and Technology Policy and Its Basic Goals

1. State science and technology policy is a component of the socioeconomic policy of the country, expresses the attitude of the state toward scientific and technical activity, and specifies the goals, directions, means, and forms of the activity of the state in the sphere of science and technology and the production assimilation of scientific and technical achievements.

It is aimed at the assurance of the development of science and technology by the creation of the necessary legal, economic, and organizational conditions, which are favorable for the increase of scientific knowledge and the practical use of scientific and technical achievements.

2. The state promotes the increase of the role of science and technology in the life of society, the development of the freedom of scientific creativity, and the stimulation of scientific and technical activity and ensures the protection of intellectual property, which is the result of this activity.

3. The increase of the contribution of science and technology to the solution of the problems of the improvement of the quality of life and the ecological situation in the country, to the increase of labor productivity, to resource conservation, as well as to the assurance of progressive structural changes in physical production, the leading development of science-intensive sectors of production, and the achievement on this basis of the competitive ability of products on the world market, and to the strengthening of the defensive capability of the country is the most important goal of state science and technology policy.

4. The state promotes the integration of the scientific and technical potential of the country, based on the international nature of science and technology and the fact that the scientific and technical potential as intellectual wealth belongs to all of society, and supports scientific schools and traditions and the movements of the scientific and technical intelligentsia, which unite its efforts for the solution of the most important problems of scientific and technical progress.

Article 3. The Authority of the USSR and the Republics With Regard to the Formulation and Implementation of State Science and Technology Policy

1. The republics on the basis of voluntary consent and the observance of mutual interests transfer to the USSR the authority to formulate and implement all-union state science and technology policy. The subject of the jurisdiction of the USSR and the republics is specified by the Union Treaty and by interrepublic scientific and technical agreements.

2. The USSR with the participation of the republics for the purpose of implementing all-union state science and technology policy ensures:

the specification of the direction of all-union state science and technology policy;

the organization of all union state support of basic scientific research;

the specification of the list of all-union scientific and technical programs, their formulation and implementation;

the development of the all-union scientific and technical information system;

the unity of the demands on the evaluation of the skill of scientific personnel and science teachers;

the coordination of international cooperation on scientific and technical programs and projects, which are stipulated by agreements of the USSR with foreign countries;

the organization of a unified patent service.

3. The republics can additionally transfer to the jurisdiction of the USSR individual powers in the implementation of science and technology policy, which belong to them.

4. The USSR within the limits of the assets and resources of all-union funds gives in accordance with established procedure state support to:

fundamentally new, promising, and socially useful directions of science and technology, which are of vital importance for the country as a whole and the implementation of which is more effective within the USSR than in individual republics;

individual republics, whose scientific and technological potential is inadequately developed.

Section II. THE BASIC PRINCIPLES OF STATE SCIENCE AND TECHNOLOGY POLICY

Article 4. The Democratization and Decentralization of Management in the Sphere of Science and Technology

1. Management and self-management in the scientific and technical sphere are carried out on the basis of

extensive democratization and decentralization by state-public regulation, the use of economic methods, and the development of contention and competition, which rest on a legislative basis.

2. The organs of state power and administration when preparing, making, and implementing basic decisions in the area of the development of science and technology act together with, with the participation of, or in consultation with the USSR Academy of Sciences, the academies of sciences of the republics, sectorial academies, and other scientific communities, organizations, and associations.

3. The republic and local organs of power and administration, sectorial organs of state administration, scientific and other organizations, which operate in the scientific and technical sphere, with regard to questions assigned to their competence independently on the basis of their own economic, social, and scientific interests, without the interference of superior organs, specify the republic, regional, and sectorial priority directions of scientific and technical progress and ensure the concentration of resources on these directions, including the formation of a network of scientific organizations, the formulation and implementation of scientific and technical programs, the establishment and elimination of regional scientific and technological centers, and the development of other flexible organizational forms of the integration of science and production.

Article 5. Public Scientific and Technical Organizations and Their Participation in the Formulation and Implementation of State Science and Technology Policy

1. The state supports the activity of the USSR Academy of Sciences, the academies of sciences of the republics, and sectorial academies of sciences as self-managed organizations, encourages the formation of public scientific and technical organizations, and creates the conditions for their participation in the formulation and implementation of state science and technology policy.

2. The organs of state administration are obliged to consider the suggestions of public scientific and technical organizations when making decisions in the sphere of science and technology and when monitoring their implementation, as well as to enlist representatives of these organizations in the making of examinations.

Article 6. The Assurance of the Freedom of Scientific Creativity

1. Science workers, specialists (researchers and developers), and their collectives in scientific and technical activity are guided by their scientific interests, by the requirements of the humanization of science and technology, and by moral responsibility for the social, economic, and ecological consequences of scientific research and development. They are free in the choice of directions and methods of research and development, if

not otherwise stipulated in contracts, plans, and thematic assignments, which are approved in accordance with established procedure.

2. The academic (scientific, technical, scientific and technical) councils of scientific organizations, based first of all on scientific and economic interests and the type of organization, specify the plans of the scientific operations and the prospects of the development of these organizations under the conditions of public discussion.

3. Science workers and specialists can independently unite in collectives, associations, unions, and other voluntary scientific associations, establish independent nonprofit organizations or organizations oriented toward a commercial impact (firms, enterprises, joint-stock companies, corporations, insurance and other companies), as well as carry out in any form entrepreneurial activity in the scientific and technical sphere, which is not prohibited by law.

4. The status of the science worker and the status of the scientific organization are specified by special legislation of the USSR and the republics.

Article 7. The Combining of Education With Scientific and Technical Activity

1. The state guarantees the training of scientific personnel at higher educational institutions, academician scientific institutions, and other state scientific organizations, allots them the necessary material and technical resources and budget allocations, and establishes the necessary benefits and privileges, as well as creates the conditions for the realization of the status of the higher educational institution as an autonomous organization in conformity with the Fundamentals of Legislation on Public Education.

2. The state takes steps for the obtaining by graduating students in the system of secondary and secondary specialized education of the necessary level of scientific and technical knowledge.

3. The training of personnel for the assurance of scientific and technical progress is carried out through the system of education and the improvement of skills on the basis of the principle of the continuity and the diversity of the forms and methods of instruction. Highly skilled science workers and specialists are enlisted, including on a contractual basis, for the increasing the quality of the training of personnel.

4. The combining of education with scientific and technical activity is carried out through the system of the search for and selection of talented young people and their continuous training for creative work and the establishment of specialized educational institutions and educational production complexes on the basis of leading higher educational institutions, academic and sectorial scientific organizations, enterprises, scientific centers, and other forms of the concentration of intellectual and production resources.

5. For the purposes of the selection of the young specialists, who are most capable of creative scientific work, the scientific organization has the right to conclude one-year contracts with the graduates of educational institutions with the right of the subsequent extension of the contract or hiring for a permanent job in accordance with the results of the fulfillment of the contract.

Article 8. The Concentration of Resources on the Priority Directions of Scientific and Technical Progress

1. For the purposes of the efficient use of the scientific and technical potential and the assurance of the preferential development of the fields of science and technologies, which are capable of changing the technological structure of production and of making radical progressive changes in the structure of the productive forces of the country, the state concentrates resources on the priority directions of scientific and technical progress.

2. The concentration of resources for these purposes is ensured both by their direct allocation from centralized sources and by the creation of an economic interest of enterprises, associations, and organizations in the use of their own resources.

Article 9. Guarantees of the Development of Basic Scientific Research

The state gives economic, organizational, social, legal, and other guarantees for the priority development of basic scientific research—the basic source of new knowledge, which is important for the development of science and the participation of domestic science in the present system of world scientific knowledge, as well as for the creation of a base of applied research and development, which ensure the transformation of social production.

Article 10. The Freedom of Competition and Enterprise in the Sphere of Science and Technology

The state supports the development of market relations in the sphere of science and technology, encourages competition and the appearance of various scientific schools and alternative ideas and projects, and stimulates initiative and enterprise in the conducting of scientific research and the implementation of its results by means of a purposeful credit and finance, price, tax, and antimonopoly policy and the development of diverse forms of scientific and technical activity.

Article 11. The Development of the Contract System in the Sphere of Science and Technology

1. Research and development in the sphere of science and technology, which envisage the obtaining by the research collective or the individual researcher of the corresponding result on the solution of a specific problem within a specified period, are organized primarily on the basis of contracts (agreements) that are concluded between the client and the performer.

2. Scientific research and development for state needs may also be performed on a contractual (agreement)

basis. In this case the contract (agreement) is concluded between the state organ and the organization or individual performer.

3. Scientific organizations can offer a job to staff members, including scientists from abroad, on a contractual basis and specify independently the terms of the remuneration and organization of their labor. In case of a concluded contract (agreement) the science worker or specialist cannot refuse to fulfill the obligations and functions, which he has assumed, but in case of such a refusal bears liability in accordance with established procedure.

Section III. THE FORMULATION AND IMPLEMENTATION OF STATE SCIENCE AND TECHNOLOGY POLICY

Article 12. The Specification of the Directions of State Science and Technology Policy

1. The directions of all-union state science and technology policy for the corresponding period are specified by the USSR Supreme Soviet on the basis of a special report of the USSR Cabinet of Ministers.

The report contains: an analysis of the state of the development of science and technology in the country in comparison with the world level and of the influence of scientific and technical progress on the solution of state-wide problems in the social, economic, and other spheres; a list and an assessment of the priority directions of scientific and technical progress and the all-union programs on their realization; substantiations of the proposals on the necessary budget allocations for the performance of scientific research and development, for the implementation of programs in the priority directions, and for the development of the scientific and technical potential of the country; recommendations on the economic stimulation of the development and use of scientific and technical achievements and on the legal support of activity in the area of science and technology.

2. Every year the USSR Supreme Soviet makes specific the basic directions of state science and technology policy, makes more precise if necessary the list of all-union programs on the realization of the priority directions of scientific and technical progress, and specifies the annual amounts of assets, which are allocated for their fulfillment, the amount of direct financing of scientific research work from the union budget, and the amount of assets, which are being channeled into the all-union scientific and technical fund, as well as the set of economic benefits that stimulate scientific and technical activity.

3. A special organ attached to the Committee of the USSR Supreme Soviet for Science and Technologies carries out the assessment of the priority directions of scientific and technical progress, the proposed all-union scientific and technical programs, and the substantiations of the requested allocations from the assets of the union budget for giving support to state science and

technology policy, as well as the monitoring of the spending of the allocated assets.

4. The specification of the directions of state science and technology policy, the choice of priorities in the development of science and technology on the basis of scientific and technical forecasting, and the elaboration of recommendations and suggestions on the implementation of scientific and technical programs and projects and on the use of scientific and technical achievements are carried out under the conditions of glasnost and openness and with the use of various forms of public discussion and examination and competitive principles.

Article 13. The Organs of Administration, Which Ensure the Implementation of State Science and Technology Policy

1. The USSR Cabinet of Ministers:

in accordance with the USSR Constitution ensures the implementation jointly with the republics of all-union programs of basic scientific research and the stimulation of scientific and technical progress;

on the basis of and in execution of USSR laws, other decisions of the USSR Congress of People's Deputies and the USSR Supreme Soviet, and acts of the USSR President carries out the implementation of state science and technology policy, the elaboration and implementation of steps on the development of science and technology, the development of international scientific and technical cooperation, and the formulation and implementation of all-union scientific and technical and other programs and all-union programs of the development of the higher school and the training and certification of science teachers of the highest skill.

The USSR Cabinet of Ministers takes steps on the implementation of science and technology policy, relying on organs of state administration and public scientific and technical organizations, and bears responsibility for their effectiveness and for the efficient use of the allocated resources.

2. The USSR State Committee for Science and Technologies, being a collective organ that includes representatives of the republics and public scientific organizations and prominent scientists and specialists, jointly with the USSR Academy of Sciences, the academies of sciences of the republics, sectorial academies, the USSR Ministry of Economics and Forecasting, and other central organs of state administration ensures the formulation and practical implementation of state science and technology policy, prepares suggestions on the priority directions of scientific and technical progress, organizes scientific and technical forecasting in the country, performs work on the improvement of the economic mechanism which is aimed at the acceleration of scientific and technical progress, organizes the formulation and implementation of major all-union scientific and technical programs in the priority directions of scientific and technical progress and the giving of state support to these directions,

formulates suggestions on the improvement of legislation in the sphere of science and technology, and organizes international scientific and technical cooperation and the development of the system of scientific and technical information.

The USSR State Committee for Science and Technologies when carrying out its functions interacts with the corresponding central organs of state administration of the republics by:

the making and implementation of joint decisions on questions of scientific and technical activity, which belong to the competence of the USSR State Committee for Science and Technologies and the indicated organs;

the participation of representatives of the corresponding organs of the republics in the scientific and coordinating councils for the most important intersectorial problems of science, engineering, and technology, scientific and technical commissions, and expert and working groups, which are established by the USSR State Committee for Science and Technologies;

the joint preparation of suggestions on the improvement of the economic mechanism and legislation, which are aimed at the acceleration of scientific and technical progress;

the reciprocal delegation of individual powers with regard to the coordination of scientific and technical activity that affects the interests of the USSR and the republics;

participation at the request of the appropriate organs of the republics in the examination of controversial issues in the scientific and technical sphere, which arise between republics.

3. The USSR Ministry of Economics and Forecasting ensures the coordination of structural, investment, and science and technology policy and national economic and scientific and technical programs and the concentration of centralized financial, material, and technical resources on the large-scale production and use of fundamentally new equipment and technology in the priority directions of scientific and technical progress.

4. USSR ministries and other central organs of state administration promote the implementation of state science and technology policy and aid enterprises, associations, and organizations in the implementation of scientific and technical programs.

Article 14. Programs of the Realization of the Priority Directions of Scientific and Technical Progress

1. The USSR Supreme Soviet approves the list of the priority directions of scientific and technical progress and the all-union programs on their realization with the indication of the goals, the anticipated economic and social results, and the expenditures for the entire period

of the fulfillment of the programs with the subsequent annual adjustment of the allocations from the assets of the union budget.

2. The USSR Cabinet of Ministers specifies for each priority direction of scientific and technical progress the organ, which is responsible for the development of work in this direction and for the formulation of all-union scientific and technical programs that realize the corresponding directions, appoints the supervisors and scientific supervisors of the programs, and gives them the necessary powers.

3. The implementation of the programs in the priority directions of scientific and technical progress is carried out on the basis of projects, which are selected by competition and ensure the obtaining of specific results and the achievement of the goals of the program. Projects can be submitted by scientific organizations, their associations, as well as individual researchers.

4. The competitions for participation in scientific and technical programs and projects are conducted on a democratic basis, under the conditions of contention and glasnost, and with the mandatory enlistment of public scientific and technical organizations and an independent expert commission.

5. During the examination the scientific, technical and technological potential of the applicant, his approach to the solution of the corresponding scientific, technical, and technological problems, the validity of the planned expenditures and the requested budget allocations, the proposed organization of the management of the program or project, the plans of the use of the results of applied research in the national economy, and other essential characteristics of the application are evaluated.

In accordance with the results of the examination a decision is made on the acceptance of the application, on the conducting of precontractual talks with the applicant, on the conclusion of a contract, or on the rejection or the postponement of the consideration of the application.

In instances, when an application for participation in the fulfillment of scientific and technical programs and projects, which are of applied importance, is submitted by a consortium (an association on a contractual basis of scientific organizations, educational institutions, and enterprises), within the consortium there should be no fewer than two enterprises that assume the corresponding obligations on the production assimilation of the obtained results.

If the application for participation in scientific and technical programs and projects, which are of applied importance, is submitted by a scientific organization (scientific research institute, scientific laboratory, scientific center, and so forth), this scientific organization should simultaneously with the application submit the conclusions of not less than two enterprises on the

possibility and conditions of the corresponding production assimilation of the results of scientific research and experimental design (pilot technological) work.

6. Projects, which are formulated within the framework of these programs, are fulfilled on the basis of contracts (agreements) which are concluded for the entire period until the achievement of the set goal with the indication of the amounts and sources of financing.

Article 15. The Organization and Conducting of Examinations in Scientific and Technical Activity

1. The independent examination is an integral element of scientific and technical activity and is conducted at all its stages and levels: during the selection of the directions of state science and technology policy, the formulation of scientific and technical programs and the selection of projects, the holding of competitions for participation in the programs and projects, and the monitoring of their fulfillment and the use of their results in the national economy.

2. The independent examination is conducted with the mandatory participation of representatives of state and public expert organizations, scientists, and specialists. Foreign scientists and specialists can be enlisted as experts.

3. The experts when preparing conclusions, along with the scientific and technical criteria, also take into account the basic principles of state science and technology policy, which are set down in this Law.

4. An expert, who has a personal interest in the results of the consideration of an application, may not participate in the examination.

5. The enlistment in the examination of science workers, specialists, and representatives of the production sphere, as well as scientific and expert organizations is carried out on the basis of a contract (agreement, understanding), in which all the basic conditions of the conducting of the examination are stipulated.

The expenditures on the conducting of the examination are included in the total expenditures on the financing of scientific and technical activity.

6. Scientific organizations of the USSR Academy of Sciences and other scientific communities, which are financed from assets of the union budget, may also be enlisted by superior organs of state power and administration of the USSR in the examination of all-union programs and projects on an unpaid basis.

7. The organs of state administration in close cooperation with public scientific and technical organizations in accordance with the results of the examination of scientific and technical projects inform the population in advance of the safety, ecological cleanness, and economic and social significance of the works and facilities, which use the latest achievements of science and technology.

8. The procedure of the conducting of the examination in scientific and technical activity, including by public expert organizations, as well as the responsibility for the quality of the examination are established by special legislation.

Section IV. STATE SUPPORT OF SCIENTIFIC AND TECHNICAL ACTIVITY

Article 16. The Directions of State Support of Scientific and Technical Activity

The state supports scientific and technical activity by ensuring:

the creation of effective stimuli for enterprises, associations, and organizations in the development of science and technology and of equal conditions for the carrying out of such activity regardless of the forms of property;

the financing of this activity by means of various sources through the establishment of all-union, republic, regional, public, innovation, insurance, and other financial funds;

the special-purpose allocation of financial, material, and technical resources for the performance on the most important operations on all-union scientific and technical programs;

the implementation of preferential taxation and lending and the accelerated depreciation of the fixed capital of enterprises, associations, and organizations, which are performing work in the priority directions of scientific and technical progress, as well as are channeling assets into innovation funds and are allocating assets for scientific and technical activity at the expense of their own profit;

the exemption of scientific organizations from currency deductions to the union, republic, and local budgets from the currency receipts which were received as a result of their own foreign economic scientific and technical activity;

the use of economic sanctions for the failure to meet the demands on the technical level and quality of products, for the use of obsolete technological processes and ecologically dangerous works, and for the output of products and the use of technological processes, which are to be replaced.

Article 17. State Financial Support of the Development of Science and Technology

1. The financial support of the development of science and technology is based on a large number of sources of financing and its goal orientation.

2. State financial support of scientific and technical progress is carried out by the allocation of state budget assets and the establishment of privileges in case of the taxation of the profit (revenue) of enterprises, associations, organizations, and citizens.

Basic research, as well as projects, which are formulated within the framework of scientific and technical programs in the priority directions of scientific and technical progress, are financed by means of state budget assets.

3. Along with state budget allocations the financing of the indicated operations is carried out by way of sharing on a voluntary basis by interested enterprises, associations, organizations, banks, and other managing subjects, including on a returnable and nonreturnable basis, on credit terms, and on other terms.

Scientific and technical programs, which have been formulated and are being implemented on the basis of interrepublic, interregional, and intersectorial scientific and technical agreements, are also financed by way of sharing.

4. For the purposes of the preservation and protection of the scientific and technical potential and the assurance of the development of the priority directions the state guarantees regardless of market conditions a stably increasing amount of allocations for the indicated purposes and establishes the lower limit of the expenditures on the development of basic research as a specific percent of the amount of national income (the gross national product).

Article 18. The All-Union Fund of Basic Research

1. Applied research and development, which are aimed at the devising, assimilation, and extensive dissemination of new equipment and technologies for the modernization and retooling of production, are conducted mainly on a contractual basis with specific clients by the use of market mechanisms and state stimulating action.

2. The state carries out the financial support of research and development, which are being conducted in the priority directions of scientific and technical progress, by means of budget assets on a shared basis with interested organizations and enterprises.

A special all-union fund for the development of technologies is being established for the financing of the assimilation in production of the results of work in the priority directions of scientific and technical progress and sector-wide and intersectorial research and development. The procedure of the formation and use of the indicated fund is established by the USSR Cabinet of Ministers.

3. In case of the full economic independence of enterprises, associations, and organizations the state promotes their active work on the increase of the technical level of production and product quality in conformity with the requirements of the domestic and foreign market, on the development and assimilation of fundamentally new types of equipment and resource-saving,

ecologically safe technologies, and on the use of inventions. For the purposes of stimulating this activity privileges are granted in accordance with established procedure to enterprises, associations, and organizations regardless of the forms of property.

The enterprises, associations, and organizations, which have a developed scientific and technical potential and high standards of production, enjoy preference to the obtaining of an order under contract (agreement) for the performance of jobs that are connected with the realization of the priority directions of scientific and technical progress. Small innovation organizations and enterprises are enlisted for the fulfillment of these contracts (agreements).

4. The state, taking into account the special role of engineers, process engineers, and highly skilled workers in the increase of the technical level of production and the development of new generations of equipment and technologies, promotes the public recognition of the prestige of these occupations and contributes to the improvement of the systems of moral and material stimulation in conformity with the quality of their labor and the increase of skills.

Article 20. The Information Support of Scientific Research Activity

1. The state ensures the functioning of the all-union system of scientific and technical information, the development of state information resources, the gathering, processing, and acquisition of scientific and technical information, including the results of scientific and technical activity in the country, the purchase of foreign scientific and technical literature and documents, and participation in international collections and networks. The state guarantees researchers access to this information and the right to its acquisition. The collections of domestic and foreign scientific, patent, and technical information and scientific and technical databases and data banks, which are at the disposal of the USSR, are the common property of all the republics.

The state supports the development of other information systems.

2. In case of the elimination of enterprises and organizations, at which scientific and technical databases and data banks operate, their preservation and transfer to successors and their use in accordance with the procedure, which is established by special legislation, are ensured.

3. The restriction of the dissemination of and access to information, which is a state, official, or commercial secret, is established by special legislation.

Article 21. Participation in International Scientific and Technical Cooperation

1. The state recognizes that international scientific and technical cooperation is a most important direction of science and technology policy and creates favorable

conditions for the effective participation of domestic enterprises and scientific and other organizations in the structure of world economic scientific and technical ties, organizes international scientific and technical cooperation on the priority directions, programs, and projects, which are stipulated by international agreements, and promotes free contacts of science workers, specialists, and scientific organizations with the international scientific community.

2. Science workers and specialists can participate in international scientific and technical programs, conclude contracts with foreign organizations and firms for work abroad, and go abroad to participate in international symposiums and other measures in conformity with prevailing legislation.

Draft

Decree of the USSR Supreme Soviet "On the Draft of the Law on State Science and Technology Policy"

The USSR Supreme Soviet resolves:

1. To approve on first reading the draft of the Law on State Science and Technology Policy.

2. To commission the Committee of the USSR Supreme Soviet for Science and Technologies jointly with other committees of the USSR Supreme Soviet and the standing commissions of the chambers to modify the draft of the Law on State Science and Technology Policy with allowance made for the remarks and suggestions made by USSR people's deputies and to submit the draft law to the USSR Supreme Soviet in July 1991.

Information on the Remarks and Suggestions on the Draft of the USSR Law "On State Science and Technology Policy"

1. In conformity with the request of the Committee of the USSR Supreme Soviet for Science and Technologies nine union republics (committees and commissions of the Supreme Soviets, republic academies of sciences, the RSFSR State Committee for Science and the Higher School), the State Military-Industrial Commission, three USSR ministries, and three public union organizations submitted remarks and suggestions.

2. Of those that send in remarks the necessity of drafting the Law was endorsed by:

—the Commission for Public Education and Science of the Ukrainian SSR Supreme Soviet and the Ukrainian SSR Academy of Sciences;

—the Committee for Questions of the Development of Science and Public Education of the Kazakh SSR Supreme Soviet;

—the Committee for Science, Ecology, and Health Protection of the Turkmen SSR Supreme Soviet;

—the Commission for Public Education, Science, and Scientific and Technical Progress of the Supreme Soviet of the Azerbaijan Republic;

—the Moldovan SSR Academy of Sciences;

—the Belorussian SSR Academy of Sciences;

—the Uzbek SSR Academy of Sciences;

—the USSR Scientific-Industrial Union;

—the Znaniye Independent Expert Council;

—the State Military-Industrial Commission;

—the USSR Ministry of General Machine Building;

—the USSR Ministry of the Electronics Industry;

—the USSR Higher Certification Commission.

Here the Ukrainian, Belorussian, Uzbek, and Kazakh republics sent their own drafts of similar Laws, the spirit and letter of which were taken into consideration when modifying the draft.

3. The remainder of those that sent in remarks (the Academy of Sciences of the Azerbaijan Republic, the Commission for Science and the Development of Industry of the Supreme Soviet and the Academy of Sciences of the Republic of Kyrgyzstan, the RSFSR State Committee for Science and the Higher School, the Central Council of the All-Union Society of Inventors and Efficiency Experts, the USSR Ministries of the Radio Industry) believe that the drafting of the Law should be postponed until the adoption of the Union Treaty and the substantial modification of the draft first of all with respect to questions of the division of jurisdiction between the USSR and the republics is required. These remarks were taken into account by the wording of Article 3, where it is stated that the subject of the jurisdiction of the USSR and the republics is specified by the Union Treaty and by interrepublic scientific and technical agreements and, moreover, the powers, which the USSR with the participation of the republics undertakes to ensure, are listed.

4. In accordance with the results of the discussion of the received remarks and suggestions in the deputy working group of the Committee of the USSR Supreme Soviet for Science and Technologies the structure of the draft of the Law, in which the independent section "State Support of Scientific and Technical Activity" was singled out, was changed, while the articles, which specify the basic principles of state science and technology policy, were also made more precise. The draft was supplemented by articles on the examination of scientific and technical activity, on state support of the development of applied scientific research and planning, design, and technological work and the assimilation of their results in production, and on the liability for the violation of the Law. In addition a number of provisions, including with allowance made for foreign legislation, were included. In

particular, the articles, which concern the goals of state science and technology policy and the procedure of its approval by the USSR Supreme Soviet, the functions of organs of state administration with respect to the support of science and technology policy, the guarantees of the development of basic research, the directions of the combination of education with scientific and technical activity, and the development of contention and competition when realizing the priority directions of scientific and technical progress, were made more precise and were developed.

Nuclear Science Official on Maintaining All-Union Research Effort

927A00003A *Moscow IZVESTIYA (Union edition) in Russian 27 Sep 91 p 4*

[Interview with Academician Aleksandr Mikhaylovich Baldin, head of a laboratory of the Joint Institute for Nuclear Research, by IZVESTIYA science commentator B. Konovalov; date and place not given: "One Big Science Is Better Than Many Small Ones"—first two paragraphs are IZVESTIYA introduction]

[Text] Today during the period of the disintegration and reorganization of the Soviet Union one of the main strategic tasks is the preservation of the still mighty scientific potential of the country. Many republics have already realized perfectly well that on their own they will not be able to conduct serious research.

Therefore, the idea of transforming large research and educational centers and testing grounds, the activity of which is of interrepublic importance, into joint ones, which are financed on a shared basis, is now acquiring broad popularity. The Joint Institute for Nuclear Research (OIIYaI) in Dubna was the first such center of big science in our country. Therefore, it is now important to evaluate its merits and drawbacks. The editorial board of IZVESTIYA addressed this request to Academician A.M. Baldin, head of a laboratory of the Joint Institute for Nuclear Research.

[Baldin] Our 35 years of experience of successful existence, says Aleksandr Mikhaylovich, have proven that such a form of scientific cooperation, no doubt, is viable. The institute, no doubt, coped with its political task—the formation of the scientific intellectual potential in the socialist countries. And in spite of the collapse of the socialist empire, this will still, of course, have an effect. Just the fact that the specialists of these different countries can keep up contacts among themselves in Russian is of enormous importance.

The Joint Institute for Nuclear Research, no doubt, also fulfilled its scientific task. Here a number of first-class scientific devices and research methods, which were then transferred to other nuclear centers of the world, were developed, a unique collective of many thousands took shape, and the entire infrastructure, which is necessary for fruitful creative activity, was formed. Annually roughly about 1,000 other scientists and laboratories use

our devices for research. The conversion of the first unique charged particle accelerator—the synchrophasotron—into a nuclotron has been under way in recent years, which is enabling the institute to remain for another 10-15 years at the leading edge of research in the field of high energy physics.

[Konovalov] Thus, do you believe that the form of joint institutes in an entirely well-founded manner can be recommended for our new Union of republics?

[Baldin] Certainly. It is quite obvious that institutes of this sort will play a certain integrating role in the state. And they are economically advantageous, especially as compared with western countries. For example, at our Joint Institute for Nuclear Research the training of a doctor of sciences costs one-third as much as in the FRG.

But the selection of scientists for such joint institutes is extremely important. Take, for example, the wealthy petroleum-producing countries. They have the broad opportunity to send their young people to the best western universities. But, as a rule, these are people from the privileged strata. And upon returning to their homeland they think more about their palaces and harems than about the development of science. As a result given enormous wealth these countries have a low intellectual potential.

And, on the contrary, there is the example of the FRG or Japan, which were ravaged after the war, but preserved a quite democratic spirit of the training of members of the intelligentsia. Owing namely to the intellectual potential these country were able to revive quickly.

Today many oblasts of Russia are justly reproaching Moscow and St. Petersburg for the fact that the majority of major scientific centers are concentrated here. Is one to transfer them to outlying areas? Nonsense! In my opinion, it is necessary to select young personnel from those places, which already have their own recognized leaders. To give them an opportunity to work for two to three years in the atmosphere of a center of big science and then to return to the native places. Only in this way will we be able to promote the intellectual revival of the provinces. And the Russian government when financing joint scientific centers should lay down a necessary condition—the training of highly skilled personnel from the provinces. They should constitute without fail a specific fraction of the staff members.

This also applies to the same extent to the republics, nearly all of which until recently copied there the all-union scientific structures, without having enough skilled personnel for this. As a result instead of centers of science centers of nationalism, which realized perfectly well that in case of an objective examination they would not stand up to the competition, arose in many republics. It is very important that precisely capable, talented scientists from the republics would have an opportunity to do some work at the centers of big science.

[Konovalov] But is everything that unclouded in the life of the Joint Institute for Nuclear Research and, thus, in our future joint centers of big science?

[Baldin] Of course not. The Joint Institute for Nuclear Research was established to a considerable extent on the basis of political considerations. Here ideologization prevailed over common sense and economic considerations. The Soviet Union, in essence, engaged in donorship. Three-fourths of the investments in the Joint Institute for Nuclear Research were made in the USSR, but when settling strategic questions only one of the 11 votes belongs to us. While in usual world practice the number of votes most often of all is determined by the share of the financing.

As a result now at the Joint Institute for Nuclear Research, if the concept of its further development is not revised, a serious crisis will develop. Today the situation is being aggravated by the fact that the interests of the participating countries, which pay less than 20 percent to the budget of the Joint Institute for Nuclear Research, have shifted to the field of low-energy physics. As a result there has been a sharp reduction of financing for the most basic research in the field of particle physics, in which the majority of researchers and users from the USSR are interested.

[Konovalov] But the same lot may await Russia at the future joint scientific centers. We will not recall that in the preceding 70 years it engaged in donorship. But is it clear that now the bulk of the spending on science and the higher school will rest on its shoulders, while its interest may be forgotten?

[Baldin] This, of course, should not be repeated. The principle of fairness should triumph. Therefore, the activity of the joint centers should be based on the principles of economic expediency and democratization. It is necessary to proceed from the generalized cost of the work of a researcher at the given laboratory, which is determined quite easily. The special-purpose financing of projects, in which specific republics are interested, is no less important. If they financing a project, they have votes in conformity with their share of participation. If not, why should they participate in the management of other projects?

But there is another side of the life of scientific centers. Users from the entire Union and foreign countries can work on their equipment on rental terms. It is clear that the more users a specific device has, the more profitable it is for the research center. Therefore, it is not the present bureaucratic structures which should determine the priorities in the development of devices and research methods, but the councils of users, which have been democratically elected by scientists. We are now switching to this in Dubna, and this became long ago the rule of international practice.

Organizing USSR AS on U.S., European Models Recommended

927A0001A Moscow IZVESTIYA (Union edition)
in Russian 25 Sep 91 p 10

[Article by Doctor of Biological Sciences L. Margolis, chief scientific associate of Moscow State University: "The Academy of Sciences: A Special Path to Nowhere"]

[Text] The debates about what kind of Academy of Sciences we need: Russian or union, strongly resemble the discussion of not so long ago about whether we need the Russian Communist Party or whether it should be a subdivision of the union Communist Party. We now know the answer. The question of the Academy of Sciences will cease to be important, if we ask ourselves not about the form or affiliation, but about the goal. What should the Academy of Sciences (it does not matter whether it is of the USSR or the RSFSR) do?

The answer is as follows: "Almost nothing." Namely, it should be in much the same way as the U.S. National Academy of Sciences, the French Academy of "Immortals," or the Royal Society of Great Britain a prestigious community of prominent scientists. When meeting each other or inviting foreign colleagues to their country, they will share plans, tell about their research, publish their own journal, and so forth. Membership in such an academy will become terribly honorable, but not more than that. The government can turn to the academy for an expert examination (of course, paid)—for example, whether it is necessary to divert northern rivers or to build the Leningrad Dike and so on.

But how about the management of science? Now this is a completely different question which does not apply to the academy. In world practice its settlement is well known. Three things are needed: money, which is allocated by the government, a system of its distribution, and independent institutes of researchers, among which this money is distributed. Let us note that we have all the components.

Each laboratory or science worker submits a research project and substantiates the amount being requested. The requests undergo independent examination, preferably international examination, and the applications are either approved or turned down. In order to organize such a system it is sufficient to have a small committee made up of 30 staff members with computers.

Of course, here we may also seek "our own path" for several more years. Then the question will vanish of its own accord together with the remnants of our science. Nearly everyone, who is participating in the discussion of the future of the Academy of Sciences, I think, understands this. But, like the other ministries, it is difficult for the ministry of science under the name of the Academy of Sciences to relinquish power voluntarily. In order to retain it, it is doing the same thing as our other ministries, which are trying now to change their names to

concerns, now to establish inflated joint-stock companies, or else to recreate themselves in the previous form, but under the guise of the Russian Academy of Sciences.

All the fuss over the Russian Academy is connected with the retention of totalitarian scientific authority over researchers.

In case of normal organization the Academy of Sciences is not a power structure. Let us note that without power the now heated questions of the transformation of the union academy into the Russian academy, the organization of a new Academy of Sciences, and the right of other Russian academies: the academy of natural sciences, the engineering academy, to exist become dull. Let them all exist on the money of their members or other donations! In the United States, in addition to the National Academy, there are the prestigious Boston Academy of Sciences and Art, the New York Academy of Sciences, which is similar to our scientific societies, and some other academies, about which Americans themselves have also not heard very much. Is it perhaps also time to let our science switch from totalitarianism to a "multi-party system"?

Health Ministry Blocks Privatization of Eye Surgery MNTK

917A0231A Moscow IZVESTIYA (Union edition)
in Russian 12 Sep 91 p 2

[Article by S. Fedorov, general director of the Mikrokhirurgiya glaza Interbranch Scientific Technical Complex: "How the Ministry of Health of Russia 'Privatized' the Mikrokhirurgiya glaza Interbranch Scientific Technical Complex"]

[Text] At last the political superstructure of the totalitarian state is being replaced by democratic structures. But can the new political superstructure peacefully coexist with the economic ministerial monster? The impression is forming that a portion of the democratically minded people, who have found themselves in power, allow this possibility. Apparently, they imagine that it is possible to develop market relations, having formed horizontal ties between enterprises, which for this will use commercial exchanges instead of the State Planning Committee and the State Committee for Material and Technical Supply.

In this new arrangement the man-producer as before is a pawn and a screw, and no motivation for better and more efficient labor is appearing for him. Only the executives of enterprises, who are trying to earn the former wage fund for the collective and, thus, to keep their chair, are participating in the totalitarian-exchange system.

It is quite clear that it is impossible to expect any increase of labor productivity from this economic system. All normal market economists understand the absurdity of a "ministerial" economy and are calling for millions of people to be tied into economic relations.

Only these millions of simple laborers, workers, engineers, peasants, and managers can produce the necessary quantity of goods and pull the country out of the crisis. No political leader will be able to do this without having broken the ministerial totalitarian economic system.

The USSR and RSFSR Supreme Soviets have made attempts to get rid of this monster, having passed laws on the elimination of state ownership and privatization. However, both laws, unfortunately, are awkward and depend entirely on the ruling bureaucratic system. Their spirit is saturated with distrust of the worker-producer. Any collective, which desires to become the owner of its own enterprise, is doomed to overcome the bureaucratic barricade. A month or two will be spent on the overcoming of each level of it and the filling out of an endless number of documents, while the total time of the conversion to a stockholding basis of the enterprise by its staff members may last 15-18 months, and only if the ministry will agree to the transfer of the property to the collective. But it will agree, of course, only when the enterprise is unprofitable. But God forbid that you be profitable!

I will cite the latest example of the attempt to convert to a stockholding basis the Mikrokhirurgiya glaza Interbranch Scientific Technical Complex, the balance-sheet value of which comes to 162 million rubles [R]. Having read the new laws on privatization and about the fact that every inhabitant of Russia for 73 years of the most cruel exploitation will receive R5,000 and that the government will "knock off" for the collective a 30-percent discount on the value of the interbranch scientific technical complex, we understood that we could count on a sum of R113.4 million and that we will also be able to pay about R70-80 million by means of the coupons soon to be introduced for privatization.

And we began to write petitions: Give economic freedom! We will live without budget money! First to the RSFSR Council of Ministers in November 1990. For a long time there was no response. After a few months, over the telephone, they reported that the law on privatization had not yet been approved, and the RSFSR Committee for Property does not know how much money to take from us. In March 1991 we sent a second petition, now to the RSFSR Supreme Soviet. We did not receive a response. Finally, all the laws were passed, even the procedure of obtaining privatization money was described. On 4 August we succeeded in getting through to the Chairman of the RSFSR Council of Ministers with a new petition. Hurray! The question is settled, the resolution is positive and decisive: to prepare an order on the establishment of the Mikrokhirurgiya glaza Joint-Stock Company. However, 12 days later we found our document with difficulty with...the deputy chairman of the Council of Ministers, where we learned that three departments of the Council of Ministers did not support the resolution of their chairman and, therefore, it is necessary to talk with the RSFSR minister of health, who will also pronounce the final verdict.

The terrible days of the failed coup d'etat passed, and on 30 August there was a meeting of representatives of the collective of the interbranch scientific technical complex with the minister and his colleagues. Very original conditions of privatization were proposed: The price of the interbranch scientific technical complex should be 3.1-fold greater than the balance-sheet price, since in recent years brick, lumber, and cement have increased sharply in price. In other words, the collective should pay R500 million in order to become a collective of free producers. But this, it turns out, is also not everything. The interbranch scientific technical complex should turn over 51 percent of the stocks to its ministry, which as before should "supervise" us, professionals.

Thus the process of the privatization of Mikrokhirurgiya glaza with 12 affiliates ended ingloriously. For the bureaucratic structure it turned out to be easier than easy to delete the new laws of the two democratic parliaments, to repeal the decision of the chairman of the Council of Ministers, and, what is the main thing, to brush aside the 7,500 staff members of the interbranch scientific technical complex. Is it possible after this to believe in the supreme power of the law in our country and to believe in the possibility of reforming our economy, which has been turned upside down?

The conversion to a stockholding basis of the maximum number of enterprises can create millions of owner-producers, for whom labor will become the sole source of well-being, and can form the middle stratum of society, which is the guarantor of democracy, human freedom, and the flourishing of the state. Today we have the unique opportunity to make this stratum even more powerful and numerous than in Germany, the United States, and Japan. For in these countries only 8-15 percent of the population of the country are the owners of the tools of production. The remainder work on the principles of hired labor, and their initiative, as a rule, is spurred only by the fear of unemployment. In our country the opportunity exists to make 30-40 percent of the able-bodied population property owners. This is an enormous economic force, for only a person, who strives for productive labor, can solve the problems of the development of the economy. The disregard of this simple principle is at least ridiculous.

And a final thing. It is very interesting that the privatization of party property is proceeding with amazing promptness. The bureaucratic system is always prepared to increase its property. Why not turn over its property to the people just as promptly?

Republics Pledge S&T Cooperation at Kiev Conference

917A0231B Moscow IZVESTIYA (Union edition)
in Russian 12 Sep 91 p 2

[Article by IZVESTIYA science commentator B. Konov-alov: "A State Border for Science Is Nonsense"—first paragraph is IZVESTIYA introduction]

[Text] The fate of Soviet science may prove to be dramatic. The scientific potential is fragile. It is easy to destroy it. While it is unusually difficult to restore it. That is why serious concern could be detected in the statements of all the representatives of the now sovereign states, who gathered on 10-11 September in Kiev at a working conference on interstate scientific and technical cooperation.

Representatives of the USSR State Committee for Science and Technologies and the USSR Supreme Soviet took part in the conference. Of the 15 republics, which are a part of the USSR, for unknown reasons only the representatives of Estonia and Tajikistan were absent. The representatives of Georgia, Latvia, Lithuania, and Moldova came as observers, but expressed their solidarity with the decisions that were made. The participants in the working conference, of course, could not themselves sign an interstate agreement—this is the affair of heads of states, therefore, they drew up a protocol with recommendations to the governments. By 15 October an interstate agreement on scientific and technical cooperation should be prepared, based on the states' own long-term interests, the international nature of scientific activity, and the obvious advantages of cooperation in this sphere.

Everyone fears the unchecked destruction of the mighty scientific potential of the Soviet state. The representatives of Armenia and Georgia advanced the thesis that basic research is "the luxury of wealthy states," it is already becoming too much for the small republic. But, as A.N. Tikhonov, first deputy chairman of the RSFSR State Committee for Science and the Higher School, correctly noted, to be deprived of basic science means to be deprived of a future. And for small states the only way to participate in basic research and the development of promising technologies is integration in interstate programs on a shared basis.

The priority directions of joint programs and projects, for which on the recommendation of the working conference it is necessary to allocate about 10 percent of the total spending of the sovereign states on science, should be formulated. These directions should be recorded in the future interstate agreement on scientific and technical cooperation.

For the coordination of operations and the implementation of a coordinated policy the working conference in Kiev recommended to establish on a parity basis the Intergovernmental Scientific and Technical Council (MNTS) and a permanent executive committee attached to it. The future agreement should specify their functions, rights, and seat, the mechanism of the financing of the Intergovernmental Scientific and Technical Council, the establishment under it of a reserve fund, and the forms of the supply of joint projects and programs with resources and currency. The continuity of the work of the USSR State Committee for Science and Technologies should be ensured for the transition period.

The fate of the USSR Academy of Sciences worried everyone. President of the Academy of Sciences of the Ukraine Academician B.Ye. Paton addressed the working conference and informed those who had gathered that the other day a conference of presidents of the republic academies was held in Moscow. He said that for 1992 the USSR Academy of Sciences thus far does not have financing, at least 1.5 billion rubles are needed for this. Apparently, many institutes will transfer to the Russian Academy of Sciences, which is now being established. The opinion is also being voiced that the present members of the USSR Academy of Sciences, who work on the territory of the RSFSR, should be automatically elected members of the Russian Academy of Sciences. The fate of the USSR Academy of Sciences will most likely be decided at the general meeting which will be held in October.

The representatives of many republics pointed out that the USSR Academy of Sciences is all-union property and it must not be turned over to one republic. True, here they believe: everything that is on their territory should belong only to them.

But all the same the working conference proposed a constructive means of solving the problem. On the basis of mutual agreement a number of large institutes, scientific and educational centers, and testing grounds, the activity of which is of interstate importance, can be transformed into joint ones, which are open for all the member states with their financing on a shared basis.

The participants in the working conference spoke in favor of the preservation of the unified scientific and technical space on the territory of the former Soviet Union with the free circulation of information, the functioning of common data banks, and the mutual recognition of patents, scientific degrees and titles, and diplomas of the higher school.

The agreement being prepared on interstate scientific and technical cooperation, in the unanimous opinion of all the participants in the working conference, should be open. And for the entry into it of not only all the former republics of the USSR, but also the former countries of the socialist community.

USSR Academy of Sciences' Silence During Coup, Conservatism Attacked

917A0223B Moscow *KOMSOMOLSKAYA PRAVDA*
in Russian 7 Sep 91 p 2

[Article by Ye. Manucharova and A. Zakharov, scientific associate of the Institute of Oceanology of the USSR Academy of Sciences, under the rubric "Point of View": "It Is Impossible To Hope for Cream, If One Does Not Think About Milk"]

[Text] The threat of rapid and irreversible destruction hangs today over all-union structures, including the highest scientific institution of the country—the USSR Academy of Sciences. This threat is also being increased

by many fold by a subjective factor: During the days of the putsch the leadership of the academy politely kept silent. But is it worth destroying the academy, taking only revolutionary conscience as a guide?

The fate of the USSR Academy of Sciences was discussed at a meeting of its president, Academician G.I. Marchuk, with representatives of the middle level of scientists—doctors and candidates of scientists from institutes of the academy. They are united in the Club of Voters attached to the USSR Academy of Sciences (KIAN).

Those invited reminded the leadership of the academy that during the past two years they had drawn up and submitted to the presidium a large number of specific suggestions on the reform of the activity of the Academy of Sciences and its institutes. These suggestions were partially considered and approved, but were not implemented. The fact that at the academy the charter, in accordance with which the Academy of Sciences under the supervision of the USSR Council of Ministers (!) is obliged to build communism, is in effect to this day, can serve as a vivid example of the slowness.

At the same time danger exists on the path of radical reforms: If one limits oneself to the changing of the sign, nothing will change in science. It is even worse if one establishes a new academy for the very same purposes as the old academy: for the monopoly management of science. Such an academy will inevitably turn once again into a ministry of science, only time will be lost. It is easy to ruin the scientific community.

In this connection the question of the establishment or transformation of the elite community of scientists is important, but still secondary as compared with the question of the organization of the activity of institutes, at which science is made and from which the very same academicians came. No one objects to the existence of an elite, but it is impossible to hope to get cream, if one does not think about milk.

No academy—either Russian or union—should manage science by monopoly. The academy structure in general is hardly suitable for this purpose for three basic reasons.

The numerous members of the academy replenish their ranks at their own discretion. Then the general meeting forms a presidium, which hires the management staff of institutes, again without any influence of the institutes. Where is there here if only a hint at self-management? The necessity and fruitfulness of self-management are recognized for plants and factories, for workers and peasants, but not for the most educated and trained part of society—scientists.

Moreover, academic titles are for life. Thus, in principle it is impossible to rejuvenate the academy and to bring its interests close to the interests of genuinely active scientists.

Finally, the establishment of a system of the social protection of prominent scientists through the granting of a number of privileges has become one of the most important functions of the academy. These privileges, for example, a stipend for life or the right to the individual financing of scientific work, undoubtedly, should be retained. But can an organization of socially protected citizens perform management functions? We are convinced that it cannot. The executive should be entirely dependent on the work of the managed collective.

The essence of the reform proposed to the president of the USSR Academy of Sciences consists in the establishment of a confederation of institutes, which elect their own representatives to the highest body. Let us call it the general meeting or, even better, the national scientific council. The council elects an executive body, which in contrast to the system now in effect is subordinate to and under the control of the institutes.

The fact that the proposed reforms require the change of the forms of ownership of scientific equipment, buildings, and other property of the institutes, was discussed at the meeting. The preparation of institutions for work under the conditions of a market-type economy is necessary, the restoration of the connection of basic science with the higher school is necessary.

The listed problems are so complex that it is impossible to solve them in the offices of appointed officials. That is why the quickest convening of a congress of scientists with the distribution in advance of the competing programs and concepts is assuming vital importance.

The community of scientists, which has been repeatedly taught by the bitter experience of armchair changes, will not accept any reforms, if these reforms are not discussed thoroughly and comprehensively with it and if they do not correspond to the interests of the community, its experience, and its civic position.

Marchuk Declines To Discuss Post-Coup Changes for USSR, RSFSR Academies

917A0223A Moscow IZVESTIYA (Union edition) in Russian 5 Sep 91 p 2

[Article by Academician V. Barsukov, director of the Institute of Geochemistry and Analytical Chemistry imeni V.I. Vernadskiy of the USSR Academy of Sciences: "The Russian Academy of Sciences Need Reorganization"]

[Text] President of the USSR Academy of Sciences Academician G. Marchuk convened a meeting of the presidium of the USSR Academy of Sciences with the participation of all, or, at any rate, nearly all, the directors of Moscow academic institutes. This is an extremely rare event, and we all expected that the attitude of the presidium of the USSR Academy of Sciences toward the attempt at an anticonstitutional coup d'etat, the difficulties being experienced by the

academy, and its future fate would be discussed. Unfortunately, we were once again disappointed. They simply informed us in a few sentences that the Ukase of the RSFSR President on the nationalization of state institutions of the USSR does not apply to the USSR Academy of Sciences, while the attempts to ask the questions that interest us were blocked with the plea that the president was not prepared to discuss them.

I, as a full member of the USSR Academy of Sciences, am ashamed of the presidium, which neither during the busy days of the coup attempt nor afterward ever expressed its attitude toward this, although, it would seem, if anyone, the "intellectual center" of the country, which even has the specialized Institute of State and Law, should not have kept silent. Especially as hundreds of associates of institutes of the Academy of Sciences expressed their attitude toward the coup, having risen to the defense of the White House of Russia.

Now it is clear to everyone that our country is being transformed into a confederative state with the significantly increased role of the republics belonging to it, among which the RSFSR is the only and largest republic, which does not have its own Academy of Sciences. Is this right? Of course not, and steps toward the establishment of the Russian Academy of Sciences are now being taken.

But why establish a new academy practically in a void, for years and years will be required for this? For if we hold the planned election to the Russian Academy of Sciences, this is not yet the establishment of the academy. The academy, if it wants to have an appreciable influence on the development of science and to be of real help to Russia in the development of its national economy, should have a substantial base, excellently equipped institutes, and established scientific schools and creative collectives. Without this it will turn into a consultative club of "the merry and resourceful." This is a very long, difficult path that lasts many years. Why are we trying to make what we already have? We have the Russian Academy of Sciences with an excellent scientific potential and powerful institutes that are scattered throughout Russia. This is the USSR Academy of Sciences with its regional centers and institutes—it is merely necessary to return to its former name "the Russian Academy of Sciences," having held the necessary by-elections, and to transfer it to the jurisdiction of the RSFSR. Here, of course, it is necessary to retain the coordinating council of presidents of the republic academies, which was established by the president of the USSR Academy of Sciences.

I think that such a transformation of the USSR Academy of Sciences is necessary, but it should not be purely mechanical and formal. It is necessary to think both about the structure and about the responsibility of scientists to Russia. While this means that it is necessary to make a rigorous analysis of the problems being worked on by the academy, which with the preservation of the exploratory basic scientific reserves should increase

sharply the output of practical solutions that are necessary for a technological revolution in the national economy. After all, this is our duty. It is necessary to abandon what is somehow obsolete, particularly in the area of the social sciences. But the main thing is to ensure the more efficient use of already available scientific developments and to enhance the practical orientation of science.

Yes, we always suffered from the difficulties of introduction. But this is already a thing of the past. Now the conversion of the military industry is affording us enormous opportunities for this. I know this from my own experience. Science-intensive developments are being snatched up by former defense enterprises, of course, provided they promise these enterprises a profit.

Russia need not establish a new Academy of Sciences. It already has it, although, perhaps, it needs reorganization. Of course, it would be best of all if the presidium of the USSR Academy of Sciences came forth with this initiative, but I do not entertain particular hopes for this. I will be happy if I am mistaken. But the USSR Academy of Sciences is not only and not so much the presidium as the members of the academy and the collectives of the institutes that belong to it. The time has come for all of us to declare our position and to think and be concerned ourselves about our own fate and the fate of the USSR Academy of Sciences as a whole.

If we do not succeed in settling this issue on the scale of the entire USSR Academy of Sciences, which would be the most correct thing, after the establishment in the Russian Academy of Sciences of the appropriate infrastructure, which ensures the normal operation of institutes, I think, they will be able to specify themselves their affiliation with the USSR Academy of Sciences or the Russian Academy of Sciences and, perhaps, with both simultaneously, that is, to switch to dual subordination.

Post-Coup Debate Erupts Over Organization of Academy Science

917A0223D Moscow ROSSIYSKAYA GAZETA
in Russian 7 Sep 91 p 3

[Letters to the editor: "Around the Academy of Sciences"]

[Text] The letter of a group of members of the USSR Academy of Sciences, to which our signatures are affixed, was published in your newspaper for 4 September of this year. We consider it necessary to explain our point of view, which consists in the fact that for the preservation of world-level scientific schools in the area of basic research, of which the St. Petersburg, Russian, and then Union academies of sciences were the historically established center, it is necessary to transfer the potential of basic science in the person of academic institutes and members of the USSR Academy of Sciences, who work on the territory of the RSFSR, to the Russian Academy of Sciences.

The USSR Academy of Sciences should be preserved and can be a scientific association for the coordination of the development of science. With allowance made for the interests of all the republics it is expedient to set up interrepublic centers of basic research in the priority directions.

At the same time we do not share the attacks on the presidium of the USSR Academy of Sciences, which were made in the letter. There are shortcomings in its work, but one must also not forget its great positive role and especially believe that "not the fate of Russian science, but its own survival worry it."

[Signed] Academicians Zh.I. Alferov and V.I. Goldanskiy, Corresponding Member N.V. Karlov

Dear colleagues! The rapid collapse of union structures will undoubtedly affect the USSR Academy of Sciences and its scientific institutions. The press is discussing the question of how and under whose jurisdiction the community of academicians will exist. While recognizing the urgency of this problem, we all the same believe that the fates of the scientific collectives and infrastructure of the Academy of Sciences are incomparably more important. We believe that no narrow group of people, whether it is called the Union or the Russian academy, should in a monopoly manner manage science, reorganize it, and control all the property of the academy and all the assets, which are being allocated by society for basic research.

Only the general meeting of elected representatives of the institutes and organizations of the Academy of Sciences has the moral right to define the concept of the organization of science, form expert councils, which enjoy public confidence, and specify the methods of monitoring the functioning of the developed staff of the academy.

The system now in effect has a fundamentally irreparable defect: Neither the presidium of the USSR Academy of Sciences nor the staff of the academy is accountable to the community of scientists. The majority of decisions are made behind closed doors and remain unknown to the associates, whose vital interests they affect.

The broad, public, competent discussion of the conceptual, organizational, economic, legal, and social problems of the academy, including the questions of the ownership, management, use, and redistribution of property, personnel and financial policy, and the demilitarization and international integration of science, is necessary. The competing plans of the settlement of these questions should be discussed at a congress of elected representatives of scientific organizations. We are convinced that the community of scientists will accept only the reforms, which have been discussed by it and which correspond to its experience, interests, and civic positions!

No to decisions of the staff, no matter from what democratic academicians they come. It is necessary to

adopt in the scientific councils or at the meetings of scientific collectives the demands on the convening of a congress of scientists of the USSR Academy of Sciences.

[Signed] The Club of Voters of the USSR Academy of Sciences (KIAN), the Moscow Union of Scientists. RSFSR People's Deputies Doctor of Economic Sciences V. Sheynis, Candidate of Historical Sciences Ye. Kozhokin, and Candidate of Juridical Sciences L. Volkov

Contact phone number: 292-88-68 from 1800 to 2100.

Membership of RSFSR Academy of Sciences Organizing Committee

917A0223C Moscow SOVETSKAYA ROSSIYA
in Russian 15 Aug 91 p 6

[Article by Academician Yu.S. Osipov, chairman of the Organizing Committee of the Russian Academy of Sciences and organizing president of the Russian Academy of Sciences: "The Organizing Committee of the Russian Academy of Sciences Reports"]

[Text] The RSFSR Supreme Soviet at a session in June 1990 passed the USSR Law on the Establishment of the Russian Academy of Sciences (RAN) and commissioned the Committee for Science and Public Education and the Committee for Legislation of the RSFSR Council of Ministers with the participation of the scientific community to elaborate the principles of the formation and activity of the Russian Academy of Sciences. The indicated principles were considered by a session of the RSFSR Supreme Soviet in February 1991.

In conformity with the decision of the session of the Presidium of the RSFSR Supreme Soviet the Organizing Committee for the Formulation of the Draft of the Charter and the Principles for the Formation of the Initial Membership of the Russian Academy of Sciences was formed by the decree of 25 March 1991: Academician of the USSR Academy of Sciences Yu.S. Osipov—chairman of the Organizing Committee, organizing president of the Russian Academy of Sciences (Sverdlovsk); Doctor of Chemical Sciences Prof. A.K. Mikitayev—deputy chairman of the Organizing Committee of the Russian Academy of Sciences, organizing vice president of the Russian Academy of Sciences, RSFSR people's deputy (Nalchik); Doctor of Physical Mathematical Sciences Prof. B.V. Alekseyev (Moscow); Doctor of Technical Sciences Prof. G.P. Anshakov (Samara); Doctor of Technical Sciences Prof. L.I. Volkov (Moscow); Doctor of Historical Sciences and Doctor of Philosophical Sciences Prof. D.A. Volkogonov, RSFSR people's deputy (Moscow); Academician of the USSR Academy of Sciences A.G. Granberg, RSFSR people's deputy (Novosibirsk); Doctor of Philosophical Sciences T.A. Guriyev (Vladikavkaz); Doctor of Physical Mathematical Sciences Prof. A.V. Deryagin, RSFSR people's deputy (Kaluga); Doctor of Technical Sciences Prof. Yu.V. Zaytsev, RSFSR people's deputy (Moscow); Corresponding Member of the USSR Academy of Sciences

V.T. Kalinnikov (Apatity); Academician of the USSR Academy of Sciences G.B. Yelyakov (Vladivostok); Academician of the USSR Academy of Sciences V.A. Koptuyug (Novosibirsk); Academician of the USSR Academy of Sciences N.N. Krasnovskiy (Sverdlovsk); Academician of the USSR Academy of Sciences N.P. Laverov (Moscow); Corresponding Member of the USSR Academy of Sciences V.P. Larionov, USSR people's deputy (Yakutsk); Academician of the USSR Academy of Sciences D.S. Likhachev, USSR people's deputy (Leningrad); Doctor of Chemical Sciences Prof. V.V. Lunin, RSFSR people's deputy (Moscow); Doctor of Technical Sciences Prof. N.G. Malyshev (Moscow); Corresponding Member of the USSR Academy of Sciences S.P. Merkuryev (Leningrad); Academician of the USSR Academy of Sciences G.A. Mesyats (Sverdlovsk); Doctor of Technical Sciences Prof. B.S. Mitin, USSR people's deputy (Moscow); Doctor of Technical Sciences Prof. Yu.N. Myasnikov (Leningrad); Doctor of Technical Sciences Prof. V.N. Nikolayev (Cheboksary); Doctor of Medical Sciences Prof. O.Ye. Nifantsev, RSFSR people's deputy (Krasnoyarsk); Doctor of Technical Sciences Prof. G.A. Popov (Moscow); Academician of the USSR Academy of Sciences B.V. Raushenbakh (Dolgoprudnyy of Moscow Oblast); Doctor of Biological Sciences Prof. Ye.A. Stroyev, RSFSR people's deputy (Ryazan); Doctor of Philosophical Sciences Prof. B.T. Udodov (Voronezh); Corresponding Member of the USSR Academy of Sciences S.N. Khadzhiev (Moscow); Academician of the USSR Academy of Sciences Ye.P. Chelyshev (Moscow); Doctor of Technical Sciences Prof. V.P. Shorin, RSFSR people's deputy (Samara).

Meetings of the Organizing Committee of the Russian Academy of Sciences were held on 12 May, 23 May, 27 June, and 24 July 1991.

Sections of the Organizing Committee of the Russian Academy of Sciences for directions of the sciences were formed: the section of humanities and social sciences; the section of mathematics, mechanics, and information science; the section of physics, power engineering, and electronics; the section of chemical and biomedical sciences; the section of earth sciences; the section of engineering sciences. Regional organizing committees of the Russian Academy of Sciences were established in 11 economic regions of the RSFSR and in Moscow with Moscow Oblast.

The Statute on the Procedure of the Formation of the Initial Membership of the Russian Academy of Sciences was adopted. The draft of the temporary Charter of the Russian Academy of Sciences was prepared and discussed.

The Organizing Committee of the Russian Academy of Sciences reports that the publication of all the materials of the Russian Academy of Sciences will be carried out in the weekly all-union newspaper POISK.

On questions, which are connected with the formation of the Russian Academy of Sciences, one should turn to the

Executive Board of Directors for the Organization of the Russian Academy of Sciences, which was established by a decree of the RSFSR Council of Ministers (101485 Moscow, Seleznevskaya Ulitsa, 11a, phone numbers 284-37-54, 284-37-52; the thoroughfare before the Novoslobodskaya and the Mendeleyevskaya metro stations), as well as to the regional organizing committees.

Rejection of Draft Law on Intellectual Property Urged

917A0221A Moscow FIFTH SESSION OF USSR SUPREME SOVIET in Russian 15 May 91 pp 1-8

[Report to the Fifth Session of the USSR Supreme Soviet "On the Question of the Draft of the USSR Law on Scientific Intellectual Property and the Strengthening of Its Protection"]

[Text] Conclusion of the Committee of the USSR Supreme Soviet for Legislation and Law and Order on the Draft of the USSR Law "On Scientific Intellectual Property and the Strengthening of Its Protection"

Having examined the draft of the Law "On Scientific Intellectual Property and the Strengthening of Its Protection," the Committee for Legislation and Law and Order considers it necessary to note the following.

The draft, which was submitted to the USSR Supreme Soviet, cannot be accepted for consideration by the USSR Supreme Soviet in connection with its uselessness, lack of conformity to the norms of international law, and poor legal analysis.

The contents of the draft of the Law do not correspond to its title. It is organized according to the remainder principle. The relations, which arise in connection with the production and use of the most important results of the intellectual activity of man (works of science, literature, and art, inventions, industrial prototypes, and so forth), are regulated by individual laws. In this draft of the Law mainly the results of planning, surveying, experimental design, and pilot technological operations, which in the strict sense of the word do not pertain to scientific activity, are the object of legal regulation. In general it is a matter in this case of diverse knowledge like know-how, which in industrially developed countries comes under the effect of contract law and does not require the passage of a law of this sort. Moreover, many objects, which are protected by copyright and invention law norms, including programs for computers, are included among the objects of the right of scientific intellectual property in the draft of the Law (Article 3). In conformity with the Trade Agreement Between the USSR and the United States, which was signed by Presidents M.S. Gorbachev and G. Bush on 1 July 1990, the Soviet side made the commitment to protect programs for computers by copyright, which was done in the draft of the Fundamentals of Civil Legislation (Section IV), which have gone through the first reading in the USSR Supreme Soviet.

In the draft of the Law the norms on the legal regulation of property relations, which concern things, are erroneously extended to the relations that are connected with the production and use of the results of the intellectual activity of man (spiritual values).

The concept of the possession, use, and disposal of things in the form that is stipulated by the Law on Property in the USSR is not applicable to spiritual values. It is equally impossible to extend the provisions of the Law on Property in the USSR, which concern the protection of the right of ownership of things, to spiritual values (knowledge). Whereas it is possible to confiscate an illegally possessed thing, it is impossible to do this with respect to an idea, as they attempted to do in Article 15 of the draft. The law is incapable of preventing the spread of ideas and knowledge, which are expressed in objective form on the condition of their conformity to the legal criteria of the concept of intellectual activity (novelty, a creative nature, and so forth). Here the measures of the protection of the results of creative activity are fundamentally different from the methods of protecting *jura ad rem*. Precisely all this is absent in the draft of the Law. Therefore, the assurance of the application of the Law by the courts and other law enforcement bodies cannot be realized in practice.

The mechanical carrying over of the norms of the right of ownership of things to the relations, which are connected with the production and use of the results of intellectual property, is explained by the incorrect use of the concept "intellectual property."

In the legislation of other countries and in international legal practice this concept is used in a conventional expression. And separate legislation with different legal regimes with respect to things and spiritual values exists in all countries without exception. The latter comes under the effect of the laws on the copyright and the inventor's right, and not some general laws on so-called intellectual property. Incidentally, and this is important, in the 1967 Convention on the Establishment of the World Intellectual Property Organization, a reference to which is contained in the preamble of the draft of the Law, the term "intellectual property" includes the right that pertains to works of science, literature, and art, inventions, and so on.

The draft of the Law is at variance with a number of laws, which have already been passed by the USSR Supreme Soviet, and with the drafts of laws, which have gone through the first reading, particularly the Law on Property, the Fundamentals of Civil Legislation, and the Law on Invention. Thus, in Point 5 of Article 5 in violation of the Law on Property in the USSR the state organ or the organ of management of a public association is declared a subject of the right of ownership. The provisions of the Law, which concern the status of a potential inventor at an enterprise (Articles 5, 6, 9), seem particularly distressing. The draft of the Law on Inventions, which has gone through the first reading, takes a

different position, which is more preferable for inventors. An analogous situation exists, as was indicated, with respect to programs for computers (Article 14).

As a whole the draft of the Law on Scientific Intellectual Property and the Strengthening of Its Protection does not reflect the real economic and legal needs of society. Instead of the Law on Scientific Intellectual Property it is necessary to expedite the passage of the Law on the Copyright and the Law on the Combating of Unfair Competition.

The submitted draft is at variance with the international practice and international obligations of the USSR, which cannot but lead to negative political consequences. The draft of the Law completely ignores the basic provisions of juridical science and practice.

In this connection the Committee of the USSR Supreme Soviet for Legislation and Law and Order believes that the draft of the USSR Law "On Scientific Intellectual Property and the Strengthening of Its Protection" cannot be recommended to the USSR Supreme Soviet for consideration.

[Signed] Committee Chairman Yu.Kh. Kalmykov

15 May 1991

Conclusion of the All-Union Scientific Research Institute of Soviet State Building and Legislation on the Draft of the USSR Law "On Scientific Intellectual Property and the Strengthening of Its Protection"

1. The basic task, which the draft is called upon to accomplish, consists in the extension of commodity-money and market relations to scientific and technical activity, in the conversion of the results of this activity into a commodity, and in their inclusion in the market economic turnover. The draft provides for the establishment of such conditions for the results of all types of scientific and technical intellectual activity of both applied development and basic research. The evaluation of the correctness of this statement of the task will be given as the result of this conclusion, first this draft should be regarded as an attempt at the development of a legal mechanism which is called upon to ensure the accomplishment of the indicated task and the effectiveness and efficiency of the proposed legal means.

2. The attachment to the object, which is included in the economic turnover, of the right in rem of the commodity owner, while excluding the possibility of all third persons to carry out at their discretion any actions with respect to this object, is a legal prerequisite of commodity relations. On the market an unlimited group of people is opposed to the holder of the right, therefore, the right should be valid with respect to all third persons, and not just a specific contracting party.

The draft took the easiest path. It creates the appearance of the use of the mechanism of the right of ownership, which has been well known for many millennia. Both the title of the draft law and the name of the legal rights of

the holder of the right (Point 1 of Article 1), which coincide with the legal rights of the owner (Point 2 of Article 1 of the Law on Property in the USSR), reflect this. Here the fact that the legal mechanism of the right of ownership is suited only for material objects, which are confined in space, and cannot be extended to the results of intellectual scientific and technical activity, which are of a nonmaterial nature, simply owing to their natural properties, is ignored.

Thus, the results of intellectual activity can be used simultaneously by an unlimited group of people. This is impossible with material objects. The transfer of a thing to the ownership in principle of just one person can be the content of the contract of sale of a thing. While a licensing agreement for a nonmaterial object can be concluded simultaneously with an unlimited group of people. The confiscation of an object from someone else's illegal possession in kind is the most important method of protecting the right of ownership (Article 151 of the RSFSR Civil Code). With respect to the nonmaterial result of intellectual activity this is impossible, and it is possible to protect the right to it against violation only by fundamentally different means. The legal right "possession," which presumes a material nature of the object, cannot be extended at all to the result of intellectual activity. Therefore, the declaration of the right of ownership in the draft proves to be simply a slogan that is not in keeping with real relations.

3. Legal practice has also developed several techniques of attaching the right in rem to nonmaterial objects—the results of intellectual activity. The isolation of the object from others—similar and related ones—is a necessary condition of such attachment. Otherwise it would be unclear to whom the right to the commodity belongs, and normal conditions of the economic turnover are impossible. One of such techniques is connected with the form of the object, another is connected with the content of the object. The former of these is developed in the copyright, the latter is developed in the patent right.

Practical experience has shown that the creation of a work, which has the same form, by another person, regardless of the first author, is practically impossible. This applies to all types of author's works—literary (including works of scientific literature), musical, graphic, and so forth. Therefore, the form here serves as a sufficiently reliable means of isolation.

Whereas in the result of intellectual activity preeminence belongs to its content, in contrast to the inimitable unique form duplication is possible here. Therefore, the protection of the result with regard to its content requires in principle an examination—a check of the conformity of the result to specific requirements, including novelty, feasibility, the establishment of priority, and state registration for the protection of the right in rem.

The draft does not use any of these methods. Therefore, it does not create a reliable legal basis for the commodity

turnover. If a third person were to produce independently an analogous result, he would have the same rights to it as the person who obtained it earlier. Moreover, he should be expected to be conscientious, the burden of proof of the contrary rests on whoever asserts that his right has been violated.

The draft stipulates in exactly the same way that the responsibility for the illegal use of the result rests only on the contracting party of the initial owner, with whom a contract has been concluded (Article 10 of the draft). The responsibility of third persons is not envisaged. Owing to the impossibility of determining precisely the holder of the right, the distinction of the remaining cases of violations is practically impossible, while Article 15 of the draft becomes impracticable. Under these conditions no normal commodity turnover is possible. The same (even not the very same) commodity can have simultaneously several owners and it is not known with which of them to conclude a contract.

4. The draft actually links the entire system of the safeguarding of interests with respect to the results of intellectual activity only with the bilateral relations between their producer and user, which are legalized by a contract. These are what are called "relative" relations, which are distinguishable from the absolute relations examined above. These relative relations are absolutely inadequate for the safeguarding of the market interests of the commodity owner and his contracting parties.

Contracts give rise only to a derived right. The primary right should always be the basis for it. In the absence of reliance on the right of ownership or on what are called "exclusive rights" no longer the right, but only the actual status, owing to which the preservation of the result of intellectual activity in a secret is the starting point, serves as the basis for the conclusion of a contract. Such a mechanism, though less reliable than the ones named above, is also well known to modern law. In particular, it is directly recorded in the draft of the Fundamentals of Civil Legislation, which have gone through the first reading. But the draft in question does not directly set down even this requirement.

However, this liability mechanism, which is not based on the right in rem, has a very limited force and significance, it is extremely unreliable. For example, it is not valid with respect to third persons, with whom a contract has not been concluded. Such a third person, who obtained independently and conscientiously the same result, can not only use it himself, but also conclude a contract on its transfer to someone else. A demand, which is based on the violation of the terms of a contract, of which he is not a party, cannot be made on him.

The limitation of the effect of the mechanism to contractual relations appears throughout the text of the draft. Thus, it is very significant that the term of effect of the right of the producer to the result is calculated in principle (if the contract does not stimulate otherwise) from the moment of the conclusion of the contract. It is

clear that such a most important rule, which governs the existence of the right itself, is not valid with respect to third persons who do not participate in the conclusion of the contract.

5. The description of the objects, to the protection of which the draft is devoted (Article 3), cannot be recognized as satisfactory. First of all the list of these objects is extremely mixed. Ideas, formulas, processes, methods, properties, formulations, designs, genes, polymers, solutions, algorithms and programs, and forecasts are grouped with them.

Any classification should have a single basis and not be a random collection. Otherwise there is the complete lack of coordination, which, in the legal sphere in any case, does not make it possible to create certainty in the methods of legal protection. The diversity and different nature of the objects of protection do not make it possible to select appropriate methods of protection, which cannot be identical for ideas, on the one hand, equipment, on another, methods of the management of economic and other (?) activity, on yet another, and so forth. Both objects of a material nature and ideal objects are included in the list.

It is also important to note that the list of objects, which is cited in Article 3, is not exhaustive. At the end of the list it is indicated that among protected objects there are "also other objects or sets (?) of them." The draft simply does not reveal what "other" objects.

And under these conditions the draft does not contain any general criteria of the assignment of an object to those that are protected. In all other cases of the protection of the results of creative activity the legislator gives such criteria without fail, even if the list, which is contained in a standard act, in principle is uniform and not so diverse. It is sufficient to familiarize oneself with the content of copyright and patent legislation.

6. The draft does not establish a specific relationship between the protection, which is envisaged by itself, and the protection, which is traditionally granted by the copyright and the inventor's right. True, Points 2 and 3 of Article 3 contain a stipulation, in accordance with which the effect of the Law being drafted will not be extended to objects that are protected by the copyright and the inventor's right (as well as by legislation on industrial prototypes and so forth). However, this impression of clarity is deceptive.

If, for example, we turn to Point 3 of Article 7, it will become clear that in some cases "the objects of scientific intellectual property" themselves are considered suitable for patenting. On turning to the list contained in Article 3 of the draft it becomes clear that if such objects themselves do not satisfy the demands that are made on inventions, they can contain, include solutions, the recognition of which as inventions is entirely admissible. The question of the relationship of protection in this case remains open. The results of works, which are the subject of the law, can also be patented, and in this capacity they

constitute one of the terms of the contract that is concluded in accordance with Point 2 of Article 8 of the draft. And here there is also no differentiation of the methods of protection.

Further, Article 7 of the draft stipulates the "forms" of scientific intellectual property (let us ignore the inaccuracy of the terminology—it is a matter not of the "forms" of property, but of the methods of recording the results of scientific intellectual activity). There figures among such forms, for example, reporting documents, which are a scientific literary work, graphic work, and so forth, which is protected by the copyright. What will the relationship of the different methods of protection be in such a case? Again there is no answer.

7. When appraising the consequences of the passage of the Law, it is necessary to take several factors into account.

a) The draft is aimed at the extension of commodity-money relations to the sphere of scientific and technical research and development. In essence it implies that such a commodity-money system of relations in this sphere is acquiring a universal nature. This is a fundamental change of the entire organization of work and will inevitably entail further transformations.

The consequences of the general statement of the question, which is contained in the draft, cannot be limited to themselves, logic implies radical changes in the economic organization of all scientific and technical activity to a system that is unknown throughout the world. All creative activity, at least in principle, would be changed over to the principles of cost recovery, under which individual subsidies and external financial would represent not an element of the system, but an exception. The danger of systems of this sort for the development of science and technology, particularly in the area concerning basic research (the draft also applies to its results), is obvious. In exactly the same way the method of cost recovery also can hardly be implemented in the basis spheres of humanities research. The circulation of the results of basic research on a purely commercial basis is very dangerous for the increase of the overall scientific and technical potential. The draft presumes the extension of the general conditions to all scientific and technical results, including those produced at the expense of budget allocations, and their transfer to users on a nongratis contractual basis. Here the right will be attached to the organization, at which the result was produced. Such a procedure can hardly be recognized as simply consistent.

The system proposed by the draft threatens not only the sphere of research and development, but also the sphere of their use. Such a use of all results, including the results of basic research on a nongratis basis, where the risk of rapid recovery is particularly great, may prove to be very dangerous.

It is impossible not to note that there is no system of the universal conversion of relations in the sphere of

research and development into a commodity in any country of the world. The assertion that the draft was prepared with allowance made for the experience of foreign countries does not correspond to reality. Everywhere essential spheres have been placed outside commodity relations and exist by means of external financing. The danger of the universal conversion of these relations into a commodity has also been realized in the USSR. We already have experience that makes it possible to judge the adverse consequences of such a system.

b) As a result of the introduction of the proposed system our country would be in an extremely disadvantageous position in the international sphere. In no country of the world is there a system that if only resembles the proposed one. As a result it would turn out that the Soviet national economy would be limited in the use of its own achievements owing to the rights that are attached to the holder of the right. While foreign entrepreneurs would be free in the use of the achievements, owing to the lack there of protection. This would create for us an extremely adverse situation. The unfavorability is also increased by Points 2 and 3 of Article 16, which in some cases attaches such rights to foreigners.

8. The assertion contained in the preamble of the draft that it was prepared in conformity with the Law on Property in the USSR does not correspond to reality. The decree of the USSR Supreme Soviet on the putting of this law into effect commissioned the USSR Council of Ministers to submit for consideration drafts of "USSR legislative acts that regulate relations with respect to the development and use of inventions and discoveries, works of science, literature, and art, and other objects of intellectual activity." Here in conformity with world practice industrial prototypes, trademarks, production secrets, and several other objects, which are directly named in international treaties, are included among such "other objects." The results of scientific research work and so forth are not included among them—they are outside the objects of the copyright and the inventor's right. The authors of the draft themselves at first declared these objects to be "intellectual property," but then proclaimed that the draft pertaining to them was prepared in conformity with the Law on Property. In reality this is an enterprising draft. And it is still necessary to prove its necessity, particularly before the making of general decisions on the organization of scientific activity in general.

The draft is based on a specific concept and, therefore, does not lend itself to partial amendments and improvements. It is possible to pass it or to reject it.

Owing to the fundamental and purely legal shortcomings of the concept of the draft, which are noted in this conclusion, it is necessary to conclude that the draft should be rejected.

[Signed] Head of the Department of Civil and Economic Legislation Prof. O.N. Sadikov

Chief Specialist of the Department Prof. V.A. Dozortsev
8 May 1991

USSR S&T Fund Hopes To Aid Unemployed Scientists

927A0005A Moscow RADIKAL in Russian No 33-34,
4 Sep 91 p 5

[Interview with Oleg Devyatov, general director of the USSR Scientific and Technical Fund attached to the USSR Union of Scientific and Engineering Societies, by RADIKAL correspondent Vladimir Pokrovskiy; date and place not given: "The Fund Is Buying Institutes"—first paragraph is RADIKAL introduction]

[Text] The USSR Scientific and Technical Fund attached to the USSR Union of Scientific and Engineering Societies (NTF) is capable if not of solving, then of alleviating considerably the problems of survival for many engineers and scientific personnel. That at any rate is what Oleg Devyatov, general director of the fund, stated in an interview with our correspondent Vladimir Pokrovskiy.

[Devyatov] Our fund appeared in 1987, when the USSR Union of Scientific and Engineering Societies obtained the right to engage in business activity and to enlist scientific and technical personnel in the introduction of their developments on the terms of direct contracts. For the organization of this work the Union of Scientific and Engineering Societies set up under itself a cost accounting public organization, which was named the USSR Scientific and Technical Fund.

It can now be said that the idea of setting up the fund turned out to be successful. We have obtained a large real return, by means of the fund the turnover of the Union of Scientific and Engineering Societies increased from 40 million rubles [R] in 1987 to R700 million this year. This increase is a result of the introduction of many developments, which without the fund would simply have been left to gather dust on shelves.

[Pokrovskiy] Is this a lot or a little?

[Devyatov] How should I put it? We have not calculated the percentages. One thing is clear—we are simply swimming in a sea of unclaimed ideas. According to the data of the USSR Academy of Sciences, annually 50,000 scientific and engineering developments, which have already been brought up to the stage of a prototype and have been approved by everyone, do not find further use. There are many reasons—now these developments require the efforts of several sectors, in which, as a rule, no one is interested, now the necessary financing is lacking. So that we have enough work for a long time.

In these few years the fund has developed into a large organization and has in its immediate subordination 35 works of its own, which are engaged in introduction. The orientation of these enterprises is most diverse. We are also busy with conversion.

The USSR Scientific and Technical Fund now represents the interests of 160,000 enterprises of the Union. These are no longer the property of the fund, but its members.

Any enterprise can become a member of the fund, provided it approves its charter and pays membership dues. But having become a member of the fund, it has the right to count on its scientific and technical support and, perhaps, financial support. Our charter is very democratic, while membership promises great advantages, so that we are besieged by those who wish to become members of the Scientific and Technical Fund.

[Pokrovskiy] Many of our enterprises are faced with the threat of complete collapse. There is obviously not enough financial assistance for everyone, while scientific and technical assistance is too mild a therapy for such cases. What effective assistance can the fund offer here?

[Devyatov] The most diverse. Thus, at many enterprises, which are working with us, we are introducing the contract system of work. It makes it possible to determine quite precisely which of the engineers or scientists is in reality capable of working under the conditions of a market economy. The first such experiment was conducted at the Leningrad Physical Technical Institute imeni Ioffe and yielded excellent results. Initially there were apprehensions that the changeover to contracts would be very painful and that people would not be protected socially. But whereas at first the associates of the institute feared such a system, now there is a line there of people who want it.

As for industry, now for the majority of enterprises the main problem is the lack of raw materials. For enterprises of light industry we are trying to organize the delivery of raw materials through our foreign members. These are entirely realistic programs, a number of contracts, in accordance with which these raw materials will be delivered to us until the opportunity appears to obtain our own raw materials, have already been signed.

[Pokrovskiy] The threat of unemployment for scientific and technical personnel is becoming more and more serious. Can you help those who find themselves out of a job?

[Devyatov] We hope that we will be able to. Not only legal, but also physical persons, that is, simply put, individuals can become members of our fund—for this they must agree with the charter, pay the amount of the initiative fee, which is nominal by today's standards—R50—and then pay R5 a year. We can offer such a person a job at one of our enterprises, can conclude with him a contract for the performance of some one-time job, can offer cooperation with any one of the newly formed temporary labor collectives....

We can also help not just the individual—we can help an entire scientific organization, having taken it under our wing. Thus, there now lies on my desk a contract, in accordance with which we are acquiring a scientific research bureau from Nikolayev, which deals with problems of the ferrohydrodynamics of magnetic fluids. We will support this organization, we hope that the collective of the bureau will also like working under our conditions, and, I believe, this will benefit both parties.

We are now conducting similar negotiations with one of the academic scientific research institutes. This institute has a more technical than scientific orientation, so that with respect to all the indicators it is "ours." By remaining in the academy, it would at best be doomed to a vegetable existence.

[Pokrovskiy] That is, if you are a good fairy, is it mainly for sectorial science?

[Devyatov] Yes, of course. For the present we are not taking the risk of supporting basic science or in general developments, which will yield a return only in the distant future. There are in addition organizations that deal with problems, which, in our view, are unnecessary at this stage. We are also willing to help such enterprises, but only provided that they change their specialization to tasks, for which there is a need today. An enormous bank of unsolved problems exists, and we are capable of giving everyone a job for their solution.

[Pokrovskiy] But how many enterprises can you realistically "eat up"?

[Devyatov] A good deal. We are capable of spending on this up to R50 million a year. But the acquisition of enterprises is not the only form of our assistance. We have now begun to introduce very actively another efficient form of cooperation—the establishment of joint-stock companies and limited liability companies.

In short, all would be well.... The main obstacle to our development, as in general to the development of market relations, is the fact that so far the identification of ownership between Russia and the Center has not been carried out. Until it is known exactly to whom one enterprise or another belongs, any contracts will have very little legal validity. In such a situation it is very difficult to defend one's own rights. I believe that when, at last, they get to the bottom of ownership, there will be a big spurt. Contractual relations will begin to develop like an avalanche.

Sociologists Investigate 'Brain Drain', Report Results

927A0005B Moscow RADIKAL in Russian No 33-34, 4 Sep 91 pp 4, 5

[Article by social psychologist A. Allakhverdyan and sociologist N. Agamova under the rubric "RADIKAL-Exchange": "Scientific Emigrants: The Fourth Generation"—first paragraph is RADIKAL introduction]

[Text] This article is an attempt at the analysis of the present "brain drain," which is under way primarily in two directions: the "internal" and "external" migration of scientific personnel.

Evaluations....

There is meant by it the outflow of scientists of academic scientific research institutes to new, commercial scientific structures: scientific cooperatives, centers of the

scientific and technical creativity of young people, and research divisions of joint ventures. In the process of a pilot sociological study, which we conducted at two academic scientific research institutes, scientific associates were asked the question: "How would you act, if you were given an opportunity to get a job in a cooperative?", 58 percent of those surveyed responded that they "intend" or already "are taking specific steps" for getting a job in a scientific cooperative. Here specialists up to the age of 30 are in the lead, after them are scientists of "middle age" (up to 45). The comparatively high wage is the leading reason of the scientists who want to work in a cooperative. However, the level of the wage is not the only reason for leaving for a cooperative. As the results of our study showed, such factors as the underrating by society of the role and prestige of basic science, the better (in the cooperative) equipment and technical supply of scientific work, and others are of considerable importance.

Whereas until recently young capable researchers often did not leave the academic sector of science, because there was simply nowhere to set out for, now, when the situation has changed drastically and an alternative system of commercial scientific structures, in which there are far more substantial salaries, has appeared, these people are frequently forced to leave academic institutions. Academician D. Knorre notes with alarm: "We are now faced with the threat that after some time there will simply be no one to work in large-scale science. I see that the establishment of scientific cooperatives is a number of cases is beneficial. But many people, especially energetic, talented young specialists, prefer a job there to an academic career. There are cases, when people leave for there directly from the upper classes of higher educational institution, without having obtained even a diploma.... I believe that such devastation of basic science, about which even Lysenko did not dream, is occurring today."

In recent years the "external" migration of scientific personnel of academic scientific research institutes, that is, their going abroad for both temporary and permanent residence has also been assuming an alarming scale.

"External" migration is conditionally divided into "regulable" ("contractual") and unregulable ("ethnic") migration.

At the general meeting of the USSR Academy of Sciences (13-14 March 1991) its president, Academician G.I. Marchuk, was forced to admit: "In fact we have been faced for the first time, it can be said, with the mass departure of scientists from academic institutes." This process thus far has not assumed a threatening nature, but the latest data on long-term departures abroad of scientists from leading institutes are disturbing.... Whereas in 1989, 252 people went abroad from institutes of the USSR Academy of Sciences for long periods—from one-half to five years, the next year, 1990, 534 people did. Of course, if you take an exclusively quantitative approach to the question, this is not that

many, only 0.8 percent of the permanent scientific personnel of the academy. But it is a matter rather of the pace of migration (the increase in one year is 212 percent) and, what is the main thing, the "quality" of the people who are leaving. After all, the most actively working scientists are leaving, among them are doctors (22 percent) and candidates of sciences (46 percent); 12 percent of them are up to the age of 30; 74 percent are from 30 to 45. "Of course," G.I. Marchuk continued, "this is not just a loss, in many cases this is also the acquisition of new knowledge, contacts, and ideas. However, a 'brain drain' on a significant scale can weaken our science." What is the structure of the "external" migration of academic scientists, what specialists do they prefer at foreign scientific research centers? For example, of the 252 people who went abroad in 1989, according to the data of Academician I.M. Makarov, chief scientific secretary of the USSR Academy of Sciences, there were: 131 specialists in the field of solid-state physics, theoretical physics, nuclear physics, and numerical mathematics, 69 specialists in the field of biotechnology and molecular biology, 29 specialists in the field of chemistry, and 23 specialists in the field of political science, sociology, and economics. And in 1990 specialists in leading scientific directions, first of all in the field of chemistry, molecular biology and solid-state physics, and applied mathematics, as well as specialists in mechanics and electronics and programmers left.

The situation with the other, more vigorous, conditionally called "ethnic" channel of the "brain drain," when people go abroad not as a consequence of a concluded scientific contract, but for reasons that are not directly connected with the prospect of continuing scientific work there (getting closer and reuniting with their relatives, the desire to live in an ethnic homeland, and so on), is more complicated and dramatic. Tens of thousands of scientists and engineers are leaving in a similar matter for a permanent place of residence in essence for good (in contrast to the situation with the contract system). In view of the lack of data of state statistics specifically on "scientific emigrants" we will cite the reports of the newspaper ARGUMENTY I FAKTY. According to its data, in 1989 "more than 70,000 scientific personnel" left the country, while in 1990, according to other data, one in six of the nearly 450,000 people, who received a exit permit, was a scientist, engineer, or physician. It does not seem possible to determine precisely the number of scientists and engineers of academic scientific research institutes, who left through the "ethnic" channel of migration, since such statistics simply are not kept.

Trends

In order to have an idea of the prospects and trends of "external" migration, we also studied the so-called potential "brain drain," that is, the migration aims and orientations of scientists and their willingness to go abroad. It is clear that the migration aims are rooted not in some personality traits of scientists, but first of all in

the present state of science and the conditions of scientific activity and in the sociocultural environment.

A combined procedure, which includes 24 professional and social factors (conditions) of work, which have a greater or smaller influence on the making by scientists of the decision to go abroad, was used during the sociological study. During the survey scientists were asked the question: "If you were given an opportunity to continue your scientific work at one of the foreign research centers, how would you act?" The results of the study showed that only 6 percent of the surveyed scientific personnel would not avail themselves of such an opportunity, since, in their opinion, "normal conditions for the implementation of scientific ideas and plans" exist at their present place of work, while 94 percent of the scientists expressed the desire to go abroad for a more or less lengthy period to continue their scientific work. As for the structure of the "external" migration of scientists, rather, the hierarchy of the migration aims, it was substantially different from the same one in case of the comparison with the "internal" migration of personnel to commercial scientific structures (cooperatives, joint ventures, and others). The notion current in social consciousness that the high level of the wage and living conditions is the main reason for escape abroad, did not find empirical confirmation. Of all the 24 factors, which influence the "external" migration of scientists, those surveyed "assigned" the factors of "the material reward of scientific labor" and "living conditions" respectively in fifth and 11th place. The most "powerful," leading factors proved to be (cited in descending order of influence): 1) the imperfection of the scientific equipment used in experiments; 2) the low rating by society of the role of basic science and the prestige of the labor of a scientist and an engineer; 3) the lack of the conditions for making available to one's children a high-quality education which meets present requirements; 4) the lack of sufficient opportunities for establishing stable scientific contacts with foreign colleagues. And, as we have already pointed out, the factor of "the material reward of scientific labor" proved to be only in fifth place.

Let us talk in a little more detail about the extent to which the empirically diagnosable phenomenon of a potential "brain drain" can really turn into an actual drain. In other words, to what degree the phenomenon of a potential "brain drain" can play a forecasting role. It is particularly important to clarify this, for with the passage of the law on departure and entry some experts predict an outflow of people, which is estimated in the many millions. It seems that the connection between the potential and actual "brain drain" is of an ambiguous, intricately mediated nature. The point is that the aspiration of a scientist to work a while at a foreign scientific center is an initial, necessary, but inadequate condition for its realization. Aside from the fact that the potential migrant should be a free, talented researcher, it is also necessary that the other, "adjoining" party would have a demand for highly skilled personnel.

Our specialists are particularly valued in such fields of knowledge as theoretical physics and mathematics. In the opinion of American expert Gerson Scher, the quality of scientific works and education in the USSR is high mainly in the field of the theoretical sciences. It is not surprising, therefore, that such sections of mathematics and physics as solid-state physics, nuclear physics, and numerical mathematics accounted for 52 percent of the scientific contracts that were concluded by our specialists in 1989.

Not only the abilities of scientists and the demand for them on the international intellectual market, but also specific organizational psychological factors, particularly the interrelations of the executives of scientific organizations with the staff members of the organizations, who expressed the wish to go abroad, have an influence on the phenomenon of the transformation of the potential "brain drain" into an actual "brain drain." As the practical experience of scientific life has shown, executives take a different position with regard to scientists who are going abroad. It is at least possible to distinguish three types of behavior of executives with respect to scientists who are potential migrants:

1. The executive, as far as he is able to, hinders the departure of his scientific personnel.
2. The executive takes a reserved, neutral position (he does not hinder, but also does not encourage the departure of staff members).
3. The executive encourages departure, moreover, when there is an opportunity he establishes himself contacts with foreign scientific centers for the placement of his staff members in a temporary job.

As an illustration of the first type of behavior of an executive let us cite the following case. A doctor of sciences and State Prize winner addressed to the administration of his institute the request to permit him to work temporarily at one of the European scientific centers (under contract). The director of the institute began to hinder in every way the departure of the scientist, believing that he "is suffering from the syndrome of a person, who rates himself very highly and believes that he deserves a different lot than we all do." In the end the director of the institute, not having "persuaded" his subordinate, issued an order on his dismissal. The doctor of sciences left, spent a year of his work under contract, the scientist began to contemplate to where he is to return, for the same director, clearly, will not hire him. The scientist is left with no alternative than to try to get an extension of the contract or to seek a job at a different institute in his homeland. It is clear that such a type of behavior of executives is not conducive to the active return home of specialists.

And here is another, directly opposite example from life. The director of an institute, an academician and world-famous scientist, realizes that the conditions of scientific work at the institute he directs due to the poor supply of scientific research with equipment and the low wage are

not conducive to productive activity. The director, drawing on his former scientific contacts with foreign scientific centers, conducts talks with the management of these centers with regard to temporary work (under a scientific contract) for his staff members and does not sever, but maintains constant contact with the personnel who have left. "Only a madman," notes the director of this institute, "would sever all contacts with emigre scientists. No, it is necessary to know how to take pride in our emigrants. It is necessary to stress in every way: They are ours. They are our pride. And then they will return without fail. The homeland always summons."

According to the data of the International Organization for Migration, the West following the initial shock, which was due to the prospect of a mass exodus from the USSR, is prepared to make workplaces available for the scientific and technical elite. In the next few years the West will be able to provide up to 200,000 leading scientists and specialists from the USSR with jobs. After the law on departure goes into effect they will get extensive opportunities for creative work on the most advanced equipment, as well as a high wage.

As of 1 January 1993, when the law on departure and entry takes effect, the USSR will be faced with the prospect of the massive outflow of highly skilled specialists, which can undermine the scientific and technological base of the country. The Soviet Union is already now faced with the need to check by economic, civilized steps the mass "brain drain," which it is hard to do under the conditions of the crisis development of the economy.

To think that the "brain drain" is an exclusively Soviet phenomenon means to be greatly mistaken. Here, too, we are not unique. World experience testifies that both developed (England, Canada, France, and others) and developing countries (India, Egypt, Mexico, and others) experienced a heavy "brain drain" during various periods of their postwar history. For example, the share of England alone in the total migration flow of scientists and engineers, who came to the United States in the early 1960's, came to 18-20 percent. Without going deeper into the history of this theme, let us note that the "brain drain" problem in these countries was realized as a problem of state importance. The governments of these countries stimulated special and large-scale studies of migration processes, special-purpose scientific organizational units for the comprehensive study of this problem were established on a permanent basis. The results of these studies served as the basis for the formulation of a special scientific policy in the area of the migration of the population as a whole and intellectual migration in particular.

The time has also come for us to see to the formulation of our own state program, which takes into account the specific nature of the migration situation in our country, the diversity of reasons for the emigration of scientists, the established directions and forms of migration, the structure and dynamics of the drain, the strong and weak

points of our science, and the constantly changing demand for highly skilled personnel on the world market of scientific labor.

The establishment in the system of the USSR Academy of Sciences of an interdisciplinary group of scientists (economists, sociologists, lawyers, psychologists, and others) for the comprehensive and systematic study of

migration processes would be the initial organizational element of such a program. The task of establishing and maintaining stable ties with departing scientists, the analysis of the "scientific growth" of compatriots, and, finally, the formulation of a stage-by-stage project on the reemigration of scientists, who were abroad, with the use of the experience of other countries, which have lived through a similar situation, could become an important task of such a group.

Goals of New Ukrainian Technological Academy Outlined

917A0224A Kiev PRAVDA UKRAINY in Russian
31 Aug 91 p 2

[Interview with Prof. Mikhail Antonovich Pavlovskiy, vice president of Academy of Technological Sciences of the Ukraine, academician of the Academy of Technological Sciences of the Ukraine and the USSR Engineering Academy, winner of the USSR and Ukrainian SSR State Prizes, and Honored Figure of Science and Technology of the Ukrainian SSR, by a PRAVDA UKRAINY correspondent; date and place not given: "The Academy of Technological Sciences, Which Was Recently Established in the Ukraine, Will Find Quick-Witted Newtons and Give Them a Green Light to Production"]

[Text] A month ago the constituent meeting of scientists and scientific and technical personnel of the republic, which proclaimed the establishment of the Academy of Technological Sciences of the Ukraine (ATNU), was held in Kiev. While during the first days of August the new public organization, which unites on voluntary principles prominent technological scientists and leading specialists of various sectors of the national economy of the republic, was officially registered in the Ministry of Justice of the Ukraine. A PRAVDA UKRAINY correspondent talks about the advisability of the the establishment of the academy and about the tasks, on which it will work, with its vice president, Prof. M.A. Pavlovskiy, academician of the Academy of Technological Sciences of the Ukraine and the USSR Engineering Academy, winner of the USSR and Ukrainian SSR State Prizes, and Honored Figure of Science and Technology of the Ukrainian SSR.

[PRAVDA UKRAINY] First of all, Mikhail Antonovich, explain, please, to what is the need for the establishment in the Ukraine of the Academy of Technological Sciences due?

[Pavlovskiy] This was dictated by life itself. I would not be retailing stale news if I were to say that today the output of high-quality items, first of all science-intensive and, what is particularly important in connection with the transition to market relations, competitive ones, is based, figuratively speaking, on three whales. The first of them is a substantial scientific research and new results in basic research. The second is new machines, instruments, and equipment. And, finally, the third and, without exaggeration, the primary one is the devising and development of technologies that make it possible to make a product, which has high consumer properties and satisfies present demands.

It is universally recognized that a strong Academy of Sciences has been formed in the Ukraine, the higher educational institutions of the republic also have a powerful scientific potential. Ukrainian scientists in the area of the basic sciences have many world-level achievements.

On the other hand, the designer-developers of such collectives as the Design Bureau imeni O.K. Antonov in Kiev, the Yuzhnyy mashinostroitelnyy zavod Scientific Production Association (Dnepropetrovsk), the Elektron Concern (Lvov), and many others are worthily representing the republic in the world.

A reasonable question arises: Why then in our total production volume is the share of competitive products extremely low?

There are many reasons for this. One of them lies in the very system of our national economy. The trouble is that both in the country as a whole and in the Ukraine in particular there were no and for the present are no structures, which would purposefully coordinate and ensure the development of technology as a science. Yes, we do have individual achievements in technologies. However, they, as a rule, have been materialized in defense sectors and were inaccessible not simply to enterprises that work for the needs of the national economy, but even to enterprises of other sectors of the same defense complex. Intersectorial barriers and, in many cases, the unjustified policy of secrecy were an insurmountable obstacle in their way. Moreover, the work of these enterprises, as a rule, of union subordination was coordinated and financed through the center.

Today we live under the conditions of the emergence of the sovereignty of the Ukraine, which, of course, is impossible without the economic independence of the republic. While it is impossible, in turn, to achieve economic sovereignty without the development of the technological sciences and technology itself of a modern level. The Academy of Technological Sciences of the Ukraine will also undertake the accomplishment of the indicated tasks.

[PRAVDA UKRAINY] On whose initiative was the academy established? Who is its founder?

[Pavlovskiy] Very many scientists and engineers of the republic realized the need for precisely such an Academy. Academician Boris Yevgenyevich Paton acted as the immediate initiator of the establishment of the academy. Vice Presidents of the Academy of Sciences Academician V.I. Trefilov and Academician V.P. Kukhar played a large role at the initial stage of its formation. While the Academy of Sciences of the Ukraine itself acted as one of the founders of the Academy of Technological Sciences of the Ukraine.

The Union of Scientific and Engineering Societies of the Ukraine, the Ministry of Higher and Secondary Specialized Education, the Ministry of Power and Electrification, and many very large enterprises and associations are also among our founders. For example, the "Arsenal" Zavod Scientific Production Association and the Saturn NAO (both are in Kiev), the Yuzhmashzavod Production Association (Dnepropetrovsk), the Elektron Concern (Lvov), the Ukrainian Affiliate of the International

Fuel and Power Association, the Elektronpribor Scientific Production Association (Kharkov), the Kholodmash Scientific Production Association (Odessa), and others.

[PRAVDA UKRAINY] What place will the Academy of Sciences hold among the now already numerous academies?

[Pavlovskiy] Today, in addition to the Academy of Sciences of the Ukraine, the Mining Academy, the Academy of Engineering Sciences, the affiliate of the USSR Engineering Academy, and others have been established and are operating. Their names testify that they are called upon to conduct scientific research, first of all, either in a basic field or in the sphere of applied research. Our academy is setting as its goal to solve problems which, as I have already said, are connected with technology—the narrowest part of the making of a finished product.

A few words about cooperation with the other academies. It stands to reason that we will be unable to work fruitfully without close contact, on the one hand, with the bearers of basic results—the Academy of Sciences and the higher educational institutions of the republic—and, on the other, directly with scientific production associations and enterprises. We see one of the main directions in the increase of the occupational skill of specialists—process engineers of all levels.

Of course, the establishment of business relations with all the academies of sciences, which have now been established, is in our plans. One simply cannot get by as well without contacts with individual prominent scientists, researchers, or their new forms of associations.

But our main task is to combine the creative potential of scientists, engineers, and process engineers, regardless of their political views and convictions, for the accomplishment in the immediate future of a technological breakthrough of the Ukraine in the interests of our people.

[PRAVDA UKRAINY] Who heads the Academy of Sciences? What is its structure?

[Pavlovskiy] The president and vice presidents were elected at the first general constituent meeting. Academician of the Academy of Technological Sciences of the Ukraine and Corresponding Member Anatoliy Alekseyevich Morozov—director of the special design bureau of mathematical machines and systems of the Institute of Cybernetics imeni V.I. Glushkov—took charge of the Academy of Technological Sciences of the Ukraine. While Academicians of the Academy of Technological Sciences of the Ukraine V.P. Gorbulin, V.S. Krivulko, V.Ye. Tonkal, and your humble servant were elected the vice presidents.

In the structure of the Academy of Technological Sciences of the Ukraine the department is the basic unit. To give you an idea of the breadth of coverage of the problems, with which the academy intends to deal, I will

list its departments: medical equipment, the technology of health care; pharmacology; ecologically clean chemical technologies; ecology and nature conservation; new technologies in power engineering, the metallurgical industry, special control systems, instrument making, telecommunications, transportation, light and the processing industries, and the prospecting, recovery, and use of mineral resources. But, in addition, there are the departments of materials science, electronics, new information technologies, and economics and management in the national economy.

There were elected as the first academicians of the Academy of Technological Sciences of the Ukraine, in addition to its president and vice presidents, mainly scientists, who work directly in industry or are most closely connected with it.

[PRAVDA UKRAINY] The new organization is taking its first, so far timid steps. Does it probably need at first substantial public support?

[Pavlovskiy] Of course, without this we will simply not manage during the period of formation. And here we are relying strongly on the understanding and assistance of the mass media, including your respected newspaper. And we would be very happy if PRAVDA UKRAINY would afford us the opportunity to inform the public about our academy. While we, in turn, will be active readers and promoters of the newspaper.

In conclusion I want, having paraphrased the well-known expression of Lomonosov, to say that the Ukrainian land is lavish in Platos and quick-witted Newtons. To give them a green light directly to the sphere of production, to break the closed circles of departmental isolation, to help the republic accomplish a technological breakthrough in the leading sectors of the economy, and thereby to help it to take another step toward sovereignty—what can be more alluring and noble!

Ukrainian Applied, Basic Science Indicators Reviewed

917A0232A Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 7, Jul 91 pp 65-69

[Article by Candidate of Economic Sciences N. Ostapenko under the rubric "Problems of Science and Education": "The Potential of Science: Content, Use"]

[Text] The formation and use of the potential of science are a most important factor of the socioeconomic progress of society. Its use requires the clear differentiation of the subject of science and the subject of production in the "science—production" system. Precisely the independence of science and production, the fundamental combination of which is the first condition of socioeconomic progress, makes it possible to realize the importance of such concepts as scientific activity and

production activity and to distinguish in so doing, conditionally speaking, the "border zone" of their interaction, in which the relations of scientific production activity—the weakest link of scientific and technical progress (NTP)—develop.

The initial form of the potential of science is ideal knowledge. That is why scientific and technical progress from the start has harbored difficulties and obstacles of the practice use of the achievements of science. Society surmounts these barriers more easily and efficiently, the more thoroughly the forms and methods of combining science with production are developed. Scientific activity is not only the production of elements of scientific knowledge, but also the process of their fundamental combination, in which science is an integral production organism of a special sort, of which its own proportionalities and proportions and internal laws are characteristic. Scientific activity is the potential of science in action. Collective reason has been trying for a long time to fathom both the content of the self-consciousness of science and its interaction with practice. However, the successes in this direction remain modest. The present state of scientific and technical progress and the dissatisfaction of society with its end results and the negative ecological consequences in many respects are explained by the weakness of the theoretical notions of the state of the relations of the "science—production" system and of the means and methods of their improvement.

In 1989, 1,388 scientific institutions, which were engaged in research and development, were operating in the Ukraine. Among them are 295 scientific research institutes and more than 103 affiliates of them, 143 higher educational institutions, 443 planning and design, planning and technological, and planning organizations, 97 design bureaus carried on an independent balance sheet, and other scientific institutions.

The number of research organizations depends on national economic needs and the material means of society. The number of scientific organizations itself does not reveal completely the content of the scientific potential. Its internal organization and the establishment of the optimum structure are of great importance. Inasmuch as the "science—production" system has a starting (science) and end (production) point, the number of scientific institutions at the poles of the system is of some interest. According to the logic of the organization and interrelationship of the starting (source of information) and end (receiver of information) points their possibilities should be functionally comparable and should be in the optimum correlation.

In the Ukraine 113 scientific institutions of the academic type (source) and 167 scientific research institutes and design bureaus of the plant sector of science (receiver) are in operation. For all the conditionality of such a comparison the fact remains: There are 1.5 institutions of practical scientists per scientific institution of theorists. Higher educational institutions conduct scientific

research that is close in content to the research of scientists of the academic sector of science. Therefore, there are grounds to consider that 256 scientific institutions (of the Academy of Sciences and higher educational institutions) are working for the benefit of the same 167 institutions of the plant sector of science. In this combination there are 1.5 scientific institutions of theorists per institution of practical scientists.

Independent institutions of science of the sectorial type also conduct theoretical research, including basic development, although their basic task consists in the interpretation of theoretical knowledge in the interests of the corresponding sectors of the national economy. Thus, the information load on scientific institutions of the plant sector of science, for the sake of which the entire remaining amount of research and development is conducted, comes to a level that conflicts with common sense. Whereas 69.4 percent of all scientific research institutes and design bureaus are concentrated in the sectorial sector, only 12 percent are concentrated in the plant sector of science, which is only 4 percent more than at the UkSSR Academy of Sciences.

The ideology of the introduction of the achievements of science in production in point of fact implies the isolated, at best group translation of the ideal into material practice. For a long time it has not yielded, and could not have yielded, high results, since in its essence it is not only a mechanical, but to a certain extent also a forcible action, which does not take into account the objectively dictated laws of the combination of science with production. The idea of the introduction of the achievements of science in production, which is characteristic of the period of the extensive growth of the economy, does not give answers to the key problems of scientific and technical progress under the conditions of the intensification of production and is not conducive to knowledge of the economic content and the laws of the relations between science and production.

Basic science is the theoretical foundation of scientific and technical progress. Precisely its discoveries, being interpreted in terms of the interests of sectors and large works, change radically the technical base of production and, on its basis, the economy as a whole. However, scientific knowledge (in the form of either basic or applied research) cannot become accessible to production without the appropriate processing, without its reduction to a form that is suitable for use by a specific works. At this stage of the materialization of scientific knowledge a special organizational form of science, which has received the name "the plant sector of science," comes into effect. Here it is appropriate to use the concept "the preproduction sphere of science," which is of fundamental importance for the understanding of the essence of the metamorphosis, which is inevitable and characteristic of the conversion of scientific knowledge from an ideal form to a material form, that is, a production form. In essence, it is a matter of the combination of independent forces: the potential of science and the potential of production, which requires the existence of

an adequate scientific reserve, on the one hand, and the ability of production to use it efficiently, on the other. The interaction of the potential of science and the potential of production is a global problem of scientific and technical progress, which awaits its solution. The formed structure of the personnel component of science is confirmation of such a conclusion.

In the Ukraine the average registered number of personnel of basic (scientific and technical) activity comes to more than 532,000, including 349,000 specialists who conduct research and development. In the academic sector of science the number of people engaged in research and development comes to 57,000 (16.2 percent) and at higher educational institutions to 38,000 (10.9 percent). Let us stress that the two indicated sectors unite 95,000 people (27.2 percent), who conduct research and development, while in the plant sector of science there are 33,000 of them (9.6 percent).

It seems natural that at sectorial scientific organizations nearly fourfold more personnel are engaged in research and development than at academic organizations, but the fact that in the plant sector of science there are 1.7-fold fewer of them as compared with the academic sector, attracts attention. The situation is such that there are 66 specialists of applied science, 11 specialists of higher educational institution (VUZ) science, and 17 specialists of academic science per 10 specialists who conduct research and development in the plant sector of science. Conditionally speaking, 17 theorists work for the benefit of 10 practical personnel of scientific and technical activity.

Approximately the same situation has formed in the relations between applied and plant science. At independent scientific organizations of the sectorial type 221,000 specialists conduct research and development. They are sectorial, in order to work primarily in the interests of production. However, a natural question, which is connected with the ability of specialists of the scientific subdivisions of the primary unit of the economy to cope with the conversion of the scientific product of sectorial scientists, whose number exceeds by 6.6-fold the number of personnel of the plant sector of science, arises. And this is given the fact that only 14-15 percent of the scientific production associations, 7-8 percent of the production associations, and about 2 percent of the industrial enterprises have their own scientific research institutes and design bureaus. As to the plant sector of science itself, of the 33,000 specialists, who are engaged in research and development, only 10,300 (30.8 percent) work at industrial enterprises, while the remainder are employed at scientific production associations (19.9 percent) and production associations (49.3 percent). Whereas per scientific research institute and design bureau within scientific production associations there are (on the average) 550 specialists, who are participating in research and development, and within production associations 270, at industrial enterprises there are only 110 specialists.

The picture with the provision with highly skilled personnel is even more contrasting. In the UkSSR the number of candidates of sciences, who are engaged in research and development, comes to 32,000, of them 12,900 are employed in the academic sector of science, 6,500 are employed at higher educational institutions, 12,000 are employed at sectorial scientific institutions, and only 574 are employed in the plant sector of science. There are 21 candidates of sciences of the sectorial type and 34 candidates of sciences of academic institutions and higher educational institutions per candidate of sciences, who is employed in the sphere of plant science.

It is also worth directing attention to the fact that associations and enterprises have at their scientific research institutes and design bureaus 253 candidates of sciences, while the 12 scientific production associations have 221 candidates of sciences (38.5 percent of their total number in the plant sector of science). Whereas there are 18 candidates of sciences each for every scientific production association of the republic, there are four at scientific research institutes and design bureaus of production associations, while there is one candidate of sciences each at the scientific research institutes and design bureaus of industrial enterprises. Having take the number of candidates of sciences at academic institutions and higher educational institutions to be one, we will see that at sectorial scientific institutions their number is equal to 0.6, while in the plant sector of science it is equal to 0.03.

At scientific organizations and institutions of the Ukraine 3,299 doctors of sciences are conducting research and development, of them 2,449 (74.2 percent) are conducting them at the UkSSR Academy of Sciences and higher educational institutions, they remainder are conducting them in sectorial and plant science. Here only 14 doctors of sciences, which comes to 0.4 percent of those engaged in research and development, work in the plant sector. There are 235 doctors of sciences from other fields of research, including 142 doctors who are theorists, per doctor who is a production worker. The number of doctors of sciences in the plant sector of science formed according to the rule of geometric progression, but not in favor of the users of scientific knowledge—scientific research institutes and design bureaus of industrial enterprises, at which only two doctors of sciences work. At scientific research institutes and design bureaus of production associations there are four of them, at scientific production associations there are eight doctors of sciences.

We believe that in the foreseeable future the radical improvement of the structure of employment of scientific personnel in all sectors of science will remain one of the important problems of increasing the effectiveness of the operation of the "science—production" system.

Scientific research requires the corresponding material and technical supply. At the end of 1989 the fixed capital of scientific organizations came to about 5.1 billion rubles [R], the "sectorial" structure of which, excluding

the plant sector of science, does not give grounds to judge the essential differences in the formation of the bone and muscle basis of intellectual labor. Institutions of the academic type have fixed capital in the amount of R1.3 billion (25.5 percent of its total value); higher educational institutions have just as much; sectorial scientific institutions have fixed capital worth R2.5 billion (49 percent). One should particularly emphasize the weakness of the material base of the plant sector of science, in which there is fixed capital worth only R490 million, or 9.6 percent of its total value of other sectors of science. This situation does not have theoretical explanations, but in practice follows from the fact that, first, the economic need of industrial production for the organization of its own scientific institutions with a high level of material, technical, and manpower supply is weak; second, state resources for the development of science are limited; third, scientific and technical activity in the preproduction sphere is based mainly on the use of the fixed capital of industry itself, which is responsible in the final analysis for the separation of production from science and the decrease of its efficiency.

The instrument base is the backward sphere of scientific and technical activity. Thus, scientific institutions of the Ukraine have measuring and regulating devices worth in all an amount that slightly exceeds R1 billion, including academic science—R332 million, VUZ science—R256 million, and sectorial science—R440 million. A large part of the fixed capital is worn out and obsolete. But the main thing is that to a significant extent it is formed in the image of industry and for that reason does not always satisfy the requirements precisely of scientific research.

The analysis of the potential of science in action is an important aspect of the efficiency of scientific and technical activity. During 1989 jobs in the amount of R4.7 billion were completed and accepted by clients; organizations of the academic type performed one-fifth of them (18.2 percent), organizations of the sectorial type performed 66.3 percent, the plant sector of science produced scientific and technical products worth R317 million, which comes to 6.7 percent of the total amount in the republic.

The actual expenditures by types of scientific and technical activity have the following structure: scientific research—35.8 percent, planning, design, and technological operations (PKT)—42.6 percent, planning operations for construction—9.6 percent, the production of prototypes and test batches—8.4 percent, and scientific and technical services—3.6 percent. There is no doubt that scientific research constitutes the basic content of scientific and technical activity. However, let us direct attention to the fact that it has a share of 35.8 percent. Consequently, it is possible to assert that only to this extent does the activity pertain directly to research activity.

In academic science scientific research (by cost) makes up 31.8 percent, in sectorial science—46 percent, and at higher educational institutions—17.9 percent. The plant

sector of science performed only 4.3 percent of the scientific research work. The low level of this indicator raises a natural question: Is the sector scientific in essence? Considering that scientific and technical activity is not confined just to scientific research, let us turn to another type of operations, which are a connecting (or intermediate) link between basic scientific research and the practical application of the achievements of science—to planning, design, and technological operations.

However, here the overall picture is also not changing. The logic of scientific and technical activity suggests that mainly sectorial and plant scientific institutions should engage in planning and design operations. In general this is the case. They perform more than three-fourths of the indicated operations. At the same time the plant sector of science accounts for only 9.1 percent of their volume. Let us also note that institutions of the academic type, which are called upon to engage in theoretical research, perform 16 percent of the planning, design, and technological operations.

The production of prototypes and test batches of items, for the sake of which research and development, which confirm the validity, utility, and practical applicability of scientific ideas, are conducted, can be regarded as the end result of scientific and technical operations. However, in the scientific activity of scientific research institutes and design bureaus, which are on the balance sheet of scientific production associations, production associations, and industrial enterprises, the production of prototypes holds an insignificant place. In value terms it is inferior to institutions of the UkSSR Academy of Sciences.

In the "science—production" system, strictly speaking, there is essentially no division of labor. The rule, according to which "everyone should do his own job," is being violated both in the economy as a whole and in the sphere of scientific labor. Our organization of science is characterized by the fact that all scientific institutions perform all or the majority of types of scientific labor, forming something like a subsistence scientific works.

Scientific research at present is oriented toward the end economic result. Let us look at it through the prism of the profit from scientific activity. In 1989 the research and development, which were conducted in the republic, yielded a profit of more than R1.3 billion. This means that the expenditures on science are recovered in less than three years, but at the same time the length of the "science—production" cycle comes to more than 10 years. If we judge from the profit, planning, design, and technological operations, which provided nearly half of its entire amount, are the most profitable. Scientific research is less profitable (27 percent). Operations on the production of prototypes and test batches of products almost do not yield a profit (7 percent). The profitability of planning operations for construction is at the same level. Scientific and technical services yield the smallest profit (5 percent). The analysis reveals a contradiction,

the essence of which consists in the fact that given the orientation of science toward the end result it is more profitable to invest assets in the initial (theoretical) stages of the "science—production" system, and not in the final (practical) stages. It is paradoxical, but a fact: The academic sector of science derives a twofold larger profit than the plant sector. In the plant sector of science the profit is broken down among subdivisions in such a way that the scientific research institutes and design bureaus on an independent balance sheet of industrial enterprises (the largest group) have less of a profit than the scientific research institutes and design bureaus within scientific production associations (the smallest group).

When determining the effectiveness of science and the degree of use of the potential of science it is possible to use the indicator of profitability on the basis of the use of the data of statistics on the amount of contract prices and the cost of scientific and technical operations. In 1989 the overall level of profitability as a whole for the Ukraine came to 33.3 percent. By types of activity of scientific institutions scientific and technical services have the highest profitability (50.7 percent), then come planning operations for construction (46.2 percent), planning, design, and technological operations (41.6 percent), and the production of prototypes and test batches of products (31.1 percent). Scientific research operations have the lowest level of profitability (27.7 percent), but it is only negligibly inferior to the level of profitability of the production of prototypes and test batches. The fact, which testifies to the necessity of radical changes of the relations of the "science—production" system, is alarming.

Practical experience shows that economic methods of research are also being applied to the sphere of basic scientific research. For all the conditionality of such a technique it should be acknowledged that not only cognitive (theoretical), but also applied (practical) goals of large-scale science exist. Clearly, one should not exaggerate the directly practical function of basic science. The fundamentally new thing is that it is impossible to predict or explain it by means of the formed theoretical notions. We believe that the economic evaluation of basic scientific research does not make sense. And nevertheless it is possible and necessary to use it for the study of the logic of the relations of the "science—production" system. Statistical data (form 1-nauka) testify that in 1989 scientific institutions of the republic conducted on a contractual basis basic research costing more than R230 million. They also make it possible to determine that the level of profitability of the indicated operations came to 12.5 percent.

Basic scientific research on a contractual basis is a fact that requires independent study. We believe that basic scientific research should be financed from the state budget, while its results should belong to the state. The policy of introducing the results of scientific labor, particularly basic scientific research, can adversely affect

scientific and technical activity. The interaction of science and production should be based mainly on the rendering of scientific and technical services, and not just in the area of information, patents, licenses, and scientific and technical consulting, but over the entire range of activity. At present the low level of services, as was already noted, is explained by a number of factors, but the main one is the lack of development of the economic relations of the "science—production" system.

The increase of the influence of scientific and technical progress on the development of the economy and on all aspects of social development appears first of all as the establishment of a powerful plant sector of science, the effective actions of which can ensure the use of the potential of science in the interests of socioeconomic progress. It does not meet now the demands that are being made on the economy. In the country only half of the industrial enterprises have their own subdivisions of science.

The 167 scientific research institutes, design bureaus, special design bureaus, planning and design organizations, and other institutions, which are on the balance sheet of scientific production associations, production associations, and industrial enterprises, should be recognized as the highest form of the organization of the plant sector of science. There are employed in this sector 52,000 working people, of whom 33,000 specialists are engaged in research and development. Production subdivisions, which perform research work, constitute the main base of plant science. The last statistical study of them was conducted in 1985, and although the data are obsolete, for the most part they nevertheless reflect the formed situation. It is possible to consider that the plant sector of the Ukraine has 15,000 different subdivisions, including 9,000 laboratories, 4,000 design bureaus, about 1,000 pilot experimental organizations, 360 departments of the mechanization and automation of production, and 60 departments of the introduction of new equipment.

This sector performs 6-7 percent of the actual volume of jobs, which have been completed and accepted by the client, as well as scientific research and scientific and technical operations; about 9 percent of the planning, design, and technological operations; 12 percent of the operations on the production of prototypes and test batches of new products. The volume of operations, which are performed by plant science, depends on the possibilities of the research potential and the needs of production for scientific products, on the specific achievements of science, and on the state of the relations of the "science—production" system.

There is another detail from the area of the relationship of the starting and end points of scientific and technical activity. The analysis shows that only with respect to the expenditures on research and development does the plant sector of science surpass organizations of the academic type. With respect to all the other items, and

particularly the number of doctors and candidates of sciences, it lags. The relationship of the potential of scientific organizations of the sectorial type with the potential of plant science is such that the latter is many fold inferior to the former with respect to all items. There is every reason to believe that the plant sector of science exists symbolically and does not have any substantial influence whatsoever on the development of the "science—production" system. Meanwhile it is called upon to perform a special function—to process the scientific information accumulated by society for the purpose of ensuring its practical application and increasing on this basis the science-intensiveness of production and its output. This function is being poorly performed, which is leaving a mark on the overall state of the formation and use of the potential of science as a whole.

The solution of material problems is dependent on science, but if it inadequately influences the production of human wealth, one should seek the reasons not in itself, but in social conditions and in the policy of the state. So that science would become a tool of the increase of the standard of living of man, the appropriate organization and the assurance of the optimum relationship between all the units of science, as well as of science with production are needed. Disproportions and first of all those between the potential of plant science and its other sectors are hindering the establishment of such a relationship.

Practical experience has shown that the simultaneous (parallel) improvement of all the units of science did not yield the needed result. At present the radical change of the proportions of the "science—production" system in favor of the material and technical component and personnel component of the plant sector of science is a task of vital importance. In essence, it is a matter of turning the organism "upside down." Given such an approach a single solution, it would seem, suggests itself: to transfer material and manpower resources to plant science. But for all the external simplicity and appeal of this means it is necessary to treat it seriously, in a state manner.

First, the material and technical base of the different fields of science is original and unique, but far from every scientist of the sphere of basic and applied science will be able to work productively in plant science. Whereas "pure" science operates, as a rule, without concern for practice, while applied science works on important sectorial and intersectorial scientific problems of the development of production, the specialist of plant science should proceed from the technical and technological peculiarities of production and its long-range, but specific needs. In connection with this it is necessary to emphasize that thus far the role of plant science in the development of production has not been explained either practically or theoretically. Empirical notions continue to prevail over scientific evaluations, which is one of the main causes of the low effectiveness of scientific and technical activity.

A special state program of the development of the plant sector of science, the implementation of which will ensure structural changes in the "science—production" system and the constant increase of the science-intensiveness of products as the material base of the development of science in general, is needed. The basic goal of such changes is the formation of a great need of all sectors of science and all forms of management for the development and use of the latest achievements of science. Its urgency is confirmed by the fact that the management forms being newly developed (concerns, associations, joint-stock companies, small enterprises, and others) are gravitating toward activity, which is far from the requirements of development on the basis of the use of the latest scientific achievements and is based on empiricism.

By its nature the transition to science-intensive physical production is objective. If the cycle of the "science—production" system comes to more than 10 years, it is possible to develop equipment of new generations no sooner than the indicated time. The active role of the subjective factor, which appears first of all in the science and technology policy of the state, consists in the achievement of the optimality of the process.

Thus, three factors of the functioning of the potential of science—the number of scientific organizations and institutions, the personnel component, and material and technical supply—determine the effectiveness of the work of the "science—production" system as a whole. The economic interaction of the indicated factors is a complicated problem that requires independent scientific investigation. At the same time the undertaken analysis revealed a regularity, the essence of which consists in the fact that with the advance of a scientific idea to the sphere of its practical application, that is, from basic to applied science, the potential of all three factors diminishes. In the plant sector of science there are fewer institutes and scientific personnel and the material base is less developed, which is not conducive to the stimulation of the materialization of scientific knowledge in the physical elements of production.

Every sector of science (basic, applied, plant) should be actively developed. Without this scientific and technical progress is impossible. However, state priority in this development should, in our opinion, be given to the plant sector of science. This, it would seem, is at variance with the unshakable place of basic science in the development of society. There are no contradictions here. The examined components of the potential of science do not and cannot go beyond the activity of the "science—production" system, of which the practical use of the achievements of science in production is the basic content. The study of the economic relations of the interaction of basic, applied, and plant science has assumed particular importance. Such research does not exist, which is hindering the development of the "science—production" system.

Based on the analysis of the potential of science of the Ukraine, there are grounds to conclude that the increase of the effectiveness of its use requires the implementation of state measures, which are aimed at the assurance of the fundamental unity of the actions of all the factors of the "science—production" system: the number of scientific institutions and organizations, scientific personnel, and the material and technical base of research.

However, without the rapid development of the plant sector of science it will be impossible to solve this problem, for in the primary unit of production the need for the development of science itself is forming.

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RSFSR Academy of Technological Sciences Announces Vacancies

927A0002A Moscow IZVESTIYA (Union edition)
in Russian 24 Sep 91 p 6

[Article: "The RSFSR Academy of Technological Sciences"—first paragraph is IZVESTIYA introduction]

[Text] The RSFSR Academy of Technological Sciences (ATN) in accordance with its charter and the decree of the All-Russian General Assembly of 17 June 1991 gives notice of the next election to vacancies of members of the academy (full members, corresponding members of the RSFSR Academy of Technological Sciences).

The RSFSR Academy of Technological Sciences—a self-managed association of prominent technological scientists of sectorial, higher educational institutional (VUZ), and academic science—was founded in July 1990. It performs large-scale basic and applied operations which develop science-intensive technologies and technological science education. These operations were begun with the enlistment of the advanced developed experimental technological base of collectives of science-intensive sectors of industry.

The consolidation of the efforts of technological scientists on the speeding up of the development of science-intensive, ecologically clean technologies, which determine the level of civilization, on the development of fundamentally new technologies, and on the conversion of science-intensive defense technologies in the interests of people and the environment is the basic goals of the activity of the academy.

The formation of the initial membership of the academy was completed in February 1991 by the holding of a democratic election throughout the territory of the RSFSR, which was announced by ROSSIYSKAYA GAZETA in December 1990. The presentation of the RSFSR Academy of Technological Sciences took place at the session of the RSFSR Supreme Soviet on 15 February 1991 and, on the instructions of RSFSR President B.N. Yeltsin, on 28 June 1991 in the RSFSR House of Soviets, where on behalf of the Russian leadership Deputy Chairman of the RSFSR Supreme Soviet R.I. Khasbulatov greeted the members of the academy. Reports on the results of the election of the initial membership of the RSFSR Academy of Technological Sciences were published in the newspaper ROSSIYA on 16 February 1991, in ROSSIYSKAYA GAZETA on 14 March 1991, as well as in independent publications (VECHERNYAYA MOSKVA and others). Information on the presentation of the RSFSR Academy of Technological Sciences was broadcast over Russian Television and Radio and over American television by ABC (in New York).

The RSFSR Academy of Technological Sciences took part in five of the 18 all-Russian scientific comprehensive programs, which were displayed in the RSFSR House of Soviets at the Programmy Rossii-91 exhibition.

One of the republic programs, which was formulated by scientists of the RSFSR Academy of Technological Sciences—"New Intensive Technologies for the Agroindustrial Complex of Russia in the Interests of Expediting the Solution of the Food Problem During 1991-1993"—on the instructions of RSFSR President B.N. Yeltsin was submitted to the emergency commission of the second extraordinary RSFSR Congress of People's Deputies for foodstuffs, was approved by it, and was accepted for implementation. Work was also begun on other enterprising programs of the RSFSR Academy of Technological Sciences, which were approved by the RSFSR Government.

In June 1991 the International Academy of Technological Sciences, the first in the world, on the initiative of the RSFSR Academy of Technological Sciences was registered by the USSR Ministry of Justice. In addition to the RSFSR Academy of Technological Sciences, the Russian-American Academy of Technological Sciences, the Russian-Korean Academy of Technological Sciences (Seoul), and the New High Technologies international association (the United States), which have been registered by the governments of these countries, are its founders. Prominent scientists of the FRG, Switzerland, Italy, France, and other countries of the world have expressed the desire to participate in the work of the International Academy of Technological Sciences. The initiatives of the RSFSR Academy of Technological Sciences were supported by UNESCO.

The most prominent scientists of the country: academicians and corresponding members of the USSR Academy of Sciences, the USSR Academy of Medical Sciences, and the republic academies of sciences, winners of the Lenin and USSR State Prize and international prizes, the authors and founders of new science-intensive technologies, and the leaders of major technological science trends, are working in the 28 problem councils of the RSFSR Academy of Technological Sciences.

The RSFSR Academy of Technological Sciences has regional departments: the Pacific Ocean, Northwestern, Ural-Siberian, Central, Volga River, Black Sea, and others, and over 40 technological science centers in all regions of the country. Republic joint departments and centers of the RSFSR Academy of Technological Sciences in these republics, as well as the Ukrainian Academy of Technological Sciences, which was established jointly by the Academy of Sciences of the Ukraine and the RSFSR Academy of Technological Sciences, have been established on the initiative of the most prominent technological scientists.

The academy publishes its own international and Russian scientific literature: VESTNIK TEKHNOLICHESKIKH NAUK, NOVYYE INFORMATSIONNYE TEKHNologii, NOVYYE VYSOKIYE

TEKHNOLOGII, and others, which have been registered in accordance with established procedure and are being disseminated in the RSFSR, in other republics, and abroad.

Under the academy the permanent International Committee for the Holding of International Conferences in the Area of the Technological Sciences and New Science-Intensive Technologies is operating and large associations and corporations have also been established. At a number of regional centers of the RSFSR Academy of Technological Sciences commercial scientific centers and technological science firms of various types, including limited liability companies, for new technologies, which have been proposed by scientists of the RSFSR Academy of Technological Sciences, have been organized under the supervision of members of the academy. A fund of technological scientists has been established.

The basic demands on the scientific level of members of the academy completely correspond to the great demands in case of the election of full members and corresponding members of the USSR Academy of Sciences.

In accordance with the charter, scientists, who have achieved in the field of the technological sciences results of vital practical scientific importance (the development of new science-intensive technologies, the conversion of high technologies, basic discoveries and theories, which have served as the basis of fundamentally new technologies), are elected full members of the RSFSR Academy of Technological Sciences.

Scientists, who have achieved in the area of the activity of the academy outstanding practical scientific results, are elected corresponding members of the RSFSR Academy of Technological Sciences.

First of all scientists, who have submitted economically substantiated personal programs of basic and applied work on new science-intensive technologies and the conversion of technologies for the agroindustrial complex, on economics, ecology, medicine, information science, and other directions of the national economy, which are priority ones for Russia, under the conditions of the transition to a market economy, are allowed to participate in the competition, which is held with the enlistment of a computer rating analysis and foreign experts. Technological scientists, who have gone through the computer rating competition, are elected members of the problem councils of the academy.

The right to nominate candidates for full members and corresponding members of the RSFSR Academy of Technological Sciences in the specialties indicated in this publication is given to full members and corresponding members of the academies of sciences, to scientific institutions and higher educational institutions, and to state and public organizations. In case of the recommendation of candidates by scientific institutions, higher educational institutions, and state and public organizations the nomination is made at meetings of the academic and scientific and technical councils, collegiums, or presidiums by secret ballot by a simple majority of votes.

Specialty	Number of vacancies	
	Full members	Corresponding members
1. Section of Bioagrarian and Medical Technological Sciences	4	15
2. Section of Economics, Conversion, Computer Examination, and Forecasting of High Technologies	6	20
3. Section of Physical and Chemical Technological Sciences, Nanophysics, and Nanotechnology	4	25
4. Section of Information Technologies, Communications, Communication Technologies	4	25
5. Section of Technology of Machine Building, the Construction Industry, Instrument Making, Microelectronics, and Materials Science	5	25
6. Section of Geospace and Aerospace Technological Sciences	2	10
7. Section of Ecological Problems of Technologies	2	10
8. "Russian Encyclopedia" Section	3	15

The suggestions of the regional departments, centers, republic associations, as well as the Academy of Technological Sciences of the Ukraine were taken into account in the announced number of vacancies.

For candidates for full members and corresponding members it is necessary to attach to the statement the following documents (in duplicate): a statement (decision) of the council, regional departments, centers, and state and public organizations with the results of the

secret ballot or a letter with the corresponding justification in case of the nomination of a candidate by full members or corresponding members of the academies of sciences, an autobiography, the personal personnel registration form, a list of scientific works (form No 3.3), copies the VUZ graduation diploma, the diploma of a doctor of sciences, and the certificate of a professor, a reference on the public scientific activity of the candidate from the basic place of work, the personal scientific program with an economic substantiation no more than

two pages in length, and three copies of a 4.5 by 6 cm photograph.

The election is held on the basis of a secret ballot in accordance with the charter. Scientists of the RSFSR Academy of Technological Sciences and the USSR Academy of Sciences participate in the work of the competition and credentials commissions.

Send the indicated materials to the address: 102001 Moscow, Ulitsa Shchuseva, 4, the RSFSR Academy of Technological Sciences, the Computer Rating Center.

[Signed] President of the RSFSR Academy of Technological Sciences V.N. Alfeyev

Chief Scientific Secretary of the RSFSR Academy of Technological Sciences L.N. Neustroyev

Role of Computer Net in Resisting August Coup Attempt

927A0004A Moscow RADIKAL in Russian No 35, 11 Sep 91 pp 2, 6

[Article by Vadim Kaplun and Vladimir Pokrovskiy: "The IBM PC Hasten to the Help"]

[Text] The computer, as is known, is a great thing, and the putschists should have confiscated from the population not only copiers, facsimile machines, and walkie-talkies together with weapons, but also this new-fashioned thing for Russia. With a printer, as we know, it is possible to produce leaflets and banned newspapers in acceptable quantity. With a modem it is possible to communicate with other owners of personal computers, thereby disseminating information which the putschists would have liked to suppress.

But in this demonstratively inept coup, which we survived, it did not come to confiscations. Telephones were also not cut off. Therefore, along with banned radio, banned newspapers, and the simply uncontrollable grapevine [uzun-kulak] during those days another not very conventional information network—the computer network—operated in the country.

Yevgeniy Krosser to everyone, 19 Aug 91 19:05:00

—Moscow is completely controlled by the military authorities, the television and radio centers have been seized by troops of the putschists.

B. Yeltsin is in his residence, HIS armed people are guarding him, he is able to issue and distribute ukases and so forth.

...Now (19.20) they are showing Yanayev's press conference. I will go have a look, then I will write more.... If I am unharmed.

Ladies and gentlemen! Whoever has not generally accessible information, do not be too lazy to publish it here (while we still exist).

FidoNET—the largest amateur computer network in the world—spread to our country at the best possible time. In order to become a subscriber (or rather a "node") of this network, it is sufficient to have a computer of the PC class, a modem, and two or three simple programs. In spite of the universal computer shortage in the USSR, some people have already acquired such a set, and we, in turn, acquired our own network. It is difficult to say how many people are working in this network, but in any case it is in no way less than several hundred. And many of them enthusiastically rushed to stick spokes in the wheels of the State Emergency Committee. They transmitted the texts of the ukases of Boris Yeltsin and the record of his press conference of the 19th, disseminated the reports of Interfax, the radio station SNC, and the "White House," they reported on the situation in Leningrad and other cities, transmitted official and unofficial reports, and spoke about what was happening beneath their windows.

Ivan Ryabov to Andrey Kovalev, 20 Aug 91 03:16:02

In a Radio Liberty interview U.S. President G. Bush stated that Gorbachev was a talented centrist, which is necessary for a president, and his replacement in the post of president will lead to the association of the leadership of the country with some political wing. Bush also stated that the U.S. Government would invariably welcome all progressive changes in the Union and that he expresses deep regret with regard to Gorbachev.

In the commentary on this interview Mark Zakharov said that what had happened is more a natural thing than a surprise....

To the above I want to add that the machinery of the stifling of "voices" has begun to work again. On the short waves the noise of ZAS equipment (ZAS—communications encryption equipment—is used only in armed troops) stands as a solid wall.

Petr Kvitek to everyone 20 Aug 91 21:52

According to received information, today, 20 August, the armed storming of the RSFSR House of Soviets is planned. On behalf of and on the instructions of the leadership of the republic we ask that the necessary steps for the protection and support of the legitimate authorities of Russia be taken. We ask that this information be conveyed by all accessible means.

RSFSR Antimonopoly Committee

Endi Yelkin to Nik Nemirov, 20 Aug 91 01:37:25

While here, in Saratov, everything is absolutely calm. If it were not for TV, no one would sense anything.

Daynis Ulyanovs to everyone, 20 Aug 91 02:14:33

On the situation in Latvia. At 19.30 television was occupied by paratroops. There are one dead and one wounded as a result of the firing of a special-purpose militia detachment at a microbus. Radio and communications for

the present are operating. The access of heavy equipment to Riga has been blocked by troops. The bridges are controlled.

As everywhere during those days, the information of the computer communications amateurs was not noted for 100-percent reliability. They reported the death of Gorbachev in a shootout of security guards with a raiding party, they reported tens of casualties during the storming of the "White House," the arrest of the Latvian prime minister, and much else of the same type. But they also reported the movement of tank columns, the barricades around Mariinskiy Palace, the meeting in Chelyabinsk, and the shootout on the Sadovyy Ring Road. But the main thing at that time was not the reliability (there was no time and no one to verify the reports), but the promptness and the openness of the information to everyone. To everyone—including the services of the putschists. The information, which has entered the FidoNet network, is lost far from immediately—it is accumulated in special "mailboxes," from which anyone who wants to can get it. "The situation is really critical," said one of the amateurs, but he obviously did not have in mind the situation that was taking shape with himself. For had the putsch dragged on for weeks and had repressions begun, his reports, which had settled in the files of the "mailbox," would have given him away no worse than finger prints. "If I am unharmed"...this, after all, was said in earnest.

Aleksandr Ivanov to everyone, Moscow 3:00

About 10 tanks of the Tamanskiy Division and units of the Ryazan Division of the paratroops are protecting the building of the RSFSR Supreme Soviet. The approaches to the building have been block with barricades made of reinforced concrete blocks. There are approximately 10,000-15,000 people (mainly young people) within this ring. Approximately once an hour new reports are broadcast from the loudspeakers, which have been installed on the building of the RSFSR Supreme Soviet. The situation around the building of the RSFSR Supreme Soviet is calm.

Petr Kvitek to everyone, Leningrad 21-08-91 2:40

One radio station is still operating here. The latest reports: Tanks and armored personnel carriers have all the same entered Leningrad. A gathering of the population next to the Mariinskiy Palace has been announced. Barricades are being built. Airborne from the settlement of Siverskaya near Leningrad has entered.

Timur Tsyganko, 21 Aug 91 12:04:00

In Kharkov everything is quiet and calm.... The jammers, thank God, do not work (until?).... According to latest reports, troops are heading for Kiev.

Reports of this sort went on during those hours in a real avalanche. Then the avalanche would begin to abate, in order toward the end of the day to burst out in a new avalanche, which consisted this time of just one report.

Sergey Mansurov transmitted to Dmitriy Bondarenko, Dmitriy Bondarenko transmitted to Maks Mikeyenko, he transmitted to Sergey Khan, from whom through Aleksandr Ivanov this information came back to Sergey Mansurov:

According to received information, the State Emergency Committee has issued an order on the withdrawal of troops from Moscow!!!

And then, after a brief and calm report on the arrest of the putschists, life resumed its usual course, the negotiations on the recording of new programs were resumed, someone made arrangements about a meeting, someone asked advice regarding some purchase, some joint venture advertised its product....

Reports on Science Officials During Coup Attempt

Marchuk, Academy Leaders Silent

927A0006A Moscow RADIKAL in Russian No 33-34, 4 Sep 91 p 1

[Interview with Vice President of the USSR Academy of Sciences Yuriy Andreyevich Osipyan by Nataliya Safronova; date and place not given: "But Are the Chiefs Again Ones Who Have Taken a Vow of Silence?"; first paragraph is RADIKAL introduction]

[Text] Vice President of the USSR Academy of Sciences Yu. Osipyan: "The Academy of Sciences did not publicly express its position."

[Safronova] Yuriy Andreyevich, the position of the Academy of Sciences during those critical days—19-21 August—interests me. Did the presidium of the USSR Academy of Sciences undertake anything, did it convene any conferences, did it discuss the formed situation?

[Osipyan] No, there were no conferences and discussions at the academy, and the Academy of Sciences did not publicly express its position somehow or other. But many organizations, which belong to the academy, and many institutes expressed it. As far as we, the members of the presidium, are concerned, we talked with everyone who addressed us and we called a spade a spade. But in the presidium we did not undertake anything like that and did not adopt any document, especially in support of the State Emergency Committee.

[Safronova] The silence of the Academy of Sciences under the conditions of the military coup is already a position. In my opinion, a conciliatory one.

[Osipyan] But the USSR Supreme Soviet also remained silent.... It would probably have been more correct to have convened the General Assembly of the USSR

Academy of Sciences or a meeting of the presidium. Incidentally, we held such a meeting on Friday, 24 August.

[Safronova] The second day after the victory. And what did you decide at it, to what conclusion did you come?

[Osipyan] We discussed the situation, which had formed as a result of the coup, and the attitude of the academy toward the military coup.

[Safronova] All right, but did you discuss your own silence?

[Osipyan] No, we did not do that. The point is that there was not a quorum at the meeting. You know, it is vacation time.

[Safronova] Consequently, was there no discussion of the conciliatory silence? Does it not seem to you that this characterizes the Academy of Sciences as a profoundly conservative organ?

[Osipyan] I do not think that this somehow characterizes the Academy of Sciences. You see, many associates of institutes came out against the State Emergency Committee—they participated in demonstrations, stood watch at the barricades. Our children were also there. You cannot deny that precisely these actions of the scientific community first of all characterize the USSR Academy of Sciences, and in far from the worst way. At the institute where I work they adopted the corresponding appeal. This happened on 20 August. But, I repeat, the academy as a whole and the presidium did not adopt an appeal of this sort.

[Safronova] Our correspondents tried all these days to get calls through to members of the presidium, but the telephones were oddly silent.

[Osipyan] I do not know, probably you simply were not lucky. Marchuk was on hand, many others also were. Shatalin and I got in touch and said over the phone everything that we thought about this regime. But this was a private conversation.... Did it characterize in some way the position of the academy, what do you think?

[Safronova] In my opinion, this expressed your personal position, the position of a private person, but by no means the position of the entire academy.

[Osipyan] Shatalin and I discussed whether it was worth it for us to convene the presidium during those days and to adopt some document. And we concluded that such an action would simply signify dispensation for us.

[Safronova] This would have been dispensation, had you expressed your position only after the victory. But if this had occurred on the second or, in the end, the third day after the coup, that is, during the struggle, this would have been a blow to the putschists. Imagine, the Academy of Sciences in the person of its highest body—the presidium—calls the proclaimed committee unconstitutional, criminal. This would have drawn to the side

of the Russian government the people, who were deceived during the first days by mass misinformation, and, perhaps, new military combined units. Your position, it seems to me, would have played an unconditionally positive role....

[Osipyan] But, I repeat, many associates of academic institutes were at the barricades and thus expressed unequivocally the position of the USSR Academy of Sciences. Although, of course, now, when I recall those difficult days, I get an uncomfortable feeling due to the fact that the presidium of the USSR Academy of Sciences and the Academy of Sciences as a whole were silent.

Nevertheless I want to note, and do not regard this as an excuse, to make political declarations is not at all the task of the USSR Academy of Sciences. We are, after all, not a sociopolitical organ, not a party. Our task is to analyze the state of society and to discover the causes of the occurrence of crisis situations. But, as you understand, you will not make such an analysis in three days—ininitely more time is required for it. And the Academy of Sciences now also intends to engage namely in this.

Kudryavtsev Claims Negative Position

927A0006B Moscow RADIKAL in Russian No 33-34,
4 Sep 91 p 1

[Interview with Vice President of the USSR Academy of Sciences V. Kudryavtsev; date and place not given—first paragraph is RADIKAL introduction]

[Text] Vice President of the USSR Academy of Sciences V. Kudryavtsev: "Our opinion was reported to everyone...."

[RADIKAL] What was the reaction of the presidium of the USSR Academy of Sciences to the events of 19 August?

[Kudryavtsev] The position of the Academy of Sciences was in principle negative from the very beginning of the putsch.

[RADIKAL] And when did G. Marchuk arrive?

[Kudryavtsev] The president of the Academy of Sciences returned to Moscow on the 20th and immediately called us together. His first words: "Let us define the attitude toward the events that have ensued. The USSR Academy of Sciences," Marchuk stressed, "is an independent organization, which in accordance with the ukase of August of last year is subordinate only to the USSR President. The orders of the State Emergency Committee for us are illegal, and we will not execute them."

[RADIKAL] Was this stated at a meeting of the presidium of the Academy of Sciences?

[Kudryavtsev] No, there was no meeting of the presidium as such. Everyone was on vacation, rather, this was a meeting of the vice presidents of the Academy of

Sciences. Five people attended it: Frolov, Nefedov, Osipyan, and I. [as published] Only Velikhov and Makarov were not there.

[RADIKAL] Was your summary somehow recorded?

[Kudryavtsev] No, we recorded it the next day, while two days later we convened the presidium of the Academy of Sciences. This was on Friday, and we made a decision on the opinion of the Academy of Sciences, the official verbatim report was made on Friday.

[RADIKAL] Was your decision at the conference of vice presidents reported to the scientific community?

[Kudryavtsev] Our opinion was reported to everyone, to whom, if it can be said this way, we had access. It is important to note that our decision got not only to Moscow scientific research institutes, but also to Obninsk and Chernogolovka.

From the editorial board. Which of the two vice presidents of the USSR Academy of Sciences had a lapse of memory, and was there at all a meeting with the president of the Academy?... Of course, this is far from the only and not the most important question for its leadership. But, perhaps, every honest scientist can share with Prof. N. Vorontsov the shame for its actions. Even if he did not personally have occasion to be at the barricades at the Russian "White House."

Velikhov Condemns Attempt From Italy

927A0006C *Moscow RADIKAL in Russian No 33-34,*
4 Sep 91 p 1

[Article: "Velikhov Condemned the Putsch From Italy"—first two paragraphs are RADIKAL introduction]

[Text] During the days of the putsch Vice President of the USSR Academy of Sciences Academician Yevgeniy Velikhov was in Italy, where the World Laboratory was working. In connection with this questions arose among a portion of the scientific community in connection with the position and actions of Yevgeniy Pavlovich with respect to the events that had occurred in the country. As we learned, on 19 August Velikhov took part in drawing up the text, which was signed by Antonio Zichichi, president of the World Federation of Scientists (the organization which sponsors the World Laboratory), in which the coup d'etat in the USSR was condemned. The next day this document was sent to Italian Prime Minister G. Andreotti.

We are bringing to the attention of the readers this text, as well as the letter which was sent to Velikhov by well-known nuclear physicist Edward Teller.

On behalf of the 10,000 members of the World Federation of Scientists permit me to emphasize the importance of science without secrecy and boundaries for the good of mankind. The dramatic aggression against freedom and democracy in the USSR is dangerous in th

highest degree for mankind. The new dictators may use the destructive power of nuclear weapons, which has practically not been touched in the USSR arsenals.

We scientists support freedom and democracy—the foundations of peace and civilization. There can be no progress in science, if in the USSR they kill democracy and freedom. We resolutely support the actions aimed at the restoration of freedom and democracy in the USSR.

[Signed] Prof. Antonio Zichichi, President of the World Federation of Scientists

20 August 1991

Ariccia

Dear Yevgeniy,

During the terrible days of the crisis I admired your unshakable confidence in the resolve of the people and your conviction that their will would be fulfilled. You proved correct, and we are all glad.

The question of who controlled the nuclear weapons in the Soviet Union during these critical days still worries you. I am certain that the question of the stability of control should be discussed in the Soviet Union and the results, convincing results, I hope, should become accessible to the public at large.

We know that madness exists. There are no absolute guarantees against it. But resolute and reasonable guarantees of control can and should be found.

[Signed] Edward Teller

23 August 1991

Ariccia

USSR Academy of Sciences Leadership Silent During Coup Attempt

917A0225A *Moscow MOSKOVSKIYE NOVOSTI in Russian 1 Sep 91 p 2*

[Article: "The Academy Kept Silent, Scientists Did Not"]

[Text] On the decisive night of 20-21 August in the cordon around the "White House" it was possible to encounter Corresponding Member of the USSR Academy of Sciences G. Abelev, a well-known immunologist, Prof. A. Bazykin, a physicist, and other prominent scientists and associates of academic institutions. While Academician Yu. Ryzhov and Corresponding Member of the USSR Academy of Sciences A. Yablokov were in the very building of the RSFSR Supreme Soviet from the first hours of the attempt at a coup d'etat. Academician D. Likhachev addressed a rally of many thousands in Leningrad.

Scientific personnel were also among the 69 RSFSR people's deputies who went out to the troops in order to

prevent a blood bath. And only the leadership of the USSR Academy of Sciences maintained silence. And this is given the fact that on the second day after the declaration of martial law all the creative unions of the USSR, except for the Union of Writers, had come out with a direct condemnation of the putsch. "Silence during the fateful days of August 1991 is equivalent to complicity," declare Doctor of Biological Sciences N. Vorontsov, an RSFSR people's deputy, and Doctor of Physical Mathematical Sciences L. Mukhin, who sent this letter to MOSKOVSKIYE NOVOSTI.

Malkov Essay on Decline of Soviet Science

917A0233A Moscow RADIKAL in Russian No 30,
7 Aug 91 p 3

[Article by Candidate of Economic Sciences Leonid Malkov: "The Odds for Survival"—first paragraph is RADIKAL introduction]

[Text] Candidate of Economic Sciences Leonid Malkov addressed the conference, the results of which have already been discussed in two issues of RADIKAL in Doctor Sergey Glazyev and Prof. Ben Martin. Many theses of this speech evoked a lively discussion. The author also voices the same ideas in the article being called to your attention. We hope that the opponents will continue the discussion on the pages of RADIKAL.

The underlying mystery of Soviet science is not so much the prospect of its survival as the very fact of the appearance of such a powerful scientific potential in our country.

The effectiveness of science, however you measure it, was and remains in the majority of cases exceptionally low. An economic system, which if only to some extent is rational and is oriented toward the result, should have ceased to finance and support such a sector. As a result it either would have become more efficient or would have disappeared. For decades science remained very uncompetitive and unproductive, but at the same time continued to grow and to receive considerable financing.

The reasons for low productivity, which in themselves are undoubtedly interesting, are not basic for this article, therefore, I will mention just a few of them, perhaps, not the most important ones.

The pressure of ideology, which stood incomparably higher than science and dominated it, appeared in all kinds of campaigns against scientific freethinking proper for the purpose of subordinating it to a single theory, which was chosen as the official recognized (most often of all absolutely erroneous) theory.

Moreover, a large number of purely Soviet restrictions in the way of talented young people into science existed. Ethnic-based restrictions are the most well known, but, perhaps, the fact of the residence permit was (and remains) even more significant.

Scientific circles were isolated from the world community and from the scientific and other events occurring in the world. And whereas with respect to other categories it is possible to speak of the violation of the rights of the individual, with respect to the intelligentsia this, in addition, completely undermined the productivity and efficiency of labor. There were difficulties even in obtaining the necessary literature, not to mention personal contact, which is so necessary for scientists. Three years ago special permission was required for an associate of an academic economic institute to obtain access at the Moscow central library to the journal BUSINESS WEEK.

A totally rigid, conservative, and shortage-based system of scientific relations proper existed. In particular, it appeared in the shortage of scientific journals and publishing houses. The possibilities of scientific contact and the rapid promotion of talented people were restricted to the utmost.

It is possible to continue or make more specific the list of factors that hindered the normal development of the system of research and development in the USSR. However, the named ones already suffice to formulate the first problem.

How did it turn out that, in spite of the large number of such factors, an enormous potential in this area, which surpasses in several parameters analogous structures even in such countries as the United States and Japan, was formed in this country? This is explained, in my opinion, by the fact that actual practice was not based at all on efficient economic principles and did not pursue economic goals.

Actual economic policy in the USSR for many years was based on the following principles:

Ideology. Science for some reason got on the list of prestigious ideological "playthings," and pride in the number of scientific associates was on the same level as pride in the tons of smelted steel or the length of dug canals. The stimulation of science did not depend on its successes, but was oriented toward the simple quantitative end in itself. The actual effectiveness was not very important, just like the effectiveness of the use in the national economy of smelted steel or dug canals.

Political Survival. For a long time the leaders of the country proceeded in earnest from the existence of a real threat of war for the USSR. The military-industrial complex acquired enormous influence, particularly after the Caribbean crisis and the change of leadership in 1964. For members of the military the role of science was completely obvious, and they, apparently, acted as the main lobbyists of the scientific sector and the main users of personnel. Here work efficiency was not evaluated and was not taken into account. On the contrary, the decrease of efficiency was offset by the additional extensive expansion of the sector.

The Inertia of Past Decisions. The Soviet economy proved to be extremely sluggish. It is probably possible to explain this by the lack or weakness of economic motives proper of development. The need to resort to noneconomic stimuli, for example, to ideological substantiations of reforms and so forth, left for current activity only one serious argument in favor of the making of some decisions or others—this was precedent, or “work from the achieved level.” What it was possible to count (take into account) when formulating national economic plans with respect to science, was grouped with external (with respect to the results of scientific work) parameters which it was easy to increase—the number of people, investments, and so forth. The impossibility of taking into account the real return of science within the framework of macroeconomic planning led to the willingness of the state to stimulate the development of science even under the conditions of its gross inefficiency, without any change of the conditions of its functioning.

Science in the USSR is now experiencing ever increasing difficulties. The outflow of a large number of the best specialists to the business sphere is occurring. Independent (private) business in our country is quite young, and this is leaving a significant mark on what the people who left the state sector of science are doing in private business.

On the one hand, this business does not yet have sufficient assets for the conducting of serious independent research. On the other hand, inasmuch as the level of use of developments, which were produced during the preceding period, is very low, many specialists have the opportunity to begin practically immediately the making of new products which it is not necessary to develop. The lack of clear legislation and judicial practice with respect to intellectual property disputes promotes this sort of opportunity.

The present state of the private sector in the sphere of science resembles the state of the private sector in agriculture, where private plots, the area of lands of which comes to approximately 1 percent of the total area for the country, provide with respect to many leading products tens of percent of the gross harvest of this product. But there the private sector is not simply more efficient. It also uses resources of the state sector, including at the level of unofficial commercial operations. The current success of the nonstate sector is connected with the use of what has already been made at state organizations, but is not being used owing to various reasons, first of all the lack of initiative. As long as the transfer from the state sector continues, this factor will have an effect. But state organizations are already now forced to be more vigorous, and this resource may soon dry up.

The flow of specialists leaving the country is growing. The pace of the drain of specialists can only increase after the Law on Entry and Departure From the USSR goes into effect on 1 January 1993. Theoretically the

specialists who have gone abroad can contribute to the greater integration of Soviet science in world economic structures. But in practice for the present this is not happening.

The difficulties with financing within the state sector in connection with the budget deficit are appreciable.

International competition is intensifying. Many products, which were developed and produced in the country and did not have rivals on the domestic market due to superprotectionism, now are not standing up to the competition.

The computer industry is in the most serious state, and the prospects are even gloomier. This situation gives rise to the next problem that is of fundamental importance when examining science as a whole.

How did it happen that Soviet science, being in a satisfactory (from the standpoint of survival) state during preceding decades and having come under more favorable conditions, found itself literally in a few years on the verge of almost complete collapse? How is one to explain not only its survival under abnormal economic conditions, but also its inability to survive under normal conditions?

I will try to answer this question, having given a description of the basic method of obtaining the results of Soviet science.

The copying of foreign models became the main route of Soviet science.

It is necessary to treat this thesis, which has been accentuated for convenience of presentation, as a working hypothesis. In a more exact formulation it would need a greater number of stipulations and comments. It is not a question of the denial of original developments in the USSR. But for the obtaining of a guaranteed result under the conditions of inefficiently organized work the use and copying of foreign models often played an invaluable role. Moreover, such copying, where it did occur, was encouraged, apparently, not by scientists, but by administrators from science, who understood the impossibility of obtaining further financing without the constant production of the guaranteed result—the development of models of equipment and so on.

On the basis of the example of the computer industry it is possible to distinguish two basic means of such copying.

The first is adaptation to our own production conditions. This means was chosen when copying models of computer hardware. Practically every computer, which has been developed in the USSR, had what is called a prototype, that is, a model for copying, which was chosen from among western products.

The second means of copying western achievements is direct borrowing without any consultations with the

authors. This means was fully implemented in the sphere of programming. The fact of the use of American software at first not only was not concealed, but was even stressed. Thus, when making the decision on the copying of computers of the IBM 360 series in the 1970's, which were realized in computers of the YeS series, one of the arguments in favor of such a step was the fact that then it would be possible to use the large accumulated store of software for these computers. Of course, the direct copying of these programs without coordinating legal questions with IBM representatives was implied. The fact that in the United States the copyrights to programs were finally secured by an act of Congress only in 1980, served as an extenuating circumstance. Large collectives were engaged in adapting western programs for all types of computers. They appeared on the Soviet market under different names.

Western ideas and methods constantly had a decisive influence on the computer sector. I will cite a little known example: The center of the electronics industry near Moscow (Zelenograd) was built following a note of two American engineers who had settled in the USSR, which they sent to N.S. Khrushchev in the late 1950's.

The legal and efficient copying (with adaptation) of western achievements has been chosen as the new main means. The past experience of copying (where it occurred) was often used extremely inefficiently and not always with the observance of all the rules of professional ethics. It is interesting to note that these two traits are interconnected.

Borrowing was based on the lack of direct contacts (and especially contracts) with the authors of prototypes. At times developments, which to a significant extent were imitative ones, were announced and presented as our own and original ones.

The new phase, the new means of development of the Soviet sector of research and development, so it seems, can be based for some time on close contacts with foreign partners and on the adaptation and modification of their achievements in the Soviet Union on a legal contractual basis with the retention of the right of authorship of all parties. This will be an intermediate stage, which Soviet science needs not only for the increase of the level of competitive ability, but also for the overcoming of the accumulated lag and cultural isolation. The experience of Japan shows that copying can be a quick, effective beginning of the path to one's own original developments.

The most graphic example is the programming industry, where in place of the dissemination of adaptations of western products under new names cooperation with the manufacturing firms of the original products is beginning to be developed. Their legal deliveries to the Union are enabling Soviet specialists to gain experience and to continue work on the development of truly original products on the basis of standard products.

Bureaucracy Buries Institute of General Reanimatology

917A0233B Moscow *RADIKAL* in Russian No 30,
7 Aug 91 pp 4, 5

[Article by Galina Sidorova: "Lysenkoism Ministry Style"—first paragraph is *RADIKAL* introduction]

[Text] Scientific schools are not born by order from above. Decades are spent on their formation. But to destroy one, it is sufficient to begin with a bureaucratic document.

In 1936 the Laboratory for the Development of Methods of the Resuscitation of a Dying Organism or an Organism That Has Just Died, the first in the world, was born in our country. For nearly 50 years Vladimir Aleksandrovich Negovskiy, an academician of the USSR Academy of Medical Sciences, a USSR State Prize winner, and a professor, headed it. The scientists of the modest laboratory gave Soviet medicine and, we will not be modest, world medicine as well the theory of clinical death proper, the science of reanimation, and a new field of medicine—reanimatology.

And it is entirely logical that in the end the question of transforming the laboratory into an institution arose. In March 1985 the USSR Council of Ministers issued an order on its reorganization into the Institute of General Reanimatology of the USSR Academy of Medical Sciences. The new stage in the development of the theory and practice of resuscitation, it would seem, should begin with this moment. I do not want to cast gloom, but, it seems, the direct opposite stage began, the entire ruthless essence of which is denoted by five words—the beginning of the end.

From the order of the USSR Ministry of Health of 31 May 1985:

"To establish for the Institute of General Reanimatology of the USSR Academy of Medical Sciences in conformity with the decisions of the USSR State Committee for Science and Technology the following main directions of scientific activity:

"—basic studies of terminal (between life and death—editor) states and the basic forms of post-reanimation pathology of the organism;

"—the development and introduction in practice of methods of the prevention and treatment of terminal states, the development of principles of the organization of reanimation aid at the stages of medical evacuation, including in case of serious multiple trauma and blood loss and under special conditions.

"Comrade V.P. Rusanov, chief of the Soyuzmedtekhnik All-Union Association of the USSR Ministry of Health, annually from 1986 to 1990 is to envisage in the amount of 100,000 rubles [R] specially for the Institute of General Reanimatology of the USSR Academy of Medical Sciences the purchase of medical equipment

(made by capitalist countries) in accordance with a list that has been coordinated with the USSR Academy of Medical Sciences.

"[Signed] Minister S.P. Burenkov"

The order of the USSR Academy of Medical Sciences also sounds like a song:

"To establish that the Institute of General Reanimatology of the USSR Academy of Medical Sciences is the head institution in the country in the area of reanimatology and to assign to it the scientific methods supervision of research in the area of reanimatology in the country and the introduction of scientific achievements in the practice of health care.

"To oblige the deputy president of the USSR Academy of Medical Sciences for administrative management and financial affairs to submit proposals, on which agreement has been reached with Academician of the USSR Academy of Medical Sciences V.A. Negovskiy, director of the institute, on the transfer of the Institute of General Reanimatology of the USSR Academy of Medical Sciences to new premises (the deadline is 1 January 1986).

"N.V. Razumtsev, chief of the Technical Administration of the USSR Academy of Medical Sciences, is to ensure during 1986-1990 the realization of the currency allocations in the total amount of R500,000, which have been allocated in accordance with Order 747 of the USSR Ministry of Health of 31 March 1985 for the acquisition of the necessary equipment made by capitalist countries.

"[Signed] President of the USSR Academy of Medical Sciences Academician N.N. Blokhin"

Against the background of such fine promises no one could even suppose at that time that the hitch with the obtaining of its own premises with time would assume a fatal nature for the fortunes of the scientific school of Negovskiy.

When the Council of Ministers was still preparing its order, the Ministry of Health and the academy gave guarantees that they would provide the newly fledged institute with its own premises (it was leasing the ones in which the laboratory was located). Since then the merry-go-round of correspondence between the Moscow City Soviet, the Ministry of Health, the academy, and the institute has been spinning in this regard. But this is not ordinary red tape which has already set everyone's teeth on edge. You read the correspondence and it is difficult to get rid of the thought: This is the death throes of the administrative command system, which is still capable of an iron grip.

Judge for yourselves. Thus far the institute does not have its own building, although the Moscow City Soviet, it turns out, allocated it to the reanimatologists three years ago. On 11 May 1988 the Moscow City Soviet Executive Committee made the decision to transfer to the Institute of General Reanimatology building 2 along Ulitsa Petrovka, 25. By this time Ye.I. Chazov was already minister

of health and, as the documents attest, he directly set himself the goal to leave the institute in the street.

The minister acted resolutely and quickly. The Moscow City Soviet Executive Committee had not had time to make the decision, when the ministry then and there, to put it mildly, shut its eyes to it, but then rather quickly laid hands on the building. Without a pause it offered the premises along Petrovka, 25 to the Stomatologiya Scientific Production Association, which just did not need precisely this building. By which V.V. Menshikov, deputy chairman of the Moscow City Soviet Executive Committee, consoled Negovskiy with his letter of 8 September 1988: "...building two along Ulitsa Petrovka, House 25 will not be used for the needs of the Stomatologiya Scientific Production Association, since for technical reasons it does not meet the requirements of a medical institution. In connection with the above these premises in accordance with Decision 935 of 11 May 1988 should be transferred to the Institute of General Reanimatology of the USSR Academy of Medical Sciences."

But that is not how it turned out. Neither in the Moscow City Soviet nor at the institute did they know that the minister had moved his knight a month ago.

From the order of the USSR Ministry of Health of 4 August 1988:

"In connection with the organization of the Zdorovye Health Complex attached to the All-Union Scientific Research Center of Preventive Medicine of the USSR Ministry of Health I order: Comrade V.I. Pokrovskiy, president of the USSR Academy of Medical Sciences, to transfer from the balance sheet to the balance sheet of the All-Union Scientific Research Center of Preventive Medicine of the USSR Ministry of Health in accordance with established procedure building 25 along Ulitsa Petrovka by 10 August 1988.

"[Signed] Minister Ye.I. Chazov"

But the most interesting thing is that the Zdorovye Complex did not move in at Petrovka, 25. So who is that lucky one? As Viktor Semenov, current director of the Institute of General Reanimatology (V.A. Negovskiy after retirement remained an adviser), told me, the matter ended with Chazov establishing a joint Soviet-Indian venture. It also came into the building.

Now, as is known, Yevgeniy Ivanovich is no longer in charge of the Ministry of Health. He left and "took away" with him building 2 along Ulitsa Petrovka, 25.

By what is one to explain the administrative arbitrariness? It is difficult to choose a different word here. The answer is in a letter of Academician Negovskiy, which in the same 1988 as a last hope he sent to M.S. Gorbachev.

"Dear Mikhail Sergeyevich.... My appeal to you is due to the fact that a direct threat to the existence of the Institute of General Reanimatology has arisen on the part of the USSR Ministry of Health.... The Ministry of

Health continues to insist, of course, 'for the good of the matter,' on the merger of the Institute with some other large scientific medical institution. In any case this will be the elimination of the Institute of General Reanimatology as an independent center, for the basic problems of life and death are not being elaborated at any other 'big' scientific institute."

Formally the position of the minister was explained by the fact that at that time he intended to eliminate small institutes. But some small one will also give odds to one larger in size, we know examples. But the Institute of General Reanimatology, which is recognized throughout the world, did have something to show. Ye.I. Chazov could not have but known this both as minister and as an experienced cardiologist. It is well known that at the cardiological center of Chazov they bring out of a state of clinical death 95 percent of those who have died of myocardial infarction. But the road to this success all the same passed through the laboratory of Negovskiy, where at one time the idea of resuscitating people who had died of myocardial infarction originated and was developed and where the first Soviet defibrillator, which, incidentally, to this day remains the best in the world, was developed.

In such a case was the institute, perhaps, needed as a Moor who has done his duty?...

Another bit from the letter of Negovskiy to M.S. Gorbachev.

"If one agrees with the opinion of the USSR Ministry of Health with respect to the further existence of the Institute of General Reanimatology, in this case only one institution of this direction remains in the world—the Center for Research in Resuscitation in Pittsburgh (which is generously subsidized by the U.S. Department of Defense), which would give quite obvious advantages of American science. It should be noted that this center was established 25 years after the organization of our Laboratory on the basis of the study by American scientists of the experience of its operation."

It is worth telling in more detail how the Pittsburgh center was born. In the early 1960's Senator Humphrey visited the laboratory of Negovskiy. On arriving home he told colleagues about the work of the Soviet reanimatology experts and lamented that America lagged greatly behind the Soviets in this matter. Without delay assets were allocated, and Professor Safar, who is now famous throughout the world, undertook the organization of the center in Pittsburgh. The results of the competition with us are as follows: The resuscitation center located in the United States has become international, while our institute, the only one in the Union, it appears, should prepare for a quiet death.

Professor Safar, in contrast to official representatives of Soviet medicine, it turns out, is a good friend of the institute. In the words of V.N. Semenov, he comes here two or three times a year, writes down everything, and then implements it at his center. Semenov has visited

Safar only once. So that the integration of science is proceeding for the most part in one direction.

It is not surprising that we have given up priorities in science so many times. Priorities have also slipped away from us because in the West, however surprising, such concepts as native land and patriotism proved to be active categories, in our country they became empty words long ago.

The Institute of General Reanimatology is the same age as perestroika. And it, like the latter, has not been lucky all six years. And where is one to get luck? For there was no escaping the system of appointment, including from science. The diehards of the notorious administrative command system were reshuffled in their own deck and again fell from the top, only now in other departments. In the six years of perestroika and the existence of the institute three ministers of health and two presidents of the USSR Academy of Medical Sciences have been replaced. But the obligations on paper have not made any progress.

Incidentally, the institute in theory still has an opportunity to get the building intended for it: to have it awarded away from the joint venture in court. But in case of the loss of the case the Ministry of Health (since, it turns out, not a specific comrade minister, but the ministry is to blame) will have to pay the venture a penalty.

"Is the ministry prepared to pay for its offenses?" I ask Semenov.

The minister says: "Do not touch the building on Petrovka, select another one. We do not have the money to pay a penalty."

But at the institute they are no longer counting on either the first or the second version.

"It is not even necessary to close us, we will die ourselves," the director gives a sad prediction. "They allotted the institute only R30,000 for equipment. But now the order has come to reduce financing by another 75 percent. We now have a budget of R6,000 for the year."

I do not know what equipment the institute can buy with this money, but I do know that the individual citizen cannot buy with this amount even a "residence permit."

The flywheel, which should demolish the institute, has been started, and no one wants to stop it. The fact that the work of the institute will help to protect hundreds of thousands of lives, is not an argument for administrators from science. In trying if only somehow to save what has been made, the reanimatologists began to seek help from those, for whom all the above is an argument. They found support among the miners of the Kuzbass. They with their own currency established in just a year in Novokuznetsk an affiliate of the Institute of General Reanimatology. And as V.N. Semenov said, Donetsk and Sverdlovsk want to have the same kind of affiliates of their own.

The lighthearted principle of our life: The rescue of drowning people, in this case dying people, is the job of the drowning people themselves, is not obsolete.

Of course, it is good that an affiliate of the Institute of General Reanimatology has appeared in Novokuznetsk. But the scientific school will not automatically settle in the fine turnkey building, which is even filled with fine imported equipment.

While in Moscow they are asking the school of Negovskiy, the patriarch of reanimatology, to leave House 9 along Ulitsa 25-letiya Oktyabrya. The building has been

turned over to the resident landlord. By the end of the year it is necessary to move. Where? It turns out, into the street.

"The clinicians will find a job at hospitals," the director of the institute supposes to be on the safe side. "But what about the theorists? This colossal scientific potential? Where is it to go? Into the street? But this is just the same as during Stalinist times, when they undercut the scientific intelligentsia...."

It is hard, in my opinion, to disagree.