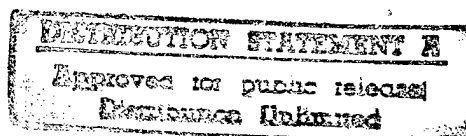


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Science & Technology

Central Eurasia: Science & Technology Policy

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Science & Technology

Central Eurasia: Science & Technology Policy

JPRS-UST-92-006

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Report on Uzbek Academy of Sciences
927A0182A Tashkent PRAVDA VOSTOKA in Russian
18 Apr 92 p 1

[Article (UZA): "Academic Science: Reserves and Prospects"]

[Text] Under the conditions of the implementation of radical economic changes, particularly during the period of the entry of the republic into market relations, the role of science and the responsibility of scientists in the solution of urgent problems are increasing. With allowance made for the new tasks science of the independent republic should be aimed at attaining the world level in many most important directions.

Today particular attention has been devoted to the development of science, which should occupy leading positions in the accomplishment of the key tasks of the rapid development of society.

This was discussed at a meeting of President of the Republic of Uzbekistan I.A. Karimov with scientists. On 17 April the president visited academic institutes—the Institute of Bioorganic Chemistry, the Institute of Chemistry of Plant Substances, and the Physical Technical Institute of the Fizika-Solntse Scientific Production Association. Executives of a number of ministries and representatives of the scientific community of the republic took part in the meeting.

Meetings of the president with researchers have become traditional. This meeting is a special one—it was held on the eve of a big event, the annual meeting of the Academy of Sciences of the Republic of Uzbekistan. At it the results of the activity during the past year will be summarized and questions of the state of academic science and its subsequent prospects will be examined.

At the laboratories of the Institute of Bioorganic Chemistry, which the president visited, valuable dyes for the food industry, preparations that speed up the development of cotton, and effective drugs are developed. Thus, medicinal gossypol ointment was obtained on the basis of the waste products of the Kokand Oil and Fat Combine. Biological methods of plant protection are being developed and introduced extensively here by the efforts of scientists of the institute, who synthesized the pheromone of the bollworm.

At the Institute of Chemistry of Plant Substances of the Academy of Sciences of Uzbekistan they acquainted the president with developments in the area of the production of new drugs, which have already begun to be introduced in medical practice. For example, an effective remedy for arrhythmia of the heart—allapinin—has been obtained here. However, it is being produced in small batches, and for the present it is impossible to meet the needs for it even for inhabitants of our republic.

Among the other interesting developments by scientists of the institute are many that are extremely necessary for the needs of the national economy. For example, a sugar substitute, which is possible to use in the confectionary industry, as well as pectin, and is an important ingredient for the production of fruit-paste candies, has been obtained here.

World-level developments exist at the Physical Technical Institute of the Fizika-Solntse Scientific Production Association. Research in the area of solar materials science has become priority here. A unique solar "furnace," which makes it possible to obtain ultrapure alloys, is located on the territory of Uzbekistan. The electronics industry and other sectors of the national economy need them.

They told the president about the great possibilities that are coming to light in connection with the development of effective medical sterilizers, which do not have analogs, as well as high-temperature boxes and driers, which were developed on the basis of infrared rays and replace autoclaves.

Summarizing the meeting, I.A. Karimov stressed that science should become an integral part of the transformations that are occurring today in Uzbekistan. It is necessary to mobilize efforts for the solution of the key problems of socioeconomic development and to launch an intensive search for effective methods of management and advanced forms of the organization of science, which are aimed at the increase of the responsibility of scientific collectives for the end result. Under the conditions of the transition to market relations scientists and specialists of institutes will have to confirm the competitive ability of their developments and to strive more quickly for effective end results.

In the talks with scientists it was noted that now it is necessary to devote the main attention to the increase of the practical significance of scientific research and to the development of priority directions.

The institutes should strive to enter into direct contacts with western countries and to conclude contracts with foreign firms on the establishment of joint ventures and laboratories. This is a direct route to the earning of currency and the strengthening thereby of the material, technical, and experimental base of scientific institutions. Moreover, the president stressed, the government is formulating measures, in accordance with which all the currency receipts from the sale of developments will be left to the institutes for their production and scientific purposes.

Prime Minister of Uzbekistan A. Mutalov, President of the Republic Academy of Sciences M.S. Salakhitdinov, State Adviser S.S. Saidkasymov, Deputy Prime Ministers R. Radzhabov and M. Karabayev, and the Hokim [governor, administrator] of the City of Tashkent A.I. Fazyzbekov took part in the meeting.

Experimental Physics Director at Arzamas-16 Interviewed

927A0170A Moscow PRAVDA in Russian 9 Apr 92 p 4

[Interview with Vladimir Aleksandrovich Belugin, director of the All-Union Scientific Research Institute of Experimental Physics in Arzamas-16, by Konstantin Kondyryn; date and place not given: "Where the Shield Was Forged"—first paragraph is PRAVDA introduction]

[Text] "We expected certainty from the visit of B. Yeltsin," says Vladimir Aleksandrovich Belugin, director of the Scientific Research Institute of Experimental Physics in Arzamas-16.

[Kondyryn] Vladimir Aleksandrovich, your institute was never ignored by the high leadership. None of the general

secretaries of the CPSU Central Committee and ministers of defense forgot to congratulate the collective on holidays. And this is understandable: After all, the products of this institute were transformed in the end into high-level politics. And here is the arrival of the President of Russia. To what was it due?

[Belugin] Also add here the visit to Chelyabinsk-70 by J. Baker. The reasons are obvious. The common diseases of the country, which did not pass over the entire defense complex and, of course, our institute. There is no need, I think, to list them. But the main thing that we have lost in recent times is the awareness of our necessity, which was constantly felt earlier.

[Kondyryn] Pardon me, I will interrupt you. Are not wounded pride and the understanding of your own exclusiveness, which was acquired over the years, not appearing here? And here suddenly....

[Belugin] I will talk later about the exclusiveness of the institute. No, it is not a matter of wounded pride. The security of the country is at stake. After all, how do some politicians reason at times? Their logic is simple: We have, they say, as it is enough nuclear devices to withstand any potential danger. Yes, we do. Today. But tomorrow we might lose all of them. Why? Russia, as is known, is joining the "family" of nuclear states and, hence, should observe scrupulously its laws with respect to the safety, reliability, and stability of nuclear devices. If we were to halt the improvement of our items in this direction, the world community would have the right to raise the question of confiscating from us the obsolete nuclear arsenals. Is this permissible? That is why the arrival of the president was so important to us.

[Kondyryn] What did you expect from the visit of B. Yeltsin, and did it live up to these expectations?

[Belugin] If I am to be as brief as possible, we expected one thing: certainty. It is almost like Hamlet: To be or not to be? Although in principle we knew that it is "to be." But in what capacity? The president proved to be at his best. I am saying this not out of the desire to flatter. Here, in Arzamas, he signed the Ukase, which is very important for us, on the transformation of the All-Union Scientific Research Institute of Experimental Physics into the Russian Nuclear Science Center.

[Kondyryn] This fine name is being heard today in many newspapers, but what does it signify, what, finally, does it give the collective?

[Belugin] Confidence in the future, confidence that the most unique collective of scientists, designers, and workers—and I will recall that precisely our institute gave the country three-time Heroes of Socialist Labor Yu.B. Khariton, A.D. Sakharov, Ya.B. Zeldovich, K.I. Shchelkin, and N.D. Dukhov—will not spread among cooperatives and other commercial structures. The status of a federal nuclear center, which is similar to the status of the Los Alamos and Livermore National Laboratories of the United States, signifies state recognition of the fact that the All-Union Scientific Research Institute of Experimental Physics is the center for the assurance of the national security of Russia. While this signifies that the assurance of the security of the nuclear weapons, which are left in service, steps on the

nonproliferation of nuclear weapons, the disassembly and reclaiming of the nuclear munitions, which are being removed from service, and a set of operations on the prevention of the possibility of a technological lag in the area of strategic weapons are included in the sphere of our immediate tasks.

[Kondyryn] In other words, does the status of a nuclear science center expand significantly yesterday's framework of the duties of the collective of the institute?

[Belugin] In principle it does, but it is not only a matter of this. The status obliges us to rethink the very philosophy of our existence. It as if raises us from the level of simple "technical specialist-bomb makers" to active participants in the elaboration of the technical aspects of political decisions in the area of nuclear disarmament. That is why we proposed to B.N. Yeltsin to introduce the position of adviser to the president for the nuclear weapons complex. He supported our proposal.

But another thing is also no less important.

It is as if a two-in-one task faces us. On the one hand, in striving to fit the lofty status of a federal science center, we need to take a significant step forward in those areas of basic research, in which we are traditionally strong. These are first of all the study of the properties of substances under the conditions of extreme temperatures and pressures, the physics of superdense fields and pulse reactors, the physics of several types of lasers, and so on.

On the other, we need to enter the conversion processes smoothly and competently, using the enormous scientific and production potential that we have. Incidentally, now we have already joined in the fulfillment of all-Russian scientific and technical programs on ecological monitoring, the assurance of the safety of nuclear power plants, the development of autonomous power engineering, the increase of the efficiency of petroleum and gas production, and so on.

But, of course, the problems, with which we deal, contain a large number of questions of a purely humanities nature. There is untouched territory here for the joint research of physical scientists with biologists, geneticists, medical personnel, ecologists, psychologists, and philosophers. In this we have something to learn from our foreign colleagues.

Now our main task is to "take" the collective to the solution of the challenging general scientific problems, which open for the country a breakthrough to the future.

[Kondyryn] But will people be able to switch over psychologically and adapt themselves to these new conditions?

[Belugin] Not only will they be able to, but they already can. Do not consider it immodesty, but we can do practically everything. From the logging of oil wells to the development and production of the most unique instruments, which do not have analogs, for the most complicated eye operations. After all, five academicians, more than 50 doctors and 500 candidates of sciences, and many workers of the highest skill work in the collective.

[Kondyryn] Vladimir Aleksandrovich, returning to the visit of the president, is it possible to say that the solution of the financial problems of the institute was also a result of it? After all, let us face it, difficult material living conditions

are one of the possible causes of the "brain drain." And not only our side is concerned about this problem....

[Belugin] As to the financial aspect of the matter, the president has already issued the corresponding orders. The state is taking upon itself the financing of our research. The wage of associates will be increased. However, we have to manage very carefully and considerably the financial resources that are being made available. We must not allow them to be shared "as with a brother."

The "brain drain." Precisely because this theme is not leaving the pages of newspapers, I will be brief. Yes, scientists are leaving, including nuclear physicists. But all of them are associates of institutes that deal with problems of the "peaceful" atom. In the country only two centers deal with the development of nuclear weapons—here, in Arzamas-16, and in Chelyabinsk-16. There is nowhere else. In essence the associates of just these two institutes are the real bearers of secrets of nuclear weapons development. And I fully confirm the words of V.N. Mikhaylov, the minister of our sector, which were published by PRAVDA, that no nuclear weapons scientist has left the homeland. A certain Yegor Belousov, whose surname appeared in an article from a foreign newspaper, which was reprinted by TRUD, never worked at the All-Union Scientific Research Institute of Experimental Physics.

At the same time it would also be very frivolous to underestimate this problem. It is very important to interest a person materially. But it is even more important not to humiliate the physical scientist, having forced him to "bake" frying pans. Even for high pay.

[Kondyrin] Well, the last question, Vladimir Aleksandrovich. Will this mysterious "atomic city" Arzamas-16 simply remain a secret place of residence and work of Soviet nuclear physicists, which is inaccessible for outside eyes?

[Belugin] In the city itself there is nothing secret. All the secrets are centralized at the institute and, I assure you, they are reliably protected. Yes, our city is behind a controlled outside security force along the entire perimeter, with strict entry and exit conditions. But everyone for some reason considers that we are protecting ourselves in this way from the local population. But no. Just the other way round. It is we who are protecting it from the danger that is connected with our activity. For it is difficult even to imagine the consequences, if the materials, with which we deal, were to suddenly find themselves in the hands of some maniacs or terrorist groups. Only the most rigorous, strict technological and social discipline is capable of protecting us from a disaster.

As to the closed nature of our city for visits, it, one can say, is already in the past. Moreover, we are now going through a period of a kind of pilgrimage of journalists, film crews, actors, and directors. In just the last two to three months about 10 delegations of foreign scientists, including our colleagues from Los Alamos and Livermore, visited here. And the visits of our scientists to scientific centers of the United States and Europe are becoming more and more customary.

And it must be said that this relative accessibility, which was inconceivable even in the recent past, is not causing us particular anxiety. On the contrary, we are beginning to reap

the first positive fruits of contact with the outside world. We must also improve this work further, having additionally established a special public relations service. We have the vital need to melt the ice of distrust, or else fear, which is still felt at times with respect to us. Only in this way is it possible to show that not at all silent people, who, it is true, know how to keep silent, live here, in Arzamas-16.

Osipov Comments on Problems of Russian Academy of Sciences

927A0180A Moscow POISK in Russian No 15 (153),
4-10 Apr 92 p 13

[Article by President of the Russian Academy of Sciences Yuriy Osipov under the rubric "What Is Science To Be Like?": "President of the Russian Academy of Sciences Yuriy Osipov: We Are Constantly Late"]

[Text] The year 1991 was one of events that affected the foundations of our state. In essence, we are now living in a new country.

The Russian Academy of Sciences is among the few structures which for the time being have succeeded in remaining intact in the maelstrom of events. Time has shown the correctness of the decisions which were made at the end of last year by the USSR Academy of Sciences and the leadership of Russia. These decisions and first of all the well-known Ukase of the president of Russia saved the academy from razing "to the ground." These decisions were aimed at the preservation of the nucleus of domestic basic science, they laid the foundation for the intelligent, considered reorganization of the academy.

I hope that the report about what the presidium of the Russian Academy of Sciences was faced with during the first three months of its activity and how the academy spent this period will contribute to the constructive discussion and formulation of sound decisions.

First of all about the conditions of the work of the Russian Academy. Of course, the difficulties, with which we were faced, to some extent are a reflection of the problems, with which all of Russia was faced, but to a certain degree they are a consequence of our internal relations. First of all I have in mind the actions which put the academy on the path of extensive development. Let us analyze from this standpoint the situation, for example, over the last 20 years. The increase of the number of institutions by years. In 1970 there were 191 institutes in the USSR Academy of Sciences, in 1975—223, in 1983—260, in 1985—265, and in 1991—365.

In the last year, when much began to collapse in the country, we successfully established more than 20 new institutes. And we, the presidium of a new composition, have already established five institutes.

Now about the increase of the number of associates of the academy by years, to the nearest 1,000. In 1965 there were 51,000 associates, in 1970—91,000, in 1975—92,000, in 1980—102,000, in 1985—112,000, and in 1991—nearly 161,000. You will agree that the cited data make an impression. And they set one thinking. For example, a question arises: How strategically was the swelling of the academy thought out, if some of the newly established permanent institutes had as a source of financing not the academy's

own budget, but various programs, orders, and so forth? After all, these programs and orders by their very definition were, as a rule, temporary....

I will recall that in 1991 the Academy of Sciences' own budget came to approximately 1.4 billion rubles [R] in old terms, while the additional financing through outside programs and orders came to approximately R800 million.

Now this additional financing does not exist as yet, and this is one of the main problems, which had to be faced.

We bound ourselves to discuss openly and publicly the budget of the academy. But, unfortunately, the academy during the first quarter did not have a budget in the normal understanding of this word. But then on 1 January 1992 we had a debt of \$174 million, which had accumulated during 1989-1991. They allotted us for the entire first quarter only 13 percent of the annual budget, and in January the academy received R160 million. But the outlays for electric power, heat, and water alone for the month came to R84 million as against R9 million in 1991.

The implementation of the Ukase of the president on the increase of the wage by 1.9-fold (of course, with allowance made for the increased deductions for social insurance) required about R100 million more. Thus, the allotted amount did not suffice us even for the covering of these expenses, not to mention the payment for the leasing of premises. As a result many institutions of the academy found themselves indeed in a critical situation.

Judge for yourselves: Over the last 12 months the prices for a basic chemical product have increased by sevenfold, while the prices for special chemical reagents have increased on the average by ten- to twelvefold. As a result, given the existing amount of financing not more than 20 percent of the needs, for example, of the Institute of Organic Chemistry are now provided for.

At the Institute of Physiology the danger of the forced elimination of the breeding core of the vivarium arose, while the reason is prosaic—there is nothing to feed the animals....

All expedition activity of the scientific institutions of the academy is in danger. The reason for this is the sharply increased rental fee for motor transport and helicopters, as well as the significant increase of the outlays on the outfitting of expeditions....

According to our estimates, in order to maintain the support of basic science at last year's level, the academy needs to have approximately R15 billion, while for the time being they have allotted us according to the plan about R9 billion, and you see how we are receiving it....

Incidentally, we had now hoped to receive in good time the budget of the second quarter, but, according to preliminary data, in April we can expect about a third of what we should have received during the first quarter.

And still I would like to caution you against too emotional criticism aimed at the government. We all know the situation in the country. And I should say with all certainty that under these difficult conditions, under which our country is living, support of the academy by the leadership of Russia is in far from last place.

All this time we fought for the improvement of financing and at times achieved success. Currency has finally been allocated for subscribing to foreign publications. The sum of approximately R10 million is being allotted to us for the purchase of some instruments, on the order of R20 million are being allotted for some capital construction projects. We have begun to receive money through several state programs and one-time assistance for individual institutes which have gotten into a particularly difficult position.

And here I should, of course, note our constructive cooperation with the Ministry of Science, the Higher School, and Technical Policy and with the Committee of the Supreme Soviet for Science and Public Education.

One of the problems is the new building on Leninskiy Prospekt, 32. This is a headache for us. About \$12 million are needed to complete the building. And it is being operated for the present very poorly. A portion of the premises are not yet occupied. But the primary thing: The academy cannot afford to maintain such a building. It will ruin us.

Therefore, we addressed to the president the request to turn over to us one of the large buildings in Moscow, which it would be possible to complete quickly. A foreign firm is prepared to do this. Having occupied it, we will vacate the building on Leninskiy Prospekt, will complete it, and will lease it, perhaps, to large scientific firms. We will receive money, will pay off the debts, and then, perhaps, will return this building. This does not mean that we will not use all the conference halls, everything that is there....

Housing construction. During the entire past year the academy received only 250 square meters from the Moscow City Soviet. The plan was completely upset. While the assets, which were allocated in 1991 for capital construction, have been spread among all kinds of projects. As a result there are very few achievements.

The questions of the medical and sanatorium service of personnel of the academy are frightening questions. The homes for the aged are a disgrace of the academy. We understand how much of a sore and weak point of the academy this is. I want to gladden you a little: From the currency allocations, which have been received by the academy, we have satisfied to a considerable degree the request of our medical institutions for the purchase of drugs and the most necessary preparations.

A few words in particular about the problem of the Nauka Publishing House. Since 1988 the steady decrease of book production has been observed. In 1991 the output of books decreased by 30 percent as compared with 1990.

We now have the idea of establishing an international book publishing house with the name Nauka, which would be filled with the spirit of science and which would not be unprofitable.

Very briefly about the work of the presidium. Everything that we did in these three months was aimed mainly at allowing the academy to collapse.

The work on the preparation of the draft of a decree of the government on measures on the implementation of the Ukase of the president of 21 November was the most important task of the presidium. We incorporated in this draft the practical bases and necessary measures for the halt

of negative phenomena in the development of the academy and for the restoration of normal conditions.

Back on 20 December we sent the appropriate documents to the government. Thus far there is no decision of the government on this issue.

The matter ended with my writing to the address of the president a complaint about the government. And blunt instructions of the president to the government to prepare in a very short time a decision in development of his ukase were received literally a few days ago.

We are continuing to defend our positions regarding the rent for buildings and premises in the amount of the actual expenditures of the lessor on the maintenance of the buildings and premises. What is the snag? Neither the president nor the Supreme Soviet can force some organs of local authority or others to change the lease. All this should be based only on good will.

In February the presidium addressed to both the president and the government individual questions of the survival of the academy. It is a matter of exemption from taxes, fees, and duties and of questions of measures in connection with the receipt of grants by our scientists.

A absurd situation has formed: Foreign colleagues performed much work on the organization of a number of funds in support of science in Russia. These decisions were publicized very well by our and the foreign press, but now it is turning out that it is possible to get this support only on one condition: If the government will exempt these donations from taxes. Because it is incomprehensible to the American taxpayer why 40 percent of the allocations being offered for support should settle somewhere in the government and be used not for the purposes of supporting science.

Now the draft of the ukase of the president "On Urgent Steps on the Preservation of the Scientific and Technical Potential of Russia" has been prepared, all the official stamps have been collected, and I hope that in the next few days this ukase will appear. The Russian Basic Research Fund will be formed. Assets from this fund will be used on a competitive basis for the support of enterprising and scientific projects, that is, both individual scientists and collectives can apply to the fund. The formation of the nonbudgetary Russian Technological Development Fund for the financing of intersectorial scientific and technical programs and projects is also envisaged.

But our appeals to the government are meeting with definite resistance. In order to issue the decree of the government in development of the ukase of the president, the agreement of all the ministries, which are connected with this problem, is needed. Nine of them have already issued negative conclusions regarding the proposed draft. And now everything has started in a new circle. The president in very blunt form issued instructions to prepare the appropriate decision. We will hope that things will get going.

What has been achieved? A very large fund for the support of scientists in special fields is being set aside, but no one has spoken distinctly and clearly about the support of precisely basic science.

Now there is an understanding of this problem: Senator Brown, chairman of the Science, Space, and Technology

Committee of the U.S. House of Representatives, introduced a special bill in Congress on this question. It is a matter of the organization of a bilateral Russian-American fund for the support of precisely basic science.

While in the United States, we participated in the work of the House of Representatives. In my statement I said that our partners poorly understand the situation in conversion. Everyone is talking about conversion in industry, the conversion of specific plants and institutes, but for some reason no one is talking about the conversion of minds at the Academy of Sciences, where this problem is particularly urgent. The academy participated in all military programs. What should these skilled scientists do?

In general I should note: There is very much talk and very little real support of science. The Szoros Foundation, which granted us \$100,000 at the most difficult time, a month ago, so that we would subscribe if only to a portion of the journals, especially stands out against this background. With UNESCO I signed a memorandum on behalf of the Academy of Sciences, and UNESCO Director Professor Meyer allocated \$300,000 to our academy. On the basis of this money we will now establish an international fund for the support of Russian science.

Under the difficult conditions of the transition to a market economy the presidium devoted attention to questions of the strengthening of the social protection of the personnel employed at academic institutions. As of 1 February new salaries were established for the scientific associates and managerial staff members of the scientific research institutions of the Russian Academy and its regional departments and scientific centers. Now the Institute of Economics together with the planning and finance administration is completing the preparation of proposals on the formation of the wage of the personnel of the academy on the basis of price indexing and other factors.

A statute on the introduction of the nonstaff positions of scientific associates of structural subdivisions of institutions of the academy for doctors of sciences, who are working and have reached retirement age, has been drafted and approved. After all, there was an obvious injustice, when members of the academy could remain advisers after reaching some age, while doctors of sciences did not have this right.

An understanding has been reached on granting the academy the right to establish funds for the solution of problems of social development and the founding of institutions of the social protection of personnel of the academy by means of assets that are obtained from various sources, including the state budget.

The data presented to you testify that our progress in the basic questions of the survival of the academy is far from as significant as one would like. We are for the present succeeding in protecting against the breakup of the material and technical base of basic science and in protecting its basic creative potential and organizational structures. Base state budget financing is being maintained and is working, although with long interruptions.

In this connection I would like to speak about the commercial structures that have now appeared in the academy. We already have more than 300 of them. The experience of the

activity of these commercial structures is contradictory. There are useful results, but there are also examples of the transfer of the assets of base financing to other spheres of activity. This is intolerable. However, a general attitude of the academy toward such structures has not been formed. We have so far not determined the status of the academy in the system of legislatively established types of organizations and in general do not understand ourselves what kind of organization we are in the system of institutions of Russia. In accordance with the Temporary Statute this is an all-Russia self-administered organization, but for the present there are no such organizations in the legislation. In our charter there is no concept of the budget of the academy as an organization. The relations of the institute to the academy and of the academy as a whole as an organization have been poorly studied.

We do not have the expert approval of the agreements, which are concluded by the academy with its institutions and with Russian international organizations, including commercial organizations. It is necessary to treat with extreme consideration the conclusion of international agreements, particularly commercial agreements. We, of course, are constantly late with the establishment of the legislative base for the normal work of the academy. And we still live in the system of notions of the state organization that is carried on the state budget. In practice this is manifested in the inadequacy of our behavior in the system of market relations, which is actually functioning around us.

And the last important thing. Regardless of whether we will be able to formulate a new coordinated concept of the Academy of Sciences or will retain the old one for the time being, it is necessary submit without delay to the Supreme Soviet of Russia the draft of a law on the Russian Academy of Sciences. The basic tasks of the academy, its status, and its local organs, as well as the status of the scientific associate of the academy should be set down in it legislatively. And an important place in this law should belong to the question of the financing of research from the federal budget and the determination of the share of the gross national product, which is being allocated for basic science.

In connection with the change of the forms of ownership the rights of the academy, institutions, and organizations with respect to the property, which is attached to them, and the parcels of land, on which these facilities are located, should be specified in the law. The questions of intellectual property, the interrelationship of the academy with the state with respect to the use of scientific results, and the scientific entrepreneurial activity of the academy and the granting of tax benefits and the support on the part of the state of international ties will find their reflection in the law.

We have submitted the draft of the law on the academy to the Supreme Soviet, but for the time being have ourselves hindered the consideration of this question, inasmuch as we have still not specified our position with respect to the problem of property.

Editor's note. Read in the next issue the report on how the discussion of the question of the property of the Russian Academy of Sciences went.

Russian Federation S&T Policy Concept Paper

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[Article under the rubric "Draft": "The Concept of the Science and Technology Policy of the Russian Federation"—first two paragraphs are RADIKAL introduction; last paragraph is RADIKAL conclusion]

[Text] In conformity with the order of the President of the Russian Federation of 7 October 1991, Adviser of the President for Science and Technology Policy and Information A. Rakitov and a group of specialists of the Ministry of Science, the Higher School, and Technical Policy of the Russian Federation headed by B. Saltykov with the participation of a number of scientific research institutes and departments formulated the fundamentals of the Concept of the Science and Technology Policy of Russia. After the examination, which was conducted on the instructions of First Deputy Chairman of the Government of the Russian Federation G. Burbulis, and the consideration of the remarks and suggestions this document in an abridged version is being submitted for discussion to the scientific and engineering community and specialists of enterprises and organizations of the state and commercial sector.

The authors of the document hope to receive constructive suggestions which will be used when formulating state science and technology policy.

Introduction

The market economy without advanced technology cannot ensure the revival and prosperity of society. From this it follows that the formulation of state science and technology policy on the basis of new principles, which include the replacement of administrative command management with state support, is a decisive element of reform, without which it will peter out.

I. A General Assessment of the Situation in Russian Science and Technology

At present in our country leading positions in a number of directions of basic and applied science are being lost, invention activity is declining, and the effectiveness of scientific research is decreasing. The problems in the sphere of education and the training of scientific personnel remain urgent. The drain of talented young people from academic and VUZ scientific organizations and graduate studies is occurring. The labor of a scientist, like the labor of an engineer, is becoming less and less prestigious. Legislative support of scientific and technical progress is practically absent.

The number of organizations and enterprises of the republic, which carried out scientific and technical operations, came on 1 January 1991 to more than 4,600, or 58.3 percent of all the organizations and enterprises of the country, which performed such operations. The volume of the operations performed by them in 1990 came to 28.7 billion rubles [R], or 76 percent of the total volume of scientific and technical operations in the country.

On the territory of Russia 78.8 percent of all the scientific research work of the former Union, 74.7 percent of the planning, design, and technological operations, 75.2 percent

of the development work, 73.8 percent of the construction design, and 70.0 percent of the scientific and technical services were performed.

In the European part of Russia 88.8 percent of the scientific personnel are concentrated, 90.3 percent of the scientific and technical operations are performed, and 88.8 percent of the fixed capital of science is located, that is, about 90 percent of the scientific and technical potential of Russia is in Europe.

The number of people employed in science and scientific service came in 1990 to 2,854,000. There were 1,227,400 people employed directly in research and development, including 15,500 doctors of sciences and 127,000 candidates of sciences.

The analysis of the breakdown of scientific personnel by fields of sciences shows that nearly 50 percent of their total number were employed in the area of the technical sciences. At the same time in the area of the natural, social, and psychological sciences their share is substantially less than in developed countries.

The pilot experimental base is being poorly developed. The capital-labor ratio of a specialist, who is engaged in Russia in scientific and technical operations, is estimated at R16,300, while in industry it is 2.5-fold higher. (In the United States it is the other way round—in science it is 1.7-fold higher.) Sixty percent of the scientific research institutes and more than 80 percent of the higher educational institutions do not have a pilot experimental base at all. The total need for scientific instruments is being met at the level of 20-25 percent, while for a number of most important instruments it is being met at the level of 10 percent. Moreover, the utilization ratio for 65 percent of the descriptions of instruments comes to 0.1-0.3. Collective-use centers have not been developed. According to available data, in the United States nearly 40 percent of the scientific equipment is used collectively, a nationwide network of powerful multipurpose centers, which operate practically around the clock, exists for this.

The information support of the researcher does not meet the needs. Less than one-third of the world scientific and technical information reached the country, while starting in 1992 in connection with the lack of freely convertible currency the purchases of foreign scientific literature decreased by tens of fold. This is bringing the level of information of our scientists close to zero and is threatening the very existence of science. Here only a negligible number of scientists are able to receive it promptly. According to available estimates, the information of our scientists in 1990 was one-hundredth as high as in the United States, while in 1992 it may be one-thousandth as high.

Typical of the present state of the sphere of research and development are:

- an unusual breadth of the front of scientific research and at the same time the concentration of enormous material, financial, and manpower resources in a small number of directions of a prestigious and defense nature;
- a high level of monopolization, which is encouraged and supported by departmental organization;

—the very significant and stable differentiation of the quality of resources and, as a consequence, the results of research and development in different spheres of science and regions;

—the extremely low mobility of the scientific potential, slow reaction to the new needs of society and science itself.

The following inevitable consequences, which are connected with the reorganization of administrative structures, which is being carried out, may prove to be most destructive:

- 1) The sharp reduction of the state demand for products of high-technology sectors.
- 2) The decrease of state spending on research and development in real terms.
- 3) The uncompensated elimination of state administrative structures, which carry out the resources, financial, and information support of the development of the scientific and technical potential. As a consequence a large number of scientific research institutes, design bureaus, and so on may be deprived of orders, financing, and supply, which is fraught with disintegration and the decrease of the level of research and development.
- 4) The starvation wage of scientists and the lack of social protection and social prestige, equipment, and the conditions for research activity can lead to the rapid internal and external migration of the most skilled scientists and engineers. For the irreversible degradation of our science it is sufficient for 10-15 percent of the most promising energetic and talented scientists of young and middle age to leave.

In this situation individual strong-willed decisions or personal approaches, which are connected with the taste preferences of some executives or others, are completely ineffective. This is confirmed by many decades of activity of our scientific ministries and departments. It is possible to change the situation for the better only by means of a fundamentally new state science and technology policy, which has been adopted at the state level, has been supported by the president and the Supreme Soviet, and is implemented consistently and steadfastly.

II. The Basic Principles of the State Science and Technology Policy of Russia

A. The Basic Provisions and Definitions

For the formulation of state science and technology policy it is necessary to use consistent concepts. First of all it is necessary to realize clearly the difference between scientific and technical [nauchno-tekhnicheskiy] policy and science and technology [nauchno-tekhnologicheskii] policy and the differences connected with this between the concepts "tekhnika" and "tekhnologiya."

The concept "tekhnika" has two meanings:

- 1) equipment, apparatus, instruments, machines, and so on;
- 2) a particular proficiency, a set of skills and knowledge, which are necessary for a specific activity.

The modern concept "tekhnologiya" is far broader. It includes equipment, a set of the corresponding knowledge, financial, technical, manpower, raw material, and information resources, skills and production standards, a system of adequate management, the social and natural environment,

in which this process is carried out, as well as the set of socioeconomic consequences, including ecological consequences. Technology in this sense needs a specific economy which creates adequate resources for it.

The concept "science-intensive technology" signifies that it is a matter not of traditional technologies, which were developed by craftsmen, at best engineers who are inventors, but of technologies, which were developed on the basis of the achievements of science and embody them. All modern technologies—from minor to major—are such. We have entered the era of scientific and technological progress and science and technology policy.

Under present conditions science should be technologized in order to influence effectively the development of society, while technology should rely entirely on science in order to ensure the ecological safety, social adequacy, and high competitive ability of products.

Russia neither now nor in the past had and has its own concept of science and technology policy. The Soviet Union in the person of the central government also did not have an officially recognized concept. If we did have a scientific and technical policy, it was only as activity on the financing and support of the military-industrial complex and on the development of defense technologies.

On the other hand, science and technology policy is a set of goals and tasks, which are recognized and supported by the state, are set down legislatively, and are oriented toward the development and state support of science, science-intensive technologies, and measures, which support innovation processes in the basic spheres of industry, agriculture, and the social complex and the effectiveness of which is determined by the level of technologies. It includes a set of measures, which ensure the achievement of these goals, the determination of the financial, technical, and manpower resources, which are necessary for this, the place of science and technology policy in the system of other political directions of the activity of the state, and a list of hierarchically arranged priorities.

B. The Present Trends in the Formulation of Science and Technology Policy

The basic characteristic of the state administration of science and technology during preceding decades in our country can be formulated as the maximum militarization of production, science, technology, and the economy. At present in developed countries a radical shift from the traditional scientific and technical policy to an innovation, science and technology policy is taking shape. The difference consists in the fact that a shift from systems of the formation and state financing of the production of military hardware to the state stimulation of all types of technological and scientific innovations in the sphere of civilian production, which is based on the fact that far more fundamentally new ideas, which are subsequently taken up and developed in military technological complexes, are advanced in this sphere, is emerging. In developed democratic countries this is explained by less secrecy in civilian scientific and technological research programs, the greater mobility of personnel, and the intensity of private initiatives and business decisions, which ensure constant innovations and their rapid introduction, which increases the competitive ability of enterprises.

In major military technological programs even given state support, privileged supply, and gigantic collectives innovation processes take place far more slowly. Inasmuch as the product, which is made in the civilian sector, is of a market nature and can be sold by an extremely flexible system of small and medium-sized enterprises, it proves to be highly profitable and attractive for private investments and receives support not only on the part of the state, but also on the part of business, as well as the moral support of public opinion and the population as a whole. Therefore, now in the United States and particularly in Western Europe, first of all France and Germany, the correction of science and technology policy in the direction of its transformation into innovation policy is occurring. The main task of which is the creation of the most favorable conditions for scientific and technological innovations, first of all for small and medium-sized firms, as well as for rapid diversification in the sphere of intermediate-term and short-term programs.

The turn from the formation of traditional scientific and technical policy to innovation, science and technology policy is fundamentally important. This is explained by the enormous role which it may play in changing the situation in our country.

The adoption of the program of Yeltsin and the transition to a market economy are creating completely new conditions of the implementation of science and technology policy. The basic efforts of the state will be aimed at the stimulation of the production of goods and services for the population and at the maintenance of political stability. Under these conditions it is necessary to understand that without rapid scientific and technological development one will not create a civilian world, material well-being, a new economy, or a market. Here it is important to preserve everything of value, which was produced in the former state scientific and technical programs, including the achievements of the defense complex, both, first of all, for innovations in our backward civilian production and for the support of the defensive capability.

The process of privatization will lead to the establishment of a large number of private, joint-stock, and other nonstate enterprises. Science and technology and introducing business will emerge. Therefore, sections of the state support of the science business and scientific and technological enterprise at all levels should appear in the new concept of science and technology policy. Commercial banks and organizations, which make credits available and make investments in the sphere of innovative technologies, should be granted the corresponding preferences and a stimulating standard legal base should be created. However, our private sector will be very weak for a long time to come, and the state will be a decisive factor of scientific and technological progress and policy. But it is necessary to stimulate vigorously and to form an interest of business and enterprise in innovation activity.

III. The Choice and Implementation of the Priority Directions of Scientific and Technical Progress Is the Key Task of the Science and Technology Policy of Russia

The concentration of scientific forces and material and financial resources on the priority directions of industry, agriculture, and information of scientific and technological progress and policy. But it is necessary to stimulate vigorously and to form an interest of business and enterprise in innovation activity.

society, the development of which is vitally important both for the solution of immediate problems and for the prospect of the development of the Russian Federation, are the key problem of an effective state science and technology policy.

It is a matter of new areas of science and technology, which are capable of changing the technological structure and on this basis of ensuring the structural reorganization of the economy of the republic, the large-scale redistribution of resources for obsolete sectors to new ones, the transition to a new type of consumption and way of life of people, the significant increase of labor productivity, and a qualitatively new level of resource conservation, as well as of ensuring the development of science itself.

Tasks similar in appearance were also posed earlier, but in fact such concentration was carried out with respect to a narrow group of directions of a prestigious and defense nature. In this connection it is necessary to develop immediately and to secure legislatively a system of the choice of priority directions of scientific and technical progress.

The formation of expert bodies and procedures of the choice of priorities in the staff of the president, in the government, and in the Supreme Soviet is also necessary.

Traditional scientific and technical policy in the USSR encompassed practically the entire natural economy, since the state was the sole monopoly owner of all forms and types of production and all enterprises. However, this policy concerned only nominally such sectors as light industry, agriculture, health care, and the personal service sphere. The transition to a market and the appearance of new economic forms, in spite of their weak development during the period of 1987-1991, are already now becoming an appreciable factor. Products, which are developed in the private and commercial sectors, come already now to 15 percent of the gross product that is produced on the territory of the former USSR. Therefore, the present innovation science and technology policy of Russia should not only take this circumstance into account, but also promote the development of production in the sector of privatized enterprises and all new commercial structures. At the same time this policy should take into consideration that state enterprises and several completely nationalized sectors (for example, rail transport), as well as the state order for the needs of defense, state government, social security, and so forth will be retained for a certain time. It, consequently, should be, figuratively speaking, double-deck: On the first deck all-Russian programs of scientific and technological progress should be supported on the basis of a rational choice and the consideration of state interests, on the second deck there is the state support of scientific and technological innovations in the sphere of business, enterprise, and individual and collective commercial activity. The fundamentally important distinction from the former scientific and technical policy lies in this.

The choice of priorities of scientific and technical progress should be oriented first of all toward the ultimate social goals: the improvement of the pattern of the consumption of foodstuffs and consumer goods, the increase of the life span, the solution of the problems of information and transportation supply, housing, relaxation, spiritual development, and education, and the improvement of working and living

conditions. The importance of the solution of acute ecological problems and the rational use, preservation, and reproduction of natural resources is increasing.

Each program of a superpriority direction is approved by the government and serves as a mandatory basis for the financing and the formation by the appropriate state bodies of administration with the participation of experts, specialized analytical services, and interested organizations of programs on the conducting of scientific research and on the development and practical assimilation of the latest types of equipment and technologies in a priority direction.

Depending on the goals and nature of the tasks being accomplished the programs of the state level can be aimed at the development of basic research in "breakthrough" directions, at the development of fundamentally new equipment, technology, and materials, at the assimilation and the development of the production of new types of products, and at the solution of regional problems.

The implementation of programs should be carried out on the basis of projects with the use of an independent scientific examination. Therefore, the establishment of a system of independent expert institutions and the guarantee of the high quality of the independence of the examination should become the subject of the constant attention of the organs, which formulate and implement innovation science and technology policy. Dilettantism in the sphere of examination, the lack of a clear expert forecasting methodology, or the professional bankruptcy of an expert can become a source of big state miscalculations and mistakes that are hard to correct in the area of the implementation of the new science and technology policy.

On the basis of the interests of Russia and with allowance made for the transition to a market economy it is possible to group the priority programs together in the following blocks:

1. The block of priority programs, which are oriented toward the immediate accomplishment of the very urgent tasks of the economy and are intended for the prevention of famine, social conflicts, and mass illnesses and the support of economic activity and business, the increase of the level of information of state and social structures, and the stabilization and expansion of industry and agriculture. There can be represented within this block such programs as:

- the program of agrobiological research and technology: the canning and preservation of agricultural products and technology which increases the quality of foodstuffs, the production of feeds, drugs, and organic fertilizers;

- the energy program: energy conservation, the rational use of fuel resources, alternative power engineering, new energy technologies;

- the program of informatization: the informatization of the financial and tax system, accounting and statistical activity, banking and exchange systems, and transportation, the intensive improvement of traditional and new systems of communication and telecommunications, the informatization of state government and education, the support of programs of the informatization of cities and market structures;

- the program of the introduction of innovative construction technologies: new technologies of house building,

road technologies, the automated production of construction materials, a computer-aided design system of construction projects;

—the program of resource conservation and new materials: priority programs of the rational use of nonreproducible and secondary resources and the development of materials with preset properties.

2. Ecological programs: radiation protection, the protection of the atmosphere, the protection of bodies of fresh water, the ecology of cities, the program of the rational use of nature, programs of zoophytic reproduction.

3. The set of basic research programs. This block of programs should be developed first of all in the directions, in which Russian science can count on the obtaining of significant results in the immediate future. The programs, in which our science can count on leadership, are to be financed first of all.

4. The block of programs of "breakthrough" technologies of dual purpose, which are aimed both at the needs of the national economy and at the development of new technologies for weapons, among which are, for example, the goal programs on aviation and aviation technology, the goal programs of space technologies, and the goal programs on shipbuilding, including dry cargo and transport vessels of a modern level.

5. The block of social and humanities programs: the programs of the modernization of higher education and the programs of economic, sociological, political science, and cultural studies research, which in practice were not financed at the state level.

A list of state scientific and technological programs is being prepared by the Ministry of Science, the Higher School, and Technical Policy, the Russian Academy of Sciences, the Academy of Natural Sciences, and the Academy of Technological Sciences, the academies of agricultural, medical, and pedagogical sciences, and independent scientific and technical societies and should be approved by the Supreme Soviet of the Russian Federation.

Annually the government of the Russian Federation if necessary makes more precise the list of the top priority directions of scientific and technical progress of the Russian Federation and the programs on their accomplishment and specifies the annual amounts of assets, which are being allocated for the fulfillment of each of the programs from the republic budget.

IV. From the Policy of Management to the Policy of Support

The ideology of management was the basic mechanism of the administrative command system, including in the sphere of science and technology. I was based on the following three principles:

1. It was recognized that management from above, which signified that all scientific organizations report back on their every step and action, submit their every step and action for approval to superior instances, and through the chain from the top down receive directions, instructions, and standards, which govern entirely every action, step, the form of

reporting, the sequence of operations, and so on, is the main mechanism that stimulates the development of science and technology.

2. Management took place according to a complex hierarchical system, the top official regardless of real scientific authority and real competence was automatically considered the most competent person. Every inferior official reported back to the superior official not for the real scientific result, but for the fulfillment of plans, instructions, orders, and norms. As a result of this plans became a means of the destruction of real science and research initiative. Prestige, income, incentives, foreign business trips, and so on were determined not by the scientific results, but by the position in the hierarchical system and by the fulfillment of instructions.

3. The financing and material and technical supply of scientific research organizations, and not of goal programs and real scientists, were the last and most crippling principle of management. Here institutions, which were headed by corresponding members of the Academy of Sciences, often received more allocations than institutions, which were headed by doctors of sciences, while those headed by academicians received more than those, of which corresponding members were in charge. Under these conditions red tape, bureaucracy, and incompetence increased as one moved toward the top management bodies. Financing was not in any direct connection with the end results. Since in this case less competent people supervised more competent people, the gradual degradation of science and technology in our country was inevitable.

Under present conditions the elaboration of innovation science and technology policy is incompatible with the former concept of management. A fundamentally new ideology of the support of science should succeed it. Its essence consists in the fact that state bodies should give assistance and support not to institutions and hierarchical structures and should finance not the fulfillment of instructions and plans, but both the obtaining of scientific results, which are envisaged by the basic, priority state programs, and unforeseen discoveries and results in the sphere of basic science. The scheme of support is: goal—result. Therefore, goal programs, as well as research programs, which are based on basic hypotheses and calculations, should become the basic structure of financing. State support signifies that the state rejects the detailed regulation of the activity of scientists and is directing attention to the real scientific results and to the talent and organizing abilities of individual researchers and research groups, it makes available material and technical supply and financial assets for specific projects and programs, which have undergone competitive examination, and not for administrative positions and institutional signs. State support is accomplished through financing and priority material and technical supply, standardized acts, and legislation, which create the most favorable conditions for scientific research and planning and design activity, as well as for technological and pilot operations. This support is carried out at three levels.

1. The intensive financing and material and technical supply of superpriority crash programs, which are aimed at the stabilization of the economic and political situation in the

country, recovery from the crisis, and a rise in production during the first one and a half to two years of the commenced reform.

2. Alternative financing and material and technical support according to the order-result scheme with the evaluation of the intermediate results for intermediate-term programs with a duration of two to four years, the results of which should affect the subsequent expansion of the economy and the extensive introduction of innovative technologies.

3. The stable financing and material and technical supply of basic research with adjustment for inflation and constant comparison with the international level of research.

Finally, there should be singled out by a special line the financial, material, technical, and social support of researchers, engineers, and process engineers, who form the gold intellectual fund of Russia, the loss of which could have irreversible, catastrophic consequences. For the purposes of preventing such an outcome it is necessary to implement a special program of socioeconomic measures, which is aimed at the prevention of a "brain drain."

In the program it is necessary to provide for:

- the further development and improvement of legislation in the area of scientific research and scientific pedagogical activity, including such issues as the simplification of the procedure of the return of specialists and scientists to work at domestic scientific organizations, higher educational institutions, and enterprises: the introduction on the basis of the principle of reciprocity with individual countries of the right to dual citizenship; the attachment to scientists and specialists, who have gone abroad to work, of apartments and other rights in the social sphere (job seniority, the provision of pensions, insurance, and so forth);
- new approaches to the organization of medical service, insurance, and the provision of pensions;
- the promotion of the establishment of professional organizations and unions for the protection of various categories of creative personnel, the assurance of scientific contacts between Russian and foreign specialists, the organization of the exchange of specialists and students, and the holding of international conferences;
- the use of the mass media for the extensive coverage of the achievements of science, culture, and education in Russia, as well as legislative acts of foreign countries in the area of emigration policy and international legal norms of the International Labor Organization;
- the development of an effective mechanism of the use of the aid, which is made available to Russian science by organizations of the United Nations, UNESCO, the EC, NATO, and others.

In the program it is necessary to envisage a number of steps, which are aimed at the improvement of the conditions of the professional activity of specialists and scientists, meaning:

- the increase of the amounts of financial support on the part of the state of intellectual activity through the system of funds (all-Russian, republic, private, and others);

- the implementation of an effective tax policy, which stimulates scientific and technical progress, with the simultaneous introduction of the progressive taxation of the profit from the output of obsolete and defective products;
- the development of the production of advanced instruments and automation equipment for scientific research;
- the establishment at the largest scientific centers and regions of the country of technopolises, technology parks, and a network of centers of the collective use of intricate equipment;
- the further development of democratic principles in the organization of the labor of highly skilled specialists and scientists;
- the systems improvement of the business skill of personnel, including their sending for extended foreign practical training and participation in joint scientific and technical activity;
- the preparation of new legislation that regulates the interrelations of state, collective, mixed, and other organizations with hired personnel in the area of the use of commercial secrets and official information;
- the improvement of the work of all units of the system of education, devoting particular attention to the question of the early identification and subsequent development of talented young people.

The transition from the principle of management to the principle of support requires the structural reorganization of top administrative organs.

The main lever of the state support of science and technology is their priority financing and material and technical supply. However, the system of the financing of research and development from assets of the state budget and centralized funds (up to 80 percent), which exists to date, was actually aimed at the sustaining of the existence of collectives of scientific research institutes and design bureaus, not at their research work, moreover, it ensured the obtaining by enterprises of scientific and technological achievements practically free of charge, thereby contributed to the break of science with production, eliminated the influence of the client on the scientific and technological level and quality of developments and products, and did not create an interest in scientific and innovative activity.

The transition to a market economy requires radical changes in the scheme of state financing of research and development, which should make it possible to concentrate the flow of financing on the support of the most valuable and vulnerable sectors of the scientific and technical potential. This scheme is based on the goal program principle with the multichannel attraction and distribution of assets for specific scientific and technical programs and projects.

Basic scientific research, being the basis of scientific and technical progress, is of a noncommercial nature, and because of this budget allocations should be the basic source of the financing of basic research.

The amount of budget allocations is singled out by a separate line in the total amount of spending on science, which is approved in the State Budget of the Russian

Federation. The Ministry of Science, the Higher School, and Technical Policy of the Russian Federation sends these allocations to research organizations.

It is planned to channel a certain portion of the assets into the financing of basic research mainly in the system of the Russian Academy of Sciences, the Agricultural Academy, the Academy of Medical Sciences of the Russian Federation, and the system of Russian higher educational institutions, for which it is necessary to retain budget financing for the transition period of the restructuring of the academic system (during the period from January 1992 to June 1993), since the collapse of these systems would be not less a catastrophe than the collapse of defense science. The remainder should be distributed on a competitive contract basis with the enlistment of the scientific community at large and the organization of the independent examination of outlined programs and projects.

The financing of research and development in the priority directions for the Russian Federation of the development of science and technology, which are carried out through scientific and technological programs that are approved by the government of the Russian Federation, should be based on the flexible combination of budget assets and assets of interested enterprises and organizations, innovation and other funds, bank credits, sponsor contributions, and financial resources of commercial structures and private entrepreneurs.

The budget allocations, which are earmarked for the implementation of programs, are distributed by the Ministry of Science, the Higher School, and Technical Policy of the Russian Federation. Scientific councils determine on the basis of competitive selection the immediate participants in the work, with whom the executive boards of directors for the programs conclude contracts. An independent examination should be used for the selection on a competitive basis of the projects which are most effective and correspond to the interests of Russia.

The Ministry of Science, the Higher School, and Technical Policy of the Russian Federation should be one of the main holders of state funds of the financing of science and technology. The exclusive financing of goal programs, a significant part of which should be selected on a competitive basis, is a fundamental innovation within the new science and technology policy. Budget financing on a nonprogram basis is envisaged for libraries, astronomical observatories, information institutes, botanical gardens, reserves, instrument rental stations, and other organizations, for which goal programs are not used in practice. Budget financing is also envisaged for scientific research centers and institutes, which were established for the conducting of research in the area of the science of science, the economics and sociology of science, the organization of scientific research, the analysis of the social consequences of scientific and technical progress and the informatization of society, and the improvement of international cooperation, which form the research and consultative structure of organs of federal government and work on their direct orders.

Applied research and development, which are oriented toward the market, should be financed, for the most part, by means of the assets of interested economic subjects with some state support (mainly legislative) and risk sharing.

Here, the more the research is oriented toward the market, the less participation the state should take in its financing.

State support of applied research and development of an intersectoral and sectorwide nature is to be given from the assets of nonbudgetary funds, which are established in ministries and departments, concerns, corporations, and associations by means of the deductions of 1.5 percent of the product cost (cost of operations, services).

It is proposed to transfer 25 percent of the collected assets of the indicated funds to the Russian Technological Development Fund under the Ministry of Science, the Higher School, and Technical Policy of Russia for the financing of the most important research and development and measures on the assimilation of new science-intensive products, which are of a federation-wide nature, including those connected with the production implementation of state scientific and technical programs. Here the Ministry of Science, the Higher School, and Technical Policy of Russia can carry out the partial redistribution of the assets among sectors and can not only finance operations, which are of great intersectoral importance, but also give the necessary assistance to scientific organizations of nonproduction sectors, which are conducting research in the area of culture, health care, and so on.

The subsidizing of applied operations on the part of the state should be confined only to major innovation programs and the most important intersectoral research and development, which are capable of yielding an increasing economic return and of improving the export potential of Russia in the sphere of high technologies, as well as should be allocated to national laboratories and centers, which provide the base for technological advances in the corresponding sectors. In the United States several hundred centers and laboratories, which work for the government, receive budget financing.

It is necessary to introduce a fundamentally new mechanism of the stimulation of the adoption of innovative technologies. Under the conditions of the developing market and the privatization of production the imposing of innovations, as was the case earlier, on private and commercial enterprises is impossible. Under the conditions of the deficit, which will continue for a rather long time, the predicted decline of production at the initial stage of reform, and slack competition enterprises will introduce innovative technologies only if this will be profitable. Therefore, it is necessary to grant tax credits and benefits not only to developers, but also to enterprises, which introduce this technology, for the increase of the production volume and the improvement of product quality. The exemption from taxes of the portion of the profit, which is invested in research and the introduction of innovative technologies, could become a really economic and truly market mechanism of the stimulation of scientific and technical progress. In this case entrepreneurs themselves will stimulate their effectiveness and will select really effective projects and programs better, more quickly, and more correctly than any economic experts.

Indirect methods of regulation, first of all tax credits, which are granted to organizations for the covering of a part of the expenditures on research and development, are one of the most effective means of the state support of scientific and technical development. Under the conditions of the state

budget deficit it seems advisable to grant these credits first of all for research and innovative operations, which are being conducted in the priority directions of scientific and technical progress.

The other financial privileges and preferences can be formulated in the following manner:

- to exempt from all types of taxes, fees, and duties, including on the currency assets, which have been obtained from the foreign economic activity of scientific institutions of the Russian Academy of Sciences and individual institutions, in accordance with a list, which is approved by the Ministry of Science, the Higher School, and Technical Policy of Russia, with the channeling of these amounts into the development of scientific activity and the training of highly skilled personnel, the strengthening of the material and technical base and the social base of these organizations;
- to exempt from taxes the part of the profit of associations, enterprises, and organizations, which is channeled into research and development, the devising of scientific equipment, as well as into the Russian Basic Research Fund, the Russian Technological Development Fund, and the Insurance Retirement Fund of Personnel of Science, but not more than 20 percent of the taxable profit;
- to exempt from the value-added tax the research and development, which are performed under contracts with clients and are financed from the state budget;
- to envisage the introduction of tax credits for scientific and technical libraries and institutes and centers of scientific and technical information, which participate in the formation and development of the state information resource of the scientific and technical development of Russia and the federal system of scientific and technical information.

Moreover, it is advisable during the first three years not to tax the profit, which has been derived from the sale abroad of licenses and other products, which were developed in accordance with the assignments of scientific and technical programs, as well as the profit, which has been derived from the sale of products of the world scientific and technical level.

In addition to the listed steps on preferential taxation, it is proposed to establish preferential lending to scientific research organizations and enterprises by the lengthening of the terms of lending and the decrease of the interest charge for credits, which have been obtained for the development and introduction of new equipment and technology. It is necessary to envisage compensation for the increased expenditures, which are connected with the assimilation of new equipment and technology, and stimulation by means of a special policy of the pricing of highly efficient competitive products.

For cases of the obtaining by Russian scientists of foreign financing in the form of grants for research in the area of the basic sciences it is advisable to establish the following privileges:

- to allow Russian scientists, who receive the indicated grants, the opening of accounts and the receipt of foreign currency at branches of foreign banks on the territory of Russia;
- to use the assets, which have been received in the form of international grants, in conformity with the terms which are specified by the organizations which distribute the grants;
- to exempt the assets, which have been received through grants, from the value-added tax, for which the government of the Russian Federation is to submit to the Supreme Soviet a proposal on the corresponding amendment of point "M" of Article 5 of the RSFSR law "On Value-Added Taxes."

The proposals on the methods of indirect regulation should find reflection in a special law of the Russian Federation or other standard acts.

The implementation of the new state science and technology policy should be based not on the customary administrative command, directive approach, but on stable legislative support of scientific and technological progress, which is in keeping with world practice. (In the United States, for example, about 100 laws, which regulate relations in the sphere of science and technology, are in effect. Until recently we in practice had nothing.)

The role of the legislative support of creative activity during the transition to a market economy in the area of the protection of intellectual property and the social protection of the science worker is increasing particularly sharply. The legal protection of intellectual property constitutes the basis of the formation of market relations in the sphere of the dissemination of innovations. At present such protection in practice does not exist in our country, as a consequence of which the legal protection of the creative activity of a scientist is lacking, nonequivalent exchange between scientific research organizations and enterprises is increasing, and the practice of the unsanctioned use of the results of research and development is expanding, which in the end cannot but lead to the "erosion" of the scientific and technical potential.

For the purposes of the establishment of the legal and social protection of Russian scientists and specialists a number of laws of the Russian Federation, Ukases of the President of the Russian Federation, and other standard acts, which concern the sphere of scientific and technological activity, should be prepared and be adopted without delay (a package of laws on intellectual property, on the status of scientific personnel and scientific organizations, on innovation organizations, on the stimulation of scientific and innovation activity, on resource conservation, on conversion, on scientific and technological information, on the state program on the increase of the social protection of scientists and the decrease of the flow from the country of highly skilled specialists, on the development of the nonstate provision of pensions to the personnel of science and the insurance of scientific and innovation activity, on the organization and conducting of examinations of scientific and technological programs and projects, on academic degrees and titles, on state awards and state prizes to scientists, on the stimulation of research in the social and economic sphere, and a number of others).

A list of the priority legislative acts and ukases of the President of the Russian Federation, which are necessary for the support of state science and technology policy, is attached to the concept. They should be drafted as a unified system in two to three months and be submitted for consideration by the President of Russia and the Supreme Soviet.

V. The Information Infrastructure of the Implementation of Science and Technology Policy

Now three levels of informatization are clearly traced:

- 1) the state level, which is connected with the solution of major state problems;
- 2) the sectorial level, which is connected with the solution of the problems that arise for one sector or another in the sphere of the economy, industry, agriculture, health care, education, and so forth;
- 3) the level of commercial entrepreneurial structures and individual labor activity.

Before the start of the economic reform, when 90 percent of all production of the country was carried out by state enterprises and 100 percent of the scientific research was carried out by state and scientific institutions, in essence just the first level occurred, the others were simply absent.

At present in connection with the start of intensive privatization the picture is changing drastically and the center of gravity is beginning to shift gradually to the second and especially the third level, although the highest, state, level in the sphere of economic activity will dominate for a rather long time. Therefore, to the extent to which the state is interested in the implementation of its science and technology policy, which called upon to become the basis of state socioeconomic policy in general, it should intensify its efforts on the realization of highly effective short-term and intermediate-term diversified programs of informatization. First of all this should concern the establishment of a favorable information environment for the development of science and advanced technology. In order to accomplish this task, it is necessary:

1. To ensure the production of domestic (where this is expedient and where it is possible to do this at a modern level) or the purchase of foreign information and communication technology, including hardware and software, for the conducting of scientific research, experimental design development, and computer-aided design. The importing and production of information technologies, which are intended for experimental intensive technological works, scientific research institutes, laboratories, scientific rental organizations, centers of scientific and technical information, and other research organizations, should be accompanied by the granting of specific preferences and tax and customs credits.
2. To give vigorous state support to centers and institutes of scientific and technical information and particularly to scientific libraries, by implementing a thought out state policy on the timely injection of foreign scientific information, which ensures a high level of information of our scientists, engineers, process engineers, and designers. At present 98 percent of the centers of scientific and technical information and the largest scientific libraries of the country

are deprived of the opportunity to purchase scientific literature, especially periodical literature, and, if this situation is not corrected in the next few months, by the end of 1992 our scientific lag will become irreversible, while the lag in information, which in 1989 was estimated as a hundredfold, will become practically infinite. The state, which treats disdainfully the acquisition of scientific information, will never be able to become modern, successful, and flourishing and especially to enter into world economic relations and to join in the global process of development.

The failure to understand this circumstance is equivalent to the return of universal general illiteracy.

3. Since our information industry in practice is incapable of producing mass computer hardware, it is advisable from an economic standpoint, to orient it toward the production of microprocessor and communications systems that support: a) the needs of experimental research programs of average and low complexity, while buying imported hardware for programs of high complexity; b) for the production of hardware, which is intended for automation and the development of industrial flexible automated systems. This will constitute a necessary prerequisite for the implementation of science and technology policy in the area of the development and introduction of automated industrial, transportation, agroindustrial, household, and other systems.

4. To change the system of the training and advanced training of personnel who work in the sphere of science and scientific technologies. To include the teaching of information on the operation of computer hardware, programming, and other types of use of computers in the system of the minimum requirements for a candidate degree, teaching at all higher educational institutions, vocational schools, and schools. Without this it is impossible to use means of informatization efficiently and effectively for the conducting of research work in design and the control of technological processes at a modern level.

5. To grant to scientific research institutes, design organizations, institutions, and enterprises, which are pursuing innovation technology policy, preferences and privileges with respect to the priority hook up to domestic and international communications systems and along the lines of the acquisition of the corresponding information equipment. Timely information exchange is one of the powerful means of acceleration and the implementation of science and technology policy. At the same time this is a factor, which minimizes the expenses for business trips and possible miscalculations in science and technology policy and opens the way for telecontacts, teleconferences, and so on.

6. To formulate and implement in 1992 on the basis of special instructions of the Ministry of Science, the Higher School, and Technical Policy and with the support of the government a set of steps on the publication of scientific reprints, reports, and papers of our researchers, which contain specific developments and innovative proposals, to organize the open and simplified access to them of all interested organizations and enterprises in order to shorten as much as possible the path of the passage of scientific and technological information from developers to enterprises, and first of all enterprises in the sphere of private business.

7. To commission the Ministry of Science, the Higher School, and Technical Policy of Russia and its institutions

within a five-month period from the moment of the adoption of the fundamentals of science and technology policy to draft and adopt standard legal statutes, which facilitate and stimulate the establishment of public and open databases and knowledge bases, which make it possible to implement and introduce rapidly and to bring up to the level of market realization the most important and practically effective achievements of domestic science.

8. To give state support and the maximum assistance, particularly on the level of the making of premises available and access to the state system of scientific and technical information and means of communications, to private scientific consulting, scientific and technological, and research firms, organizations, and corporations, which introduce innovative achievements of an advanced international level in domestic production. To establish a set of incentive measures in the form of state ruble and even currency prizes for commercial organizations, which introduce, produce, and sell on the domestic market for the population and other producing structures products of a high innovative international level. This at the same time will be a powerful stimulus for the development of the innovation infrastructure, inasmuch as it will stimulate the interest of enterprises in the use of the latest domestic and foreign information.

The previous experience of the slow, creeping development of the state system of scientific and technical information shows that it was unable to ensure the creation of the necessary information environment of scientific and technical progress. Therefore, it is now necessary to elaborate and implement in practice a set of measures, which make it possible during 1992-1993 to commercialize 40-60 percent of the state system of scientific and technical information, to develop a system for its further commercialization, and to create the most favorable legal and economic conditions for small private business firms and organizations, which are oriented toward the gathering, processing, dissemination, and introduction of the latest information which ensures the realization of scientific and technological innovations on a commercial level. At the same time it is necessary to envisage measures on the retention in the system of the GES of scientific and technical information of personnel of the highest scientific level, who are capable of ensuring the timely adjustment, modification, and transformation of state policy and organizational structures in the system of institutions and scientific and technical information.

VI. The Implementation of State Innovation Science and Technology Policy Under the Conditions of the Structural Reorganization of the Economy

The new innovation science and technology policy can be implemented only if there is a new market economy, which has to emerge under extremely complex conditions. In contrast to the countries of postwar Western Europe, South Korea, and Japan, which began to implement a thought out state science and technology policy under the conditions of overcome economic dislocation and the domination of private property, developed commercial, business structures, and a developed market economy, we should implement it in the situation of an intensifying crisis and overall instability. The new policy can be implemented only if there are profound structural changes in the economy. They include the following components:

- the process of privatization, which spreads resolutely from the level of small enterprises to the level of large highly technologized enterprises;
- the transition from command mechanisms of the management and distribution of resources to market mechanisms;
- the granting of powers for economic and technological decisions to regions, enterprises, concerns, and associations, the gradual minimization of hierarchical structures, and the development of horizontal ties;
- the transfer of the main functions of state influence on the economy from management and tutelage to the level of the financial and legislative support of innovative technologies and enterprise in the sphere of science.

The structural changes of the economy will be able to lead to the increase of the competitive ability of our goods on international markets and to the saturation of the domestic market with the simultaneous decrease of the rate of inflation only in case of the rapid increase of production and the increase of product quality. Given the present state of technology and engineering, the obsolescence and wear of equipment, and the low professional level of producers both are impossible. The structural reorganization itself of the economy without the accelerated introduction of new technologies will peter out. In connection with this it is important to single out as a system-forming factor of the reorganization of science and production on the basis of the new science and technology policy the large-scale privatization of state enterprises, which is beginning in our country. It, as is known, will affect not only civilian industries, design bureaus, experimental laboratories, and so on. In the process of privatization forms of the interaction of science, technology, and production, which are new from the organizational and economic standpoint, can and, apparently, will appear. From this standpoint it now already possible to outline several basic directions of the formation of new science-industry complexes.

The first direction can appear by the integration of sectorial scientific research institutes, design bureaus, and departments, which have received complete economic independence or were privatized, with independent, also privatized, enterprises of a similar type. Here two versions are possible, when the industrial part of the complex is the dominant structure, while the scientific research or design part, which subordinates its activity to the accomplishment of the tasks posed by the dominant part, is the recessive structure. Another model appears in case of the domination of a strong scientific research, scientific and technical part. In this case the scientific component of the complex raises technological solutions to the level of scientific solutions, design solutions to the level of technological solutions, and, finally, the production process to the level of the most advanced design and technological developments. Being more risky, this version is at the same time also more innovative and, in case of correctly chosen solutions, more profitable.

Another type of science-industry complex can appear during the integration of sectorial institutes with the corresponding large higher educational institutions and several industrial enterprises. On the organizational level versions, in which either the scientific, VUZ (given a large number of small

enterprises attached to chairs and faculties), or large industrial components of the system can play the dominant role, subject to the ratio of personnel, economic capacities, production capacities and resources, and so on, are also possible here. All the versions indicated here are actually observed in world practice, and preference should be given not to some dogmatic notions, but to the possibilities of actual adaptation to the economic situation.

Finally, various types of integration of the interaction of small, medium-sized, and large defense and civilian enterprises, higher educational institutions, special design bureaus, design bureaus, and scientific research institutes with the corresponding foreign enterprises, organizations, and institutions are possible. The establishment of an open economy and an open system of scientific and technological innovations, the exchange of scientific information, scientists, experimental equipment, and so forth is possible only in this case. Without this the establishment of a new science-industry complex and, consequently, the implementation of a science and technology policy, which ensures the support of economic reform and the recovery of Russia from the general crisis, are impossible.

The privatization and democratization of science and the existence of various forms of property in the sphere of the generation of knowledge are affording a fundamentally new opportunity for the transition from an economy, which is almost completely identical to the military-industrial complex, to an economy, at the basis of which the science-industry complex (NPK) will be.

The difference of the military-industrial complex from the science-industry complex is the fact that the former was a one-way "intake" device: It swallowed from 80 to 90 percent of all the resources of the country, but provided almost nothing for the meeting of ordinary human needs, the increase of well-being, the development of civilian sectors, and so on. On the other hand, the science-industry complex, which unites both defense and civilian enterprises in combination with research and scientific and technological organizations, should be oriented toward the market, toward competition, and toward the assurance of the needs of society for consumer goods, by establishing a diversity of organizational forms. Being open for foreign participation and trying to penetrate world markets, the science-industry complex naturally will not only need a new state science and technology policy, but will also support it, for it will not only consume the assets of state support, but will also produce new financial, technical, and manpower resources for self-support and self-development. Taking into account the tremendous might of the military-industrial complex and the possibility of using its resources for the transformation of the defense industry and science into the science-industry complex, we can assert with good reason that under the conditions of the increasing privatization and democratization of society the conversion of the military-industrial complex, including its scientific institutions, is nearly a synonym of economic reform. Therefore, not the destruction of the military-industrial complex, but its effective transformation into the science-industry complex and integration in world economic relations on the basis of the establishment of flexible organizational forms and the corresponding state, public, and commercial structures should be the motto of the new science and technology policy. The

specific steps of the state on the combining of economic structural changes and on the technological reequipment of the economy should be:

1. The development of mechanisms of the legislative support of the internal transfer of technologies from highly technologized defense sectors to the sphere of civilian production, this transfer on no account should be confused with conversion. The latter consists in the changeover of military enterprises to the output of civilian products, particularly by means of so-called dual technologies. The internal transfer of defense technologies implies the introduction on cost-effective terms of already existing scientific developments and technological projects, equipment, materials, and other achievements in the sectors of civilian production, including first of all at enterprises that are being privatized. For this it is necessary to put into effect a number of legislative acts on the declassification of these achievements and technologies, as well as to create a standard legal base that guarantees the procedure and the cost-effectiveness of such a transfer both for the developers of the technologies and for manufacturing enterprises.

2. The assurance and stimulation of production under license, as well as concessions, which are granted to large foreign firms on the condition that the concession of enterprises will be accompanied by the introduction of the most advanced western technologies. If this is not ensured legislatively and the corresponding advantages for foreign firms and investors are not envisaged, they will release to us, perhaps, rather good, but obsolete technologies. The requirements of the training of domestic personnel should also be included in the terms of concession.

3. The establishment of a system of the expert evaluation of new technologies that are being introduced at both state and privatized enterprises. The approved principles, which today are the basis for the examination, should be first of all the following ones:

- a) the support of technologies which ensure the rapid output of marketable products. The speed and time factor should be decisive along with the quality factor, otherwise the economic reform will peter out;

- b) the development of a mechanism of the technological modernization of the base sectors of machine building, power engineering (the production and processing of coal and petroleum), the sphere of construction, the production of instruments and equipment for the making of products that are competitive on world markets, the production of technologies for the agroindustrial complex from farming and animal husbandry to the storage of products;

- c) the development of a thought out system of limited protectionism for those types of advanced highly efficient innovative technology, which in the interests of Russia we should produce ourselves, and not only import. The Ukase of the President of Russia on the liberalization of foreign economic activity created the optimum conditions for commodity intervention in Russia. Under these conditions we cannot and should not produce ourselves all types of products. Not one, even most developed country in the world does this. For example, in the United States they do not make video recorders and several other types of electronics. But at the same time for the support of the sectors of production and technologies, which are most important for

the economy, all countries of the world without exception implemented and to date are implementing a policy of partial protectionism for the support of industries and technologies, which are most important from a national standpoint, and the prevention of additional unemployment. The flip-flopping of our policy from complete protectionism to complete freedom of trade, which does not take into account the interests of science and technology policy, can have the most adverse consequences;

d) the creation of reserves for technologies of the future.

4. In the area of the interaction of structural economic reorganization and innovation science and technology policy it is necessary to support in every region the directions of scientific and technological development, which can yield the quickest possible impact in the interests of Russia.

State innovation science and technology policy under the conditions of hyperinflation, the liberalization of prices, the increase of the wage, and a local central staff, which is poorly prepared for reform, under certain conditions can become a decisive factor that moderates the negative consequences of these processes. For this the two following directions should be envisaged in it:

the first is the development and introduction of the most advanced technological processes at large enterprises, where there are sufficient resources and highly skilled personnel for this;

the second is the development of small-series high-technology works, which make advanced tools for craftsmen, individual farmers, small entrepreneurs, and small and medium-sized enterprises. These tools should ensure not automated, but efficient manual labor for small-series types of products, and this will make it possible, as Japanese experience shows, to minimize unemployment and to create workplaces constantly. In Japan this policy had the result that the level of unemployment even during the most difficult times did not exceed 2-2.5 percent, while in the United States it often rose to 12 percent. In all three main industrial regions—the United States, Japan, and Western Europe—the combination of industrial giants with an enormous number of independent small and medium-sized firms and separate manufacturers and ones that are integrated with the giants is the most typical feature of the economy. However, our former state policy in the area of engineering and technology was also oriented only toward large state enterprises. Such it also remains to date. If a rapid, resolute, legislatively backed turn of science and technology policy toward private commercial and first of all small and medium-sized enterprises is not made, the reform will peter out and will perish. Such a turn presumes, in particular, not only the development of special technologies and tools for the system of small and medium-sized business, but first of all also the development of the highly technologized construction of premises for business and production. Now the lack of such premises is the main obstacle for their development. It is possible to solve this problem only on the basis of highly technologized high-speed construction, which never completed a project late in our country. The state support of such construction technologies should be superpriority for a number of the next few years.

5. And, finally, structural reorganization in the scientific and technical sphere itself on the basis of the reorientation of priorities as applied to changes in the structure of the economy, to the export orientation of the Russian scientific and technical potential, and to its integration in world economic relations, and in connection with this the specification of the list of programs of the federal level and the directions of activity of scientific organizations, and the change of their specialization for the new tasks.

The privatization of state property in the sphere of research and development, which it is advisable to carry out in accordance with a special program, is of decisive importance in shaping the future development of the scientific and technical potential. The basic directions of the reorganization of scientific research institutes and design bureaus, their integration with industrial enterprises and the emergence of firm science, and the establishment of national science centers, scientific educational centers of contract research, technopolises, technology parks, and other new scientific innovation structures should be stipulated in the program.

Here it is necessary to transform state scientific organizations primarily into organizations, which make their fixed capital available for the activity of individuals and the collectives established by them, which have received orders from the state. These orders are to be issued for specific specialists and their developments, granting broad independence in the disposal of the received assets with great responsibility for the filling of the order and the obtaining of the desired result. It is also necessary to revise the plans of investments with respect to state orders for the purpose of using in them the best achievements of science and technology.

Small scientific introducing firms based on outstanding achievements of science and technology should be established and supported. In the process of privatization it is necessary to make an inventory of the construction projects of scientific and technical facilities, which are being carried out, and to determine what should be realized through the state order as state property, and what is to be privatized.

VII. Science and Technology Policy in the Area of Defense Technologies

State science and technology policy, just as the entire concept of the policy of economic reform, should proceed from a clear understanding of the special place of defense science and the defense industry in our society. The failure to understand this can lead only to a political, economic, and social catastrophe. The demagogic and publicistic attitude toward defense technology and science, which was based on denunciation, sensation, and superficial antimilitarism, led to a purely negative attitude and the underestimation of their economic and scientific importance. A common program of conversion thus far does not exist, the matter has actually been allowed to take its own course, but meanwhile precisely the sphere of the defense industry and science contains real resources for survival and subsequent progress.

According to official estimates, more than 50 percent of all the allocations for science until recently were spent on defense science, and up to 40 percent of the scientific personnel and engineers worked in it.

The country and especially Russia for nearly 60 years pumped into the defense industry and science nearly all their material and intellectual resources. The most prominent scientists, engineers, and process engineers, who have the best training and information, worked and continue to work here. The amount of physical assets and the quality of installations, test ranges, and stands, the stock of instruments, the capacity of computer complexes, and so on in quantitative and qualitative terms are greater than in the civilian sector of science. The squandering of the potential of the defense industry and science would be a fatal offense, which is far more terrible than any economic miscalculation. Therefore, science and technology policy in this area should be based on the following principles:

1. On the territory of Russia the control and support of defense science and technology should be carried out by a special administration under the personal supervision of the President. Its task is the taking of an inventory of the reserves, resources, materials, enterprises, and other national property in the system of the Ministry of the Defense Industry and the "nine" on the territory of the RSFSR, the prevention of squandering, and the consistent implementation of state policy.

2. The production of weapons should be reduced to a reasonable level in conformity with the new defense doctrine, but modernization should be carried out continuously, while the corresponding scientific and technological research should be supported by budget financing.

3. Conversion should be aimed at:

- a) the production of consumer items, as a temporary and limited step at defense enterprises which are being converted and privatized;

- b) the development along with limited series of weapons of high-technology automated lines and entire works for the production of peacetime products (not rails, but plants for the production of rails, not refrigerators, but automated lines for their production, and the like).

4. It is necessary to distinguish clearly the conversion of industry from transfer, that is, the transference of military technologies to civilian production. It is naive to think that the West will give to us its superadvanced technologies in order to make a competitor of us, therefore, the internal transfer of technologies on a commercial basis to the civilian sector is the basic source of real and rapid scientific and technological progress.

5. The existing secrecy often hinders innovation processes in defense science and should be reduced to reasonable limits, which determine state security, the loss of priorities, and so forth.

6. Since the loss of first-class personnel of defense science would do the most serious harm to our scientific potential, it is necessary to envisage an entire package of measures for the support of elite scientists and engineers in defense science and in science in general, including the allotment of dacha plots and limits for dacha construction and state subsidies, the purchase of personal cars at preferential prices or on installment, and so on. This would make it possible to keep in the country 25,000-30,000 elite young scientists, whose departure abroad would simply signify the end of our science. They will "buy up" precisely them from us first of all.

7. A saving on defense technologies and defense science may be obtained just due to the fact that supernew prototypes of weapons will be produced only in single specimens for the modification and improvement of scientific and technological developments. Moreover, new research and development should be financed in part by means of the commercialization of defense science itself and the available tremendous unclaimed defense reserves.

8. Unclaimed defense resources, for example, numerous information transmission networks, computer centers, runways, and so forth, should be promptly included in the economic turnover with the deduction of 30-40 percent of the profit for conversion (after the pattern of point 3b) and high-technology research and development.

9. Legislation should be passed and ukases of the President should be promulgated, which regulate the activity in the sphere of defense science and technology, standardize the forms and methods of the privatization of defense enterprises and the right to the establishment of concerns, associations, and so on, which carry out conversion and internal transfer and specify their obligations with respect to the state. The elaboration of these measures should be carried out and completed during the first and second quarters of 1992. At the same time parliament and the President should finally consider and approve openly and publicly all the basic programs of conversion. Regular hearings and discussions of its implementation in the sphere of defense technologies in the Supreme Soviet of the Russian Federation should become an important element of the new science and technology policy.

VIII. On the Creation of a Common Field of Science and Technology

The revolutionary process of merging science and technology is occurring throughout the world. Science is being technologized, technology is being "scientized." The division of the sciences into applied and basic sciences is a survival of the 19th century, which in practice has been overcome in developed countries. In our country this division has been secured by the departmental organization of science. Academic science, sectorial science, defense science, VUZ science, and plant science exist, and, finally, the sphere of scientific business, including small and private scientific organizations, is beginning to take shape. The latter, as a rule, are weak and engage mainly in the introduction and commercialization of the achievements of state scientific research institutes and higher educational institutions. Given a normal course of events the role of the commercial sector of science will gradually grow. However, there should be no illusions: For the next few years state support will be the main lever of the development of science and high technologies. Their financing as a whole for the present is beyond the power of the private sector. In order to overcome the gap between basic and applied science, on the one hand, and technology and production, on the other, it is necessary to create a common field of science. General talk, entreaties, and appeals to creativity, democratization, debureaucratization, and the overcoming of monopolism and incompetence in science are not enough for this. Specific, resolute, and quick actions, which are called upon first of all to improve the atmosphere at scientific institutions and to create the conditions for the development of the creativity of scientific personnel, are needed in order to revive our science and technology.

1. Financing should mainly be carried out not for an organization, but for a specific scientist, a leader, his group, laboratory, department. This should be supported by a special legal base.

2. Sectorial institutes should acquire the full right to cooperate or integrate with manufacturing enterprises and higher educational institutions. In these cases higher educational institutions and sectorial scientific research institutes together with enterprises can establish various forms of associations and receive state support only for specific special-purpose research.

3. All research should be divided into two groups: exploratory research without a predefined result and goal-oriented research, with a given result. Research of the second type is financing after the pattern: task—result, moreover, the result itself, final or intermediate, is financed. The board of directors of the project or program, not the administration of the institute, should be the recipient and distribution of financing. The latter is financed at the expense of programs and projects only for the intermediary, accounting, supply, and other services performed by it.

4. Scientists, process engineers, and engineers should become the main figure in the implementation of research and development and in the system of state support. The clear separation of the administration and scientific leadership of institutes, programs, and projects, without the combining of administrative and scientific posts should be made. Priority should be given to scientific leaders and supervisors, which should be secured legislatively. Assets for foreign business trips in the interests of science should be made available to scientists, but should not be distributed through the administration, which eats up as much as 80 percent of these assets, creating a vacuum of information, competence, and scientific contacts. A unified system of expert criteria and prestige mechanisms, which will take into account only the personal, individual achievements of scientists, including within the framework of collective research, should be established.

5. Extensive rights should be granted and laws and standard acts, which secure for scientists and research collectives the rights to the obtained results, should be passed. The rights to open independent accounts and to dispose of the earned assets at their own discretion, including deductions for the pay of the administration, should be granted to research and engineering technological divisions, laboratories, sectors, and departments. Common rules of financing, material and technical supply, and the support and social protection of scientists, regardless of the departmental subordination of research organizations, chairs, laboratories, and so forth, should be established.

6. It is necessary to allow the rectors of higher educational institutions to retain scientific personnel regardless of the number of students. To allow them also to use the personnel of the scientific research institutes, which have been integrated with higher educational institutions, for teaching work in order gradually to reduce the estimate and the ratio on the average to seven to 10 students per instructor. To determine the elite nature of higher educational institutions on the basis of objective criteria, for example, from the standpoint of the training of scientific personnel, the

number of professors with degrees, the number of published works and protected patents, and the number of candidates for admission per vacancy.

7. To ensure by means of budget financing the acquisition by scientific research institutes and higher educational institutions of the foreign information necessary for research (journals, reports, books). The corresponding currency outlays should be included in the financing of scientific programs, projects, and so on. To regard the development of scientific libraries and information institutions as the most important task of the state support of the development of science and technology, without this we will not have even backward science and technology, they will simply disappear.

The development of a common standard legal base of the system of financing, material and technical supply, social protection, and state support of higher educational institutions, academic science, defense, sectorial, and commercial science is the only real mechanism of the establishment of a common field of scientific and technological research as a sturdy basis of the development of the scientific and technological base of a market economy.

IX. Scientific and Technological Cooperation With the Sovereign Republics and the Assurance of the Entry of Russia Into the World Scientific and Technological Community

The new political and economic situation requires the substantial revision of the forms and methods of state administration and the clear delimitation of the powers of the organs of administration and the managing subjects.

Taking into account the existence of highly integrated elements of the scientific and technical potential and the established scientific and technical ties and the intolerability of their uncontrolled destruction, as well as the necessity of interstate cooperation in the scientific and technological sphere, the support and development of scientific and technological cooperation with the other sovereign states, which are a part of the Union, will be of extremely great importance for Russia. It is expedient to bring about these ties on the basis of an agreement on interstate scientific and technological cooperation, which should be concluded by the states on the basis of the principles of the voluntary nature of their participation and the equality of rights.

Within the framework of interstate scientific and technological cooperation Russia together with the other participating states will determine the priority directions and forms of joint scientific and technological activity; will give state support to joint scientific research and development, devoting particular attention to basic science; will formulate interstate programs; will establish a network of scientific and technical facilities of joint use; will cooperate in the area of the training of scientific and technical personnel, the protection of intellectual property, and the exchange of scientific and technical information.

For the assurance of effective cooperation it is necessary in the immediate future:

—to create the legal, economic, and organizational conditions, which guarantee the equal rights and responsibility of all the organizations, enterprises, and citizens, who are participating in interstate scientific and technological cooperation;

- to achieve the compatibility of the rules of law, which regulate scientific and technological activity; to begin the regular holding of consultations and the exchange of information;
- to develop the elements of the common infrastructure of this activity, including a patent service and a system of scientific and technical information, standardization, and metrological support;
- to accomplish the changeover to comparable statistical indicators;
- to ensure cooperation in the making of a scientific and technological examination.

The indicated agreement should be prepared and signed during the first quarter of 1992, while for the coordination of the interaction of the states within the framework of this agreement it is necessary to establish an Interstate Scientific and Technological Council.

It is advisable to effect the cooperation of Russia with the sovereign states, which earlier were a part of the USSR, in the solution of complex scientific and technical problems in the form of interstate basic research programs, interstate scientific and technological programs, and interstate programs and projects on the development and assimilation of new technologies.

For the more efficient use of the facilities of science and technology, which were established in the former USSR, in the interests of all the sovereign states of the Union it is expedient to form a list of scientific and technological facilities of joint use, on which scientific and technological organizations, scientific research and experimental testing grounds, information networks, libraries, and others can be included.

The financing and operation of scientific and technological facilities of joint use should be carried out on a contractual basis in conformity with special agreements.

For the information support of cooperation within the framework of the Agreement the participating states form an interstate system of the exchange of scientific and technological information on the basis of existing information structures.

It is advisable to carry out joint patent activity on the basis of national legislations and an interstate Patent Convention.

With respect to the listed aspects of cooperation after the signing of the Agreement it is necessary to draft and approve a number of additional standard acts, among which are:

- the Statute on Interstate Scientific and Technological Programs;
- the Agreement on the Use of Joint Scientific and Technological Facilities;
- the Agreement on Questions of the Training and Certification of Specialists, Scientific Personnel, and Scientific and Technical Personnel;
- the Agreement on the Interstate Exchange of Scientific and Technological Information;
- the Agreement on Metrology, Standardization, and Certification;

the Convention on the Protection of Industrial and Intellectual Property;

the Temporary Patent Agreement.

The programs from block I, which are connected with the storage and transportation of foodstuffs, and the programs from the block of informatization, which are oriented toward the computerization of financial settlements when carrying out all types of transactions and customs and tax operations, as well as the programs, which are oriented toward the automation of communications systems and their changeover to advanced technology, are of vital importance. Here it is necessary to minimize the contribution of Russia or to reject completely for reasons of financial and resource saving the support of programs, which are not of priority importance or are being implemented purely for reasons of prestige. The contribution of Russia to the scientific and technological programs and research of the states from the USSR should be determined exclusively by the expedience of the planned results for the solution of the priority problems of the next few years. The more distant results should be examined within the framework of the overall strategy of long-term programs. If necessary all the financial and resources expenditures should be calculated in accordance with the standards of international scientific relations.

Under the conditions of the sharp decrease of domestic demand for high-technology products the export reorientation of our scientific industrial potential is becoming one of the main directions of the strategy of its survival and economic growth. The most important source of the latter, as the present-day experience of economic development attests, is intellectual rent, which is materialized in the nonequivalence of international economic exchange. Russia, by exporting mainly raw materials in exchange for complex machine building products, holds an extremely unfavorable position in the international division of labor, which is characterized by the decrease of national wealth and the undermining of the sources of future economic growth. This situation should be changed radically, which can be achieved under present conditions by the reorientation of the accumulated scientific industrial potential toward the production of export products.

The difficulty of this task consists in the lack of competitive ability of our machine building, which for decades developed under the conditions of isolation from the world market. Special and significant efforts on the part of both enterprises and the state are needed to overcome this lack of competitive ability and to ensure appearance on the world market of high-technology products. These efforts should be concentrated in the following basic directions.

1. The maintenance of comparatively low production costs. This can be achieved on the basis of:

the retention of an artificially low exchange rate of the ruble, which should remain floating until the completion of the program of stabilization and afterwards should be fixed at an artificially low level;

the maintenance of several artificially low prices for energy, which is consumed within the country, by means of a gradually decreasing export tariff;

the banning of the indexing of the wage and the higher taxation of its increase;

the reduction of constant costs by the disposal and conversion of the mobilized reserves of production capacities.

2. The state stimulation of structural changes and the export of high-technology products by means of:

programs of the modernization of industry, which are aimed at the development of competitive export-oriented sectors;

the organization of preferential credit lines, which are made available for the same purposes;

privileges with respect to the taxation of the profit, which is reinvested in modernization and the development of new production capacities;

active foreign policy efforts on the lifting of all kinds of nontariff restrictions on foreign markets with respect to Russian high-technology exports;

the development of the infrastructure of the crediting and insurance of exports.

3. The creation of the conditions for the transfer of advanced foreign technologies and their assimilation by domestic enterprises by means of:

the subsidizing of imports of new technologies by means of special state subsidies;

the attraction of foreign capital, first of all of multinational corporations that specialize in machine building, in the establishment of joint ventures in the sectors of the military-industrial complex, which are being converted;

the categorical requirement of the elimination of all political barriers in the way of the importing of technologies and capital and the changeover to the support on the part of foreign states of the policy of cooperation with Russian enterprises.

The systematic and goal-oriented efforts in the indicated directions should be supplemented by the universal spreading of the ideology of economic growth on the basis of the increase of the competitive ability of Russian industry and the winning of foreign markets. The assurance of favorable conditions for the export activity of Russian enterprises on foreign markets should become the main task of Russian foreign policy.

The effective integration of the scientific and technical potential in world economic relations cannot be achieved without the state protection of the interests of national science-intensive sectors of industry on both the foreign and domestic market. Active foreign policy work on the dismantling of nontariff barriers in the way of Russian exports should be supplemented by the organization of a system of the preferential crediting and partial subsidizing of exports of high-technology products, as well as by the assurance of the temporary protection of promising export-oriented sectors of industry for the period of their formation and growth from foreign competitors on their own domestic market.

For the purposes of maintaining continuity in matters of international scientific and technological cooperation the assurance of the fulfillment of the corresponding obligations, which follow from the previously concluded international scientific and technological agreements of the USSR in the area that concerns the Russian Federation, should be assigned to the Ministry of Science, the Higher School, and Technical Policy.

For the purposes of the effective use of advanced foreign know-how in the acceleration of scientific and technological progress it is expedient:

—to carry out the organization of international scientific and technological ties in the priority directions of scientific and technological progress;

—to create the conditions for large-scale cooperation on the basis of the use of the results of original domestic development, which are of interest for foreign partners, by developing joint enterprise in the area of science and technology;

—to ensure the active participation of Russian science and technology in the solution of global problems of the present;

—to promote actively the formation of a market of scientific and technical products and services, as well as the establishment of standard legal support in the area of scientific and technological ties, patent and license activity, the exchange of scientific, technological, and patent information, the protection of intellectual and industrial property, and the use of international standards and the principles of certification, which have been adopted in world practice.

Under the conditions of the decrease of state demand for high-technology products the importance of the appearance of competitive firms on the world market is increasing. In this connection it is necessary to help domestic firms to realize their advantages (relatively low prices and costs) first of all on the markets of space services and equipment, in the aviation industry, and in the sphere of arms.

With the transition to a market and the elimination of departmental barriers the conditions are appearing for the development of horizontal ties between managing subjects. The organization of the appropriate infrastructure, which includes all-Russian information networks and data banks and regional centers of interdisciplinary research and the transfer of technologies, is necessary in order to increase their effectiveness substantially. It is advisable to establish a special state organization—the Agency for the Transfer of Technologies—which operates independently or under the Ministry of Science, the Higher School, and Technical Policy for the purpose of the state promotion of the interregional, intersectorial, and international transfer of technologies.

While supporting and expanding international scientific and technological cooperation, Russia should minimize the expenditures on projects, in which it cannot hold a leading position and which cannot yield practically useful results that are capable of influencing the recovery of the economy in the next few years. At the same time it should be clearly specified that participation in a number of long-term projects, such as programs involving the study of Mars, the solar system, and so on, can be of not only prestigious, but also practical importance, inasmuch as the international cooperation, which is connected with their implementation, leads to the development and introduction of fundamentally new technologies and advanced instruments, computer hardware, and measuring equipment. All this can find quick and effective application in domestic instrument making.

The Ministry of Science, the Higher School, and Technical Policy jointly with the Ministry of Foreign Affairs of the Russian Federation needs to prepare during the first half of

1992 standard legal documents and drafts of ukases of the President of the Russian Federation on questions of international scientific and technological cooperation, which provide the legal, economic, and political conditions of such cooperation, which are most favorable for Russia.

X. For the New Policy a New System of State Support

At present as a result of the made decisions the conditions are appearing for the creation of the necessary political and economic prerequisites of the active inclusion of scientific and technical progress as the main factor of the structural reorganization of the economy.

Such conditions are:

- the increase of the role of legislative bodies in the management of scientific and technical progress;
- the fundamentally new role of executive bodies of government in the formulation and implementation of policy on behalf of the state on a legislative basis in the spheres assigned to it (science and technology, industry, agriculture and food stuffs, defense, education, health care, power engineering, transportation and communications) on the basis of economic measures;
- the active inclusion of the market as a regulator of economic development and efficiency, which are possible only on the basis of the use of scientific and technical progress.

The presence of these conditions makes it possible to develop a new system of the management of scientific and technical progress, in which three components—legislative authority, executive authority, and production which operates under the conditions of a market—participate simultaneously. First of all the diversification of the management of the sphere of science and technology should be carried out. In Russia there should not be a monopoly body that manages science. Competition, in case of which management bodies would strive to create for their scientists, specialists, and organizations the most favorable conditions, which is especially important in case of market relations, is necessary.

In this system the President of the Russian Federation and the Supreme Soviet of the Russia Federation carry out:

- the elaboration of legislation in the area of scientific and technical progress;
- the determination of the policy of the state in the area of the structural reorganization of the economy and scientific and technological development; the approval of the priority directions of scientific and technical progress, the programs on their realization, and the executive bodies of management, which are responsible for their implementation;
- the allocation of assets from the state budget for basic research and for the implementation of programs of structural reorganization and the priority directions of scientific and technical progress;
- the monitoring of the implementation of state policy and the spending of the allocated assets.

The executive bodies of authority of the state level:

- elaborate proposals for the President of the Russian Federation and the Supreme Soviet of the Russian Federation on the policy of structural reorganization on the

basis of scientific and technical progress in the sphere attached to them, formulate programs on their implementation, and organize their fulfillment;

- provide the conditions for the creation and development of advanced organizational structures of various forms of property, which are necessary for the implementation of the priority directions of scientific and technical progress in the attached sphere;
- establish basic research and technological development funds by means of various sources of financing for subsidizing the performers of programs and projects on a competitive contract basis;
- carry out within the limits of established legislation the economic stimulation of scientific and technical progress by means of direct financing (interest-free loans, subsidies, grants, and others) and indirect stimulation (preferential lending, tax credits, accelerated depreciation, preferential customs tariffs).

In the system of executive bodies the Ministry of Science, the Higher School, and Technical Policy of the Russian Federation:

- formulates and implements state science and technology policy, prepares proposals for the President of the Russian Federation and the Supreme Soviet of the Russian Federation on the priority directions of scientific and technical progress and on the list of programs on their implementation, as well as proposals on the allocation of budget assets for basic research and programs of the federal level;
- organizes the fulfillment of scientific and technological programs of the federation level on the implementation of the priority directions of scientific and technical progress, which envisage the development of promising technologies of the future and their bringing up to practical realization;
- carries out state support of basic research and the development of the infrastructure of science;
- organizes the rapid transfer of knowledge about the latest scientific and technical achievements, the training of scientific personnel;
- carries out the support of small scientific and innovation business;
- drafts proposals on the legal support of scientific and technical progress;
- organizes international scientific and technical cooperation.

Then in the concept the specific tasks of the Ministry of the Economy of the Russian Federation in the area of science and technology policy are formulated in brief and steps on the training of personnel for the meeting of the needs of science, technology, and the national economy for specialists of the highest skills are outlined.

Saltykov Interviewed on Science Funding Efforts
927A0192A Moscow IZVESTIYA (Morning edition)
in Russian 1 Jun 92 p 2

[Interview with Minister of Science, the Higher School, and Technical Policy of Russia Boris Georgiyevich Saltykov by IZVESTIYA science commentator Boris Konovalov; date and place not given: "There Will Be Money for Science, But There Will Not Be Enough for Everyone"—first paragraph is IZVESTIYA introduction]

[Text] The deplorable state of the financing of our science, the possible loss of the still potent scientific potential of Russia, and the increase of the "brain drain" abroad are causing anxiety. IZVESTIYA's science commentator asked Minister of Science, the Higher School, and Technical Policy of Russia Boris Georgiyevich Saltykov to tell what way our of the forming situation the government sees.

[Saltykov] Most likely not everyone knows that in practice two-thirds of the state allocations until 1985 were spent on military scientific and experimental design work. Now we have begun the demilitarization of the country, but the structure of science by its nature is conservative and inert, it is changed with enormous difficulty. And the main thing is that the consciousness of scientists, whom for decades they accustomed to the fact that the state provides the money for everything, is being reformed very slowly. Now titled petitioners are coming to me in masses: There is an excellent development—give the money for implementation. When you begin to ascertain what kind of development it is, it turns out that it is a new model of a tractor or, for example, a machine tool. But pardon me—what does the state have to do with it? Why should the state support at the expense of taxpayers one of the competing designs? If you have struck a technical "vein of gold," go to a bank, get together a financial group for its development, develop your own advanced, competitive product, and derive a profit.

By large account the state should finance mainly basic science, which everyone needs and on the basis of which technical applications grow.

[Konovalov] But, unfortunately, today basic science is also destitute, many institutes are now on the verge of bankruptcy. Scientists are not miners, not medical personnel, and not teachers, their strikes will not affect the everyday interests of the population. Therefore, they actually can count only on the intellect and common sense of the government....

[Saltykov] We understand this, and the government is taking steps on the strength of its possibilities. During just the first quarter of this year, while not yet having long-term allocations, we financed about 400 projects of basic and VUZ science.

Now in conformity with the ukase of the president the Russian Basic Research Fund has been formed. Vice President of the RAS [the Russian Academy of Sciences] A.A. Gonchar became its organizing director. But we do not regard this fund as an academic fund. Its goal is not to finance the "signboards" of institutes, but to distribute on the basis of independent expert evaluations grants to scientists of any departmental affiliation. This will be a state, but self-administered organization that carries out the selection of programs and projects on a competitive basis.

The reorganization of state scientific and technical programs of the former USSR and Russia is now under way. We should specify the priorities more clearly and update them in conformity with the requirements of today and, what is the main thing, the future. We should reject the former doctrine of competition with the entire world along the entire front of scientific research. We need more thorough integration with the world community. It is pointless to invest money in the directions, in which we have fallen hopelessly behind.

Abroad immediately after appointment I have actively sought sources of the financing of our basic science. This is first of all "explanatory work" among my colleagues—executives of science in the wealthy countries of the West. I have been showing that now it is wise to help Russian science, if they think not about their own petty advantage, by reinforcing several of their universities by enticing our specialists, but as a whole about world science. Our scientific schools belong not only to Russia, but also to the entire world, as does, for example, Tolstoy or Dostoyevskiy—this is not only Russian property, but also the property of all mankind.

In the West, it seems, they are beginning to understand the importance of preserving the intellectual potential of Russia for the progress of civilization on the entire planet. Recently French President Mitterrand came forth with the initiative to establish a fund of the developed countries for the support of basic research in Russia during this difficult time for us. Many small funds of the West, including private ones, are also prepared to help us.

There will not be enough assets, of course, for everyone. It is necessary first of all to help the most intelligent, talented people, and not to hand out "to all the sisters a pair of earrings each." This, incidentally, will also be more fair. Let us face it, in our science there are not only many talented people, but also much ignorance and mediocrity. Why support the existence of this part of science?

[Konovalov] And what strategy has been selected for the financing of sectorial, applied science? Here, after all, the situation is also being aggravated by the fact that the process of the "sovereignization" of experimental and pilot works, which under the conditions of a "barren" market can live better alone than in a complex with scientific institutions, has begun.

[Saltykov] Technological research funds of ministries, departments, state concerns, and corporations are now being set up for the support of sectorial science, without which, of course, scientific and technical progress is impossible. There should be deducted for these funds 1.5 percent of the product cost of all state enterprises. From each holder of these funds our ministry will take 25 percent for the financing of intersectorial development. If this is not done, it may "hang in the air," in spite of its particular importance for the state.

As for experimental and pilot works, now by the Ukase of the president of Russia the possibility of their separation from scientific institutes and associations has been checked.

Of course, all these steps are of an administrative nature, these are "crutches" for the sick organism of the old system. It is necessary to use economic methods which have a

self-adjusting capability. Of course, the future of the sectorial scientific institutions, which will be unable to survive under the new conditions, is ruin or merging into industrial and commercial structures, in which they should exist as intrafirm science. But today enterprises do not have the money for this, they have been forced in general to abandon scientific and technical progress. Thus, in order not to destroy science, it is necessary today to preserve it for tomorrow, even if by administrative measures.

Although timidly, the use of economic levers of management is also beginning. Thus, all scientific research and experimental design operations, of which the state budget serves as the primary source of financing, regardless of through what "chain" they pass, are already exempt from the value-added tax. We are preparing a decree so that experimental and pilot works, if they separate from institutes, would be assessed taxes as purely industrial enterprises, while if they stay, they would receive privileges. We are striving to see to it that all institutes, which change over to the self-financing of research, as well as commercial structures, which invest assets in scientific and technical progress, would enjoy preferential taxation.

[Konovalov] What is to be done with the giants of sectorial science, like the Central Aerohydrodynamics Institute? After all, their research, although it is applied research, in essence is of a basic nature. Commercial structures will hardly help such giants....

[Saltykov] Of course. It is planned to turn them into National Scientific and Science and Technology Centers. There will be a few of them—approximately 20-25. They will be financed by a separate line in the state budget. The first such center has already been established—the Institute of Atomic Energy imeni I.V. Kurchatov, others are next.

But in sectorial science, in addition to them, there are a large number of institutes with 500-600 associates—large ones by western standards, which often openly engaged in the borrowing and adaptation to our conditions of foreign technologies. The state is no longer capable of maintaining such institutes.

It is necessary today to tell the truth, that for our generally poor country we had science, which was too large and very heterogeneous in efficiency. Yes, owing to the heroic efforts of our scientists, engineers, and workers, who worked for a starvation, by western standards, wage, we obtained a large number of outstanding achievements and a good level in many directions. But in far from all directions. And today we can no longer invest assets in the "black hole" of weak directions only on the grounds that abroad they are also working here and we should not fall behind. Today there will not be enough money for everyone. Therefore, it is necessary to support the most intelligent and best people in their field. Earlier they appealed endlessly for the combating of mediocrity in science, now it is necessary to begin it. We can no longer allow ourselves the luxury of supporting science, as Mikhail Bulgakov said, of "second freshness."

Russian Academy of Sciences Faces 'Financial Collapse'

927A0181A Moscow POISK in Russian No 15 (153), 4-10 Apr 92 p 1

[Appeal of the General Meeting of the Russian Academy of Sciences to President of the Russian Federation B.N.

Yeltsin and the Sixth Congress of People's Deputies of 7 April 1992—first paragraph is POISK introduction]

[Text] A general meeting of the Russian Academy of Sciences was held on 6-7 April. President of the Russian Academy of Sciences Academician Yuriy Osipov delivered the report. (Read the extracts of the report on page 13.) At the general meeting the Appeal of the General Meeting of the Russian Academy of Sciences to President of the Russian Federation B.N. Yeltsin and the Sixth Congress of People's Deputies was adopted.

The atmosphere of sociopolitical crisis, the uncontrollable upsurge of prices and rates, and exorbitant rent in the absence of any substantial compensation on the part of the government have placed the Russian Academy of Sciences and its institutes on the threshold of complete financial collapse.

The increase of the wage of personnel of science in conformity with the decisions of the president of Russia, which was recently carried out, can in no way compensate for the real increase of prices on the consumer market. Moreover, institutions are often incapable of paying this minimum wage due to the lack of the necessary assets.

The semi-starvation existence of scientists and the further decline of the prestige of scientific labor are causing an ever increasing flow of skilled personnel from academic institutes, are contributing to the departure abroad of scientists, first of all those who work in the most promising directions, and are sharply decreasing the influx of young personnel to scientific institutions.

All the expeditionary activity of scientific institutions of the academy is in danger due to the increase of the operating expenditures on transport and the increase by more than twentyfold of the outlays on the outfitting of expeditions. To a considerable extent our scientific fleet has been frozen. There are no assets even for the mothballing of single-design expensive ships.

The publishing base of the Russian Academy of Sciences was found to be in catastrophic condition. Deprived of even the minimum preferences, which educational and children's literature has, scientific publications without state subsidies are doomed to elimination. Many scientific journals of the academy, which are translated in tens of foreign countries, may cease their existence due to the lack of support in their own country.

Organizations of the social infrastructure of the academy: hospitals and polyclinics, homes for veterans, require immediate help.

The government is not fulfilling the commission of the Ukase of the president of Russia of 21 November 1991 on the submission to the Supreme Soviet of proposals on the exemption of institutions of the Academy of Sciences from the payment of taxes, fees, and duties for the channeling of these assets into the strengthening of the material base of academic institutes and the training of highly skilled personnel.

The situation is being complicated by the fact that enterprises and organizations of industry are reducing substantially the orders to science for the fulfillment of basic development under economic contracts.

The general meeting of the Russian Academy of Sciences states with full responsibility that the occurring financing suffocation of basic science and the ill-considered decisions in the area of its support during the period of the drastic change of socioeconomic relations are capable of leading in a short time to the complete collapse of the formed scientific potential of Russia.

The history of many countries testifies that the destruction of scientific schools and cultural traditions can occur in just a few years and even months, while the efforts of more than one generation will be required for their reconstruction. One must not allow this to happen in Russia.

In order to prevent the slide of our homeland to the level of underdeveloped countries, it is necessary to take all steps for the protection against destruction of such national wealth as science, education, and culture. For the preservation of domestic basic science society should find the means to ensure a fitting level of its financing, should grant it tax privileges, which attract the idle assets of production and commercial structures to this sphere, and should secure the necessary social guarantees for personnel of science.

In connection with this we regard as necessary the quickest passage by the Supreme Soviet of laws on science and science and technology policy of the Russian Federation and the finding of means of settling the questions of the subscription of libraries to foreign scientific journals and books, the maintenance abroad of patents of institutions and organizations of the Russian Academy of Sciences, and the introduction of substantial privileges on international airlines for trips of scientists to other countries within the framework of scientific exchange programs.

On its part the Russian Academy of Sciences during this difficult period is performing serious work on the rearrangement of its activity, the reorganization of the structure and the democratization of all aspects of the life of institutes, and the concentration of resources in the most important directions of basic science.

The general meeting of the Russian Academy of Sciences appeals to the president of Russia and to the Sixth Congress of People's Deputies to do everything possible for the support of domestic science.

Our common task is to preserve and increase the scientific potential of the country in the interests of future generations.

Fourteen International Centers Created in Siberia

927A0194A Moscow IZVESTIYA (Morning edition)
in Russian 1 Jun 92 p 2

[Article by IZVESTIYA correspondent Kim Smirnov: "In Siberia 14 International Scientific Centers Have Been Established"; first paragraph is IZVESTIYA introduction]

[Text] Baykal water is already being sold. I found out about this at the presentation of 14 international research centers (MTs's) of Siberia, which was held on 28 May in the Blue Hall of the new building of the presidium of the Russian Academy of Sciences.

Indeed, the Baykal International Center of Ecological Research displayed at its stand large beautiful bottles with the blue label "Baikal Water" [in English—translator]. Inturist bought 2,000 of the test batch of 14,000 bottles. At 300 rubles apiece. They say that they were then sold to foreigners for \$5 each.

It cannot be helped: In order to save and study Baykal, today it is necessary to learn to obtain money. If it is possible to obtain credit of \$4-6 million and to produce 20 million bottles a year, the received money can mark the beginning of the Baykal Science Fund.

Baykal is becoming a magnet which is attracting scientists of the entire world. In addition to the Siberian Department of the RAS [the Russian Academy of Sciences], the Baikal Research Association of the United States, the Japanese Association of Baikal International Research Programs, and the Royal Belgian Institute were the founders of the international research center on the shores of the "glorious sea." Scientists of Germany, China, Mongolia, Sweden, France, Norway, and other countries are conducting research at the lake.

The Altay International Center of Humanities and Biospheric Research, which is studying the initial settling of Central Asia by man, the culture and traditional world outlooks of the peoples of the Altay and Central Asia, and the unique gene pools of life—from plants and animals to the population genetics characteristics of the peoples of Siberia—also concentrates such a planetary constellation of science. The center is conducting archeological digs that are sensational in results. Is it really not interesting, for example, during the year of the 500th anniversary of the discovery of America to learn that many, many centuries before both Columbus and the Vikings, 20,000-25,000 years ago, the New World was discovered by the ancient Siberians? There is also much of interest at the stands of the other international centers.

What fate awaits this spiritual wealth, which grew from the "primary atom" of Academician Lavrentyev, under the conditions of our tough market, which is ungracious to science? Are the international research centers, which are now growing like mushrooms, not doomed to frost injury?

At one of the stands I asked this question to a group of Siberian Academicians. They consider: No, on the contrary, the international centers have a great future. Because in each specific case a unique object or unique equipment or both together were made the basis for them.

Russian Academy of Sciences Tackles 'Property Issue'

927A0184A Moscow RADIKAL in Russian
No 14, 17 Apr 92 pp 9, 10

[Excerpts from speech by Academician O. Nefedov at the General Meeting of the Russian Academy of Sciences, recorded by Vladimir Pokrovskiy, under the rubric "Reforms in Science": "The Academy Is Renouncing Its Own Property"—first two paragraphs are RADIKAL introduction]

[Text] As we have already reported (RADIKAL, No 13, 1992), at the General Meeting of the RAS [the Russian Academy of Sciences] the question of the property of the RAS was raised. After the report of Academician O. Nefedov, who examined quite in detail the situation with academic property today, and several statements—among them the statement of Academician V. Koptuyg, who called upon the General Meeting to put an end without delay to this question and to recognize for the possessions of the RAS the federal status of property, was particularly conspicuous—such recognition was made practically without discussion.

The arguments of the academicians seem very reasonable to us, however, the fact that such a complex and key question for the entire academy was settled in such haste is somewhat disturbing. We hold that the problem should be discussed, at the minimum, with the participation of all interested parties, including the associates of academic institutes, who are not members of the RAS. As a starter for such a discussion we call the attention of the readers to excerpts from the statement of Academician O. Nefedov.

The events of the past year have changed the status of the academy, however, the question of the legal regime of academic property remains one of the central ones.... I will recall that by the second article of the Ukase of the USSR President of 23 August 1990 "On the Status of the USSR Academy of Sciences" the fixed capital and other state property, which were in the use of institutes, laboratories, enterprises, and organizations of the USSR Academy of Sciences, were transferred to its exclusive ownership. However,...the RSFSR Supreme Soviet by its decree of 21 September of the same year suspended the effect of this article on the territory of the RSFSR as being at variance with the Declaration of Sovereignty of the RSFSR and the RSFSR law on property on the territory of the RSFSR. Then President B. Yeltsin on 21 December 1991 in development of the processes, which had taken place in the country and in academic science, promulgated the ukase on the establishment of the RAS.

In conformity with this ukase the buildings, major scientific instruments, ships, scientific equipment, and other state property, which at the moment of the signing of the ukase were in the use and at the disposal of institutions and organizations of the USSR Academy of Sciences, which were located on the territory of the Russian Federation, were transferred to the ownership of the RAS. According to this document, the question of the use of our property, which was on the territory of the other sovereign states, should have been settled on the basis of the corresponding

agreements, while the question of the assignment of proprietary rights within the RAS should have been settled on the basis of the charter of the RAS and the legislation in force in the Russian Federation.

By the same ukase the government of the Russian Federation was commissioned to take steps on the attachment to the institutes, laboratories, enterprises, and organizations, which are subordinate to the RAS and are located on the territory of the Russian Federation, of their buildings, fixed capital, and other property.

However, a month later, on 27 December, the Supreme Soviet of the Russian Federation adopted a decree on the demarcation of state property of the Russian Federation into federal and state property of territorial formations within the Russian Federation (including here Moscow and St. Petersburg), as well as into municipal property. According to this decree the scientific research institutions, enterprises, and other facilities of the RAS, along with the others in the sphere of science and higher education, in the area of their possessions were grouped with objects of state property, which has an exclusively federal status. The State Committee for the Management of State Property (the so-called Goskomimushchestvo), which in consultation with ministries and departments of the Russian Federation has the right to delegate to these ministries and departments some rights and powers, has the rights of disposal with respect to objects of federal property....

The federal status of the property of the RAS was confirmed by the subsequent Ukase of the President of the Russian Federation of 29 December of last year and it was established, in particular, that its privatization can be carried out only in accordance with a decision of the government of the Russian Federation.

Thus, the Supreme Soviet of the Russian Federation and the President of the Russian Federation himself did not confirm the property status of our academy, which was specified by the Ukase of B. Yeltsin "On the Establishment of the Russian Academy of Sciences." To execute the decree of the Supreme Soviet of the Russian Federation of 27 December the Committee for Science and Public Education of the Supreme Soviet of the Russian Federation prepared the draft of the decree of the presidium of the Supreme Soviet "On the Buildings, Structures, Facilities, and Property of Institutions and Organizations of the System of Science and Education." The Academy of Sciences—Academicians Koptuyug, Kudryavtsev, and Nefedov, Professor Andreyev from the Institute of State and Law, and Chief of the Economic Planning Department Konoshenko—took an active part in the work on this draft. As a result it was possible to include in the draft of the decree the point that henceforth until the adoption by the Supreme Soviet of a decree on the status of the RAS, the functions of the management of the property attached to the academy would be assigned to it, in the person of its presidium....

The prepared draft was approved in the Committee for Science and Public Education, was submitted for approval to the Committee of the Supreme Soviet for Legislation and First Deputy Chairman of the Supreme Soviet of the Russian Federation Filatov, as well as was discussed at a meeting of the presidium of our academy on 24 March of this year. Unfortunately, its adoption by the Supreme Soviet

of the Russian Federation was delayed due to the absence of Academician Shorin, chairman of the Committee for Science and Public Education, who until the end of March was on a business trip, while after his return intensive work on the preparation of the Congress of People's Deputies was begun.

The vagueness in the understanding of the property status of the RAS to a large extent is a reflection of the problems of the interpretation of the status of the RAS as a whole. In conformity with the ukase of Yeltsin the RAS as the highest institution of Russia is an all-Russian self-administered organization that operates on the basis of the legislation of Russia and its own charter. Thus, the academy has the specific nature of both a state organization (for example, state budget financing) and a public, self-administered organization. However, very often in case of the discussion and settlement of questions, which pertain to the RAS, only one of these components is examined. In particular, we have occasion to come across this all the time, as soon as a discussion of some questions, which pertain to the academy, begins at various state and governmental levels. All this is complicating extremely the solution of many problems of our life, including the problems of the property of the RAS and questions of the leasing by academic institutions of municipal property and the leasing out of academic property. Apparently, a state-public status or the status of a state self-administered scientific institution, which is similar to the one granted to Moscow State University, is optimal for our academy.

Recognizing the federal status of the property of the RAS, one should try to see to it that the Academy of Sciences would manage itself, and not through organs of the Goskomimushchestvo, the property attached to it with the subsequent delegation of the rights of management to its institutes and institutions in conformity with the charter and the decisions of the General Meeting of the academy.... The decision on the change of the forms of ownership of buildings, structures, production facilities, the infrastructure, and the social sphere, including housing, should be made by the government of the Russian Federation only on the basis of the petition of the Academy of Sciences.... The question of leasing out the property that we have, which under the conditions of the inadequacy of the state budget is assuming particularly great importance, also requires clear regulation. One must not allow the settlement of these questions to be turned over to committees for the management of state property of various levels and to be placed under their strict control, which will extremely complicate or will make practically impossible the optimum use of academic property in the interests of basic science, the reality of such a danger absolutely exists.

There follows from what has been said the necessity of the adoption of a decree of the Supreme Soviet of the Russian Federation or its presidium on the status of the RAS, including the legal regime of its property, and, subsequently, a more complete law on the RAS, perhaps, as part of the state concept of scientific and technical policy....

On the eve of the General Meeting of the academy the General Meeting of the Siberian Department of the RAS adopted practically unanimously a resolution on the legal and property status of the Academy of Sciences. On 6 April

this resolution was also supported by the General Meeting of the General and Technical Chemistry Department of the RAS.

It is important that the General Meeting of the Academy would specify its position clearly and would make a decision on these questions, having given the corresponding order to the presidium of the RAS on the quickest practical implementation....

Staff of Ukrainian Duma S&T Policy Collegium

927A0176A Kiev PRAVDA UKRAINY in Russian

11 Apr 92 p 2

[Order of the President of Ukraine "On the Staff of the Collegium for Questions of Science and Technology Policy of the State Duma of Ukraine" of 7 April 1992]

[Text] Order of the President of Ukraine "On the Staff of the Collegium for Questions of Science and Technology Policy of the State Duma of Ukraine"

To approve the staff of the Collegium for Questions of Science and Technology Policy of the State Duma of Ukraine (attached).

[Signed] President of Ukraine L. Kravchuk

Kiev

7 April 1992

The Staff of the Collegium for Questions of Science and Technology Policy of the State Duma of Ukraine

Yukhnovskiy, Igor Rafailovich—state adviser of Ukraine for questions of science and technology policy, people's deputy of Ukraine—chairman of the Collegium.

Balabuyev, Petr Vasilyevich—general designer of the Aviation Scientific and Technical Complex imeni O.K. Antonov, doctor of technical sciences.

Bizov, Vladimir Fedorovich—rector of the Krivoy Rog Mining Institute, doctor of technical science, professor.

Borisyuk, Mikhail Demyanovich—general designer of the Zavod imeni Malysheva Production Association, candidate of technical sciences.

Kamenetskiy, Yuriy Teodorovich—president of the Ukrainian Ukrsudostroy Shipbuilding Corporation, head and

chief designer of the Chernomorsudproyekt Special Design Bureau, candidate of technical sciences.

Kraynik, Lyubomir Vasilyevich—general director of the Galavto Association, candidate of technical sciences.

Kuchma, Leonid Danilovich—general director of the Yuzhnyy mashinostroitelnyy zavod Production Association, candidate of technical sciences.

Lavrinovich, Aleksandr Vladimirovich—deputy chairman of the Popular Movement of Ukraine, senior scientific associate of the Institute of Superhard Materials imeni V.N. Bakul of the Academy of Sciences of Ukraine, candidate of technical sciences.

Lysenko, Vladimir Sergeyevich—head of a department of the Institute of Semiconductors of the Academy of Sciences of Ukraine, doctor of physical mathematical sciences, professor.

Melnichuk, Dmitriy Alekseyevich—rector of the Ukrainian Agricultural Academy, corresponding member of the Academy of Sciences of Ukraine, academician of the UAAN, doctor of biological sciences, professor.

Paton, Boris Yevgenyevich—president of the Academy of Sciences of Ukraine, academician, doctor of technical sciences, professor.

Sergiyenko, Ivan Vasilyevich—deputy director of the Institute of Cybernetics imeni V.M. Glushkov of the Academy of Sciences of Ukraine, academician, doctor of physical mathematical sciences, professor.

Topchiiy, Dmitriy Gavrilovich—general director of the Kiyevskiy radiozavod Production Association.

Chirkov, Vladimir Grigoryevich—chief scientific associate of the Center of Studies of the Scientific and Technical Potential and the History of Science imeni G.M. Dobrov of the Academy of Sciences of Ukraine, doctor of economic sciences.

Shidlovskiy, Anatoliy Korneyevich—academician secretary of the Physical and Technical Problems of Power Engineering Department of the Academy of Sciences of Ukraine, academician, doctor of technical sciences, professor.

Shpak, Petr Fedorovich—head of a department of the Institute of Geological Sciences of the Academy of Sciences of Ukraine, corresponding member of the Academy of Sciences of Ukraine, doctor of geological mineralogical sciences.

Poll Examines Russian Computer, Information Market

927A0185A Moscow RADIKAL in Russian
No 14, 17 Apr 92 p 12

[Article by Boris Grushin, Georgiy Smolyan, and Dmitriy Chereshekin under the rubric "Sociological Research": "The Production of Means of Informatization on the Road to the Market. The Results of a Poll of Managers of Enterprises"—first paragraph is RADIKAL introduction]

[Text] In October 1991 the Vox Populi service (the service of Professor Grushin) to the order of the All-Union Scientific Research Institute of Systems Research of the Russian Academy of Sciences, now the Institute of Systems Analysis, conducted a survey of 73 managers of enterprises of the sector of computer hardware and information science in Moscow, Severo-Donetsk, Kiev, Vinnitsa, Kazan, Minsk, Kursk, Orel, Penza, and St. Petersburg. The goal was to establish their attitude toward the changeover of enterprises to a market economy.

Readiness for a Market Exists

The responses to the question "How do you assess the readiness of your enterprise for the acceptance of new technologies, economic mechanisms, and production conditions, including ones which are being introduced from developed countries?" were broken down in the following manner:

	high readi- ness	sooner high	sooner low	low	found it hard to respond
as a whole	6.8	52.1	30.1	9.6	1.4

The majority of assessments, as we see, are cautious. The conviction of managers of sooner the high than the low readiness of their enterprises for a market predominates. Chief designers are pessimistic in this respect—their overwhelming majority (53.8 percent) are inclined sooner to a low assessment of the readiness of their enterprises.

The readiness for a market increases depending on the rank of the enterprise—from an ordinary organization (41.2 percent) to an organization that is a monopolist (58.4 percent).

The responses to the question about the preferred means of the organizational transformation of enterprises also testify to the definite readiness for entry into the market of the sector of the production of means of informatization (here and below in similar cases each respondent could give several responses, as a result of which the grand total of the latter exceeds the number of respondents themselves):

joint-stock enterprise	60.3
leased enterprise	12.3
state enterprise	11.0
holding company	9.6
concern	5.5
cooperative	1.4
other types	4.1
found it hard to respond	4.1

The certainty of the majority of respondents that their enterprises already in their present state are ready for new economic relations, is evident here.

When carrying out technological and organizational modernization more than half of the production managers (54.8 percent) are relying on the enterprises' own assets. Only one in 10 enterprises is relying on the state budget, that is, on the preservation of nonmarket relations. The opinions about the necessity of foreign investments for the modernization of enterprises are very numerous.

The Conditions of Entry Into the Market Are Unfavorable

The responses to the question "How do you assess as a whole the conditions of the entry of your enterprise into the market?"

	sooner favorable	sooner unfavorable	found it hard to respond
as a whole	20.5	76.7	2.7

With the exception of the managers of enterprises with the smallest number of employees all the groups are unanimous in pessimistic assessments of the conditions of the changeover to market relations.

What are the main difficulties of the entry into the market of enterprises that are the manufacturers of means of informatization?

One of the external difficulties—the lack of the necessary laws—came out in first place in the responses, which once again testifies mainly to the unfavorable conditions of the changeover of the sphere of production being studied to market relations. To counterbalance this purely internal problems—the lack of preparation of the collective, the lack of the necessary personnel—held the last places.

The responses to the question of similar meaning "What is hindering the use of the potential of your enterprise for the increase of the competitive ability of the products being produced?" were broken down in the following manner:

the prevailing economic mechanisms and price mechanism	42.5
wage restrictions	32.9
the technical and economic level of products	31.5
existing legislation	24.7
restrictions on the choice of partners who are suppliers	2.7
the state order and restrictions on the free selling of products	1.4
other conditions and restrictions	21.9
found it hard to respond	0.0

And once again external difficulties came out in first place.

The Basic Shortage Is Economic Information and Computers

The opinion that at the majority of organizations computers have accumulated in abundance is widespread. Is this the case for organizations that are the manufacturers of means of informatization? The responses to the question "How

should the indicator of the degree of equipment with computers be changed at your enterprise?" were the following:

	decrease the degree of equip- ment	leave it unchanged	increase it	found it hard to respond
as a whole	2.7	12.3	75.3	9.7

From the presented data it follows that the overwhelming majority of manufacturing enterprises are experiencing a need for the increase of the indicator of the degree of equipment with computers.

The responses to the question "What share of the information processed by computers (of its total volume) is required for the support of your needs?" testify to the causes of the urgent need for computers:

up to 15 percent	8.2
16-25 percent	8.2
26-40 percent	13.7
over 40 percent	50.7
found it hard to respond	19.2

It is obvious that one cannot do without computers—half of all the specialists talk about the necessity of processing on computers more than 40 percent of all the information being handled at the enterprise.

The State as a Supplier of Information Is Competitive

In the study the preferences of some channels or others of obtaining information were established. Let us examine first of all the nature of the responses to the question "From whom would you prefer to buy or obtain marketing information (about needs, the demand, potential partners, possible competitors, and so forth) for the enterprise?":

from commercial organizations	42.5
from foreign sources	41.1
from intermediary organizations, on exchanges, and so forth	39.7
from state organizations	28.8
through other channels	4.1
found it hard to respond	5.5

It is clear that with regard to marketing information the respondents first of all prefer to apply to the corresponding partners of market structures. At the same time more than a fourth of the responses were given, however, in favor of state organizations.

The responses to the question "From whom would you prefer to buy or obtain specialized information (new technologies, standards, patents, and so forth)?" belong to this area of analysis:

from state organizations	53.4
from foreign sources	49.3
from commercial organizations	23.3
from intermediary organizations, on exchanges, and so forth	17.8
through other channels	2.7
found it hard to respond	6.8

Conclusion

The last open question of the questionnaire invited the respondents to express in free form their opinions about the problems of the entry into the market of enterprises that are the manufacturers of means of informatization. The following responses are the most interesting ones:

"Due to the increase of spending in all directions enterprises are forced to carry out development only in accordance with applied orders."

"The sector may cease its existence in case of the liberalization of prices without the preliminary elimination of monopolism."

"It is necessary to formulate a state program of informatization, which is based on joint activity with foreign firms. This will ensure the support of our manufacturers of means of informatization."

"It is necessary to establish a special service, which provides information on the state and proposed development of all sectors which are connected with the production, output, realization, and introduction of computer hardware. There should be reliable information about the need for cooperation, collaboration, and commercial activity."

Government Efforts To Recreate Patent System Detailed

927A0195A Moscow *DELOVOY MIR* in Russian
29 Apr 92 p 9

[Interview with Viktor Ivanovich Blinnikov, first deputy chairman of the Committee for Patents and Trademarks of the Ministry of Science, the Higher School, and Technical Policy of the Russian Federation, by Yuriy Krasnov; date and place not given: "The CIS Is a Patent Vacuum. An Interview With Viktor Ivanovich Blinnikov, First Deputy Chairman of the Committee for Patents and Trademarks of the Ministry of Science, the Higher School, and Technical Policy of the Russian Federation"]

[Text] [Krasnov] The disintegration of the USSR led to the elimination of the unified patent system headed by the USSR State Patent Office and to the elimination of the unified patent space. What are the consequences of this situation for the economy of the countries of the Commonwealth?

[Blinnikov] In all the countries of the CIS due to the formed vacuum in the system of the protection of industrial property an adverse situation with invention activity, with the development of new commodities, and with the introduction of new technologies has formed. Harm has actually been done to the development of scientific and technical progress in all the states of the community. For several months now patents for inventions have not been issued. All this is evoking legitimate protests among people of creative thought. New patent offices have been established only in Russia and Ukraine. In essence none of the states of the Commonwealth has passed any new laws in this sphere. The legal aspects of the effect of the protective documents, which were in effect in the USSR, have not been determined.

[Krasnov] And to what degree is the formed situation affecting industrial, scientific, and technical cooperation with western countries and foreign trade in scientific and technical knowledge?

[Blinnikov] Precisely the vagueness with the legal status of patents and other protective documents in the area of industrial property is forcing our foreign scientific and industrial partners to refrain from submitting to us applications for their own inventions. It is not clear to firms on what territory their previously registered protective documents are valid, what the procedure of drawing up new documents is, and who will guarantee their protection. Under these conditions it is hardly possible to interest any foreign firm in making capital investments in the economy of states that do not guarantee the protection of industrial property. In short, the introduction in our economy of advanced western technologies is being hindered, the development of all forms of scientific and technical cooperation is being artificially kept in check.

[Krasnov] What has already been done and what are the plans of Russia with regard to setting up new effective protection of industrial property on the territory of the Federation?

[Blinnikov] By the Ukase of President of Russia Boris Nikolayevich Yeltsin of 24 January 1992 the establishment of a system of the legal protection of industrial property in Russia was begun. The Committee for Patents and Trademarks of the Ministry of Science, the Higher School, and Technical Policy of the Russian Federation was established. The Committee became the direct heir of the USSR State Patent Office, that is, it bears all its functions, but only on the territory of Russia, the Committee has begun the drafting of the corresponding laws of Russia. A portion of them have been considered in the chambers of the Supreme Soviet of the Russian Federation. It is a matter of "The Patent Law of Russia," "The Law on Trademarks, Service Marks, and Names of the Places of Origin of Goods," "The Law on the Legal Protection of the Technologies of Integrated Microcircuits," and "The Law on the Protection of a Program for Electronic and Computing Machines and Databases." It is necessary to speed up their passage in the Supreme Soviet of Russia.

In the independent states of the Commonwealth autonomous systems of the protection of industrial property and independent organs of this protection are beginning to be established. However, the idea that one must not cut science and technical achievements into small isolated pieces has already ripened almost everywhere. Everyone will suffer from this. A system of coordination is needed. Harmonized principles are required.

In October 1991 in Moscow the development of a mechanism of the joint guarantee of the protection of industrial property on the territory of all the countries of the former subjects of the USSR was begun, while in December in Minsk the authorized representatives of a number of states of the Commonwealth signed the Agreement on Interstate Scientific and Technical Cooperation. The parties to this agreement came to an understanding on the coordination of the legal norms, which regulate scientific and technical activity, and on the harmonization of the system of the protection of industrial property. In conformity with the protocol to the agreement the Temporary Agreement on the Protection of Industrial Property took effect. An interstate organization for the protection of industrial property, which the Administrative Council, which consists of representatives of the independent states that signed the agreement, will head, is being established. The establishment of the Interstate Patent Office and Patent Court is also on the agenda. In short, the ice has broken. It is up to the leaders of the states, who intend to include the indicated problems on the agenda of the next summit meeting of the Commonwealth and to make a decision on the possibility of other states (for example, the Baltic countries and the former partners from the Council for Mutual Economic Assistance) becoming parties to the Temporary Agreement on the Protection of Industrial Property, to decide.

Russian Intellectual Property Agency Hopes To Sign Bern Convention

927A0171A Moscow NEZAVISIMAYA GAZETA
in Russian 8 Apr 92 p 6

[Article by Yelena Voronenkova under the rubric "Property": "The Russian Intellectual Property Agency Wants To Sign the Bern Convention. Intelligence Officers Have Left the Ranks of the New Agency"]

[Text] The Russian Intellectual Property Agency (RAIS) under the president of Russia has been established in Russia. It is the successor of a well-known structure of the former USSR—the GAASP (the State Agency for Copyrights and Related Rights), which earlier was known to everyone as the VAAP [All-Union Copyright Agency].

The VAAP for representatives of the creative intelligentsia does not need presentation. This agency monopolized the collection and payment of royalties (moreover, foreign currency royalties were paid, naturally, in rubles) and the exporting and importing of the copyrights of Soviet citizens. Having frozen the accounts of the GAASP at the USSR Bank for Foreign Economic Relations, to which the royalties of authors were remitted, and having used the personal money of citizens for the payment of state debts, the government placed the GAASP (VAAP) in a very awkward position. In such a situation the RAIS is also beginning its work.

In the words of RAIS President Mikhail Ipatov, the activity of the agency will be not ideological activity, but activity aimed at the protection of rights. The basic goal is the

protection of the rights of authors and the creation of favorable conditions for the creative intelligentsia. The RAIS will engage in the preparation of a law of Russia on copyrights and related rights and will become a party to the Bern Convention. At this moment, in the words of the president, the RAIS has been forced to continue the work on the collection and payment of author's fees and on the sale and purchase of copyrights and related rights, but it intends to demonopolize its rights and to stimulate the establishment of nonstate structures in the sphere of the protection of intellectual property.

"It is necessary to remember," M. Ipatov stressed, "that intellectual property is not ideas in a person's head. This is inventions, a copyright, know-how, and so on, that is, the material embodiment of ideas. And in this sense the market can give them the most realistic appraisal."

The collective of the RAIS consists mainly of former staff members of the GAASP, with the exception of representatives of foreign intelligence, who left the agency "at their own request." There were not more than 10 such people on the central staff, as Ter-Gazaryants, deputy chairman of the board of the former GAASP, says.

The representatives of the former GAASP and the new RAIS were not unanimous in the evaluation of the financial status of this institution. Ter-Gazaryants spoke about the multimillion ruble debts of the GAASP to domestic and foreign authors, emphasizing that these are the debts not of the organization, but of the state. At the same time M. Ipatov stated that today the RAIS has neither debts nor money....

Continuation of Cocom Technology Export Restrictions Criticized

927A0196A Moscow DELOVOY MIR in Russian
No 92, 15 May 92 p 4

[Article by Yuriy Malinov: "Cocom Is Alive. Will Cocom Live?"—first paragraph is DELOVOY MIR introduction]

[Text] The majority of sensible people both in the West and in the East are certain that the times of the Cold War have departed permanently. However, it turns out, the survivals of it are still very tenacious. One of the examples is specific restrictions on the export of high technology equipment to the countries of Eastern Europe and the former Soviet republics, which remain to this day and were introduced back during the years of the irreconcilable opposition of West and East. Up to the present the Coordinating Committee on Export Control (Cocom), to which 17 states (the NATO countries without Iceland), as well as Australia and Japan belong, is carrying out the supervision of exports to the former socialist countries.

The other day the U.S. Department of Commerce announced the easing of restrictions regarding the control of American exports to Western Europe and Japan, as well as the relaxation of requirements in the area of licensing conditions for reexport from these countries. It is possible only to welcome this decision. It will probably increase the possibility of the acquisition of new technologies by the countries of Eastern Europe and the CIS. According to the announcement of the department, the need to obtain thousands of export licenses, including in the sphere of computer production, is disappearing, while American exports themselves will increase by approximately \$2.5 billion.

In speaking about the necessity of liberalizing trade, U.S. President G. Bush stated that over the last three years the world had undergone fundamental changes and the decision that was made had become possible "owing to the new strategic situation and the peaceful revival of freedom in the former communist countries." "By eliminating the barriers in the way of economic freedom, we are freeing the powerful forces of creativity and economic growth," Bush stressed.

However, it is hardly worth idealizing the words of the U.S. President. American interests first of all are behind them, but the Cocom restrictions on exports to the former communist countries for the time being remain, true, to a small extent. The restrictions connected with trade in products, which can be used in the production of nuclear weapons and in the improvement of ballistic missiles and equipment for conducting combat operations at night, remain in force. As before it is necessary to obtain a license for the export of supercomputers, cryptographic equipment, high-speed cameras, several types of X-ray equipment, and other goods.

Nevertheless definite shifts are still occurring. On 5 May the White House announced the official elimination from the prohibited lists of Cocom of Hungary, which, on its part, made the commitment to establish close "domestic control over the use of the latest technologies being made available to it by the West." It is also planned to liberalize trade with Czechoslovakia and Poland, but only after they have established the corresponding legal base. The members of Cocom are undertaking to help the three states of the Baltic region

provided they introduce regulations that guarantee against the reexport and possible dispersion of the technologies that are being made available.

As for the countries of the CIS, at its March meeting the Cocom executive committee decided to expedite the cautious review of the discriminatory practice that had existed with respect to them. True, here it stipulated that one should avoid the dispersion of strategically important technologies and the possibility of their reexport to "risky countries." It was decided that control on the part of Cocom will remain in force, but only "temporarily and as a precaution." Incidentally, since last year it has applied only to truly superadvanced technologies. It is a matter mainly of technologies, which concern telecommunications systems and machine tool equipment.

Many western experts consider that Cocom should be reorganized so that it would focus attention on the problems of trade between North and South, that is, trade between wealthy and poor countries, as well as on questions of the nonproliferation of nuclear weapons and the export of the corresponding technology. However, for the present it is not clear whether this organization is suited for the fulfillment of such a task.

Without the more extensive participation of the East European countries, as well as the states of Asia and the Middle East, any control whatsoever will be, in all likelihood, ineffective.

It is no secret for anyone that the restrictions on the export of technologies to the former USSR and other countries of Eastern Europe, which were introduced by Cocom, are turning into a loss of significant revenues for western companies. In a report, which was prepared by the organization "Economist Intelligence Unit," it is indicated, in particular, that, for example, in 1985 alone these restrictions cost American corporations \$9.3 billion and led to the loss of 188,000 workplaces.

Incidentally, the United States traditionally held the most rigid position on the question of exports to the former USSR. It is not surprising, therefore, that precisely American manufacturers protested most of all against this policy. And now they are putting great pressure on the U.S. Administration, demanding that, for example, fiber-optic cable be eliminated from the list of goods that are prohibited by Cocom for export to the countries of the CIS.

Industrialists argue that this cable, which is used in laying modern communications systems, particularly telephone lines, is produced not only in the Cocom countries, but also in a number of others, and, therefore, the export ban, which should supposedly "complicate the intelligence activity of Russia," does not make sense. But meanwhile the market of the Commonwealth, which is important for them, is being captured by competitors.

Thus, the National Security Agency (NSA) acknowledged that at least 10 countries, which do not submit to the Cocom regulations, can deliver cable to the CIS. These are Austria, Brazil, China, Israel, India, Taiwan, Finland, Sweden, Switzerland, and South Korea.

There are already examples of the fact that competitors of the Americans will not bring themselves to wait. As the newspaper YOMIURI SHIMBUN reported, the contract,

which was concluded by the Japanese firm Nippon Denki with the Danish firm Telekom Denmark and the Russian firm Softelekom, provides for the establishment on the territory of Russia of a modern digital communications network with a total length of more than 1,000 km. It will interconnect Moscow, St. Petersburg, and Kingisepp, as well as will make it possible to maintain reliable round the clock communications between Russia and Western Europe. The central station will be located in Kingisepp, from which an underwater fiber-optic cable will be laid along the bottom to the Gulf of Finland and the Baltic Sea to Denmark.

Owing to the fact that the project provides for the delivery to Russia of the latest digital communications system with a capacity of 140 megabytes, initially there were fears that it would not receive the approval of Cocom, but this time this did not happen. It is proposed to complete all the work on the establishment of the new line, the cost of which is estimated at \$1.2 billion, by the end of this year, while in March 1993 it will go into operation.

The construction of this digital network, in the opinion of Japanese and Danish specialists, affords the prospect of building later through the territory of Russia a transcontinental communications system, which will link Japan with Western Europe. The first meeting of the international consortium, which as the first step intends to lay a new fiber-optic cable between Japan and Russia, was held in January in Tokyo.

Along with representatives of Softelekom and the firm Telekom Denmark the Japanese company KDD and Korea Telecom of South Korea also took part in it.

The Organization for Economic Cooperation and Development also intends to give the former USSR assistance in the elimination of the crippling disproportion between the highly developed communications technology, which is used for military purposes, and the catastrophic backwardness of the communications system at the everyday level. The OECD, which unites the leading industrially developed countries, decided as a step on aiding the conversion of the defense industry of the CIS to promote the use for civilian purposes of the satellite and microwave communications technology, which is used by the military. If these plans, which financially may be supported by the World Bank, are implemented, they will become the first series of real steps on the aiding by countries of the West of the conversion of the military industry in the former USSR.

However, the West fears the the republics of the collapsed USSR might deliver to other countries technologies that are connected with the production of strategic weapons. Therefore, the countries of the "Seven" made the decision to study the system of control of the export of weapons and strategic materials, which exists in the CIS. As the London TIMES reported, according to the information that it has, "the reward to the republics, which demonstrate the resolve not to allow the proliferation of weapons, will be their elimination from the list of Cocom...."

All right, we shall see what we shall see.

Turkmenistan Passes Law on State S&T Policy

927A0186A Ashkhabad TURKMENSKAYA ISKRA
in Russian 1 May 92 p 2

[Interview with Garly Myalikgulyyevich Myalikgulyyev, chairman of the Committee for Science, Ecology, and the Use of Nature of the Supreme Soviet of Turkmenistan, by Z. Agamamedova; date and place not given: "New Mechanisms Have Been Triggered. Henceforth Science and Technology of Turkmenistan Are Fated To Grow and Develop on Market Soil"—first paragraph is TURKMENSKAYA ISKRA introduction]

[Text] At the last session of the Supreme Soviet the Law of Turkmenistan "On State Science and Technology Policy" was passed. G.M. Myalikgulyyev, chairman of the Committee of the Supreme Soviet of Turkmenistan for Science, Ecology, and the Use of Nature, comments on it.

[Agamamedova] Garly Myalikgulyyevich, the need for the passage of this law became ripe long ago. Will it be able to provide favorable conditions for the development of science and technology in our state?

[Myalikgulyyev] The law specifies completely new forms and methods of the management of scientific and technical progress and clearly regulates the functions of organs of executive power and the scientific and technical community. And, what is the most important thing, the changeover from state centralized planning of the development of science and technology to the state-public regulation of scientific and technical progress is ensured.

The passed set of economic laws and the transfer to the jurisdiction and ownership of the republic of all its natural resources, productive capital and scientific and technical potential, scientific and technical societies, higher educational institutions, and enterprises are the basis of this. In short, henceforth science and technology are fated to grow and develop on market soil, by means of economic and sociopsychological methods.

[Agamamedova] In connection with this it is proposed to establish a completely new management structure—the Council for Science and Technology. What are its peculiarities?

[Myalikgulyyev] The council, of which prominent scientists and specialists will be members, will be formed under the President of Turkmenistan, more precisely, under the Council for Science, Education, and Sociocultural Questions.

The sphere of its activity: the formulation of science and technology policy, the training of personnel, and the determination of the sources of financing of basic research. This will be a kind of coordinator of the work of scientific collectives. Until recently this activity was the prerogative of the Academy of Sciences of Turkmenistan, but the lack of

economic mechanisms (the State Planning Committee dealt with the distribution of finances) led to the curtailment of important work.

Moreover, earlier the USSR State Committee for Science and Technology financed basic research in accordance with the applications of the Turkmen SSR Academy of Sciences and individual institutes, bypassing the republic budget. The monitoring of the use of assets and the quality of the fulfillment of programs was also not carried out by republic organs. Now the right to determine the amounts of financing of scientific programs from the budget of Turkmenistan has been assigned legislatively to the Council for Science and Technology. It is natural that first of all the assets will be allocated for priority programs, which have been selected through competition and have undergone an extradepartmental independent examination.

[Agamamedova] Will the state budget, as before, be the only source that finances science?

[Myalikgulyyev] The science and technology fund will be the basic one in Turkmenistan. In addition to it other sources are also named in the law—various funds, to any of which scientists will be able to address an application for participation in the competition. The impartial distribution of assets is guaranteed.

[Agamamedova] Is there hope that under the conditions of the market scientific recommendations will not prove to be unclaimed?

[Myalikgulyyev] I think that there is. In the law the protection of the mutual interests of science and the market is envisaged, enterprise in the scientific and technical sphere is stimulated (Article 18). Henceforth scientific personnel, engineers, inventors, and developers of scientific and technical products can set up their own enterprises, the authors of the most promising developments have the right to choose independently for themselves both the client and the user of their scientific product and technology.

[Agamamedova] But are taxes established for entrepreneurs?

[Myalikgulyyev] The law guarantees favorable opportunities for enterprise in this sphere. For the purposes of stimulating the development of science, at the suggestion of the Council for Science and Technology, enterprises and organizations can be exempted from the payment of taxes. The list of them will be approved by the Government of Turkmenistan. Moreover, breaks on the taxation of the portion of the profit, which is channeled by them into investment funds, can be granted to the associations or organizations, which will direct their effects at increasing the technical level of production in conformity with the requirements of the domestic and foreign market. In short, new economic mechanisms of the management of science and technology policy, which are more reliable and powerful, are beginning to operate.

Official Interviewed on Drafting Presidential Decrees on S&T

927A0200A Moscow *RADIKAL* in Russian
No 16, 8 May 92 p 14

[Interview Ilya Vadimovich Lomakin-Rumyantsev, chief of the Department of Science and Technical Policy of the staff of the government, by *RADIKAL* correspondent Marina Lapina under the rubric "In the Corridors of Power"; date and place not given: "The Birth of an Ukase"—first paragraph is *RADIKAL* introduction]

[Text] Our correspondent Marina Lapina talks with Ilya Vadimovich Lomakin-Rumyantsev, chief of the Department of Science and Technical Policy of the staff of the government.

[Lapina] Ilya Vadimovich, you have held this post for a little more than two months. Therefore, I would ask you to start with to introduce yourself.

[Lomakin-Rumyantsev] Ilya Vadimovich Lomakin-Rumyantsev, born in 1957, graduated from the economics faculty of Moscow State University, dealt with questions of scientific and technical progress, my last place of work was the Analytical Center of the RAS [the Russian Academy of Sciences] for Problems of Socioeconomic and Scientific and Technical Development.

[Lapina] To what degree did Minister of Science B. Saltykov, who was your chief at the Analytical Center, contribute to your appointment to this position?

[Lomakin-Rumyantsev] Not in the slightest degree. Moreover, Saltykov promised the director of the Analytical Center "not to steal" me. He was one of the first to learn about my decision to transfer to the staff of the government, but after I had made it.

[Lapina] Does your department perform the same functions as the similar department of the former USSR Council of Ministers?

[Lomakin-Rumyantsev] For the present our functions are not strictly defined, inasmuch as the statute on the department has not been approved. But as a whole it is a matter of preparing government decisions and monitoring their fulfillment. We have 18 responsible performers. Responsible is not simply an epithet, but a real description of the work, inasmuch as a significant share of the responsibility for the preparation of decisions rests precisely on our staff members. They should ensure the qualified presentation of all the provisions of the document, make it legally competent, remove everything impractical that is contained in the proposed drafts....

Recently, as you know, the Ukase of the President "On Urgent Steps on the Preservation of the Scientific and Technical Potential" was finally signed. This is an example of the work of the department. The first versions of the Ukase depicted a financial paradise for scientists—if you consider 1991 a paradise. Then the work on the draft was begun. It was necessary to understand clearly and separate dreams from the proposals that are practicable today. The draft of the Ukase was submitted for approval to more than 20 interested departments. Among others the staff members of our department coordinated this work.

[Lapina] Should one understand you to mean that the people, who prepare documents in ministries and departments, do not have a sufficiently clear idea of the possibilities of the government, have inadequate knowledge of the situation, and have not mastered to a sufficient degree the technique of preparing similar documents? As a result do documents of the Manilov level inevitably appear, while your staff members adjust them with allowance made for the realities of "earthly life"? Do disagreements and conflicts, apparently, often emerge in connection with this?

[Lomakin-Rumyantsev] It happens. For example, differences with the leadership of the RAS arose here. It was a matter of the preparation of the government decision on the academy. From there they sent to the government a draft that had not been approved by anyone. It came to us and was sent for approval to the appropriate instances. Before long the academy sent the next draft, which again had not been approved by anyone. This is instead of beginning to work on the preceding one. We had to make a second round. Then a letter, which contains all sorts of complaints against us and against the Ministry of Science, the Higher School, and Technical Policy, appeared. As a result the ministry all the same brought together representatives of all the interested departments, whom this decree concerned, and now joint work on the elaboration of a coordinated version of the draft is under way. But the moment was missed. Of course, it is possible to assume the pose of offended people, but it is possible to work together and to seek a compromise.

I do not question the competence of all the people who prepare documents within ministries and departments. I have in mind a completely different thing. I will cite an example from one of the points of the Ukase on urgent steps, in particular, the point on transportation privileges for students and scientific associates. Indeed, without them our science and higher school will be in a very bad way. But in order for the corresponding point to become a line of the presidential ukase, it is necessary not simply to show the necessity of these steps, but also to specify how to implement them. This question is outside the competence of the Ministry of Science, the Higher School, and Technical Policy. It is in the jurisdiction of the Ministry of Finance. Several versions of the decision are possible. Their implementation will have different consequences for the Ministry of Science, the Higher School, and Technical Policy, the Ministry of Transportation, the Ministry of Finance.... The organization of the search for and the selection of an acceptable compromise decision are precisely one of the tasks of our department.

At times it is impossible to make such a decision at the given moment. Then the point of the document turns into a point of the assigner: The responsible departments are specified, the deadlines for the making of the final decision are set....

[Lapina] If we took as an example the preparation of "The Ukase on Urgent Steps," we would not be confining ourselves to one point, with which everything is clear. The situation is different with other provisions of the Ukase. In particular, the first and, in the opinion of many people, basic point—on the maintenance of the financing of institutions of science at the level of last year—was present in all the drafts. It disappeared completely from the final text of the Ukase. As far as I know, it was deleted by Gaydar with his own hand. What is to be done with this point?

[Lomakin-Rumyantsev] Yes, it disappeared. The wording, about which you spoke, is very simple and tempting, but no one can say how much is this "at the level of last year"? According to different estimates, from 60 billion to 220 billion rubles. But for the Ministry of Finance a general wording is unacceptable—it needs specific figures, moreover, by quarters.

[Lapina] The Ministry of Science, the Higher School, and Technical Policy gave these figures.

[Lomakin-Rumyantsev] This is one of the possible estimates, which, in particular, was made without consideration of the May cost increase, the increase of prices for energy resources, and so on.

There is also a second factor which is connected with the general trend of science and technology policy. To what extent is it possible today to regard the maintenance of financing at the level of last year (and at the same time the structure) reasonable? This is a very complicated question, which has not been settled not only at the level of the government, but also among scientists themselves. Based on all these considerations the corresponding point disappeared from the Ukase. I would not regard this as the result of the ill will of the Ministry of Finance, rather this is a reflection of the objective state of affairs.

[Lapina] Of course, it is not a question of ill will. In the end, the Ministry of Science, the Higher School, and Technical Policy and the Ministry of Finance in this situation have their own interests: For one it is to achieve the allocation from the budget of as large a sum as possible, while for the other it is to allocate as small a sum as possible. But here is what seemed strange to me in your discussion: You are more disposed to the position of the Ministry of Finance, although ideally you should defend the interests of science. Having embarked on the path of endless consultations on one question or another, you are thereby intentionally or unintentionally impeding the making of decisions. It is possible to discuss endlessly what "at the level of last year" means and whether this "at the level" is needed....

[Lomakin-Rumyantsev] Correct, that is why with respect to this Ukase the following decision was made: to achieve—and it was very difficult to do this for a number of reasons—the quickest appearance of the Ukase. No one, of course, expected that this is a panacea for science. It is a matter of a very limited number of priority steps. New steps, which, as you correctly stated, require consultations and careful checking, should then follow.

As to the proposed wording with respect to financing, it would only lead to a flow of letters from institutes, design bureaus, and scientific production associations with the demand to ensure last year's level of financing on the basis of their own calculations. We would once again make a deceiver out of the government.

In addition to the entirely natural fear of causing such a reaction, there are also considerations of another type. At one time it was announced that as of a specific date they were closing one of the institutes of the former Ministry of the Fish Industry. It would have been natural to expect that the associates would begin either to hold rallies or to express their discontent in some other way. Nothing of the sort. The people continued to go to work and wrote reports, although

they knew that not only would not one read them, but the typist would also not even have time to type them.

Approximately the same situation was observed in recent months. Everyone knew that there would be a decrease of financing—budget and decentralized—everyone knew about the coming reforms, but did hardly anything. I have the feeling that everyone expected a miracle. The proposed wording gave grounds to hope for this miracle.

Of course, there is another factor. It is no secret that a significant portion of our scientific and technical potential has already disintegrated. The pilot experimental base is collapsing, scientists are leaving, the scale of secondary employment is increasing, and so on. The very object of financing has changed. And it is not entirely proper to talk about the maintenance of the scale of financing at the level of last year.

Therefore, instead of politically apt wording we are proposing something different. Now in the Ministry of Science, the Higher School, and Technical Policy and other departments they are preparing documents, the basic idea of which should consist in the following: Those people, who make the decisions about the amounts of financing, should bear the same responsibility for the substantive aspect of science and technology policy as the departments that implement it. Moreover, these materials should be based on specific figures. Assume that given a specific amount of financing the state can provide free instruction at all higher educational institutions, in case of the decrease of these amounts by so much it can be a question of free instruction only at the 100 leading higher educational institutions of the country, while the rest will have to be closed and the question of introducing paid education will have to be raised. But this question is under the jurisdiction of the Supreme Soviet, inasmuch as it is a matter of amending the corresponding articles of the Constitution. The situation is the same with science.

The second idea, which I would like to incorporate in the materials being prepared, is the necessity of establishing special mechanisms of financing, which differ from the existing ones, for the various directions of the support of the scientific and technical sphere.

Therefore, I would not talk about the fact that the position of our department is closer to the position of the Ministry of Finance than to the position of the Ministry of Science, which should watch over its interests. Rather, we are for an intermediate position—we are seeking a compromise between what is desirable and what is possible.

'RADIKAL' Science News Briefs May 1992

927A0200B Moscow *RADIKAL* in Russian
No 16, 8 May 92; No 17, 15 May 92

[Article] [No 16, 8 May 92 p 9]

[Text] **The World**

The West Will Help Us, If We Do Not Help the East. The United States is threatening Russia and India with economic sanctions, if an agreement on deliveries to India of Russian rocket engines is concluded between these countries. The value of the contract is estimated at \$200-250 million. Washington is demanding that we rigorously observe the conditions of the control of rocket technology.

Russia did not sign the corresponding agreement, but gave the promise to act in accordance with its provisions. However, in the opinion of specialists of Glavkosmos [the Main Administration for the Development and Use of Space Hardware], the plant, which we intend to sell to the Indians, cannot be used for military purposes, and the United States in this case is guided by motives of protectionism. By having met our obligations to India, we are risking losing the promised American aid in the amount of \$4 billion. Refusal will entail the cooling of relations with the great state of Asia and the loss of an enormous potential market for our high technologies.

The New American Space Shuttle Endeavor Is Ready for Launch. The launch is planned for 7 May. During the mission the astronauts have to complete a complicated operation on the rescue of an expensive communications satellite. The astronauts will make three space walks in order to install on the satellite a 10-ton engine which will enable the spacecraft to attain the necessary orbit.

The Country

It Is Simply Not Possible To Sell the Topaz. The deal on the sale of the space nuclear reactor in the United States, which for more than a year it was not possible to complete due to opposition of the American bureaucracy, has now come up against a paper barrier in St. Petersburg. Russian authorities stated that the necessary export license for the exporting of the reactor does not exist. Steven Afterwood, representative of the Federation of American Scientists, considers that the \$7.5 million, which the Americans are prepared to pay for the reactor, will still prove to be a sufficiently weighty argument. But for the time being negotiations are going on.

We Will Destroy Missiles by Means of Bacteria. The director of the Moscow Institute of Microbiology announced that on the order of the military experiments on the development of bacteria, which are capable of destroying missile propellant, are starting at laboratories of the institute. If successful, the destruction of strategic missiles will take place very quickly and without powerful explosions.

An Interstate Agreement on the Use of Atomic Energy Is Needed. The board of the concern Ukratomenergoprom appealed to the presidents of Russia and Ukraine to conclude it as quickly as possible. "The agreement between Ukraine and Russia on the use of atomic energy would enable us to establish a joint venture for the production of nuclear future and the storage of its waste and thus would guarantee the stable operation of nuclear power plants in both states," Mikhail Umanets, president of the concern, considers. At the same time the board of the concern addressed to the president of Ukraine the proposal to include in the concern the design and scientific research institutes, which were previously under the jurisdiction of the Ministry of Medium Machine Building.

[No 16, 8 May 92 p 10]

[Text] The General Meeting of the Academy of Sciences of Lithuania

A session of the general meeting was held at the beginning of April at the Academy of Sciences of Lithuania. It discussed the results of the work during the past year.

The Academy of Sciences prepared and submitted to the government of Lithuania 10 major scientific expert programs of instruction. In the area of the social sciences particular attention was devoted to de-ideologization and depoliticization and to the restoration of the historical truth.

After the establishment of ties with scientific centers of many western countries the implementation of joint research programs was begun. Lithuanian scientists on the basis of noncurrency exchange went for practical studies to foreign scientific centers. This year a center of international science and culture—the Lithuanian Branch of the World Laboratory—the principle of which is science without secrecy and boundaries, was established under the Academy of Sciences. Thus, favorable conditions were created for participation in the world scientific and cultural process.

The changes also affected the structure of the academy. All its institutes acquired the status of state autonomous institutions, its administrative staff was reduced by several factors of 10, and the election of the leadership of the academy was held.

A Regional Department of the Academy of Sciences of Kazakhstan

A regional department of the engineering academy of the republic has been established in Chimkent. It will operate on a cost accounting basis—through specialized introducing centers. Perhaps, it will thus be possible to coordinate the interaction of basic and applied science by means of market relations.

In Turkmenistan There Is No Provincial Science

The Annual General Meeting of the Academy of Sciences of Turkmenistan concentrated on the analysis of the status of Turkmen science under the conditions of sovereignty.

The problems for the most part are old ones—finances, personnel, and introduction. New ones are just coming to light. But it is already clear that their solution will require the sweeping away of old stereotypes.

For decades the republic academy worked together with big science. Under the conditions of integration and specialization there was no need to conduct research in the area of defense and finance. All the academies worked for the same "pot," and it was possible to use the obtained results free of charge. Now the structure of scientific research, which has been fixed for years, has to be reorganized, and not only because the independent state should conduct its own research in vitally important areas, but also because it has to pay for any information.

Of course, it is impossible to keep science within state borders. A search is under way for new forms of interaction within the unified space of the CIS. Considerable obstacles have to be surmounted here. In the opinion of Turkmen scientists, the meeting of the presidents of the academies of sciences of the former union republics, which was held in Moscow, showed that Russia and Ukraine are striving to impose on the others their own rules of the game, availing themselves of the fact that practically all the leading scientific institutions of the former Union have come under their jurisdiction. For the republics such an approach, of course, is unacceptable. Under the conditions when the USSR

Academy of Sciences—now the RAS [the Russian Academy of Sciences]—has ceased its activity as the main center and coordinator, bilateral agreements have become the only correct means of cooperation.

Science of Turkmenistan has received serious support on the part of the state. For the present none of the countries of the CIS has a law similar to the law of Turkmenistan "On State Science and Technology Policy." It creates the economic, organizational, and legal conditions for the assurance of the leading development of basic research and research in the priority directions of scientific and technical progress. Now not less than 1 percent of the produced national income is being deducted for the maintenance of science. Thus, 455 million rubles [R] are planned for 1992. For comparison: R26.3 million were allocated in 1991. And this amount will increase with the increase of the economic might of the state.

The average wage of a scientific associate in the system of the Academy of Sciences of Turkmenistan now comes to R1,168. But, it seems, Turkmen scientists have something to hope for.

The Norwegian Academy for Estonia

An official visit of President of the Academy of Sciences of Estonia Arno Keerna to the Norwegian Academy of Sciences and publishing houses to become acquainted with the activity of scientific institutions of Norway has taken place. Taking into account the previous joint research of both countries, the parties signed an agreement which will promote the development of direct scientific cooperation between Estonian and Norwegian scientific research institutes.

The cooperation will encompass all fields of science, which come within the framework of the academies. The formulation of joint scientific projects is in the future. An opportunity will appear for Estonian graduate students to do lengthy practical studies at Norwegian scientific institutions.

Will Tajik Science Survive?

The Annual General Meeting of the Academy of Sciences of the Republic of Tajikistan was held against a complex political and economic background. It is difficult for the republic to preserve its scientific potential.

The past year, when the academy lost the assistance of the all-union fund, while the republic assumed the financing of scientific research, was a serious test for the scientific community of the republic. It was important to preserve the formed scientific collectives and to help new scientific research institutes: of written heritage and of the humanities, and the Khudzhanskiy Base of the Academy of Sciences to get on their feet. In the search for a way out of the crisis the academy appealed for the establishment of small enterprises and joint ventures on the basis of individual scientific institutions. Scientific results, which now, under the conditions of a market, ministries and departments should buy, became an additional source of financing.

The priority of basic research is indisputable. But in the present crisis a turn to the requirements of the national economy of the republic is necessary for the survival of science. Scientists have something to offer. But for the time

being republic organizations and enterprises are not displaying an interest in the introduction of new developments.

With the disintegration of the USSR the united front of scientific research also disintegrated. It is necessary to organize cooperation all over again. Realizing this, the academies of Tajikistan, Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, and Azerbaijan concluded an agreement of scientific cooperation and scientific and technical cooperation. Interacademy programs will be established, the exchange of information and the conditions for practical studies of scientists will be set up.

[No 17, 15 May 92 p 1]

[Text] The World

Developing Countries Should Not Possess Rocket Technology, They Believe in Washington. And for this reason the Russian Glavkosmos and its Indian partner, the Indian Space Research Organization, have been punished. The sanctions can be repealed, if the Russian-Indian deal on the delivery to India of cryogenic engines is suspended.

Progress is at hand—in past years the sanctions would have concerned the entire set of Russian-American relations.

It Is Expected That U.S. President George Bush Will Participate in the Conference on Environmental Protection in Brazil, which will be held on 14-15 June under the aegis of the United Nations. The problem of the global warming of the climate will be one of the main points of the meeting. In this matter the United States has significant differences with the industrial countries of the West. President Bush essentially has not supported the proposals which are aimed at eliminating the threat of global warming, considering that they will have a negative effect on the U.S. economy.

Hungary Has Been Officially Eliminated From the Lists of Cocom [the Coordinating Committee for Export Controls]. It became the first country of Eastern Europe, which has been honored with such trust of the West. On its part Hungary gave Cocom the commitment to establish close domestic monitoring of the use of the latest technologies that are made available to it by the West.

The Country

The First Official Visit to Great Britain of a Delegation of the Russian Academy of Sciences Has Taken Place. President of the RAS Academician Yuriy Osipov headed the delegation. Within the framework of the visit a 10-year agreement on the further development of comprehensive cooperation between scientists of the two countries was signed. In particular, the details of new mutually advantageous programs of the stimulation of scientific ties were discussed and agreed on. The British side displayed particular interest in such fields of science as space research, X-ray astronomy, and biotechnology. The significant expansion of bilateral contacts, especially exchange programs with the participation of young figures of science of Russia and Great Britain, is envisaged.

The RAS delegation visited Oxford and Cambridge. The visit was organized with the direct participation of the London Royal Society.

The Best Russian Scientists Are Prepared To Go Abroad. Such are the results of a sociological study that was conducted at scientific research institutes of Moscow (including the military-industrial complex) by the Russian national committee for the problem of the "brain drain." In spite of the fact that 79 percent of the scientists consider going abroad for permanent residence impossible or unlikely, among the few who are prepared to leave there are precisely the best specialists, Mark Urnov, an expert of the Gorbachev Fund, commented on the results of the study.

Let us add that reports that several nuclear scientists from Arzamas-16 are finding out how things stand for moving abroad, have appeared in the press....

A Joint Norwegian-Russian Expedition Will Engage in the Search for Radioactive Waste in the Barents and Kara Seas. During the summer of this year it will conduct research in 14 marine regions for the purpose of determining the sites of the burial of radioactive waste and the degree of their ecological danger. It is also planned to determine the overall picture of the contamination of the region and to identify other sources of pollution, in particular, to study the paths of the potential radioactive contamination of the northern sea water areas between the Gulf Stream and the waters of Siberian rivers—the Ob and the Yenisey.

Aleksey Poryadin, head of the Russian delegation, who signed the corresponding protocol in Oslo, reported that, according to available data, the radioactive waste, which was sunk in the seas, does not represent a danger for the population of the coastal regions of Norway and Russia.

An Agreement Between Buryatia and Russia on Questions of the Development of Academic Science Was Signed in Ulan-Ude. The spheres of activity and the obligations of the partners are clearly specified in the agreement. The main goals of the agreement are the coordination of actions on the increase of the economic, scientific, and technical potential, the expansion of research in all fields, and the development of the system of higher education.

The Presidium of the Supreme Soviet and the Council of Ministers of Buryatia signed a decree on the establishment of the science fund of the republic. This year R5.5 million have been allocated for its financing.

Scientists of the Pacific Ocean Oceanology Institute Have Taken Their Fate Into Their Own Hands. Here they have formulated and begun to implement a project that is conditionally called "The Intellectual Exchange." By means of the extensive advertising of the voluminous information on the use of marine resources in the most different areas, which is contained in the data bank of the institute, the scientists hope to find an additional source of assets for scientific research.

Situation on Beloretsk Nuclear Facilities Still Unclear

927A0178A Moscow SOVETSKAYA ROSSIYA
in Russian 18 Apr 92 p 2

[Article by SOVETSKAYA ROSSIYA correspondent M. Merzabekov (Ufa): "The Beloretsk Secret. What Is Concealed Behind the Regular 'Numbered Address'"—first two paragraphs are SOVETSKAYA ROSSIYA introduction]

[Text] In our times the curtain of secrecy is being lifted from "closed" facilities, the operation of which is attended by danger to the health of people and the environment. However, for some reason "numbered addresses" remain at the very center of the South Urals. It is a matter of the Beloretsk-15 and Beloretsk-16 facilities, which are located near the city by the same name. The population of Bashkortostan, on whom the words "atom" and "radiation" have a frightening effect, is beginning more and more warily to look close at the "secret," which was put by without their knowledge, in places that personify the history and spiritual traditions of the people and the beauty of their native region.

The open letter, which a group of people's deputies, scientists, ecologists, representatives of the creative intelligentsia, and religious figures addressed to the leadership of the republic, was an expression of this anxiety. They demand complete information about the purpose and activity of the named facilities. However, conflicting, mutually exclusive explanations, which only intensified the suspiciousness of the public, followed in response to the inquiry.

The Central Intelligence Agency asserts that the open press is for it the basic source of intelligence data. I also use only the information, which has been reported in the press or from the rostra of conferences, and form on their basis my only logical conclusions.

Let us reason a little. Major changes in the geography of Bashkortostan: the building of a railroad and a first-class highway, the towns of Tatla and Solnechnyy for 30,000 residents, the establishment of the South Urals Preserve on 254,000 hectares, are connected with the appearance of the secret facilities in Beloretsk. Do you sense the scale?

In the last few years representatives of the Supreme Soviet and the Council of Ministers of the republic, the State Committees for the Protection of Nature of Bashkortostan and Russia, organs of the sanitary and epidemiological service and health care, the KGB, and the Ministry of Forestry have given official explanations with respect to the construction near Beloretsk. Of these monotonous and surprisingly unsupported explanations I will cite if only the following one: "The Council of Ministers informs the residents of the republic that there are no sites of the burial of the waste of the atomic industry on its territory and none are planned. All the statements and discussions of unqualified people on this theme are based on rumors and do not have an objective basis."

Finally General L. Tsirkunov, director of the project, decided himself to have a talk with the "too inquisitive" citizens. He reported that he was building an enterprise named the Ural Mining and Ore Dressing Combine. The impossibility of burying radioactive waste here is proven very easily by Leonid Akimovich: "If anyone thinks that in our region it is possible to make some burial sites, I as a specialist state that this cannot be." What strong reasoning!

The next sharp discussion of the "Beloretsk secret" occurred in December of last year at the Sixth All-Bashkir Kurultay [Council]. And so what? One of the directors of the project stated that a storehouse for...the valuables of Russia was being built near Beloretsk. Inasmuch as the response did not convince the audience (where is one to get so many valuables to fill an enormous repository?), another director

attempted to come to the rescue. His version: A storehouse is being built, but it is for food reserves. This report completely undermined the belief of the public in the possibility of obtaining truthful information from officials.

Then an idea occurred to the delegates of the kurultay: What if they ask M. Shakirov, former first secretary of the oblast committee of the CPSU, who was sitting in the hall? Having become a retiree, he, perhaps, would not "keep things secret." And, indeed, Midkhat Zakirovich lived up to the expectations of the delegates, having informed them that more than 15 years ago the construction of an underground shelter for the leadership of the USSR was begun near Beloretsk. In case of an atomic war.

It seems that such a version should set our mind at rest: The government of the former USSR is not radioactive waste for you. And still the discussion requires continuation. For in past years huge sums of money were invested in the construction of the underground structure in the South Ural mountains, the corresponding infrastructure was established, and a collective of skilled workers and engineering and technical personnel was formed. During all that time this powerful force did not make any sort of thing that could be used for meeting the vital needs of people. Of course, the personnel of Beloretsk-15 and Beloretsk-16 are in no way to blame for the fact that their labor is a typical labor of Sisyphus. Another thing is surprising: The construction, which was begun under L. Brezhnev, took on scope under M. Gorbachev, and, as if nothing had happened, is continuing under B. Yeltsin. It was started during the years of the domination of the doctrine of the possibility of a global atomic war (as if it is possible in the bunker to sit out a universal nuclear catastrophe). We have finally buried, we will hope, this deadly doctrine. It would also be time for the builders of the bunker to shut down their earthmoving equipment. However, they are continuing "to wage war on the underground front," devouring vast assets from the state budget. And this is when there is a catastrophic shortage of assets for the implementation of programs of the social protection of the destitute majority of the population of Russia. Who will halt the bacchanalia of wastefulness and mockery of common sense and when?

Appointment Irregularities Upset RAS Members, Employees

927A0188A Moscow *RADIKAL* in Russian
No 14, 17 Apr 92 p 10

[Article by Vladimir Pokrovskiy under the rubric "To Live by the Law": "A Time To Gather Stones Together"]

[Text] Say what you like, but to hope for the best is not the best of pursuits. The scandal with the election of the director at the Institute of the History of Natural Science and Technology had only just come to an end (and did it come to an end?), we had only just ventured to express the timid hope that this scandal would be the last one for the RAS [the Russian Academy of Sciences], when a new one then and there broke out—this time at the State Geological Museum imeni V.I. Vernadskiy. And in a little more scathing manner than the former one.

Here is what happened there. After the death of museum director Aleksandr Dymkin (on 30 January 1992) deputy

director Georgiy Naumov began to fulfill his duties temporarily. It was anticipated that the election of a permanent director would take place in the fall, when suddenly the "Four G's" Department (Geology, Geophysics, Geochemistry, and Geomorphology), without having reporting anything to anyone, changed its decisions and in circumvention of all set procedures appointed a new acting director—for a term of one year.

Academician Oleg Bogatikov became him. This is an academician of the last, RAS, enrollment, a man, who is completely unknown to the collective of the museum, which only aggravates the situation. While it, the situation, as it is looks rather improper: In addition to purely legal violations ethical irregularities are also being dragged in here. The appointment occurred not simply quietly, without pomp, but even as if in secret. It is not that they did not invite G. Naumov to the meeting of the department on 3 April, when they turned the museum over to O. Bogatikov, but they even talked him out of coming—for you, they said, there will be nothing interesting there. And the department, of course, did not present to the associates of the museum the reasons for such an unexpected change of the leader.

But was everything done, perhaps, although in a strange way, yet according to the law? No, in conformity with the Temporary Charter of the RAS, and now also with "The Basic Principles..." that were approved at the last General Meeting of the RAS (See *RADIKAL*, No 13, 1992), the director all the same should not be appointed, but be elected. Within not more than three months from the day of the opening of a vacancy the department should announce the competition, then all the candidates for the chair, who have appeared, "pass" through a meeting of the collective, where they either receive or do not receive the support of the collective, after which an election is held in the department—from among the candidates who have been supported by the collective. And only if this procedure will not work and they will not elect anyone, does the department appoint an acting director—for a term of up to two years.

The associates are discontent, they wrote a letter to Academician Bogatikov with the request to decline the directorship, they also wrote a letter to President of the RAS Yuriy Osipov, in which they asked him to revoke the decision of the department and to speed up the election procedure. They consider completely illegal how they were treated.

Unfortunately, we did not succeed in finding out what the department thinks in this regard. No one except Academician Secretary Vilen Zharikov can answer the question of whether they regard there as legally valid the decision about the museum, and if they do, in what the validity consists, but he is on a business trip. We will gladly give Vilen Zharikov an opportunity to explain the position of the department on the pages of *RADIKAL* and consider this very useful, since for the present the situation really looks derisively illegal.

Moreover, it seems threatening. The associates of the museum hold that such a step can in the end ruin the most valuable mineralogical collection, which has been gathered since the times of Yelizaveta and the value of which is not only that it is expensive, but also that it is the basis of all Russian geological science.

The logic here is as follows. All the troubles, which in recent times for some reason have been raining down very often on the museum, are due to the space that it occupies. This is a space, which is very large by present notions and is very valuable—52,000 square meters at the very center of Moscow, in an old building of Kleynov construction, which is among the monuments of architecture. Several years ago, if the reader remembers, the Moscow intelligentsia—students, scientific associates, and so on—literally snatched this building from the city authorities and did not let them evict the museum from there. A long time afterwards they had to force to leave the museum an organization that had nothing to do with it. And to this day it simply cannot rid the museum of a certain strange commercial firm, which was imposed on it by Academician Laverov.

Three and a half years ago the museum was very lucky, when Corresponding Member of the USSR Academy of Sciences Aleksandr Dymkin became its director. He earned the warmest treatment of associates not only by the fact that at the first opportunity he increased their salaries—under him the concept of the museum was developed, under him it was possible to protect the building from destruction and to establish a project of its reconstruction, without which it seems very difficult to save the collection stored here.

Last year the "Four G's" tried to introduce social justice and to seize a portion of the space, having installed there an entire group of organizations under the common sign "National Geological Committee." In reality not associates, but exhibitors need the vast space, from which they want once again to squeeze it thoroughly.

The museum is not simply being greedy and does not want to lose the space that belongs to it. In reality for it this is a matter of life and death. The reconstruction, which the old building needs so much, requires neither more nor less than 500,000 rubles, which neither the academy, the state, nor any any outside sponsor is capable of giving. The only way is to let in temporarily firms, which are prepared to settle accounts, but not those, which the department is trying to impose on the museum and "for no particular reason."

In his day D. Dymkin pursued very effective tactics of defense against these pretensions. Without directly objecting to the housing of geological services and even getting to the bottom of their dire straits, he proposed "to settle the question" after the reconstruction (when it would already have become clear to everyone that the decision can be only adverse). After his death his former deputy, G. Naumov, continued the same policy.

The associates of the museum assume that as soon as the acting director is replaced, a new attack on the space will begin, here with nonresistance, but then with the support of the newly appointed museum leadership—so that there is every chance that the attack will prove to be successful.

All these, of course, are no more than suspicions, even though well-founded ones, for those people, whom they treated so unceremoniously. In principle it is not ruled out that the department is not preparing any such atrocious plans, but is proceeding entirely even from lofty and noble motives. But the secrecy, which is responsible for the illegality (incidentally, the law is a delicate matter, therefore, for the time being we will make a reservation—apparent illegality) of the actions of the department, and its

reluctance to have it out with the collective of the museum force one to doubt somewhat the nobility of the motives.

'RADIKAL' Science News Briefs April 1992

927A0188B Moscow RADIKAL in Russian
No 14, 17 Apr 92 p 9

[Article under the rubric "The Country"]

[Text]

URAL SCIENTIST ARE LEAVING INSTITUTES AND LABORATORIES. More than 1,000 people last year went abroad or preferred work in commercial structures.

The reasons for leaving are the low wage and the impossibility of engaging fruitfully in science. The supply of subdivisions of the Ural Department of the RAS [the Russian Academy of Sciences] with material and technical resources has decreased to nearly own-half as compared with 1990, the degree of wear of capital has reached 50 percent.

THE NOMATEKH ASSOCIATION OF NEW MATERIALS AND TECHNOLOGIES HAS BEEN ESTABLISHED AT THE ACADEMY OF SCIENCES OF BELARUS. It will unite the efforts of production workers and scientists, which are aimed at the formulation of new methods and technologies, which make it possible to develop competitive products, to reduce the imports of raw materials to the republic, and to decrease power consumption.

"THE STUDENT AND SCIENTIFIC AND TECHNICAL PROGRESS"—that is what the international scientific and technical conference, which was recently held on the basis of Novosibirsk University, is called. Students of the countries of the CIS, Latvia, the FRG, and the Netherlands took part in it. Of course, Novosibirsk State University would not have had enough funds to finance independently such a large-scale conference. The sponsors helped. Among them are the Daleks and Unikom firms and the Intellektron Scientific and Technical Center of the Youth Interacademy Association of Siberian Scientific Centers.

THE SEMIPALATINSK NUCLEAR TEST RANGE WILL BE TURNED INTO A SCIENTIFIC RESEARCH CENTER. This will take place in conformity with an ukase of the president of Kazakhstan.

The development of a technology of producing superhard substances in underground shafts with the use of convention explosives and solid-propellant rocket engines is included in the program of the conversion of the test range. Moreover, the test range will be used for the reclamation of industrial waste. An important place is being assigned to land recultivation.

Nuclear Physicists Aid in Disposal of Radioactive Equipment

927A0178B Moscow NEZAVISIMAYA GAZETA
in Russian 31 Mar 92 p 6

[Article (ITAR-TASS): "Instruments Glow"]

[Text] In cities and settlements of Kamchatka staff members of the Yelizovo geophysical expedition found, removed, and buried about 3,000 instruments and teaching aids with radioactive radiation that is harmful to the health.

Reporting on the work of the nuclear geophysicists, the newspaper KAMCHATSKAYA PRAVDA notes that a large number of instruments with vials of radioactive substances, as well as with luminous dials and faces have accumulated at schools. But educators most often of all are not familiar with the instructions on safe methods of work with them. While, for example, the luminous layer from instruments, which has within it harmful substances, frequently peels off, turns into dust, and is inhaled by children and adults. The Yelizovo geophysicists are engaged for the third year in the search for such mini-Chernobyls.

Reports on Russian Academy of Sciences General Meeting

Opening Announcement

927A0173A Moscow IZVESTIYA in Russian
8 Apr 92 p 7

[Article by IZVESTIYA correspondent Kim Smirnov: "They Are Also Picketing the Meeting of Academicians"—first paragraph is IZVESTIYA introduction]

[Text] The general meeting of the Russian Academy of Sciences opened on 7 April. The second in number, but first in importance of the questions being discussed at it: about the basic principles of the organization of the scientific research institute of the RAS [the Russian Academy of Sciences] and about the legal regime of its property. There will be an election of vice presidents of the academy—for the biological sciences and for the social sciences—and the members of the presidium of the RAS.

It has become a tradition—the academicians and corresponding members are gathering in the Assembly Hall of Moscow State University. And—to keep up with the new tradition—representatives of the academic community are picketing their general meeting. We will tell in one of the next issues about what decisions the meeting will make. But what are the pickets advocating and against what are they protesting?

L. Vakhnina, cochairman of the Club of Voters at the Academy of Sciences and a scientific associate of the Institute of Chemical Physics of the RAS, considers:

"This is a forced step. We agreed to it only after numerous attempts at a constructive dialog with the presidium of the RAS. The dialog began in a reassuring way. Provisions, which broaden the rights and freedoms of scientific collectives, were inserted in the draft of the statute on the basic principles of the organization and activity of the institute. The conference of scientists of the institutes of the RAS supported the draft, they sent it out for discussion. However, the decisions of the conference on the reforming of the academic community are being ignored. Our only provision, which was included in the temporary charter of the RAS—about the public nature of the distribution of financing—is not being fulfilled. That is why we also decided to picket the general meeting...."

Some of the academicians do not share such a point of view, believing that some people work creatively in laboratories and entirely others go to meetings and organize pickets. I cannot share their categoricalness. But what if there are no fewer future academicians in the pickets than in laboratories?

Report on Conclusion

927A0173B Moscow IZVESTIYA in Russian
10 Apr 92 p 2

[Article by IZVESTIYA correspondent Kim Smirnov: "How Much Alcohol Does the Academy Need?"—first paragraph is IZVESTIYA introduction]

[Text] On 8 April the general meeting of the Russian Academy of Sciences (RAS) concluded in the assembly hall of Moscow State University. It registered a discovery of our days: Basic science in the homeland is on the verge of complete financial collapse. About which it informed by a special message of appeal the president of Russia and the Sixth Congress of People's Deputies of the Russian Federation, seeing the causes in the cosmic soaring of prices, rates, and rent in the absence of substantial compensation on the part of the government.

The world-famous Pulkovo Observatory during just the first 10 days of this January put out 112,000 rubles [R] for electric power. While during all of last year it put out only R78,000. Under such conditions science is de-energizing and is being blocked by the life and death struggle for survival. The Pulkovo blockade meridian now passes through hundreds of laboratories, permanent establishments, and research testing grounds. The expenditures on the outfitting of expeditions have increased by twentyfold, the expenditures on chemical reagents have increased on the average by twelvefold. The scientific fleet is in a dead faint—there are no assets even for its mothballing. The free soaring of the prices for airline tickets above the clouds overnight reduced to absolute zero the Brownian movement of scientific exchanges.

A ton of alcohol, which is necessary, as is known, not only for keeping up the spirit of the population, but also for many scientific experiments, has increased in price as compared with last year from R60 to R100,000. For this reason—due to the lack of alcohol—for example, the well-known scientific collection, which was established in accordance with an ukase of Petr I, is perishing. But only some 10 tons are needed for upholding the reputation of the great ancestor. In short, it is almost a la Ostap Bender: "Give the poverty-stricken academy a million!"

But if we are to be serious, what do scientists want from the executive and legislative authorities? The fulfillment of their, the authorities', promises and decisions. In particular, the presidential Ukase of 21 November 1991, in which the government was given a commission: to prepare a proposal on the exemption of institutions of the RAS from taxes, fees, and duties, including those on foreign currency assistance to the academy. They have gotten tired of waiting at the RAS for the gift that was recently promised by both the former president of the USSR and the current president of Russia—the national basic research fund.

The question of the legal regime of property is a key one for the life of the academy. The general meeting supported the following formula: The RAS is an all-Russian state self-administered organization with the granting to it of rights on the management of the property, which is in its use and possession, with the assurance of the integrity and inviolability of the property assets of the academy.

The general meeting of the RAS approved of the basic principles of the organization, work, and life of the academic institute. The many months of work, in which together with the presidium of the Academy of Sciences first of the USSR, and then of Russia the scientific community participated actively and beneficially for the matter, concluded with a big step forward in the democratization of the scientific community. The center of gravity is actually shifting to where discoveries are born. And scientists of Russia as before have many of them, which was attested in the report of President of the RAS Academician Yu. Osipov.

New vice presidents of the RAS—Academicians V. Kudryavtsev (the social sciences) and R. Petrov (the biological sciences)—as well as academician secretaries of departments—L. Faddeyev (mathematics) and G. Chernyy (machine science, mechanics, control processes)—were elected.

Report on Turkmen Academy of Sciences 1992 Annual General Meeting

927A0179A Ashkhabad TURMENSKAYA ISKRA
in Russian 7 Apr 92 p 2

[Article by N. Osipova under the rubric "Problems. Opinions": "Sailing in the Sea of Market Relations. Notes on the State of Turkmen Science"—first paragraph is TURKMENSKAYA ISKRA introduction]

[Text] The general annual meeting of the Academy of Sciences of Turkmenistan has concluded. The statements of President A.G. Babayev, Chief Scientific Secretary V.N. Nikolayev, and leading scientists—Academician R. Bayramov, Doctors of Sciences A. Khanberdiyev and T. Khydyrov, and others—were the basis for this article.

I will begin with the daily bread—with the wage—inasmuch as it determines our vital tone and social health. The average wage of a scientific associate in the system of the Academy of Sciences of Turkmenistan comes to 1,168 rubles [R]. Is that a lot or a little? It depends. If we compare it with the remuneration of labor in several other states of the Commonwealth, the improvement is appreciable. If we direct our attention to cooperatives and small enterprises, scientists, of course, are the loser.

But clear certainty, which is due to the fact that recently the Supreme Soviet passed the Law of Turkmenistan "On State Science and Technology Policy," has appeared here. It is difficult to overrate what it means for Turkmen science. First, no sovereign state of the Commonwealth yet has such a law, here Turkmenistan is setting a good example. Second, for the first time the economic, organizational, and legal conditions for the assurance of the leading development of basic research and research in the priority directions of scientific and technical progress are being created at the state level. Put more simply, the hope has appeared that henceforth science will not be in the position of a poor relative. Not less than 1 percent of the produced national income is being allocated for its maintenance, for 1992, for example, R455 million (for comparison: in 1992 R26.3 million were allocated). And the contribution will increase as our economy becomes stronger. While this affords an opportunity for the extensive development of research work, the strengthening of the material and technical base of

scientific research institutes, the material support of scientists, and their social protection on the threshold of the impending market.

But it is impossible to acquire anything without losing something. With the collapse of the country the losses are being felt extremely keenly. The break with "big" science placed our academy in a difficult position. This idea was heard in one way or another in many statements of the scientists. The collapse of the Union struck a painful blow to everything. And science included. To the existing problems, to which we have already gotten used—finances, personnel, introduction—new ones were added: It is necessary to revise the structure of scientific research work, which had become fixed for years, to unite and strengthen something, and to give up something. While this is a breakup, a process that is always painful.

For decades republic science worked in unison with "big" science. Under the conditions of integration and specialization there was no need to conduct, let us suppose, research in the area of defense, finance and credit, and other directions, central scientific research institutes engaged in it. Moreover, rejection of the thematic duplication of research took place, inasmuch as all the academies worked for the same money box, and it was possible to use its results free of charge. Such a distribution of forces made it possible to focus attention on regional problems. Now one will have to pay for any information in accordance with the laws of the market. Intellectual property is valued extremely dearly. We will have to adopt a new attitude.

But the phenomenon of science consists in the fact that it develops according to its own objective laws and it is impossible to keep it within state boundaries. Fortunately, scientists proved to be wiser than and superior to many politicians, they are seeking an opportunity to unite. A search for new forms of contact within the unified space of the CIS [Commonwealth of Independent States] is under way. Although here, too, many obstacles have to be overcome.

A meeting of the presidents of the academies of sciences of the former republics of the USSR, in which we placed great hopes, was recently held in Moscow. But it did not yield anything comforting. Russia and Ukraine proposed their own rules of the game, while they "played" by no means for unification, which, in general, hurt the interests of the outlying academies. Yes, the big republics are strong, their potential is greater, especially as all the leading scientific institutions of the former Union have transferred to the jurisdiction of Russia. But it does not at all mean that provincial science will as before look respectfully at its "older brothers." It is seeking its own path of development, without dismissing the idea of unification and while striving to preserve the bonds of friendship with the neighboring sovereign states. Under the conditions, when the USSR Academy of Sciences ceased its activity as the main center and coordinator, bilateral agreements have become the only correct means of cooperation. They have been concluded with the academies of sciences of the states of Central Asia, Kazakhstan, and Azerbaijan. A large number of major joint regional programs, which will make it possible to solve many basic problems of the national economy, have been formulated.

Turkmen science is seeking its own way and is seeking it purposefully, inasmuch as a good reserve remains from former times. Criticism was not heard once on the pages of *TURKMENSKAYA ISKRA*, especially if this concerned the introduction aspect of the matter. The time has also come to tell about the practical results of research.

The Physical Technical Institute developed and introduced at the Ashkhabad Construction Materials Combine a technology of the production of glass ceramic facing tiles on the basis of local raw materials. Materials for the construction of a shop of cotton fiber boards were turned over to the Kaakhka Gin Mill.

The Solntse Scientific Production Association is carrying out the design, construction, and installation of solar power plants. On the order of the *Turkmenskhozvodoprovod* Production Association the construction of a pilot industrial self-contained solar complex for 1,000 head of sheep has begun in the small town of Uzyn-Adzhi. The construction of solar hothouses for the year-round growing of seedlings of agricultural crops is being carried out at the Yubileyny Plant of the *Turkmenvino* Industrial Agricultural Association. A unit for the steam-curing of reinforced concrete items and components is being successfully operated in the Administration for the Supply of Complete Sets of Production Equipment of the *Turkmenselektrostroy* Trust. A similar unit is being built at the Bezmein Plant of Reinforced Concrete Items of the *Agropromstroy* Production Association and in Tashauz at the plant of the *Turkmenavtodor* Production Association.

The Institute of Chemistry organized at the Nebit-Dag Iodine Plant the production from raw iodine of iodate and potassium iodate, which are widely used in medicine, photography, and the production of chemical reagents. At the Cheleken Chemical Plant the installation of a pilot industrial plant for the obtaining of magnetic fluid has been completed, a technological system of the purification and desalinization of mineralized waters by reagentless methods with the obtaining of quality standard drinking water for the needs of the population was introduced in the zone of the Turkmen Aral Sea Region (Tashauz Oblast).

The works of Turkmen desert experts, seismologists, and botanists are well known in the CIS and abroad. Scholars—social scientists, economists, philosophers, sociologists, and linguists—are making their contribute to the development of national science and culture. It is simply impossible to tell about all the works that deserve attention, for in 1991 academic institutes performed research on 169 themes and assignments. Of them 27 were completed.

Science received serious material support of the state. But this does not mean that it is possible to rest calmly on our laurels. We are on the threshold of the market, and it requires one to earn a living, if you want to live not on the modest state allowance of R1,168. And scientists are gradually grasping the market laws. Alternative economic structures, which provide an outlet to introduction: small enterprises, cost accounting subdivisions, and joint ventures with foreign firms, have appeared in the system of the academy. The Institute of Chemistry and the Nebit-Dag Iodine Plant established the Progress small enterprise for the obtaining of products of the processing of iodine. The *Biomelioratsiya* Interdepartmental Cost Accounting Scientific Production

Association, which cleans the water reclamation network by biological methods, was opened. The Academy of Sciences and the Institute of Chemistry became the cofounders of the Omur Scientific Production Association, whose task includes the implementation of promising chemical technologies. This institute signed a protocol of intention with the Indian Sri Exports firm on the establishment of a joint venture for the production of finished concrete block products and carbon-mineral compounds. At last, the ice has begun to move, good gentlemen! Oh, how much has been said and written about the need to place at the service of the young state the abundant natural resources that it has. And now the first step has been taken.

And there is more reassuring news. A contract between the Solntse Scientific Production Association and the Sri Exports firm on the output of solar power engineering products has been signed.

I am writing about this with much satisfaction. Of course, people may reproach me with the fact that I passed over in silence the unfortunate situations that are arising now in one, now in another scientific collective. But this is not the main thing now, it is necessary to rise about personal resentments and vanities into order to see significantly more. The provincial academy has ceased to be an appendage of "big" science. Of course, it has to overcome much and to face problems, which hitherto it did not know. Of course, it was for a long time in a quiet backwater under the protection of the former State Committee for Science and Technology and the former USSR Academy of Sciences, which in the position of masters and father-benefactors would chide, but would also help with finances in order to close the breach that had formed. While now, let us say figuratively, the ship of Turkmen science is setting out on an independent cruise over the stormy sea of market relations.

Conference Examines High Energy Physics Program

927A0187A Moscow *RADIKAL* in Russian
No 14, 17 Apr 92 p 1

[Article by G. Dernovoy: "The Members of Parliament in Protvino"]

[Text] On 31 March a meeting, at which the question "On the State Scientific and Technical Program 'High Energy Physics' and on the Course of the Work on the Development of the Accelerating-Storage Complex (UNK) in the City of Protvino" was examined, was held in Protvino. The composition of the meeting participants testifies to the extraordinary nature of the discussed problem. In addition to the members of the Committee for Science and Public Education of the Supreme Soviet of the Russian Federation headed by Committee Chairman Yu. Ryzhov Minister of Science, the Higher School, and Technical Policy of Russia B. Saltykov, Minister of Atomic Power Engineering V. Mikhaylov, executives of the Ministry of the Economy and the Ministry of Finance, members of the committee for science policy of the Russian Academy of Sciences, supervisors of directions and projects of the state scientific and technical program on high energy physics, leading scientists of the Institute of Higher Energy Physics, as well as administrators of organs of executive and representative power of Serpukhov attended the meeting.

The need to hold a meeting of such a level was due, on the one hand, to the position of the Kaluga Oblast administration, which readdressed the settlement of the question of the additional allotment of land for the construction of the second section of the accelerating-storage complex to the Supreme Soviet of the Russian Federation, and, on the other hand, to the difficult situation with the financing of Russian scientific programs, particularly on high energy physics.

A tour to the accelerator complex of the Institute of High Energy Physics, which has been in operation since 1967, to physics laboratories, and to the new giant accelerator, which has been under construction since 1983 and will be located in a 21-km underground circular tunnel, preceded the meeting.

Deputy Minister of Finance of the Russian Federation I. Molchanov shared his impressions from the tour: "For the first time I have had occasion to visit an accelerator and to see where millions and millions of rubles are being invested. I am convinced that the assets were allotted to you not without reason, they will be repaid with interest." The impression, apparently, actually was strong, if I. Molchanov even promised the leadership of the institute to pay off the debt for the first quarter (an amount of just one-fourth of last year's amount was allocated for it) and to try for subsequent quarters to maintain the 1991 level of financing.

Nearly all the speakers were unanimous in the opinion that it is necessary to save high energy physics from ruin and disintegration. Scientists familiarized the members of parliament and the members of the government with the

appeals of their prominent western colleagues to the Russian leadership, which contained entreaties to preserve for world science the potential that has been accumulated in Russia. And not only to preserve it, but also to develop in within the framework of international integration. In connection with this the continuation of the construction of the new accelerator and its startup in the next few years are of vital importance. This is spoken about, for example, in the letter addressed to B. Yeltsin from Prof. C. Rubbia, general director of the European Center for Nuclear Research and a Nobel Prize laureate.

The Committee for Science of the Supreme Soviet of the Russian Federation, which held in Protvino its first field meeting, made the decision on the approval of the work within the framework of the Russian state program "High Energy Physics." It was recommended to the government of Russia and the leadership of the Russian Academy of Sciences to make the necessary decisions for its implementation and to find opportunities for the completion of the construction of the accelerator complex in Protvino within the time, which was agreed on in the international program of the development of high energy physics.

Thus, as a result of the meeting in Protvino at least two tasks were accomplished. First, an end was put to the discussion, which had developed on the pages of newspapers, about the necessity of developing such a field of science as high energy physics and about the construction of the new accelerator. Second, a common point of view of the executive and the legislature of Russia on the problem of the preservation of the potential of one of the most complex fields of basic science was worked out.

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