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Discussion on Establishment of RSFSR Academy of Sciences

Konovalov Report on Commission Approval

907A0059A Moscow IZVESTIYA in Russian
28 Nov 89 p 2

[Article by IZVESTIYA science commentator B. Konovalov: "What the Russian Academy of Sciences Is to Be Like—Scientific Collectives in the RSFSR Should Discuss This"]

[Text] On 25 November in the Commission for Science and Technology of the RSFSR Supreme Soviet, which worked under the chairmanship of Academician S.V. Vonsovskiy, they unanimously came out in favor of the quickest establishment of an Academy of Sciences in the RSFSR. A working group under the chairmanship of Academician V.A. Koptyug was established for the speeding up of the preparation of documents and the settlement of organizational questions.

What is this, the "contribution" of the RSFSR to the processes of disintegration, which are tearing the country to pieces, national vanities, or a truly vital need?

It is impossible to give an unequivocal answer to this question until it is completely clear what the Russian Academy will be like.

Academician I.M. Makarov, chief scientific secretary of the Presidium of the USSR Academy of Sciences, reported that the day before the expanded presidium of the USSR Academy of Sciences had come out in favor of the establishment of an Academy of Sciences in the RSFSR, but on a new basis—mainly without institutes, simply for the coordination of work, analysis, and the compiling of forecasts. In other words, the USSR Academy of Sciences, the "lion's share" of the scientific institutions of which are located in the RSFSR, remains inviolable, while a new organization is being established.

But then a natural question arises: Why should it be called the Academy of Sciences and not, say, the RSFSR State Committee for Science and Technology or the Russian Association of Science and Education? The name is not a trifle. Because behind ingrained names there are also ingrained structures and tasks, an ingrained procedure of financing, and ingrained privileges. We now have in the country the flourishing USSR Academy of Sciences and academies of sciences of the union republics and at the same time a crisis in the economy and education and are buying advanced technologies for foreign currency.

One would like to know whether the role of the Russian Academy of Sciences does not reduce only to basic research. Life requires that it would deal with the entire complex of science and higher education. But even if one makes the entire USSR Academy of Sciences the Russian republic academy, as the logic of the development of self-government and the exercise of "sovereignty" over everything that is on the territory of the republic would seem to require, there would be 60,000 scientific associates in it. But 1 million scientific associates now work on the territory of the RSFSR!

The RSFSR has a vital need for an organ of the integration and management of all scientific forces. A method has been known for a long time—the goal program method. The RSFSR Council of Ministers allocates money, while on the basis of competition academic and sectorial institutes, higher educational institutions, and scientific and technical cooperatives can perform specific research and development. Indeed, a system of "one's own" institutes, of which we have more as it is than in any country of the world, is not needed in this case.

So why all the same is everyone talking about the necessity of establishing an Academy of Sciences in the RSFSR? I am afraid of disappointing the readers, but the answer, in my opinion, is simple: only the system of the Academy of Sciences gives scientists benefits—if you call the united science of the RSFSR an association, there will be no supplementary remuneration.

But there is so simple and irrefutable an argument: How is the Russian academician worse than the Turkmen or Uzbek academician? It is not necessary to be a prophet: tomorrow to the cries "do not allow the discrimination of Russia" there will appear in the RSFSR "its own" agricultural, medical, and pedagogical academies. And the matter will reduce simply to the appearance of another detachment of privileged scientists.

Academicians usually say that they pay, they say, not for a title, but for the highest skills, which objectively are identified by elections. Academicians are cunning. What, if of 10 candidates 1 is accepted, are the others less qualified? Allow me to have doubts. We see today that for the present they more often elect precisely administrators, not creators.

Remuneration for skills should be separated from membership in any academy. If the future Russian Academy were not to pay its members for a title, this would be an example for all academies.

Another argument, which was cited, is a historical one. Some people believe that it should be a matter not of the establishment, but of the resurrection of the Russian Academy of Sciences. This makes sense. But it is appropriate to recall that Peter I thought of the academy as a triad: gymnasium-university-academy. We broke this chain and separated it with unsound barriers, but it is necessary to obliterate them. This would also be a good example for all republics. And then the resurrection of the Russian Academy would be justified.

RSFSR Minister of Higher and Secondary Specialized Education I.F. Obraztsov, N.V. Karlov, rector of the Moscow Physical Technical Institute, Corresponding Member of the USSR Academy of Sciences Yu.A. Zhdanov, and many other speakers talked about the necessity of integrating the higher school, academic and

sectorial scientific institutions, and independent laboratories, which are operating on the territory of the RSFSR. Their uniting within a single organization and work in accordance with goal programs on Russian problems are actually vitally important. While the already existing structure of the RSFSR Ministry of Higher and Secondary Specialized Education, in which there are now 40 scientific research institutes, could become the nucleus of integration. The academic and sectorial institutes on RSFSR territory would have dual subordination.

There can also be other versions. Undoubtedly, they should be considered not only in a secret office atmosphere, but also in all the scientific collectives of the RSFSR. And, in my opinion, Professor V.I. Vidyapin voiced common sense, having proposed to convene after the discussion of the problem in scientific collectives a special congress of scientists of the RSFSR.

Report on USSR Academy's Position

907A0059B Moscow NTR: PROBLEMY I RESHENIYA in Russian No 21, 3 Nov 89 pp 1, 6

[Article by NTR: PROBLEMY I RESHENIYA science commentator A. Lepikhov: "Is There To Be a Russian Academy? Report From the Meeting of the Presidium of the USSR Academy of Sciences"]

[Text] Perhaps, our reader will be amazed at the title of this article: How is it possible to doubt the necessity of the RSFSR Academy of Sciences, since this question had already "ripened" before the discussion at the session of the supreme legislative organ of the RSFSR? But let us not be hasty....

To begin, a few figures. Today 80,000 scientific associates work at the regional departments of the "large academy" (apart from Moscow and Leningrad). Of them 47 are academicians, 99 are corresponding members, 1,500 are doctors of sciences, and more than 10,000 are candidates of sciences. Moreover, about 5,000 doctors of sciences and 50,000 candidates of sciences work at higher educational institutions of the RSFSR. In all in our largest union republic more than 1 million people are employed in the sphere of science and scientific service.

Let us cite another fact that is not too well known to the public at large. It turns out that the Ural, Siberian, and Far Eastern departments of the USSR Academy of Sciences for ever so long have not been financed from the union budget, but "live" on the money allocated to them by the RSFSR Government. In other words, while legally belonging to the union academy, in fact they are republic departments (whoever pays orders the music, is that not so?).

Thus, at first glance, everything necessary for the establishment of the Russian Academy of Sciences already exists. But the discussion of this question at the meeting of the Presidium of the USSR Academy of Sciences on 17 October of this year showed that it is far form as simple as it seems at the same "first glance." The speakers (and there were about 30 of them) often voiced simply diametrically opposed opinions.

Chairman of the Siberian Department of the USSR Academy of Sciences V.A. Koptyug first of all noted that previously the Siberian Department was extremely negatively disposed to the idea of the establishment of the Russian Academy. But points of view evolve, and now at the Siberian Department the opposite opinion is maturing.

What should the future republic academy be like? In the opinion of V.A. Koptyug, it is necessary to form its structure in accordance with the regional principle. Along with the three existing regional departments (the Ural Department, the Siberian Department, and the Far Eastern Department) it is advisable to transfer to the Russian Academy the Dagestan, Kazan, Kola, and Komi scientific centers and individual institutes in a number of cities of the RSFSR, as well as to think about the establishment of two or three new regional departments.

Of course, one must not forget the objective necessity of integration in modern science. Here V.A. Koptyug sees a solution in the establishment of associations of institutes which work in a specific area. While the General Assembly of Leading Specialists (who are not necessarily members of the RSFSR Academy of Sciences) and the bureau of the association, which is selected by this General Assembly, could manage them.

The fundamental integration of academic and VUZ science, in the conviction of V.A. Koptyug, should be another indispensable trait of the Russian Academy. For example, Novosibirsk University belongs to the system of the higher school of the RSFSR and at the same time in the area of science and the organization of the educational process has been integrated to such an extent into the academic institutions of the Novosibirsk Scientific Center that it is possible to regard it as a component of the Siberian Department of the USSR Academy of Sciences.

And, of course, the regional principle of the formation of the Russian Academy does not mean at all that it will deal only with the solution of problems that are specific for the RSFSR. The rejection of a reasonable combination of basic and applied research is absurd. Without basic research there is no science as such, there is also no chance to effectively solve regional problems.

A little later, writing in the newspaper NAUKA V SIBIRI, V.A. Koptyug said that when establishing the new republic academy it is also necessary to consider without fail the role which the scientific institutions of Moscow and Leningrad played and are playing today. As is known, of the 323 academicians 229 work in Moscow and Moscow Oblast, while 40 percent of the academic institutions are concentrated in the capital itself. Therefore, as one of the practicable versions, he sees the possibility of establishing (along with the Russian Academy of Sciences) academies of sciences of Moscow and Leningrad.

Into what in this case will the USSR Academy of Sciences be transformed? Let us quote the idea of V.A. Koptyug according to the newspaper NAUKA V SIBIRI (here it is simply more detailed than in his statement at the meeting of the Presidium of the USSR Academy of Sciences): "The transfer of institutes, design organizations, and pilot works to the academies of sciences of the RSFSR, Moscow, and Leningrad should, in our opinion, be accompanied by the transformation of the USSR Academy of Sciences into an all-union coordinating organ with respect to the academies of sciences of all the union republics. It should undertake the organization of work on the analysis of the trends of development of science, on the identification of the priority directions of basic research and scientific and technical progress, on the stimulation of the concentration of forces on these directions by the announcement of competitions for additional financing with respect to all-union programs and the preparation of special decisions of the union government, and on the making of a scientific evaluation of especially important national economic projects and decisions."

And although V.A. Koptyug states that the USSR Academy of Sciences will be able to engage in such coordinating work, provided a fund "for research in accordance with statewide programs, which is distributed on a competitive basis," is at its disposal, a sacred question immediately arises: But why will the USSR State Committee for Science and Technology, which from the very start also was an all-union coordinating committee for science and technology, not be able to settle these questions? And later, who will engage in scientific and technical forecasting and evaluation? After all, in conformity with the depicted arrangement, all "intellectuals" will work at the academies of the RSFSR, Moscow, or Leningrad, and by no means at the USSR Academy of Sciences. Given such a approach will not the USSR Academy of Sciences, to which we are accustomed, disappear?

Yes, it will actually disappear, V.A. Kirillin said at the meeting of the presidium: "The only source of the formation of institutes at the Russian Academy of Sciences is an appeal to the institutes of the USSR Academy of Sciences. This is self-evident. And no matter what they say there, another source, in my opinion, does not exist. My point of view is to transfer all the institutes to the Russian Academy of Sciences. But with what should the USSR Academy of Sciences then deal? All the departments, all the councils, and the system of journals and publishing activity should remain, that is, the USSR Academy of Sciences will become the ideological unifier of all scientific directions. While the assets, which are allocated through the corresponding councils for fields of science and technology, will become a 'lever of influence' on the republic academies."

But this arrangement, alas, is also easily criticized. First of all it is difficult to imagine that several distinguished scientists (members of the USSR Academy of Sciences), who work in the councils, will be able to dictate their "scientific will" to hundreds of Russian institutes, which will have the vigorous "budgetary support" of the RSFSR (you will agree that it is simply impossible to imagine the Russian Academy without Russian money). With the establishment of the Russian Academy the present publishing activity of the USSR Academy of Sciences will also lose its role—the members of the new academy, no doubt, will have a large number of their own publications.

K.V. Frolov sees a completely different source of the scientific potential for the new republic academy. In the RSFSR there are institutes, which belong to the USSR Academy of Sciences and universities, there are about 500 problem laboratories, which "are registered" it is not quite clear with whom, there are very strong research centers that work for defense. Now in connection with conversion a portion of these defense scientific research institutes can "blend" fundamentally with the system of Russian academic science.

N.G. Basov, who directed attention to the successful work of many affiliates of academic institutes of the capital, which unite the intellectual forces of some regions or others, also expressed an idea close to this one. This, in the opinion of N.G. Basov, is the path to the gradual establishment of the Russian Academy.

But at the meeting of the presidium skeptical voices were also heard. Here are several of them.

A.M. Prokhorov: We are poor and are poorly supplied with instruments. If the Russian Academy of Sciences is established, does this mean that the money, of which the state has little, will be dispersed to a broader group of institutes, that is, will they be supplied even worse?

G.A. Arbatov: What will this cost the state and who will pay for this?

It seems that the thought of G.A. Arbatov will become completely transparent, if we recall that the realization of the desire of N.S. Khrushchev to "evict" the All-Union Academy of Agricultural Sciences imeni V.I. Lenin from Moscow would have cost our state 4 billion rubles. And this is the price of just one move!

V.Ye. Sokolov: We should act so as not to destroy what has already been created.

And a genuine cry of the soul, in my opinion, was the statement of V.I. Subbotin, who said: "Comrades, we are not a Pioneer detachment which runs ahead of everyone with a drum. This is a characteristic of the academy—we should be to a certain degree conservative, deliberate, and reflective.... It is necessary to settle the question of the Russian Academy, but this should be done in stages and without haste."

And this appeal to healthy conservatism in the end also triumphed at the meeting of the presidium—a representative commission made up of members of the USSR Academy of Sciences, which is formulating a unified point of view on the Russian Academy, was set up. It is gratifying that the members of the large academy did not give in not only to the present hypnosis of public opinion (a Russian academy for the Russians), but also to the already clearly expressed opinion of the RSFSR Government.

A quarter century ago the USSR Academy of Sciences committed one of the biggest mistakes—under pressure from above it gave up to sectorial ministries 100 of its institutes of the technical type. We are now paying for this "quick decision" with our lag in computer technology and machine building, chemical technology and power engineering, automation and material science.

Let us today "hurry up without haste."

Letters to SOVETSKAYA ROSSIYA

907A0059C Moscow SOVETSKAYA ROSSIYA in Russian 24 Nov 89 p 3

[Letters to SOVETSKAYA ROSSIYA under the rubric "Polemics": "What the Russian Academy Is to Be Like"]

[Text] **Not a Department, But a Union**

The Russian Academy of Sciences, which was established in 1724, ceased its existence in 1925. Initially its absence was imperceptible, since the all-union academy performed in part the corresponding functions. But by 1961 in all the republics, except the RSFSR, their own national academies has been established. While the scientific community of the RSFSR, which has a large potential, lacked its own organizing center. The Russian Academy of Sciences (RAN), which unites the efforts and interests of all representatives of creative labor of the republic for the acceleration of economic and social development and the solution of the ecological problems facing the RSFSR, should also become such a headquarters. For us it is unquestionable that this is possible only in case of the revival of the real Russian intelligentsia with its traditionally lofty spirituality and sense of responsibility for the fate of the homeland.

It is fundamentally important to revive the Russian Academy of Sciences on the basis of the new democratic principles. It is inadmissible to establish it as an elite organization which consists of few academicians. Our academy should unite the scientists of the RSFSR, who work in different departments and institutions: universities, sectorial scientific research institutes, and academic institutes. The technical sciences, which substantially influence scientific and technical progress, should be widely represented at the Russian Academy of Sciences.

The democratic nature of the academy as a union of scientists, who are patriots of the RSFSR, and not the formation of another "department of science," can be achieved only by a different formation of its corps. Our academy should consist of members, who join it in conformity with their specialty. Precisely join, and not are elected. While the members of the Russian Academy of Sciences will elect academicians by secret ballot at the sessions.

The members of the Russian Academy are professionals who are working successfully in their chosen field, their skills should be verified. Therefore, in our opinion, doctors of sciences, winners of the Lenin Prize and the State Prize, authors of discoveries, and members of the RSFSR Union of Writers can join the Russian Academy of Sciences. Moreover, the academicians of the RSFSR are not only the best of the professionals, but are also without fail people, who enjoy great prestige in society for their civic position and have a broad outlook and the ability to see the prospect of the development of the RSFSR. We understand how difficult the choice of such people from the extensive group of members of the Russian Academy of Sciences is, but when forming the corps it is necessary to take as the guide the principle "better is less, and better." Not a synod of "founding fathers," but broad groups of the scientific and technical community of the RSFSR, which are represented by members of the Russian Academy of Sciences, should formulate the charter of the academy and elect the academicians.

In short, the academy should become a community of patriot scientists, who realize that the central task of the Russian Academy of Sciences is the well-being of the RSFSR and the uniting of the efforts of our intelligentsia for the development of culture and the solution of economic, demographic, and ecological problems.

The second important task is the search for young talented people and concern about the young scientific generation. It is necessary to find and support creative young people and to afford young scientists from all corners of the RSFSR the opportunity to conduct practical studies at leading Soviet and foreign scientific centers.

The social protection of scientists is the third goal of the academy. Membership in it should not give any privileges. But the academy will give material support to those who have become disabled due to failing health or in connection with advanced age.

The question of the financial support of the Russian Academy of Sciences is complex. Since we are poor, at the first stage it is necessary to establish the academy without additional financing. Initially it can exist just by means of membership dues. At the second stage the structure of the research institutions of the academy should be formed. Many institutes, observatories, preserves, and other scientific institutions, which are financed from the RSFSR budget, are already operating in the RSFSR. They will also constitute the production base of the Russian Academy of Sciences. Moreover, scientific organizations, which are not working on urgent tasks of our republic, should not be financed from the RSFSR budget.

We understand that some of our suggestions may evoke objections. One thing is indisputable: the Russian Academy of Sciences should be revived on a democratic basis.

[Signed] Associates of the Institute of Radio Engineering and Electronics of the USSR Academy of Sciences: Professors O. Yakovlev, V. Meriakri, and Ye. Bazarov, winners of USSR State Prizes; Professor L. Remizov; G. Petrov, winner of the Lenin Prize; A. Yefimov and S.

Matyugov, winners of USSR State Prizes; Doctor of Technical Sciences D. Dobryak

Fryazino, Moscow Oblast

But a Standard With a Beard

It is difficult not to agree with the arguments that have been heard in favor of the establishment of the Russian Academy of Sciences. The structure of the management of science, which has formed in the country, has actually hopelessly lost touch with life. The influence of the Presidium of the Academy of Sciences, the bureaus of specialized departments, the scientific councils, and, finally, the highest organ—the General Assembly of the USSR Academy of Sciences—is being felt extremely weakly "below," at the level of institutes and laboratories. It is extremely difficult to find an example, when their decisions would give real impetus to a new direction in domestic science. In the formed bureaucratic structure of the Academy of Sciences of the country all these "semipublic" organizations are not for the large army of scientists anything that merits serious attention. An entirely different matter is the staff of the presidium, it is omnipotent.

Now, tell me, how is one to regard the special status of Moscow institutes of the USSR Academy of Sciences, which is due to their direct subordination to the Presidium of the Academy of Sciences of the country? My opinion is that here we have in essence discrimination in accordance with the principle of registration. Judge for yourselves: the academic institutes, which are directly subordinate to the USSR Academy of Sciences, are financed from the union budget, while the ones that are a part of the regional departments—the Ural, Siberian, and Far Eastern departments—are financed from the budget of the RSFSR, and the institutes of the republic academies are financed from the budget of the union republics.

The two levels of academicians: republic and union, are another indication of the nonequivalence of the formed structures. This is a quite delicate matter which is very painful for many people. I can assume that if during the establishment of the Russian Academy this principle of two stages is applied, the present academicians and corresponding members and all the potential candidates for future vacancies will rise against it as an impregnable redoubt. Only the fact that if you proceed from the principles of established financing, the Russian Academy, although in restricted form, was established long ago, is somewhat reassuring and instills certain hopes. Today it is necessary merely to take a number of resolute steps in order to finally form it into an independent structure. First of all—and this is the basic issue—it is necessary to decide the fate of the scientific institutes which are directly subordinate to the USSR Academy of Sciences. In my opinion, the large academy would be entirely able to give up the possession of its own scientific base, having aimed its efforts at the accomplishment of the tasks of the coordination and supply of scientific research and development at the level of the country. At the same time it is clear that the simple transfer of its scientific research institutes and design bureaus to the Russian Academy is no good: another unwieldy structure will appear and that is all.

Is there a way out of this situation? In my opinion, there is. I believe that it is not worthwhile to take the path of bringing the departments, centers, and affiliates, which exist on the territory of the RSFSR, together in a new department. It is far more logical to take a step in the directions of the further decentralization of science. I propose to establish independent academies on the basis of the three existing departments, having made them equal in rights with the republic academies and having formed at the same time with the same rights the Moscow and Leningrad academies. Each of them in its scientific potential is entirely comparable to any of the now operating republic academies. After carrying out such a thing, it would immediately be possible also to go farther, having eliminated the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, the Academy of Medical Sciences, and the Academy of Pedagogical Sciences and having integrated their scientific institutions in the newly established structure.

I will try to explain the reasons for the solution I am proposing. The RSFSR is too large and complex a republic to be approached with conventional standards. The proposed means conforms to the present policy of regional economic independence and solves a large number of problems of management.

Finally, I believe that it is also worthwhile to preserve the large academy as an assembly of academicians and corresponding members for the implementation of coordinating functions. During the establishment of several academies in the RSFSR their coordinating organ can also be organized on the basis of these principles.

[Signed] Doctor of Chemical Sciences N. Lyakhov

Novosibirsk

"Purity" and Advantage

Having familiarized myself with the controversial statements concerning the establishment of the RSFSR Academy of Sciences (SOVETSKAYA ROSSIYA, 16 August 1989, 17 September 1989), I find that they do not touch upon many other aspects of the perestroyka of domestic science. Undoubtedly, science not simply for the sake of science, but science with its utility for society and with the revelation of the potential of democracy, the present changes, and scientific knowledge is needed. Here haste, which several authors advocate, is dangerous. I will explain why. The maturation of society is now occurring. Moreover, at such a pace as our country did not know in the past. The prospect of the formation of regions in accordance with economic and other attributes is beginning to appear, and that is why not only the establishment of a scientific subdivision of a new type in the form of the Russian Academy, but also the reorganization of all other, academic and nonacademic, science suggest themselves.

Several ministries have just been abolished. It seems that such a process will continue. This, in turn, will lead to the perestroyka of sectorial scientific research institutes. At the same time it is necessary to observe the condition that all the detachments of science would interact with each other. I foresee disagreements of some representatives of "pure" science, which is often called basic science. Its supporters do not always treat with respect research of an applied nature. The effectiveness of the latter is also precisely the highest.

The realities of perestroyka are having the result that instead of fields of the science, which for each ministry is its own, the science, which is concentrated directly at enterprises that will be united, let us arbitrarily say, into concerns, should undergo greater development. The science of concerns will become consolidated, goal-oriented, competitive, and useful. It will require more than today ties with academic science.

Moreover, the research and sales base will come nearer to production, people, who are of little use, will be released. The changeover to modern entrepreneurial forms of management (self-financing, cost accounting, leasing, and so forth) will also change the content of VUZ science. Enterprises will release assets to higher educational institutions not without rhyme or reason, as now happens at times, but only for developments that are really needed.

In such a situation the role of academic science will cease to be far-fetched, as it often is now, and frequently subordinate to prestige—with the expectation of hasty generally comprehensible publications and dissertations.

I want to say a few words about the authors of the discussion, who advocate the establishment of the Russian Academy as a public service. What public organizations we have known—from the International Organization for Aid to Fighters for Revolution to the Society for Knowledge! It seems to me that the Russian Academy should differ from them in principle. The question of not only the generation of knowledge, which is the basis for future technologies, but also the mutual enrichment of science and production without their loss of contact with each other will face it.

Now all the sectors of the national economy have turned out to be dependent on the proper organization and planning of the economy and on the level of all types of machine building. Let us turn to the structure of the USSR Academy of Sciences. In all there are 17 departments in it, but there is no machine building department. Its representatives have been included separately in small numbers in the Physical Technical Problems of Power Engineering Department, the Problems of Machine Building, Mechanics, and Control Processes Department, as well as the Information Science, Computer Technology, and Automation Department. Is this justified according to the standards of the present? The president, vice presidents, and other executives are among the representatives of "pure" science.

I believe that at the Russian Academy the leadership should be competent and consist of specialists, of those who have not betrayed their occupation for the sake of possessing power. Here it is also necessary to avoid the other extreme—to nominate for scientific managerial positions fewer general directors (such a trend exists!) and those who have also lost their professionalism. People, who know how it is necessary to pull the country out of stagnation, should direct the academy.

Many participants in the discussion in SOVETSKAYA ROSSIYA are worried by the question: What is to be done with the existing USSR Academy of Sciences? It seems to me that time itself will put everything here in its place. If we are able to properly organize the Russian Academy, very soon the USSR Academy of Sciences without anyone's help will depart this life. Everything that is healthy in it will become a part of the republic academies, including the Russian Academy. It also seems that the present Presidium of the USSR Academy of Sciences and the State Committee for Science and Technology in many respects duplicate each other.

[Signed] L. Pankov, a specialist with 39 years of technological service

If You Soothe Vanities

The more I follow the discussion on the Russian Academy of Sciences, the more clearly I see the connection of this theme with regional cost accounting. Oblasts, krays, and republics are striving for it in order to ensure economic sovereignty, to create a basis for the harmonious development of cities, workers' settlements, and villages, and to increase the standard of living of the population. The same argument usually is also cited on behalf of the Russian Academy of Sciences. True, here another thing is also meant: academies exist in all the union republics, but not in the RSFSR. Such a statement of the question is humanly entirely comprehensible. Why, indeed, should the RSFSR be an exception? Is it really worse that the other republics? But if you look at this problem through the prism of the social and economic development of the RSFSR and the country, if you mean science in general and Russian science in particular, it is also not difficult to come to a different conclusion.

What do we have the right to expect from a republic academy? First of all in-depth scientific research, which promotes the rapid social, economic, and cultural development of the federation. But is it mandatory to conduct such research only with the forces of "one's own" academy? What prevents a republic, say, from enlisting for this any institute of the USSR Academy of Sciences or from allocating assets for the establishment on its territory of one or another scientific institution of the academic type? Nothing whatever. A question may arise: If the opening in regions of additional institutes is permissible, why not establish simultaneously a republic academy? For new vacancies will appear, the number of academicians will increase, and the zone of influence of academic science will expand. All this is so, but let us return again to regional cost accounting. The republic can become a force only if all the enterprises on its

territory are economically independent. It is also possible to say the same thing about science. The more independence academic institutes have, the more significant their contribution to the development of regions is. But can academies, which are subordinate to republics, really be free in their actions? Life has shown that they never were such. Is that not why, while amazing the world with the large number of national academies, we are at the same time startling it with technological and cultural backwardness? But take Nobel Prize winners. In the same United States, where one academy of sciences exists, there are nearly fivefold more of them than in our country. Hence a conclusion which will not gain me friends among colleagues: the republic academies are not needed.

Let us calmly look: What interests of the union republics, including the RSFSR, where, incidentally, three departments of the USSR Academy of Sciences operate, will be hurt, should they give up their academies? It seems that only the mistakenly understood patriotism and pride of men of science will suffer.

As for the union academy, it should, in my opinion, establish on the basis of the republic academies its own department and expand their network considerably in all regions of the country, and first of all in the European part of the RSFSR. It could conduct much research in accordance with the orders of oblast and kray soviets of people's deputies at the expense of both the local budget and the union and republic budgets. Moreover, the relations with republics, krays, and oblasts would be formed exclusively on a cost accounting basis. The abandonment of republic academic structures would make it possible to decrease sharply the spending on the maintenance of the enormous administrative apparatus and to channel the released assets into research, for which there has not yet been time, that is, to increase the effectiveness of capital investments in science.

It must not be forgotten that in Europe integration processes are gaining strength. Even different states are uniting efforts for the solution of common global problems. While we in one country, like madmen, are trying with all our might to split up academic science with national and territorial dividing walls. To what will this lead?

[Signed] Doctor of Economic Sciences Ye. Sapiro, deputy chairman of the Presidium of the Perm Scientific Center of the Ural Department of the USSR Academy of Sciences

Logunov on Role of Education

907A0059D Moscow SOVETSKAYAROSSIYA inRussian24 Nov 89 p 3

[Interview with Vice President of the USSR Academy of Sciences Academician Anatoliy Alekseyevich Logunov by Vladimir Denisov under the rubric "Polemics": "The Choice of Standards"; date and place not given]

[Text] **SOVETSKAYA ROSSIYA:** Anatoliy Alekseyevich, the idea of restoring the Russian Academy of Sciences, which was voiced in SOVETSKAYA ROSSIYA, it seems, arouses objections from hardly anyone. Disputes are taking place over what it is to be like. As a vice president of the USSR Academy of Sciences, you, it must be assumed, have your own point of view, do you not?

Our interview with Academician A.A. Logunov began with this question.

A. A. Logunov: I completely support the idea. I believe that the Russian Academy can be integrated into the established structure. Although, in my opinion, its activity should be different than at the USSR Academy of Sciences.

First of all is it necessary to establish its own, Russian academic institutes? In my opinion, on no account must this be done. For there are more than enough institutes as it is. Incidentally, we learned long ago to open institutes, now to learn to close them. But this is a special theme.... Let us calculate: more than 400 academic institutes, which are subordinate to the USSR Academy of Sciences and its regional departments and affiliates, are already operating on the territory of the RSFSR. Add to this more than 500 higher educational institutions and over 1,800 sectorial scientific research institutes. The scientific and technical potential is enormous! It is what it is necessary to use to the utmost.

The reorganization of the union academy has now begun. Perhaps, the process is occurring more slowly than would be liked, but nevertheless the general trend—to make the institutes independent—is appearing more and more strongly. The basic creative potential is concentrated precisely here, everything else is in essence the superstructure. How to determine more correctly the strategic directions of basic research is another matter.

Let us take the higher school. In our country it has been believed for a long time that higher educational institutions are called upon only to engage in instruction, while science proper is the affair of the academy. But how is it possible to train good specialists, if instructors and students do not conduct scientific research? Of course, at Moscow State University and at Novosibirsk University today there is also close contact with science. But it is that way far from everywhere. Very many higher educational institutions, even if they wanted to, do not have opportunities to participate actively in scientific research. It is here that the Academy of Sciences could also help—it could order research, unite the forces of the scientific research institute and the higher educational institution, and finance work, having, of course, its own funds.

SOVETSKAYA ROSSIYA: But what, in your opinion, should the model of the Russian Academy be like? I have in mind that part of it, which you just called the superstructure.

A. A. Logunov: It would be good to establish it as a minimum one, but such a one, which would be able to ensure the rapid development of scientific research. Time does not wait, we have fallen behind as it is. Today scientists spend much energy in order to get, purchase, and obtain instruments and equipment.

I cannot agree with the assertion of Academician N.N. Moiseyev, which was made in SOVETSKAYA ROSSIYA on 16 August, that the Russian Academy is needed as an alternative to the USSR Academy of Sciences. No, it is a matter of something else: the situation, when the RSFSR should have its own academy, has ripened, but it should be built, I repeat, with allowance made for positive and negative experience. I believe that the Russian Academy should specify the priority programs of research, including the urgent problems of the RSFSR, and focus attention on this, by enlisting creative forces, first of all young people. Then we will obtain an impact more rapidly from the invested assets.

SOVETSKAYA ROSSIYA: Anatoliy Alekseyevich, even after acquiring full independence, the institutes—it is unimportant whether within the USSR Academy of Sciences or the Russian Academy—will be left with the old base. What is the solution? To get hold of imported equipment quickly or by emergency measures to force our industry to supply researchers?

A. A. Logunov: Instruments and equipment are the product of the greatest intellect, new ideas and technologies are behind them. Our industry thus far has not been interested in developing unique instruments—the great concentration of forces of scientists and engineers is required, while this for the present in our country is economically unprofitable.... Abroad there are a large number of small firms, which respond immediately to any innovations and develop instruments. Our situation in the field of computer technology is especially catastrophic. The most resolute steps are needed here. I believe that this is a task of the sort, which should be accomplished by the state nearly in the same way as they solved the atomic problem at one time—by the mobilization of resources, the concentration of scientific forces, and the creation of the conditions for marked progress.

I would propose to allocate specially for the natural sciences research centers which have a large scientific potential. Moreover, these should be truly advanced centers which are well known to the world scientific community. They first of all should be supplied with modern equipment. And the other research centers should gradually be pulled up.

SOVETSKAYA ROSSIYA: In one of your statements you spoke with anguish about provincialism in science. In what is it manifested?

A. A. Logunov: By provincialism I understand the nature of thinking. Intolerance toward other views, thoughts, and ideas and at the same time amazing confidence in possessing the truth. Here, let us assume, a new phenomenon was discovered abroad. Such people, as a rule, are calm—it seems that this is how it should be. But if the discovery was made at a neighboring institute, the reaction is completely different: What, they say, can they discover? It turns out that it is not important that we have fallen behind western colleagues, it is impossible that our neighbor would not have it better than we do.... If we do not cure this disease, it will drag our science into the swamp.

SOVETSKAYA ROSSIYA: It is probably possible to group with its manifestations monopolism, cliquishness, the pulling "upstairs" of one's pupils or associates, the selfish serving of the interests of departments.... What is to be done in order to leave all this outside the walls of the future Russian Academy?

A. A. Logunov: Monopolism arises when representatives of some one school or group hold all the key positions. Even if this school is progressive, it is capable owing to its special monopoly position of closing up sooner or later in narrow group interests. It seems to me that the most normal means of developing science is the coexistence and competition of many genuine scientific schools. Schools always existed in the RSFSR, the teacher conveyed to the students not only his knowledge, but also moral principles and the great goal of serving science and the people.... The school is not a clan, in it the relations are spiritual. While in the clan selfish, careerist aspirations are in first place.... Moreover, for the sake of science one must not give any school preference and allow it to seize all the levers of development. Only the representation of different schools and the combination of the interests of different groups, even, if you wish, compromises among them, will really lead science forward. On the other hand, it is important to have different funds for financing, while once again let the representatives of different schools participate in the distribution—on a competitive basis!—of each of them.

SOVETSKAYA ROSSIYA: But does it not seem to you that the danger of monopolism is incorporated in the very organizational structure of the present academy? After all, today the USSR Academy of Sciences is a certain ministry of basic sciences, with all the defects, including departmental parochialism, which are characteristic of a ministry. But, say, the U.S. National Academy acts as a public organization, exists on the dues of its members, while with the state and firms is, as we would say, on cost accounting relations. Could we not use the same or a different form of organization as an antimonopoly form?

A. A. Logunov: The academy is taking this path, by granting institutes independence. Hence, management from the center is decreasing. Within the academy special funds of departments and the presidium are being created. Different scientists will form and distribute them, moreover, their replaceability is mandatory.... In this sense we will arrive at a different style of work of the academy. It is important to have in the leadership people who would not be bound by group interests, without which their independence is inconceivable. In essence, we are talking about the necessity of the same active processes in science, which are also occurring in society.

SOVETSKAYA ROSSIYA: Anatoliy Alekseyevich, of course, the new economic mechanism, glasnost, and democracy in science will help to solve a portion of the

problems. But there is also another aspect—the moral aspect. For provincialism is a consequence of not only economic, but also moral trouble. The majority of Russian scientists were always distinguished by purity of thoughts and altruism. Today these qualities have to a considerable degree been lost. Therefore, our gazes should probably be directed first of all toward young people. The morals, which will be incorporated in the foundation of the Russian Academy, will determine its level for a long time. I want to ask you a question as not only a vice president of the Academy of Sciences, but also a rector of Moscow State University: Does the level of knowledge and morality, with which school graduates come to the university, suit you?

A. A. Logunov: If we talk about the level of their education, it has decreased greatly. Many of the people now enrolling in the university could not solve the problems which were put to matriculants of the 1950's and 1960's. If we were now to make the same demands, we would admit hardly anyone. Our school, whether we want this or not, has proved to have taken a backseat to society. For 5 years now we have been talking about school reform, had adopted a large number of documents, have held plenums, congresses, and meetings, and have transformed ministries, but there are no results. And first of all because the school is still not independent. There can, of course, be procedural instructions from above, but independence should be the basis for studies and the life of the school. All sorts of rayon and city departments of public education are a useless matter. Remember how Ilya Nikolayevich Ulyanov worked. He did not have a staff! Himself a teacher of the highest skills, he traveled among rural schools, saw how they were teaching there, and gave an example—he taught lessons. He did not given instructions, but taught.... Further, the latest equipment is also absolutely essential for schools. School children should already have computer hardware, just as all other sorts of instruments. Try to find today such a school, at which the teachers would be concerned with science. Such schools simply do not exist. Although everyone knows: schools are very, very busy, but, alas, not with what it is necessary. If we succeeded in eliminating all this and in seeing to it that it would be interesting for scientific associates and young people from universities to go to work at the school, much would change.

Frankly speaking, at higher educational institutions there are nearly the same problems. Let us take Moscow University: What is the difficulty? We have few advanced instruments and little computer hardware. And, thus, we cannot compete with leading western centers.... But the main thing is that we teach mathematics, physics, and chemistry, but poorly teach one to be an educated individual. The old intelligentsia in our country was destroyed, but it took centuries to form. The model of cultivation in the RSFSR is morality, decency, and professionalism. While no small share of the present intelligentsia is neither very cultured nor sufficiently education, nor is it, I would say, very humane. One would like to know, whom are young people to emulate?... This is the overall process of the crisis of morality and culture. The cultivation of erudition, decency, charity, and the duty to serve the homeland should become the business of the whole of society.

SOVETSKAYA ROSSIYA: Anatoliy Alekseyevich, the problem is directly connected with another one—with the lending of a humanitarian nature to education. It presumes the existence of many qualities. But look at some engineer: even his vocabulary is a kind of base vocabulary. How is cultivation to be returned to the technical intelligentsia?

A. A. Logunov: This is a difficult and lengthy process. Cultivation is passed down from generation to generation. And now there are real intellectuals, like there were at all times, however difficult the conditions proved to be. And if a person, who has graduated from a higher educational institution, gets into surroundings, which are permeated with the spirit and cult of morality and cultivation, his formation as an individual proceeds more rapidly. Therefore, in the RSFSR not at all by chance did they become intellectuals in the first generation. The surroundings, which were new for them, made such those who came from the simple people and the merchants.

Although today there are far more manifestations of lack of cultivation. Take the meetings of the Supreme Soviet: how standards of debates, tact, and the tolerance of the opinion of others are lacking.... I believe that today genuine intellectuals—for example, our best writers, who bear anguish for the country and for its people—can do much.

SOVETSKAYA ROSSIYA: And what would think about enlisting leading writers, for example, Rasputin, Belov, Astafyev, and others, in teaching at Moscow State University? It seems to me that they could be attached to the university over and above the staff, as privatdocents, as was the case before the revolution, and teach domestic philology to undergraduates.

A. A. Logunov: As a rector I would only welcome this. At one time all of Moscow gathered at the lecture of historian Solovyev at Moscow State University. Here they also heard Klyuchevskiy and Granovskiy, historian and lawyer Chicherin, while in Soviet times they heard historians Tikhomirov and Grekov. Today at Moscow State University there is the Kolmogorov physical mathematical school. But there is no similar Solovyev school or, say, Rasputin school. Today it is especially necessary for young people to know thoroughly their history, culture, and literature. Let them feel the roots which link us with the past. At times prerevolutionary Russia is compared with a developing country. But what developing country has world-class scientists? And writers of genius? There were standards, which we should now also emulate. This is why we are restoring continuity. Historical roots nourish the self-consciousness of a people, their spirituality, humanity, and ability to form equal

relations with other peoples. All sorts of current interethnic clashes are occurring, first of all, due to the deficiency of culture in the broad sense of this concept. Moreover, note that the middle layer of the intelligentsia is advancing nationalistic demands. That is why the question of what it is to be like is so urgent....

From the problems of the restoration of the Russian Academy we have arrived at a discussion of cultivation in its various manifestations. But if the culture of the people and the level of erudition and intellect have decreased, this cannot but worry the future RSFSR Academy of Sciences. I hope that this direction of work will become the most priority direction there is.

Economist Lakhtin on Decentralization of Soviet Science

907A0058A Moscow NTR: PROBLEMY I RESHENIYA in Russian No 21, 3 Nov 89 p 4

[Interview with Doctor of Economic Sciences Georgiy Anatolyevich Lakhtin by V. Dvoretskiy: "Orient the Organization of Research and Financing in Science Toward the Individual"; date and place not given; first paragraph is NTR: PROBLEMY I RESHENIYA introduction]

[Text] Doctor of Economic Sciences G. Lakhtin, who deals professionally with the problems of the economics, organization, and management of science, answers the questions of V. Dvoretskiy about the present and future of the organizational development of science.

NTR: PROBLEMY I RESHENIYA: Georgiy Anatolyevich, our scientific and technical lag behind the developed western countries is today no longer a secret. It is also no secret that the further increase of this gap (and it, as they say, is occurring) endangers the prospects of the social and economic development of the country. And if we invest 5.5 percent of the national income in science (in the United States they invest 6.1 percent), if the scientific potential of the country is enormous, but the return is obviously small, it is clear that the mechanism, which converts resources into results, is working poorly.

G. Lakhtin: Throughout the 70-year history of our science the tendency of centralize its management and to raise this management to the state level is traced. The increase of the social role of science, which could not but be accompanied by the increase of the level of management, is the basis. From initial subordination to insignificant instances in the People's Commissariat of Education and the Supreme Council of the National Economy the rise went through the subordination of the Academy of Sciences directly to the government and the establishment of organs of the management of science to the formation of a statewide structure. This process is not finished, since there is no organ, which supervises as a whole science and the implementation of its achievements and heads all the forces, which are bringing about scientific and technical progress in the national economy. The management of progress is split among the State Committee for Science and Technology, the USSR Academy of Sciences, industrial ministries, the State Committee for Education, the State Planning Committee, and others. Such multiple authority is hindering the implementation of a unified scientific and technical policy and conflicts with the promotion of scientific and technical progress to the role of a leading factor in economic and social development. The formed situation makes it incumbent to have in the country a supreme strategic organ of the management of scientific and technical development, which would equally encompass both the activity of sectorial, academic, and VUZ [higher educational institution] science and the technical development of production.

I believe that the movement toward centralization will not culminate in this. Whereas now the supervision of science as a whole is concentrated in the sphere of executive power, subsequently legislative power will become the supreme power over science. It, apparently, will pass acts, which define the legal status of the elements of the scientific system (the status of the science worker, the scientific product, and others), will specify the priorities of scientific and technical development, and will establish the amounts of financing of science.

But the counter process—the decentralization and democratization of management—is also occurring. The solution of current organizational problems is gradually shifting from the departmental level to the level of organizations and their subdivisions, personnel themselves, labor collectives, and the scientific community are playing a larger and larger role in decision making. Initially these decisions affect managers (the electivity of managers), then may also apply to all personnel (the admission of new members to the collective with the general consent of the members already working, which is already being practiced in part), to organizational structures, and to management procedures. It is possible to boldly predict that the democratic principle will also apply to the substantive aspect of activity—the choice of themes, the evaluation of completed work, the evaluation of the degree of labor participation of each worker, and so on.

NTR: PROBLEMY I RESHENIYA: But what about a step lower—at the level of the institute?

G. Lakhtin: Here the trend is toward differentiation, which signifies a departure from general-purpose organizational forms and the search for such forms which would correspond to the different classes of problems.

Initially the scientific research institute was the successfully found form, which afforded opportunities for the formation of scientific collectives and the setting up of professional, organizational, and managed research activity. Until recently it was the basic and essentially the only organizational form: the roots of uniformity go back to the administrative system which was organized in the 1930's. At that time sectorial science was aligned with the structure of physical production—there should have corresponded to each subsector and each type of product its own institute, which is subordinate to the same main administration. This ensured the scientific

support of production and the solution of current problems, which should have contributed to the stable fulfillment of production plans.

The institute, not the theme or problem, became the basic object of financing, planning, and evaluation. Now such an arrangement has become an obstacle, it gives rise to monopolism and hinders progress on a competitive basis. The observed trend is leading to the convergence and uniting of the task and the performer and to the appearance of organizational forms, in which the task is identified with the "team" that was specially established for its accomplishment. Such are special-purpose temporary collectives, contract groups, and so forth. Their appearance is creating the prerequisites for real scientific competition.

The time of the completion of a development should also be the time of the existence of the collective that was established for its completion. Only in this case can the identity of the theme and the "team" be achieved. The future is with temporary single-purpose collectives, in the formation of which the democratic principle will play a large role.

This will simultaneously signify a change of the trend toward the growth of scientific research institutes. It was believed that their size is a sign of strength. Even in official documents the concepts of a "small" and a "weak" scientific institution were identified; appeals to put an end to small, weak institutes were repeatedly heard. Meanwhile, abroad the reverse process developed—small firms, which are flexible, reorganize easily, and are tailored to taking risks, began to play a larger and larger role in scientific and technical progress. Our giants with many thousands became more and more vehicles of inertia. And, obviously, grown, hypertrophied institutes will become extinct like the brontosaurus.

NTR: PROBLEMY I RESHENIYA: Does this concern both applied and basic science?

G. Lakhtin: We will not forget the fundamental difference between basic and applied science: the former generates knowledge, while the latter generates technical solutions. Initially the academic sector was the focus of basic research, but in the early 1930's it was already oriented toward contributing to the needs of developing industrialization; and through the present in the activity of the Academy of Sciences the share of operations with a clear practical orientation is increasing.

Whereas in the industrially developed countries of the West the share of basic research is steadily increasing, in our country the reverse process is occurring—within the framework of a constant or slightly increasing amount of allocations for academic science in it the nature of the work being performed is shifting in the applied direction. Meanwhile, the scarcity of basic results entails the low productivity of applied science—there are no fresh ideas, and hence the slow pace of scientific and technical progress.

Today basic research has been fit into the general organizational mechanism. Due to this the general rules of planning and stimulation, the methods of management, and so on apply to basic science. Obviously, its future development is governed by the possibility of organizational isolation.

NTR: PROBLEMY I RESHENIYA: Cost accounting now affects and worries everyone. The supporters are predicting vigorous growth for it, the opponents are convinced that science will reject it....

G. Lakhtin: With the development of the economic reform cost accounting in science will also evolve. It has its own ancient and instructive history. At the first stage (the 1920's) there was no allocation of money against the scientific product, which was stipulated in advance, as a system. After the "great change," when science was subordinated to the needs of the supply of current production, it was necessary to key it to the demands of enterprises and the organs supervising them. And in 1932 all sectorial science was converted to cost accounting. But it did not endure long: the conditions did not exist for cost accounting as a system of economic relations between equal and independent partners.

The second changeover to cost accounting took place in 1961 under completely different conditions. Science should have not so much supported as modernized current production. It became a relatively independent partner of production activity. But the chosen form of cost accounting relations proved to be insufficiently effective. Beginning in the late 1960's the so-called cost accounting system of the organization of work on the development, assimilation, and introduction of new equipment on the basis of economic contracts (job authorizations), which was introduced first in the Ministry of the Electrical Equipment Industry and was extended during the next decade to all industrial ministries, began to replace it. While having partially eliminated the drawbacks of the previous form, it still was not able to become a motive force of scientific and technical progress. The time of major programs arrived, while cost accounting prompted the search for clients for petty themes.

NTR: PROBLEMY I RESHENIYA: Now we are witnesses to a new changeover of sectorial science to cost accounting by the name of "full" cost accounting,....

G. Lakhtin: ...which, having introduced new elements in the procedure of the distribution of received money and the rewarding of performers, has not made fundamental changes in the main thing—the nature of the interrelations of scientific institutions with clients. As before, the subject of the contract and the object of remuneration are the process of development, not the result; as before, the end social result—the technical and economic level after introduction—has not been matched with the interests of the performers.

NTR: PROBLEMY I RESHENIYA: Consequently, it is possible to expect further steps? In what directions?

G. Lakhtin: I believe that institutes will be provided with working capital (internal or borrowed), which will enable them to produce the scientific product precisely as a

commodity; principles of pricing and anti-expenditure mechanisms (it is possible with good reason to call the present mechanism an expenditure mechanism) will be found. But the main thing in the future development of cost accounting is connected with the economic reform, which is creating reciprocal interest: of production in innovations and of science in the reward, which is used both for the stimulation of personnel and for its further development.

NTR: PROBLEMY I RESHENIYA: The scientific product exists in two forms. One is the independent product, which the producer (for example, a scientific research institute) sells to the client, who sees to its use. The other is when the scientific product is a part of the physical product and is sold together with it. A type of organization corresponds to each of the forms. Which one, in your opinion, is promising?

G. Lakhtin: In the former case science and production develop separately. In essence, an intermediate product is paid for, while the end production result in general is excluded from the sphere of cost accounting interrelations. The second means presumes complete organizational and economic integration: the updating of the physical product is combined with its current production. The product of the joint labor of the worker and the research is sold. In this case both the expenditures on the manufacture of the item and the expenditures on the achievement by this item of superior qualities are embodied in the price. That is, the already realized scientific product, in its final form, is paid for.

World experience testifies to the promise of the second means. Leading firms establish under themselves scientific and technical centers, which enable them to concentrate in their hands the results of applied research and development. In agreeing to the increase of the science-intensiveness of their products, they are striving to exceed the average technical and economic level, which ensures victory on the market. Obviously, with the development of the economic reform this means will also undergo preferential development in our country. The scientific and technical center of the AvtoVAZ Association, which has more than 2,000 personnel, can serve as a prototype; it was established in recent years in connection with the posed task of attaining the world level of the automotive industry. But such a means is possible not only for automotive giants. Several enterprises of the same type can maintain a research center on a shared basis. In such a case the very concept "sectorial science" is transformed. The nature of cost accounting is also transformed—the question of the price of the scientific product, which thus far has not been settled, disappears.

NTR: PROBLEMY I RESHENIYA: Organizational changes will also dictate changes of personnel. Does a new increase of the number or its decrease due to the elimination of ballast await us?

NTR: PROBLEMY I RESHENIYA: The increase of the number of personnel of science was never smooth—periods of especially rapid development (1929-1933, 1957-1962) alternated with intervals of a more or less stabilized increase. Each such jump was connected with the updating of organizational forms, after which an interval of the putting of the increased potential into order followed.

Now is an interval of the transition to a new stage in organizational development, an interval of qualitative changes. Apparently, the formation of new organizational forms will also require their filling with new personnel, primarily young people. The influx of young personnel not only will ensure the effectiveness of the emerging organizations, but will also make it possible to keep the age structure of personnel within the desired framework. Apparently, a new quantitative increase, although not as sharp as the preceding ones were, lies ahead.

But qualitative improvement will be the main thing in the development of the personnel potential of science. For many years the individual gave up his place to the organization. But precisely individuals, and not average extras, are needed for the progress of science, particularly basic science.

NTR: PROBLEMY I RESHENIYA: Now departure abroad is becoming quite simple. The conditions for scientific work in many countries of the West are better than in our country. Will not a "brain drain" begin?

G. Lakhtin: If the phenomenon undergoes development, this will be a terrible disaster. It is natural that they will invite the most talented and creatively active people. The losses of "gray matter" for the future of the country will be much more destructive than the losses in connection with the export of petroleum and lumber.

State personnel policy, which is based on the recognition of scientific talent as the most important national property with the ensuing set of steps on the selection, promotion, and stimulation of the creative individual, should oppose this.

In the West the system of grants—a method of financing individual scientists or small groups established by them; financing "for the individual," rather for a declared idea—proved itself long ago and well. The U.S. National Science Foundation in 1986 received 36,600 applications, of them it satisfied about 14,000 in the amount of $174 million. As is evident, on the average one grant accounts for not that large an amount. But it must be considered that the allocation of a grant is not only material support, but also a large moral stimulus: financing "for the individual" stimulates the aspiration to be such—to produce ideas and to achieve extraordinary results.

But under our present conditions it would be insufficient simply to release a certain sum. The recipient of a grant could not, for example, hire assistants, as well as purchase a new instrument. Nevertheless it must be hoped that under future conditions it will be possible to form a system of the financing and the remuneration of the labor of scientific personnel and collectives, which is different from the American system, but is no less stimulating.

Analyzing Financial Resources in Sectorial Science

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[Article by Candidate of Economic Sciences V. D. Kalachanov: "An Analysis of the Use of Financial Resources in Sectorial Science"; passages in boldface as published]

[Text] At present the transition to the special-purpose financing of specific scientific research and experimental design operations in accordance with contracts with clients, who are interested in these operations, instead of the budget financing of scientific research institutes and design bureaus is being carried out in sectorial science. The effectiveness of the new system of the financing of scientific research and experimental design work in many respects depends on how its basic elements will be "incorporated" in the forming anti-expenditure mechanism of sectorial economics and in the methodology of planning the production operations of sectorial scientific research institutes and design bureaus, which is being formulated.

In this connection the making of calculations of the basic indicators of the work of scientific organizations subject to the potential results of the use of financial assets and with allowance made for the resource limitations, which are taken into account in the thematic planning of scientific research and experimental design work, seems advisable. The making of such calculations should be based on the comparison of the financial resources, which are planned for use, with the anticipated results of the activity of scientific research institutes and design bureaus, with the indicators of the social development of their labor collectives, and with the indicators of the efficiency of the use and development of the scientific and technical potential of organizations, including their manpower potential, the structure of fixed production capital, the possibilities of pilot experimental production, and so forth.

In case of the multivariant comparison of the possible structure of the expenditures and the existing resource limitations with the anticipated technical and economic indicators it is possible to prepare proposals on the more efficient use of the financial resources of specific scientific research institutes and design bureaus. When making such a comparison the "input" parameters are:

- the economic standards which are reported by ministries (departments) to subordinate scientific organizations;
- the state orders on the development of science and technology, which are reported to scientific organizations;
- the variant proposals of independent subdivisions of scientific research institutes and design bureaus on the conclusion of direct contracts with the users (clients) of the scientific and technical product;
- the centrally allocated limits and the possible external resource organizations, which it is necessary to take into account in organizations of sectorial science;
- the economic and organizational requirements, which exist in many sectors of industry and are connected with the specific nature of the conducting of scientific research and development, as well as with the peculiarities of the introduction of the scientific and technical product.

It is possible to group with the indicated parameters the demands, which exist in several sectors of the machine building complex, on the ratio of the amounts of exploratory and characteristic scientific research and experimental design work under the new conditions of management, the demands on the structure and updating of the composition of fixed production capital of pilot production of scientific research institutes and design bureaus, the demands on the utilization and use of computer hardware and individual types of expensive equipment, the restrictions on the number and wage fund of the personnel of basic activity, as well as the demands on the level and structure of the deductions for the social needs of the labor collectives of scientific organizations.

The results of the making of a multivariant calculation of the use of financial resources when planning the activity of scientific organizations are connected with the analysis of the following "output" indicators of the work of scientific research institutes and design bureaus:

the basic technical and economic indicators of the production operations of organizations: the level of the profit and profitability (with respect to the wage fund and the amount of internal operations); the structure of the price of the scientific and technical product and the possible increase of the cost of this product as compared with the period preceding the the introduction of the new conditions of management;

the indicators of the social development of labor collectives: the amount of the wage fund, for which a worker of basic activity accounts on the average in a year; the average annual wage (including bonuses, increments, supplementary payments, and lump-sum rewards) for such an average worker; the share of the fund for scientific, technical, and social development (FNTSR), which is channeled into the social development of collectives and for which the average worker of a scientific research institute accounts; the correlations of the wage fund and the material incentive fund (FMP) with each other, as well as with the payments from the fund for scientific, technical, and social development, which are channeled into social development, both with respect to the scientific organization as a whole and with respect to all its independent subdivisions;

the indicators of the effectiveness of the development and use of the scientific and technical potential of scientific organizations: the indicators, which characterize the structure of the share of the fund for scientific, technical, and social development, which is channeled directly into the development of the scientific and technical potential; the output per worker and the labor productivity in pilot

production of the scientific research institute; the capital-labor ratio and the output-capital ratio for the organization as a whole; the ratio of the share of the fund for scientific, technical, and social development, which is used for scientific and technical development, and the value of the fixed production capital as a whole (or its "active" part); the indicators, which characterize the utilization and use of computer hardware and the basic types of advanced equipment;

the indicators of the effectiveness of the use of the financial resources, which are attracted for the conducting of scientific research and experimental design work in accordance with state orders and scientific and technical programs: the return (economic impact) per ruble of spent financial resources; the possible exceeding (saving) of expenditures as compared with the price, which is established in the contract, for developments in accordance with state scientific and technical goal programs, in accordance with other state orders, as well as for other operations, which are financed from the assets of the centralized funds of ministries (departments); the possible changes of the payments to the material incentive funds of scientific research institutes and their subdivisions, which are obtained as a result of the use of economic privileges and (or) sanctions against the performers of state orders, and so forth;

individual indicators of the use of assets which were obtained through direct contracts with clients (also including the "return" per ruble of expenditures);

individual indicators of the use of internal assets, which are spent for the conducting of research on the creation of a scientific and technical reserve and the conducting of exploratory scientific research work.

The proposed list of indicators of the effectiveness of the use of the financial resources of sectorial scientific research institutes and design bureaus can be refined with allowance made for the specific nature of the development and introduction of the scientific and technical product in various sectors of the national economy. As auxiliary indicators of the multivariant calculation of the use of the financial resources of scientific organizations there can be used: the structure and amount of all the components of the production cost of the scientific and technical product, the structure and amount of the material incentive fund and the fund for scientific, technical, and social development, payments and allowances on the side, and the residual and accounting profit.

As practical experience shows, the multivariant calculation of the indicators of the effectiveness of the use of the financial resources of a scientific organization with the use of a computer is most convenient. It is advisable to make the calculation by the joint efforts of personnel of the planning department and the accounting office and programmers, who work at the scientific research institutes and design bureaus, when drawing up the draft of the plan of activity of the organization for the next period.

When making the multivariant calculation it is also possible to analyze the effect of various elements of the new economic mechanism in sectorial science on the change of the production cost and the price of the scientific and technical product being developed, as well as on the change of other technical and economic indicators of the process of developing this product.

In this connection the analysis of the production cost of the scientific and technical product is one of the basic elements of the evaluation of the use of financial resources at sectorial scientific research institutes and design bureaus. The calculations show that at the majority of scientific organizations of machine building the change of the structure of the production cost of their product under the new conditions of management is leading to an increase of this production cost. At machine building scientific production associations and scientific research institutes, which have considerable fixed production capital, such an increase frequently comes to 15-25 percent. We explain this by the fact that the exclusion from the production cost of the outlays on the material stimulation of developers of new equipment, as a rule, is not offset by the inclusion in the internal outlays of the deductions for the overhaul and current repair of this capital. From the table it is evident that the amount of the amortization deductions and the deductions for the repair fund frequently exceeds by four- to fivefold the amounts of the economic stimulation funds. The change of the structure of the overhead in case of the changeover to the new conditions of management and the elimination from it of the expenditures on the stimulation of invention and efficiency promotion, the expenditures on the training of personnel, the fund for new equipment, and a number of other elements in practice reduced negligibly the overhead of scientific research institutes and design bureaus in industry.

Change of the Structure of the Production Cost of the Scientific and Technical Product in Case of the Changeover to the New Conditions of Management (percent)

Components of the production cost of the scientific and technical product of the scientific organization	Scientific organization with considerable amounts of fixed production capital		Scientific organization with amounts of fixed production capital less than the average sectorial level	
	1987	1988	1987	1988
Cost of internal operations, total	85.1	87.9	77.0	79.2
including:				
wage fund	24.6	18.1	14.0	14.8

Change of the Structure of the Production Cost of the Scientific and Technical Product in Case of the Changeover to the New Conditions of Management (percent) (Continued)

Components of the production cost of the scientific and technical product of the scientific organization	Scientific organization with considerable amounts of fixed production capital		Scientific organization with amounts of fixed production capital less than the average sectorial level	
	1987	1988	1987	1988
materials, purchased components	19.6	14.7	40.3	42.9
economic stimulation fund	5.6	—	4.2	—
deductions for overhaul and current repair of fixed capital	—	27.2	-	1.6
overhead	33.6	23.8	15.3	15.0
Operations and services, which are performed by outside organizations	14.9	12.1	23.0	20.8
Production cost of the scientific and technical product of the scientific organization	100.0	100.0	100.0	100.0

For scientific organizations, which have fixed production capital less than the average sectorial level, the change of the structure of the production cost of their product affected differently the cost of their internal operations. At scientific research institutes and design bureaus of machine building, where the amortization deductions and the deductions for the repair fund in this case were less than the outlays on the material stimulation of labor collectives, the decrease of the production cost of the product came to 5-8 percent. For scientific organizations of machine building, which have extremely negligible outlays on the purchase of materials and components, especially at scientific research institutes of the economic and information type with a weak computer base, such a decrease came to 10-12 percent. And this is in case of the simultaneous increase of the bonuses and increments for associates of the scientific organizations. Two opposite, but very typical cases of the change of the production cost of the scientific and technical product in case of the changeover to the new conditions of management are cited in the table. In the former case the increase of the production cost of the product came to more than 20 percent, while in the latter the production cost decreased by 6.5 percent.

The analysis of the possible increase of the cost of their scientific and technical product is another aspect of the examination of the financial status of sectorial scientific organizations. Such an increase of the cost can be calculated as the ratio of the price of this product in case of the introduction of the new conditions of management to its estimated cost, which was taken before the introduction of these conditions. Rough calculations show that at a number of machine building scientific research institutes and design bureaus of the USSR Ministry of Heavy, Power, and Transport Machine Building the maximum possible increase of the cost of their scientific and technical product in the next few years may come to 130-140 percent. The most important factors of such an increase of the cost are:

— the fee for productive capital and manpower and natural resources, as well as the fee for credit;

— the payment from internal assets for outlays, for which assets were centrally allocated earlier;

— the attribution of amortization deductions to the structure of the estimated cost of the operations of scientific research institutes and design bureaus;

— the deductions from the profit for the state budget and for the centralized fund for the development of production, science, and technology (TsFRPNT) of ministries (departments).

At the majority of machine building scientific research institutes and design bureaus the amortization deductions, which have been included in the production cost, account for about 5 percent of the possible increase of the cost of the product. At individual machine building scientific production associations and scientific research institutes, which have considerable productive capital, this share can increase to 35-40 percent. Calculations show that the fund for scientific, technical, and social development, which is channeled directly into the development of the scientific and technical potential of scientific organizations, accounts for up to 20-30 percent of the increase of the cost. The fee for manpower resources accounts on the average for 1-3 percent of such an increase of the cost, the fee for capital accounts for 1.5-6.0 percent, while the deductions for the state budget and for the centralized fund for the development of production, science, and technology account respectively for 2.5-5.5 percent and 2.0-7.0 percent.

The analysis shows that if all the payments to the budget are completely eliminated for individual machine building scientific research institutes and design bureaus (owing to the particular state importance of the scientific research and experimental design work, which is being conducted by them), by this it is possible to limit the maximum possible increase of the prices for their product at the level of 120-125 percent. If for the indicated organizations the deductions for the centralized fund for the development of production, science, and technology (with the simultaneous development of their scientific and technical potential) from the centralized assets of ministries

(departments) are eliminated as an exception, the maximum possible increase of prices will be limited at the level of 110-115 percent. Given the combination of both factors the possible increase of the cost of the scientific and technical product, which is of particular state importance and involves the conducting of science-intensive development, will be substantially limited.

Under the new conditions of management the assets of the state budget, which it is permitted only in exceptional cases to attract for the conducting of scientific research and experimental design work on the most important state themes, are becoming particularly scarce financial resources of scientific research institutes and design bureaus. The analysis of many machine building scientific research institutes and design bureaus shows the obviously inadequate efficiency of their use of state budget allocations. At the same time in case of the carrying out of development, which is financed through direct contracts with clients, during 1980-1987 a slightly different picture was observed. The financial assets, the correctness and efficiency of the use of which the client monitored, were spent far more economically and effectively.

There were instances, when the same scientific organizations developed "close" descriptions of machine building products both at the expense of assets of the state budget and on a contractual basis. Here the "contract" items were developed and introduced 1.3- to 1.5-fold more rapidly and less expensively. This is most characteristic of a machine building product of increased complexity, which has a lengthy development cycle, as well as of large technical systems, which involve the conducting of long-term and expensive scientific research and experimental design work.

Calculations show that even within the already planned state budget allocations scientific organizations practically always performed in addition (in excess of the plan) some operations or others, and at times even conducted individual exploratory studies. The majority of such operations were conducted on the direct instructions of ministries (departments). In the past 8-10 years at many machine building scientific research institutes and design bureaus without the adjustment of the total volume of the thematic plan of organizations from 10 to 20 percent of the work within the already planned state budget allocations was performed in excess of the plan. A stable situation arose: with the increase of the cumulative value of the "state budget" work at scientific research institutes and design bureaus the share of above-plan operations simultaneously increased. Frequently such work in the pilot production of machine building scientific research institutes and design bureaus comes to 20-30 percent. There were even instances when individual scientific organizations independently developed in excess of the plan new descriptions of machine building products or carried out their modernization.

The analysis of the activity of many machine building organizations testifies that in recent times the share of flaws in workmanship, which have been allowed through the fault of design subdivisions when assimilating state budget assets, has gradually increased. At some sectorial scientific organizations such a share increased during 1978-1987 by 1.5-fold and more. It seems that the changeover to the financing of scientific research and experimental design work through contracts will ensure the interest of developers in delivering the scientific and technical product on first appearance to the client. Otherwise the developer will have to pay from his own assets for each of these modifications.

For the assurance of the completion of "state budget" scientific research and experimental design work many scientific production associations, scientific research institutes, and design bureaus have gradually purchased not only the latest costly equipment, but also expensive computer hardware. Considerable foreign currency resources were spent on this. The leading machine building scientific research institutes and design bureaus attempted practically annually to substantiate the necessity of such purchases, at times even in isolation from the scientific research and experimental design work being performed and the specific prospects of the development of these scientific organizations.

Some large machine building scientific production associations and scientific research institutes during 1978-1987 increased by nearly 2.5-to 3.0-fold the share of assets for the acquisition of new equipment in the total amount of state budget allocations that are earmarked for the conducting of scientific research and experimental design work. At these organizations during the same period the share of the financial resources for the acquisition of computer hardware, which is purchased within the framework of the assimilation of state budget assets during the conducting of scientific research and experimental design work, simultaneously increased by 4.5- to 5.0-fold.

In the decree of the CPSU Central Committee and the USSR Council of Ministers of 17 July 1987, "On the Increase of the Role of the USSR State Committee for Science and Technology in the Management of Scientific and Technical Progress in the Country," the need "to carry out the strict monitoring of the efficient use of the state budget assets, which are allocated for the development of science," and to increase "the responsibility for the efficient use of these assets" is noted. Consequently, one of the most important tasks of the work of the subdivisions of scientific research institutes and design bureaus, which assimilate state budget assets when conducting scientific research and experimental design work, is the evaluation of the effectiveness of the spending of these assets and the careful comparison of the expenditures and the obtained scientific results. Such an approach under the conditions of full cost accounting and self-financing will make it possible to find the most efficient directions of the use of these resources and will ensure the necessary coordination of all the basic indicators when planning the work of scientific research institutes and design bureaus.

Economist Analyzes S&T Personnel Issue

907A0071A Moscow EKONOMICHESKAYA GAZETA in Russian No 45, Nov 89 p 14

[Article by Doctor of Economic Sciences A. Nikolayev, professor of the Academy of Social Sciences attached to the CPSU Central Committee, under the rubric "On the Paths of the Development of Scientific and Technical Progress": "The Spontaneous Attraction Toward Science"; first paragraph is EKONOMICHESKAYA GAZETA introduction]

[Text] "Why Do We Lag Behind the United States?" is what the article, which was published in EKONOMICHESKAYA GAZETA, No 39, was called. Author A. Nikolayev examined the causes of the adverse situation in the scientific and technical complex of the country. Today he analyzes another one of them—personnel policy in science.

The restructuring of the economic mechanism of the scientific and technical complex is often understood (and, unfortunately, is carried out) in a somewhat one-sided manner. All the suggestions, as a rule, reduce to the radical change of production relations, moreover, only in the direction of the expansion of market relations. The question of the necessity of the radical change of the system of productive forces remains as if aside. But the same commodity-money relations can lead to directly opposite results—depending on the base of their development.

The level of scientific collectives, their creative potential, and the technical equipment of research work are of decisive importance for the scientific and technical complex. It is possible to change economic relations as much as you like, but if mediocre scientific collectives are preserved, one ought not expect anything worthwhile.

What has the state of the basic productive force of the scientific and technical complex like by the initial period of perestroyka?

The objective requirement of the observance of proportionality between the increase of production, the increase of employment in the scientific and technical complex, and the qualitative description of employed people exists. In our economy this requirement is not being satisfied.

According to the calculations of G. Khanin, the national income in the USSR from 1928 to 1987 increased by 6.9-fold. The number of people employed in the sphere of science during the same period increased by fifty-threefold.

As a result in 1987 there were 46 scientists and engineers, who were engaged in scientific research and development, per 1 million rubles allocated for the conducting of scientific research and experimental design work, while in the United States there were only 6.65 (per $1 million). The process of research and development in the USSR is incomparably more labor-intensive than in the United States.

Is it possible to explain this by the attempt to make up for the limitation of material resources by increasing the number of employed people? Hardly. It is impossible to make up for the shortage of electron microscopes by increasing the number of scientific associates who work with optical instruments. The spontaneous attraction of people toward "science," which was dictated not such much by inclination as by the higher wage and the more comfortable working condition than at a works and by the historically established system of social values, was of decisive importance here. While a barrier to the unjustified swelling of scientific staffs was not erected in time.

As a result an enormous number of parascientific subdivisions appeared, administrative bureaucratic units appeared at scientific research institutes and design bureaus, institutes were filled with unskilled personnel. The scientific potential of some scientific research institutes, including academic ones, and design bureaus began to approach zero. It is not surprising that their personnel are engaged mainly in the duplication of developments of other people.

The declining scientific and economic return of the scientific and technical complex to a considerable extent is explained by the disproportion between the increase of manpower resources and the physical working conditions of scientists. During 1950-1987 the increase of employment in the scientific and technical complex was not accompanied by the necessary increase of spending on the material supply of scientific research institutes. Per scientific and engineer, who are employed in the scientific and technical complex, 6.4-fold more is being spend on equipment in the United States than in the USSR. And this is given the very arbitrary assumption that the ruble and the dollar have on the market the same purchasing power.

It is clear that the efficiency of the scientific and technical complex is higher in those countries which have a more developed, sensibly balanced technical base.

Of course, it is possible to reassure oneself with the fact that the changing economic relations will adjust everything. But the question is, when? At what price? There is no doubt, for example, that the improvement of the personnel composition of scientific research institutes and design bureaus will occur. But improvement is possible in a short time hardly in case of a spontaneous course of the process, of which we are already now becoming convinced. Under the conditions of cost accounting creatively fruitless collectives are also succeeding in surviving.

Without active sociopolitical intervention in the system of the selection and training of scientific personnel and without the fundamental revision of the status of the institutions, which are called upon to supervise science (in particular, the USSR State Committee for Science and Technology and the academies of sciences), and of the powers of the administrative unit the situation in the

scientific and technical complex will not simply remain the same for a long time, it will continuously worsen.

The champions of "pure" market relations at times speak for the abolition of the organs that regulate the development of science. But thus far there is no market, and it is hardly worth displaying haste in dismantling that for which the need has not disappeared. And given the existence of a market one cannot do without a centralized element. It is another matter that it is necessary once again to revise its tasks, functions, and means and forms of influence.

The changeover of many scientific research institutes and design bureaus to cost accounting plunged some economists and administrators into a state of the expectation of an immediate return in the form of revolutionary discoveries, inventions, and developments. But first of all the aspiration to sell any, even the most minor improvement, having passed it off as "the best there is," appeared. Is this accidental? Of course not. Take the position of an average-paid engineer, who has perceived that the opportunity has finally appeared to earn a lot with little sweat, and everything will be clear.

The return of the scientific and technical complex will actually be high only when enterprises will not be able to survive without the latest achievements of scientific and technical progress. It is then that science will experience the powerful pressure of demand, which makes it incumbent to work fruitfully. But we will be honest: for the present the economy is far from such a state.

The restructuring of the system of economic relations of the scientific and technical complex can profit only if world practice is taken into account. To what does it testify? First of all to the fact that it is necessary to use commodity-money relations sensibly. In some places they are needed, in some they are not.

In practically all countries general theoretical research and a large portion of exploratory applied research are excluded from direct subordination to the market.

Commodity-money and market relations are most appropriate in the area of inventive activity, experimental design development, and exploratory applied research with a relatively short work cycle. The level and pace of scientific and technical progress in such countries as the United States, Japan, and the FRG testify to how effective they are here.

But it would be naive to think that market relations are effective under all conditions and that their development is not accompanied by contradictions and various conflicts. It is necessary to keep all this in mind, so that the changeover to a market would not cause disillusionment at the first difficulties.

It is hardly worth forgetting the bleak truth of materialistic dialectics: noncontradictory solutions do not exist. Every change, and especially a radical one, when solving a specific group of important problems, also leads at the same time to undesirable consequences. Magic formulas, alas, do not exist. The main thing is to foresee these negative consequences in time and to moderate them as far as possible.

The activity of scientific research institutes and design bureaus, which operate in the system of market relations, to a significant extent depends on the ability to choose correctly the directions of work. Revenues should increase in proportion to the increase of the efficiency of work. Governments, of course, assess a progressive tax on the increasing profit. And all the same the revenue increases with an increase of efficiency. If one deviates from this rule, the initiative of scientific research institutes and design bureaus fades.

Commodity-money relations are integrally connected with competition. In case of weak competition or its absence stagnation is inevitable.

Practical experience shows that in many cases the level of competition, which is created by national enterprises, is inadequate for the stimulation of scientific and technical progress. Thus, in the United States the vigorous encroachment of Japanese and West European firms were required in order for national companies, for example, in the automotive industry to launch energetic activity in the scientific and technical field.

This has to be recalled, since, in embarking on the development of market relations in the scientific and technical complex, we are modestly failing to mention what the mechanism of the competitive struggle on the socialist market will be like. Will it be a struggle against cooperatives? I doubt it.

The market mechanism far from always creates the most favorable conditions for the development of inventions of a revolutionary nature, which prove in the final analysis to be most promising. Under the conditions of an unstable market situation firms aim at such research directions which promise a sure and quick profit. It is necessary already now to provide for the development of mechanisms which would moderate the pursuit by science of an immediate profit. They deserve special discussion. Let us name just a few.

Practical experience points to the necessity of establishing a well-organized scientific, technical, and economic forecasting service which could give scientific research institutes and design bureaus a reference point. The establishment of public funds for the financing of exceptionally risky scientific ideas and inventions merits attention. These funds should be exempt from administrative departmental subordination. Extradepartmental scientific and technical councils could manage them. Scientific and technical arbitration, which operates not only in the area of invention, but also in other areas of the scientific and technical complex, can yield a significant impact.

Does the development of market relations eliminate the necessity of plans? Not administration by mere decree, but systematic relations? Not in the least. The implementation

of major research projects in the area of atomic energy, space, and computer technology in all countries has demonstrated that without well thought out plans, which are aimed at the long-range future, the efficiency of many sectors of the scientific and technical complex decreases.

So there is no single formula for the improvement of our the scientific and technical complex. In the developed countries they are using the entire set of them. What is preventing us from using all the means of improvement? Time does not wait.

Nuclear Power Controversy Encompasses Weapons Research

907A0064A Moscow NTR: PROBLEMY I RESHENIYA in Russian No 21, 3 Nov 89 p 6

[Interview with USSR People's Deputy Olzhas Omarovich Suleymenov, a leader of the Nevada-Semipalatinsk Public Movement, and Kazakh Minister of Health T. Izmukhambetov, by NTR: PROBLEMY I RESHENIYA commentator F. Vladov under the rubric "A Look at Atomic Energy": "Explosions Under the Test Range"; date and place not given; first three and thirteenth and fourteenth paragraphs are NTR: PROBLEMY RESHENIYA introduction]

[Text] The materials of the rubric "A Look at Atomic Energy" have resulted in a great amount of mail from readers. Among the diverse arguments for the building or closing of nuclear power plants there are also letters, the authors of which request that the boundaries of the rubric be expanded, in particular, that the situation, which has formed around the military test range at Semipalatinsk, be reflected.

If only the following fact testifies to the intensity of the passions which have arisen over the tests. At a meeting of many thousands of people, which recently took place in Karaganda, the decision on the conducting of a 2-hour warning strike in case of even one more nuclear explosion was made.

NTR commentator F. Vladov met with USSR People's Deputy O. Suleymenov, one of the leaders of the Nevada-Semipalatinsk Public Movement.

NTR: PROBLEMY I RESHENIYA: Olzhas Omarovich, have you not attempted to find out what, strictly speaking, they are now exploding at the Semipalatinsk range and for what reason?

O. O. Suleymenov: I have tried, of course. They reply very unintelligibly, something like the fact that they are checking the operational readiness of the warheads that are stored at the arsenal. Even if you accept this as the truth, in any case things do not fit when the talk turns to the yield of the explosions. I, already as a people's deputy, attempted to obtain precise data, but in response they advised me to read the TASS reports, there, they said, everything is told, believe the official information. I would be glad to believe it, but what is one to do if, for example, on 4 October the newspapers reported a 20-kiloton explosion, while according to the data of Japanese seismologists it had a yield of 60 kilotons? We, of course, do not except all 100 percent of the Japanese data, but the residents of the cities, which are located around the range, confirm them. The inhabitants of Semipalatinsk, Karaganda, Pavlodar, and other, smaller cities learned long ago to distinguish 50 kilotons from 100 kilotons and 150 kilotons from 200 kilotons. The swaying of chandeliers, the rattling of glasses, the falling of objects—in short, all the "folk seismology."

On Sunday, 22 October, I was at a meeting in Karaganda; this is 350 kilometers from the range. According to natural data this zone is not considered seismically active. Quite ordinary houses are being built there, while there is no seismic station at all, in any case a civilian seismic station. Nevertheless, the residents of the city know very well what an earthquake with a magnitude of 2, 3, or else 4 is. So that, in their opinion, on 4 October there was an earthquake with a magnitude of up to 5 in the city....

NTR: PROBLEMY I RESHENIYA: But within the Nevada-Semipalatinsk Movement have there not been attempts to acquire your own seismograph, to calibrate it, and to determine accurately the yield of the explosions?

O. O. Suleymenov: We are now dealing precisely with this. An expert group made up of specialists, which should accomplish both this and other similar tasks, is being established here. For example, to set up the production and calibration of personal radiation monitors. And to do this at a high professional level, so that from their readings it would be possible to determine the real situation in the region.

We want in general to establish an independent expert commission, the personnel of which would help us to obtain a map of radioactivity both for the republic as a whole and for individual oblasts. For not only the waste of nuclear explosions "glows," increased radioactivity also distinguishes, for example, the spoil banks, which are growing in Dzhezkazgan Oblast around the mines where nonferrous metals are being extracted.

NTR: PROBLEMY I RESHENIYA: What else do you intend to undertake in the immediate future?

O. O. Suleymenov: I am now preparing a deputy's inquiry, within which I will officially demand: let them, at last, explain to us why these explosions are being conducted, what they cost, and how they relate to the American program of nuclear tests. So that all this would not take place in secret, so that we would know that they would not again decide secretly for us our fate. So that all this would become a national problem, and would not remain just a problem of departments.

It must be said that in departments they have already realized that they have come up against a serious problem—they are, after all, essentially being deprived of work. But there hundreds of thousands of workers work and a large intellectual potential has been gathered. Americans told me that just the halt of the production of weapons-grade plutonium signifies the loss of work for approximately 250,000 people. We, naturally, have the same picture—very many people are employed at atomic plants. And for them this is a matter of life, it is impossible not to think about them.

At these enterprises conversion is necessary, but thus far nothing has been heard precisely about their changeover to a peacetime footing. True, in recent times some negotiations on "peaceful" atomic explosions have been conducted, but we do not accept in principle such a

concept. An explosion is an explosion, and the consequences from it are always consequences. I believe that in this area the personnel of the military industry should enter into a direct dialog with scientists, writers, and the public in general—it is necessary here to make a joint decision. Let us sit down at the same table and talk publicly. Only it is not worthwhile to cut ourselves off again with the screen of military secrecy. I am convinced—while military secrecy exists, the threat of war also exists!

But what are local medical personnel saying about the health of the population in the regions which are adjacent to the test range? What do they think about the continuing nuclear explosions?

The next person, with whom we spoke, is Kazakh Minister of Health T. Izmukhambetov.

T. Izmukhambetov: Before February 1989 we did not deal with this question at all. And not because we did not want to. We were simply kept completely away and did not have the information, which was safely concealed from everyone—including us—under the stamp "top secret."

The first information was leaked on 12 February of this year. In order to understand how this happened, it is necessary to know that nearly a third of the underground explosions are accompanied by the seepage to the surface of the earth of so-called noble radioactive gases, particularly radon. The management of the range, of course, took this into account and, using the wind rose, conducted the tests so that the cloud would move in the direction of Abayskiy and other rayons, where this is no radiation monitoring—although there was a civilian population!

And on this ill-fated day for military men everything has been calculated, as usual, but...the wind unexpectedly changed direction sharply and the radioactive cloud headed for the military settlement. But their the people had radiation monitors, and when they "began to buzz," panic, which it was no longer possible to hide, began.

Following this a special commission, on which scientists from the USSR Academy of Medical Sciences, representatives of our Ministry of Health, and other specialists were included, was set up. Over a month preliminary data, which showed with certainty the effect of the range on the state of health of the population, were obtained. An adverse effect, of course. And how could it have been otherwise, if the people for 40 years had been subject to the combined effect of the consequences of atomic explosions! The period from 1949 to 1963, when they conducted open surface and atmospheric nuclear tests, was particularly difficult, moreover, the population repeatedly found itself and then remained in the track of the radioactive cloud....

Now the military men are trying to assure us that the high infant morality, oncological diseases, and other pathologies are connected supposedly with the shortcomings of local health care. Such shortcomings, of course, exist, who, if not I, knows about them. But even if you single out such factors, then, for example, the number of cases of oncological diseases (moreover, the number of cases of diseases of hemopoietic organs), chromosome aberrations, developmental defects, psychiatric deviations, and the number of suicides in the regions, which are adjacent to the range, are much higher than the normal level.

Therefore, the first thing, which we consider it necessary to do, is to organize immediately the most serious scientific studies of the formed situation. For example, after the catastrophe at Chernobyl medical personnel set up a special register, in which they attempted to put down all the victims in order to keep an eye on them over a long time. Why is there not a similar register of if only that portion of the population of Kazakhstan, which for 40 years now has been subjected to radiation exposure?

They tell us that today, under the conditions of underground explosions, the level of radiation does not represent a serious danger.

But what about the other adverse factors, for example, seismicity? For the ground shakes on 16-18 occasions a year, while the buildings, by the way, were built without regard for seismicity. In particular, it greatly worries me as minister of health that the buildings of many medical institutions—hospitals, dispensaries, outpatient clinics—are today literally unsafe. And not only, as they are trying to assure us, due to poor maintenance. Thus, the Abayskiy Central Rayon Hospital is covered with cracks, and who knows whether it will withstand the next underground jolt? But patients are lying there....

Some 40 years ago, when the range began to operate, it was located in a relatively unpopulated place. But now hundreds of thousands of people, whose health is constantly endangered, live in Karaganda, Pavlodar, Semipalatinsk, and other cities. And that is why the position of the ministry of health with respect to this range is absolutely unequivocal: it must be shut down, and as soon as possible.

Moldavian Academy of Sciences 'Elects' New President

907A0073A Kishinev SOVETSKAYA MOLDAVIYA in Russian 11 Nov 89 p 3

[Article (ATEM): "The General Assembly of the Moldavian SSR Academy of Sciences"]

[Text] Academician A.M. Andriyesh has been elected president of the Moldavian SSR Academy of Sciences. Such is the decision of the General Assembly of the republic Academy of Sciences, which was held on 9 November and at which along with its full members, the corresponding members of the Moldavian SSR Academy of Sciences also took part for the first time in the election of the president by secret ballot.

At the assembly it was noted that such a democratic form of the election of the leader of the republic scientific headquarters serves as a vivid example of the radical changes in the activity of the academy. A discussion of the campaign platform of the presidential candidate, which was refined and supplemented during his numerous meetings with the collectives of scientific personnel of all the departments and institutes of the Moldavian SSR Academy of Sciences, took place. It was emphasized that the highest scientific institution of the republic should promote the consolidation of all its intellectual forces for the revolutionary modernization of Soviet society and the increase of the role and contribution of Moldavian science to the solution of the urgent problems of perestroyka in all spheres of public, economic, social, and cultural life.

Science is the motive force of society, which in many respects determines the level of its development and well-being. Today no state formation and no people can do without it. In our republic, it was noted at the assembly, all the directions of science—from basic ones to applied ones, which are connected with the vital demands of everyday life—should be developed. These are comprehensive goal programs, agricultural science, and physical technical and mathematical research, which today are knocking at our door together with rapidly developing scientific and technical progress. Moldavia especially needs such science, which would ensure the development of the sectors of the economy, which do not pollute the environment and do not require a large amount of raw materials, materials, and power, in short, highly intellectual and, incidentally, highly profitable sectors.

But for this it is necessary to solve a number of urgent problems. Among them are the closer coordination of basic and applied science, the tasks of the improvement of the financing of scientific operations under the conditions of cost accounting, the improvement of the material and technical base of scientific institutions, and the improvement of the infrastructure of the academy and the working and living conditions and conditions of relaxation of associates. At many institutes a difficult situation has formed due to the acute shortage of premises, advanced scientific apparatus, equipment, and computer hardware, and housing. The need has arisen to expand and to establish a number of new scientific research institutes, laboratories, and pilot production bases. Big problems face the collectives of scientific institutions in connection with the changeover to self-financing. Under these conditions they need not only to count on budget allocations, as was previously the case, but also to stimulate the conclusion of contracts with production workers in the development and assimilation of advanced equipment and technology and the establishment of pilot scientific production bases. Such bases are called upon to embody and to debug the results of scientific insights and the latest developments of scientists and at the same time can be used for the solution of such an urgent and vital problem as the acute shortage of scientific personnel in the republic. For this the scientists of the Academy of Sciences should participate more actively in the improvement of the higher school, deliver in student auditoriums lectures on the most advanced achievements of modern science and technology, and select talented young people for work at scientific institutions and for the expansion and the establishment of new laboratories both at scientific research institutes and in industry, at higher educational institutions, and at tekhnikums. Admittedly, here there will arise for young specialists the traditional difficulties, which are connected with residence registration and housing, but it is necessary to overcome them in the interests of our future.

Without the Academy of Sciences, which integrates the intellectual potential, it is difficult to imagine the life of one or another people and state formation, it was emphasized at the assembly. The academy is not only the headquarters of science, but also one of the main centers of the culture and spiritual development of our republic. Therefore, the associates of the Moldavian SSR Academy of Sciences should participate more actively in its social life, meet more often with labor and creative collectives, and write for the press on various questions which today worry many people. Among them are the problems of economic and social development, ecology, history, philosophy, and philology and other problems. After all, unfortunately, in recent times many antisocial, antiscientific, and even antinational publications have appeared in the press.

Armed with scientific methodology, scientists should expose the "blank spaces" of history and the problems of our difficult path of the choice of socialism, defending in so doing justice and truth and consolidating and uniting the national intelligentsia, the working class, and the working peasantry for the implementation of the policy, which was proclaimed by the CPSU, of the utmost development of democracy and glasnost, the improvement of the mechanism of management, the modernization of political structures, and the revival of morality and the spiritual potential of Soviet society.

First Secretary of the Moldavian CP Central Committee S.K. Grossu addressed the General Assembly of the Moldavian SSR Academy of Sciences.

New Management System for Latvian Science

907A0072B Riga SOVETSKAYA LATVIYA in Russian 28 Oct 89 p 3

[Article by LATINFORM correspondent B. Petkevicha: "In Science Toward New Horizons"]

[Text] The General Assembly of the Latvian SSR Academy of Sciences was held on 26 October. At it the proposals on the development of a new mechanism of the management of scientific research in Latvia, which were published in advance in the press, were discussed. The interconnection of management, coordination, and financing in science constitutes its basis. It is envisaged that the Latvian Council for Science will carry out the functions of coordination and the distribution of allocated assets. In its activity it will rely on the objective conclusions of an scientific evaluation on applications for research and on the results of research. Scientists themselves and sectorial scientific councils will submit applications for research.

The effect of the new mechanism applies to the research (primarily basic research), which is financed from assets of the republic budget or other assets of the republic. The new system will take effect starting in 1991, while during the new year the former procedure remains in effect.

What will science get with the introduction of the new mechanism? In the opinion of scientists, the conditions for the rivalry of ideas, the mobility of scientific work, constant competition, and the replacement of personnel will be created. So that assets in conformity with the competitive and contractual systems will be sent to performers not in a roundabout way, but directly. There is the hope that in science it will be possible to a significant extent to get rid of everything superfluous, bureaucratic, and parasitic. The possibility of simulating scientific activity will decrease. Ineffective scientific research will be halted—it will simply cease to be financed. The new mechanism can help to break away from the morass of intellectual stagnation. Many scientists regard as a positive thing the fact that the introduction of the new mechanism will contribute to the stock-taking of current Latvian science and its thorough analysis.

Although the development of the new mechanism is a big step forward in the direction of the democratization of science, it is difficult to make forecasts with regard to how much this will aid the solution of its urgent problem—the improvement of the weak material and technical base. It will also hardly be possible by these steps to increase the share of the budget, which is allocated for science. It is possible to achieve this only if economic levers are brought into play. Moreover, some scientists have warned that the newly formed apparatus for the implementation of the present proposals can become bureaucratic and divert scientists from their immediate activity.

Much attention at the assembly was devoted to questions of the development of the desirable module of the scientific evaluation and to the problems connected with this. Should the evaluation be anonymous? Which of the scientists by right can be an expert? (In the opinion of the majority, those who are working most actively in science and are the most talented.) Is it necessary to pay for the work of experts? To hold them accountable for the making of mistaken decisions and the support of impracticable projects? What should the extent of reasonable risk be in case of the evaluation of the possible results of a study? Moreover, it is necessary to take into account that it is easy to dismantle some field of science, but it is difficult to recreate it. It was also noted that a scientist and true patriot of the chosen field, who would not consider his specialization most important, will hardly be found.

Academician Ya. Stradyn stressed that foreign specialists, including of Latvian origin, should also be drawn without fail into the system of evaluation. This would make it possible from other vantage points to evaluate the science of Latvia and the possibilities of its development and to give its evaluation in the context of world science. Academician Ya. Stradyn also proposed to replace the name "the Latvian SSR Academy of Sciences" with the name "the Latvian Academy of Sciences." This question should be considered at the next general assembly. The absolute majority of assembly participants supported this proposal.

Academician E. Gren analyzed the most significant shortcomings of current Latvian science. Several of them are the isolation of science from the system of education and the greater and greater discord in the ratio of the amounts of basic and applied research. A kind of paradox has emerged, when in the country with the most irrational economy there exists the most "rational" approach to science, which finds expression in the fact that the applied sciences, their developments, and introduction receive the lion's share of financial assets. Unfortunately, the applied sciences often receive at the expense of the basic sciences a larger and larger proportion at nearly all the institutes of the Academy of Sciences. Undoubtedly, the Academy of Sciences should remain the citadel of the basic sciences.

One thing is clear: until there is a stable market in the economy, there will also be no market of ideas. The achievements of science should not be introduced in production by special steps, nearly forcible steps. Such conditions should be created so that enterprises would vie for new ideas and would willingly buy them.

Although the Academy of Sciences is often criticized for having a bureaucratic nature and an excessively technocratic nature, it is undoubtedly the leader in Latvian science (if only, for example, with respect to the sale of licenses and the obtaining of foreign currency). The basic scientific potential is concentrated in it, but, as it turns out, not at all with respect to the number of scientists. Only 1,880 scientists work at the Academy of Sciences, while 7,800 work at sectorial scientific institutions. Moreover, approximately 4,900 of them work at institutes of all-union subordination. The material indicators are even more impressive. Of the 63 million rubles, which are allocated a year for science of the republic, only 18 million rubles are used for research, in which it is interested. E. Gren appraised this as an "export of brains," which is being carried out at a high level.

Therefore, in the immediate future, on the basis of the data of the stock-taking of science, it is necessary to determine the expedience and share of one or another direction or even field of science in Latvia.

The new mechanism of management is closely connected with the spending of the budget assets of the republic. In this connection Corresponding Member of the Academy of Sciences Yu. Zakis stressed that until now it was possible talk about the republic budget very conditionally, whether this is a budget in the full sense of the word, if the center gives instructions on where and how to spend every ruble. It is necessary to see to it that the republic would obtain complete freedom of actions in the spending of its budget.

There is no doubt that now no scientist can do without modern scientific equipment. Academician E. Lavendel made in this regard an interesting, although very unusual suggestion. Namely: since in our country there is the cheapest manpower in the world (including highly skilled manpower—scientific personnel), it is profitable for our specialists to work some time abroad. This is also no less profitable for scientific research institutions, since they would receive a significant part of the foreign currency. Thereby the opportunity would be created to purchase scientific equipment abroad. The remuneration of skilled scientific labor in various countries ranges from $100 to $150 a day. Of course, these scientists should be high-class specialists or, at least, representatives of a recognized scientific school.

The question of the establishment of the Riga Humanities Institute was touched upon in a number of statements. Ya. Poriyetis, a professor of the Latvian State University, opposed to the arguments in its favor the fact that now, when the republic is changing over to cost accounting, serious material difficulties are expected as it is, and, therefore, the formation of a new structural unit would be inadvisable and even undesirable. Academician E. Gren, in turn, indicated that the establishment of such an institute would cause a split in society and would promote the development of two different ways of thinking—"our" and "your" culture, "our" and "your" education.

In conclusion Chairman of the Latvian SSR Council of Ministers V. Bresis addressed the assembly. He stressed that the allocations for science can be increased in case of the implementation in the republic of a radical economic reform and the obtaining of sovereignty and the possibility to use the republic budget freely.

The General Assembly adopted a decree, in which the new mechanism of the management of science received endorsement. It was deemed expedient to address to the republic Supreme Soviet the request to draw up a draft law on science. In the decree it is stated that during the period of the transition of Latvia to sovereignty the right of the republic to settle itself questions of the spending of the budget is a necessary condition of the development of science, the consideration of the priority of basic research, and the guarantee of the interests of the harmonious development of scientific and other sectors.

Secretary of the Latvian CP Central Committee Ya. Okherin and A. Gruduls, chief of the Ideology Department of the Latvian CP Central Committee, took part in the General Assembly.

ESSR Academy of Sciences Discusses Financing, Personnel Issues

907A0072A Tallinn SOVETSKAYA ESTONIYA in Russian 7 Nov 89 p 1

[Article (ETA): "Science Under the Conditions of IME"]

[Text] The General Assembly of the Estonian SSR Academy of Sciences on 4 November began festively. Academy President K. Rebane presented certificates on the conferring of an academic title to Professor of Pulmonology L. Yaanus and Professor of Physical Geography Ya.-M. Punning. It was also reported that R. Willems had been elected a foreign member of the Swedish Royal Academy of Sciences in the field of medicine.

Then those who had gathered began the discussion of the points of the agenda.

The report of K. Rebane concerned scientific policy in Estonia. He said that the existence of basic science, which conforms to the level of world criteria, is an indicator which demonstrates the modernity of the national culture. Conformity with these criteria requires the harmonious organization of education and science. The development of a self-regulating system, which, by using mainly economic methods, creates the optimum conditions for the development of science, is the goal of the organization of science.

The president devoted much attention to financial issues.

"Under the conditions of IME [Self-Managing Estonia] basic research is being financed from the state budget of the Estonian SSR and other sources," he said. "The session of the Estonian SSR Supreme Soviet specifies the allocations for science from the budget when examining the state budget for the period being planned on the representation of the corresponding commission of the parliament."

The Academy of Sciences, higher educational institutions, and other scientific institutions and organizations each year before the drawing up of the state budget submit their petitions on the financing of research to the National Scientific Council, which sends them for consideration to its section. The council submits its own petition to the republic government. The republic government, in turn, submits the budget of science for consideration and approval to the parliament as a part of the state budget.

However, along with republic assets one must also not reject financial resources which are received from centralized funds. The research institutions of the Estonian SSR Academy of Sciences in the future should participate in all-union state programs, performing specific contractual assignments.

Scientific personnel were discussed both in the report and in the statements. Under the conditions of an open society the outflow of talented scientists to developed countries is a significant problem. In order to avoid this, in addition to a creative environment, which is favorable for scientific work, it is necessary to create the appropriate material and moral conditions (the conditions and means for scientific work, the wage, and living conditions). This especially concerns young personnel, whose retention and enlistment in scientific work and in the management of science are today a very urgent problem. The division of scientific institutions into categories, which hinders the effective implementation of policy in the area of the wage, should be eliminated. The bringing of the system of public education at all its stages up to a modern level should serve as a condition for the better molding of scientific personnel.

There was also a lively discussion on the materials of the Union of Scientists of Estonia, which concern the prospects of scientific policy. The speakers voiced various opinions and defended their convictions. The attitude toward the reorganization of the Academy of Sciences became the topic of a special discussion.

Questions, which are connected with the opening of new vacancies for members of the Academy, the formation of a court of honor, and the election of management organs of the Academy, were also considered at the assembly.

First Secretary of the Estonian CP Central Committee V. Vyalyas, Chairman of the Presidium of the Estonian SSR Supreme Soviet A. Ryuytel, Deputy Chairman of the Estonian SSR Supreme Soviet M. Leosk, and Chairman of the Estonian SSR State Committee for Public Education V. Rayangu took part in the General Assembly of the Estonian Academy of Sciences.

Frolov Support of Parliamentary Decisions

907A0070A Moscow IZVESTIYA in Russian
5 Dec 89 p 4

[Interview with Vice President of the USSR Academy of Sciences Academician Konstantin Vasilyevich Frolov, USSR people's deputy and a member of the USSR Supreme Soviet, by IZVESTIYA correspondent Kim Smirnov, under the rubric "Science and Perestroyka": "What the Deputy Is to Learn"; date and place not given; first paragraph is IZVESTIYA introduction]

[Text] The second session of the Supreme Soviet of the country has come to an end. The second Congress of USSR People's Deputies is approaching. The first phase of the work of the new Soviet parliamentarians was striking for the democracy, openness, and diversity of the positions and points of view, which are unusual for us. They truly became the heroes of the day, and the unpredictable topics of the debates at the Moscow Kremlin overshadowed the most thrilling television spectacles. However, having cooled down somewhat from the campaign, election, congressional, and session passions, we also soberly note today another thing: the efficiency of the work of our deputy corps has not yet become very high. Why is this? Because of inadequate parliamentary culture? Not only that. But also because serious science thus far has not joined in the work of this corps. That is what Vice President of the USSR Academy of Sciences Academician K. Frolov, USSR people's deputy and a member of the USSR Supreme Soviet, believes. An IZVESTIYA correspondent talks with him.

IZVESTIYA: Konstantin Vasilyevich! Our readers are calling the Congress of USSR People's Deputies and the first two sessions of the USSR Supreme Soviet a large university of economic, political, and legal knowledge for the audience of many millions, for our entire society. It is disturbing, however, that not only television viewers, but also many deputies and even members of the Supreme Soviet during the meetings, at which laws, which, as is now customary to say, are fate-bearing for all of us, are discussed and passed, frequently engage in self-education. The pluralism of opinions is a good thing. But do we not too often see instead of it a difference of opinions, which comes from insufficiently precise and complete information?

K. V. Frolov: Much is now being said about the training of deputies. Consultations and lectures on the broadest range of knowledge—up to the most complex, most urgent problems of the economy—are being organized for them. The Central Museum of V.I. Lenin is opening a university of parliamentary culture (not only for deputies, but also for broad electoral districts). Cooperative members are offering their services.

Of course, in the Supreme Soviet there are representatives of the most diverse occupations. The same deputy can be a professor in the discussion of some questions and a "first grader" in others. And unique courses of intensive instruction and the "equalization" of levels in this case are simply necessary. This as a whole will increase the competence of the entire Supreme Soviet. Buy may we not "become wedged" only at this level.

It is necessary to go farther—to involve science in the formulation and making of parliamentary decisions.

The present reality—democratization—is raising the question of how to link science not with decisions of the machinery, but with democratic decisions—in the Supreme Soviet itself, in its committees and commissions.

This, incidentally, also applies to national discussions of drafts and documents, which are important for the life of all society. It would be dishonest to say that during the times of stagnation the people were concern only with keeping silent. Look at how many interesting ideas also spilled onto the pages of newspapers during precongressional and other national discussions in past decades. But the trouble was that the majority of them were simply ignored. A democratic mechanism of the selection of the most rational of these ideas did not exist. The selection proceeded upward "in pyramid fashion." In the end the draft, which has been drawn up in advance by the apparatus and in which several suggestions of workers were interspersed, purely for the sake of the appearance of democracy, was approved.

One should not, of course, oversimplify the matter. Let us assume that recently at the session the large amount of work, with the involvement of the latest computer hardware, on the analysis of the suggestions of workers during the discussion of the Constitution of the country, which was adopted in 1977, was spoken well of (and justly). But still it is necessary to understand perfectly that mainly the apparatus performed this work, that both the times now are different and the will of the people has itself become different.

Only now are we beginning to get accustomed to the fact that nothing unusually is happening if drafts and decisions, which are alternatives to the suggestions of the Council of Ministers, emerge at the session of the Supreme Soviet.

IZVESTIYA: It is a matter of not only how adequate the scientific base, on which the Supreme Soviet relies when discussing and making new decisions, is. And not even to what one is to attach the scientific potential—to the administrative apparatus or to the new democratic, restructuring institutions of society. Obviously, it is to the latter. But how is one to do this without a loss of quality?

K. V. Frolov: Yes, I agree. Theoretically, after all, it is clear to anyone: without reliance on exact knowledge, on science, it is impossible to make state decisions. But another thing is also clear to everyone who in the evenings turned on the second television program: the Supreme Soviet arrived at its decisions too much by feel, with a large loss of time, even if you consider the novelty and the unprecedented nature of the path, on which we have embarked.

IZVESTIYA: In our country many faults, which appeared already during the years of perestroyka, are being explained precisely by the novelty, by the "unexplored nature of the paths." But these are only God's inscrutable ways. Human ways are both scrutable and predictable far more often than it seems to us—in any case, to a certain limit. Do we not too often not know what we are doing, below this level?

K. V. Frolov: It will be possible to saturate the entire deputy corps with information and competence to this level. But further we have to accomplish a far more complex task—to develop such a mechanism, in case of which the best scientific forces will gradual increase the mighty research potential of parliament and both any deputy and the entire Supreme Soviet will be able at any time to be connected with this potential, to obtain the necessary consultation and complete information—if we will not do this, we will simply flounder in contradictory data, which now it is actually possible to observe frequently during the meetings of the Supreme Soviet and committees.

IZVESTIYA: So what? Let us establish another departmental science—parliamentary science.

K. V. Frolov: No. It is a question not of another research department, but of the connection of the highest state authority—if necessary—with any scientific potential both in the country and abroad. And it is necessary to develop such a mechanism.

IZVESTIYA: But is there in general something similar in the world?

K. V. Frolov: There is. The USSR Academy of Sciences just received a delegation of the American Association for the Advancement of Science (AAAS). This in general is a very interesting organization. One with a 150 year old history, which includes more than 140,000 members and about 300 collective members. It is implementing a number of impressive programs, for example, "Project 2061—Education for the Future" (in 2061 a new approach of Halley's Comet to earth is expected). But in this case "The Program of the Participation of Scientists in the Work of the U.S. Congress" will be particularly interesting for you and me. It is a matter of the 15-year experience of interaction of the association with the highest echelon of authority.

It assigns to each congressman or senator scientists, who work on his staff for a year each. More than 400 scientists have already taken part in the program. A third of them remained in a permanent job in congress. Those who returned to their former places maintain contacts with the parliamentarians and advise them. All his activity takes place under the motto "A civilized state should have a highly educated government."

William Golden, who is in charge of the program and has already published two books on the experience of the interaction of science and parliament, proposed to organize the exchange of scientists who are participating in the work of the highest organs of authority in the USSR and the United States. For the same time—up to a year.

IZVESTIYA: The reciprocal training of both our deputies and congressmen?

K. V. Frolov: Precisely this is intended. But, I repeat, training in this case should not be understood in an oversimplified way.

In one of his statements Nikolay Ivanovich Ryzhkov called upon the deputies to look more deeply into the meaning of each point of the draft laws being discussed and to try to foresee the possible remote consequences of the statutes being proposed by them. Now this is the posing of a supertask. This is a higher level, forethought, and foresight. And this is absolutely necessary.

IZVESTIYA: But is science capable of assuming responsibility for a reliable forecast given the present disparity of its recommendations?

K. V. Frolov: English scientist Roger Bacon once proposed a definition which has become popular: in every science there can be equally as much science as there is mathematics in it. As applied to our parliamentary life we ought to admit that in each decision of ours there is equally as much science as reliable information has been used in it.

Neither sociopolitical perestroyka nor economic reform will advance a step farther than the present state of our science allows. Look how much time of the deputies is being spent on the discussion of controversial questions, when each of the speakers bases himself on different data and often simply on his own personal subjective opinion. Will many of us be able if only to draw up an order for scientific information with the exact indication of its type, amount, and quality? Both the sharing of experience with informationally developed countries and the more resolute involvement of our own scientific potential could also help us in this.

In other words: in those cases, where scientific laws exist, it is also possible, by relying on them, to make scientific forecasts. But there are fields, in which thus far scientific principles and reliable models have not yet been developed. Here science itself requires development and first of all the categorical and unconditional rejection of dogmatism, especially in the area of the social sciences. A strict scientific analysis of the processes of perestroyka, economic reform, and its connection with the transformations of the political system is necessary. Figuratively speaking, today perestroyka, in making an inquiry to science, is returning to it the initial status of one of the most important motive forces of social development.

In science, as in social activity, there are no "royal roads." No matter how perceptive the mind is, only intense labor without rest and a deep breath, long and persistent labor, is a guarantee of success both in science and in perestroyka. No state and no social system, which have ventured not to learn and not to work, have yet survived.

Alferov on Politics, Problems at Leningrad Science Center

907A0037A Leningrad LENINGRADSKAYA PRAVDA in Russian 16 Aug 89 p 2

[Interview with Academician Zhores Ivanovich Alferov by a LENINGRADSKAYA PRAVDA correspondent under the rubric "The Position": "Academician Zh. I. Alferov: A Schedule for Tomorrow"; date and place not indicated; first paragraph is LENINGRADSKAYA PRAVDA introduction]

[Excerpt] Academician Zh.I. Alferov, director of the Physical Technical Institute imeni A.F. Ioffe of the USSR Academy of Sciences, winner of the Lenin Prize and the USSR State Prize, a USSR people's deputy, and a member of the bureau of the Oblast Committee of the CPSU, at the General Assembly of the USSR Academy of Sciences four months ago was elected the new chairman of the Presidium of the Leningrad Scientific Center of the USSR Academy of Sciences (LNTs). On the eve of the meeting of the aktiv of the Leningrad Party Organization, at which, apparently, the problems of science will also be discussed, our correspondent talks with him.

LENINGRADSKAYA PRAVDA: Zhores Ivanovich, permit me to begin with a question which first of all worries the scientific community. At one time you spoke about the fact that Leningrad institutes in general can do without the Leningrad Scientific Center. And unexpectedly for many people you took charge of it. Does this mean that your position has changed?

Zh. I. Alferov: First I will explain for what reason these words were spoken.

In recent years a well-known struggle took place between the staff of the Leningrad Scientific Center and the directors and leading scientists of many institutes. Its essence consisted in the following. The former executives of the center, whom the local party organs also actively supported, insisted that the scientific and scientific organizational supervision of institutions of the USSR Academy of Sciences should be carried out by the staff of the Leningrad Scientific Center, by analogy, say, with the Siberian Department of the USSR Academy of Sciences. The majority of directors of institutes and leading scientists, including myself, were opposed to this. We believed that it is necessary to leave scientific and scientific organizational supervision to the appropriate specialized departments of the USSR Academy of Sciences, that there is no difference here between Leningrad and Moscow institutes.

When this question was discussed two years ago, I said: if at the Academy of Sciences they came to the conclusion that regional supervision for some reasons is more advantageous than specialized supervision, it is necessary to eliminate the departments, at least in the form in which they exist today. We are not doing this, on the contrary, we are broadening their rights. Why should there be regional scientific supervision in Leningrad? Especially as the appropriate budget, which the Leningrad Scientific Center does not have, is necessary for this. So why, I said, do we need such a center? In order to write a large number of documents for there and not to receive anything in return?

In the new statute on the Leningrad Scientific Center, which was adopted by the general assembly of the Leningrad members of the academy in the fall of last year, it is clearly recorded: the appropriate departments of the USSR Academy of Sciences carry out the scientific, scientific methods, and scientific organizational supervision of Leningrad academic institutes. There is another point: the Leningrad Scientific Center supervises the interdisciplinary regional research programs of scientific institutions of the center and coordinates this work with higher educational institutions and sectorial institutes. As compared with the former position the changes, you will agree, are fundamental. That is precisely why I consented to my nomination for the post of chairman of the center.

LENINGRADSKAYA PRAVDA: Many people believe that you took charge of the Leningrad Scientific Center at a difficult time. Often one has occasion to hear the assertions that today Leningrad science is beginning to surrender its positions in the country. Do you agree with such a point of view?

Zh. I. Alferov: I do not. This absolutely does not correspond to the truth if only because many Leningrad institutes of the USSR Academy of Sciences are pace setters in the country in their directions. The Physical Technical Institute is the leading institute in the USSR and, in some fields of research, in the world, the Institute of Nuclear Physics is the main institute of the Nuclear Physics Department of the USSR Academy of Sciences. The two institutes of physiology—the institute imeni Pavlov and the institute imeni Sechenov—are the leaders in the country. The Leningrad Department of the Mathematics Institute is a very powerful center, and Academician L.D. Faddeyev was by right elected president of the International Mathematical Union.

If we talk about our humanities institutes, although several of them are departments of Moscow institutes, they are in no way inferior to them, and at times surpass them in personnel and the level of research. The Leningrad departments of the Institute of Oriental Studies, the Institute of Ethnography, and, of course, the Institute of Russian Literature (the Pushkin House) of the USSR Academy of Sciences are gems of the largest size in the necklace of humanities institutes of the country.

In general, I do not agree with the assertion about the surrender by Leningrad science of its position. It is another matter that all Soviet science lags behind world science. Or, more precisely, is beginning to lag.

LENINGRADSKAYA PRAVDA: What is the reason?

Zh. I. Alferov: There are many of them. I would single out the two, in my opinion, main ones.

The first is the weakness of the material and technical base of our science. Leningrad institutes in this sense are in a more difficult position than Moscow institutes. This concerns both natural science and humanities institutes, especially the latter. If you were to come and see under what conditions they operate.... An accident occurred at the Library of the USSR Academy of Sciences, anything can happen at the Pushkin House, the Leningrad Department of the Institute of Oriental Studies is in terrible condition.... It is possible to continue this sad list. But, I will repeat, it is a matter of leading institutes of the country! What is it possible to say in such a case about the others?

The second problem is the training of personnel and the gap between science and education. It so turned out historically that the development of basic research in the country was concentrated first of all at the USSR Academy of Sciences. In the United States, where I worked for a long time, it is different. There basic science is being developed first of all at universities. This has its merits and its drawbacks. The opportunity to enlist talented young people in work is, of course, a plus. But the fact that basic attention is being devoted all the same to the training of personnel, and not to the conducting of research, is a drawback.

In correcting this situation, the Americans took the path of establishing scientific research centers and large laboratories in the most important and promising directions of research precisely at universities. And what path did we take? A number of academic institutes had quite strong ties with higher educational institutions. But in 1955 these ties in practice were completely broken by the well-known decree which prohibited the combining of jobs. They repealed the decree 10 years later, but, as is known, it is easy to destroy and always more difficult to restore. Years and years were required. It seems to me that to this day the ties of academic institutes with higher educational institutions have still not reached even the 1955 level.

Yes, the gap with education is today, unfortunately, a reality. And we need to think with delay about how to bring closer together, first, VUZ [higher educational institution] and academic science and, second, science and education.

In this direction all and any forms are suitable. These are both the conventional combining of jobs and the establishment of base chairs, faculties, and, perhaps, educational institutes in the system of the USSR Academy of Sciences. Here we at the Physical Technical Institute have already opened our own physical technical school. It seems to me that this is one of the promising forms of bringing science and school education closer and that it is necessary to welcome in every way the establishment of specialized schools at leading scientific research institutes. But what is happening in practice? We had to surmount a large number of barriers. We were not able to obtain either a building for the school or assets for the creation of a material base. Therefore, at first we had to engage just two classrooms. After a year we rented a floor from the preparatory faculty of the Polytechnical Institute, rebuilt and repaired it ourselves, and set up six classrooms for lessons, including computer lessons.

Of course, the teaching of physics, information science, and electronics should be at a high level at our school. But in addition, I am convinced, training in literature, biology, and English without fail is also necessary. So our main goal is to provide a good education and, of course, to attempt to stimulate, as they say now, early vocational guidance.

In general the school is an extremely important unit in the system of personnel training. Of course, it is impossible to base all school education on specialized schools, but they undoubtedly have the right to exist. The Institute of Russian Literature of the USSR Academy of Sciences, the group of institutes of the biological direction, and others can also have their own specialized schools. I do not want this to sound like a direct order—everyone is to follow the example of the Physical Technical Institute. In each case it is necessary to take a very specific look.

We have much work ahead of us on bringing science and VUZ education closer together. What is it possible to do here. To strengthen, when there is an opportunity for this, the research base at some higher educational institution, establishing a powerful scientific research center. It is probably advisable to transfer several higher educational institutions to the system of the USSR Academy of Sciences. Similar examples already exist. [passage omitted]

Obstacles to Introduction of New Technology, Products

907A0056A Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Nov 89 p 2

[Article by Candidates of Technical Sciences D. Aleynov and O. Dobrovolskiy: "Where Will the Innovation Get Registered?"; first paragraph is SOTSIALISTICHESKAYA INDUSTRIYA introduction]

[Text] It is always useful to compare oneself with others. Thus, whereas the West German Hoechst firm every 10 years develops and introduces about 4,000 new chemical products, our related State Institute of the Nitrogen Industry and Products of Organic Synthesis (GIAP), one of the oldest and best known sectorial scientific collectives, in accordance with the results of the work during the last five-year plan, cannot boast of a single significant innovation which became established in the national economy. What, are the skills of our specialists lower? No, the main cause of such a striking difference of the results of activity consists in the fact that Hoechst is free in the choice of directions of development, while the State Institute of the Nitrogen Industry and Products of Organic Synthesis is strictly limited to a departmental framework.

Indeed, who is it that would permit a sectorial institute to spend departmental assets and resources on the development of products that are not attached to the State Institute of the Nitrogen Industry and Products of Organic Synthesis?

Moreover, the described situation is also typical of other sectorial institutes. And it seems that for the present we still do not understand thoroughly enough what a danger the preserved departmental structure of the management of the economy represents for scientific and technical progress in our country. Be it even a slightly modernized structure.

Indeed, today a specific product list has been attached literally by name to every sector of industry. It is also listed in the themes of work of sectorial institutes and is assigned among enterprises. As a result each product lies in its own "compartment," it has a master, more correctly many masters, and all of them together and each one separately work for the achievement of, it would seem, a positive goal: to decrease the production cost of items, to increase the volume of their production, to increase the quality "to the level of the best foreign models," and so on.

However, in the sectorial structure there is not compartment for a fundamentally new product which actually determines scientific and technical progress. The idea of its production can originate with the inventor, but it will not find implementation, since no one "is supposed" to deal with it.

Fundamentally new materials and technologies appear wherever administrative interference is simply eliminated and wherever the derivation of a profit, and not a plan sent down from the ministry, is the basis for the activity of any collective. That is why they constantly lead us abroad.

And only when it becomes obvious that we also need some items or others, does there follow the command to organize the corresponding works, that is, "compartment." The "responsible" party, who begins to force and squeeze this new creation into the established stagnant system of production and consumption, appears. It is natural that such a product, as a rule, is no longer of interest to the world market.

But this, too, is still not everything. Any department strives to reduce as much as possible even the assortment of items, which is meager as compared with the necessary assortment and has been attached to it. The same thing also happens at departmental head institutes.

For example, in a comparatively short time such products of organic synthesis, which are important for the national economy, as benzoic and terephthalic acid, monomers for heat-resistant fibers, and salt-forming monomers for polyamides disappeared from the products list attached to the State Institute of the Nitrogen Industry and Products of Organic Synthesis. The gained experience was thereby erased, while someone had to start from scratch.

A plausible excuse will always be found: for example, the need to concentrate the efforts of the head institute on the "most important" directions. Here they somehow forget that for an intensive economy precisely the opposite—to enlarge the product assortment as much as possible—is necessary and the most skilled personnel should be used for the accomplishment of this task.

The story of nylon salt—a raw material for the production of nylon—can serve as a vivid example of the "truncation" of the themes of scientific collectives. At the State Institute of the Nitrogen Industry and Products of Organic Synthesis an advanced technological process was developed and in 1969 was embodied in the design of a pilot industrial plant. However, in 1970 the Ministry of the Chemical Industry made the decision to halt the financing of this work and to purchase the shop abroad. In 1981 a new decision was made: on the transfer of the themes on nylon salt to the GosNIImetanolproyekt, which should have ensured the scientific service of the purchased works and the development of a domestic technological process. Not having coped with the task alone, this scientific collective turned for assistance to the State Institute of the Nitrogen Industry and Products of Organic Synthesis. And now, having lost a lot of time, both organizations are developing a technological process at the level of...the one that had already been developed in 1969.

Isocyanates are another example. Isocyanates are a raw material for the production of polyurethanes (plastic, fiber). The experience of using polyurethane materials in our country and abroad shows that they have a substantial influence on the pace of technical progress in the sectors of the machine building, fuel and power, and wood chemical complexes and construction and are making it possible to accomplish successfully the tasks of the Food Program and consumer goods production. Thus, after the gaining of considerable experience at the State Institute of the Nitrogen Industry and Products of Organic Synthesis this most important theme for the national economy was transferred to one of the outlying affiliates. That is, "farming out" is continuing. And it is not by chance that in 1990 it is planned to meet a little more than half of the need for polyurethanes. The situation with the assortment of isocyanates is also unsatisfactory.

But are these sacrifices, perhaps, actually justified, and did this theme of organic synthesis, which remained on the products list of the head institute, after the concentration of efforts and attention on it begin to be developed more rapidly? By no means. The point is that for the former Ministry of Mineral Fertilizer Production (the State Institute of the Nitrogen Industry and Products of Organic Synthesis was subordinate to it) organic chemistry was not characteristic. The main task of this department is to provide more mineral fertilizers, although we already produce more of them than everyone in the world. It is here that many billions of rubles of capital investments are being spent.

But meanwhile the themes of organic synthesis, the same ones, the lack of attention to which is actually curbing technical progress in a large number of sectors of the national economy, are receiving allocations in accordance with the remainder principle. Not by chance is the construction of works of very scarce new products being carried over from five-year plan to five-year plan. Such, for example, is the fate of hexamethylenamine, a raw material for the production of the highly effective herbicide Yalan, and corrosion inhibitors.

Initially the placement of the hexamethylenamine works into operation in accordance with the technology, which was developed by the State Institute of the Nitrogen Industry and Products of Organic Synthesis, was planned during 1974 to 1975. Since then five decrees of the USSR Council of Ministers have been devoted to this product. However, things are still at a standstill. There is also an analogous situation with dodecalactam, a raw material for the production of polyamide-12, from which, in particular, advanced construction materials, including ones used in surgery, are made.

It should be noted that repeated departmental reorganizations in practice have not affected the orphan status of organic themes. In any case the attempts of developers to enlarge the product assortment have been stopped by applying a stamp—a focus on petty topics! Therefore, the suggestion on the change of the specialization of the departments from the management of production to the management of science seems not only strange, but also promising. Now a wolf has indeed been set to keep the sheep.

No, in order to experience in a short time the real fruits of scientific and technical progress in the national economy, it is necessary not to modernize the existing sectorial ministries and not to invent different work for them, but to replace them resolutely with new formations of a broad type, which in coverage are similar to the present bureaus of the USSR Council of Ministers and the duties of which would include not administration by mere decree, but economic analysis, the study of the current and long-range demand, the reserves of natural resources, and questions of ecology, the determination of the priority directions of scientific and technical progress, and so on. It would be useful to study foreign experience in this area.

Technical Advertisements Appearing in NTR: PROBLEMY I RESHENIYA

907A0057A Moscow NTR: PROBLEMY I RESHENIYA in Russian No 20, 20 Oct 89 p 8

[Advertisements]

[Text] The PC-Set will help you feel more confident in the world of personal computers.

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International Forum Discusses Licensing, R&D Security

907A0063A Moscow NTR: PROBLEMY I RESHENIYA in Russian No 21, 3 Nov 89 p 3

[Interview with Candidate of Juridical Sciences G. A. Matveyev, acting chief of the Department of Invention Law of the State Committee for Inventions and Discoveries, by NTR: PROBLEMY I RESHENIYA correspondent Yu. Meshkov: "Property Without...an Owner"; date and place not given; first two paragraphs are NTR: PROBLEMY I RESHENIYA introduction]

[Text] An international forum, which was devoted to questions of industrial property in economic cooperation, was held in October in Moscow jointly by the State Committee for Inventions and Discoveries attached to the USSR State Committee for Science and Technology and the USSR Chamber of Commerce and Industry under the aegis of the World Intellectual Property Organization (WIPO).

Our correspondent addressed to one of the Soviet participants—Candidate of Juridical Sciences G.A. Matveyev, acting chief of the Department of Invention Law of the State Committee for Inventions and Discoveries—the request to comment on this event.

G. A. Matveyev: The questions, which are connected with the gaining of access to advanced technologies, are now very urgent. A number of reports directly concerned the legal protection of industrial property when carrying out cooperation—in the plan of both the exchange of licenses and the establishment of joint ventures.

The interest in the world in questions of industrial property is explained by the fact that quite significant investments are required for the obtaining of a specific scientific and technical result and its embodiment in a specific technology. At present competition has had the result that attempts to obtain a finished result, without spending assets on development, are being observed.

NTR: PROBLEMY I RESHENIYA: Is this good or bad?

G. A. Matveyev: From the standpoint of the developers of new technologies this process is disadvantageous for them. A number of countries see some advantages in this. But on large account such activity is developing into its opposite. Since there is no experience in conducting research work, the scientific potential in these countries is languishing, and the intellectual element is disappearing, they are turning more and more into consumers. But now fewer and fewer such loopholes remain. The countries, which want to exchange new technologies legally, are switching to more stringent legislation in this respect, which does not allow what is called "piracy."

In this sense the experience of South Korea, which in a very short time introduced modern legislation, including the legal protection of computer programs (which has been done today only in a small number of industrially developed countries—the United States, France, the FRG...), is interesting. Thus far we do not have such legislation, and this is making contacts with western firms very difficult.

NTR: PROBLEMY I RESHENIYA: What is preventing the passage of such legislation? Especially as world experience exists.

G. A. Matveyev: Yes, such experience exists. Everything is coming up, in my opinion, against a certain inertia of departments, in whose power the passage of such legislation is. A specific draft on the supplementing of the fundamentals of the copyright exists, but for a year now it has been floating among the offices of the Ministry of Justice, the All-Union Copyright Agency, as well as ministries, which are appearing in the electronics industry.

NTR: PROBLEMY I In other words, collective responsibility is turning into collective irresponsibility....

G. A. Matveyev: Yes, a master is needed in this matter—a single, specific one, who would manage the entire matter from beginning to end.

NTR: PROBLEMY I RESHENIYA: These days the problems of property and the attitude toward it are also being examined at the session of the USSR Supreme Soviet. How is this connected with the work of the forum and with its results?

G. A. Matveyev: The questions of industrial property and individual property, undoubtedly, should find reflection during the discussion of the general provisions on property, which are now being examined. This worries us most of all in connection with the substantial increase of the independence and responsibility of enterprises. The questions, which are connected with the ownership of an invention, which was developed at some enterprise, in our opinion, has now been settled unsatisfactorily, inasmuch as there is no specific person who would perform the role of the owner or manager with respect to a specific technical achievement. That is, it belongs to everyone, to the whole of society, but in essence there is no owner. This, as practical experience has shown, does not lead to good results. We are interested in there being a rigid legal and economic connection between the specific scientific and technical achievement and the collective or its specific creator. World experience testifies that precisely this means leads to greater effectiveness.

NTR: PROBLEMY I RESHENIYA: Ideally there is needed such a system, in case of which failure to introduce would be criminal....

G. A. Matveyev: Disadvantageous, in any case. I would not want to speak about a crime, since we are now changing over primarily to economic methods of the regulation of interrelations. At present new technologies are not even evaluated. The patent services of enterprises should do this on the basis of information on what specifically is being introduced, at what level. Often they simply do not know this. And the second circumstance is the lack of saturation of the market. This also makes it

possible to produce many things not at the world level (if they are intended for the domestic market). In connection with the shortage of many goods here people take everything. This provokes enterprises to turn out long obsolete, but costly products. In principle this is a programmed technical lag.

NTR: PROBLEMY I RESHENIYA: If it were within your power to change the situation, with what would you begin?

G. A. Matveyev: It is necessary to switch the independence and responsibility of enterprises over to a real basis. It is necessary that the enterprise would have the exclusive right to intellectual achievements, so that it would be economically interested in the use of its own innovations.

Science Fair Features 'Unique Items'

907A0069A Moscow SOVETSKAYA ROSSIYA in Russian 1 Dec 89 p 6

[Article by A. Usoltsev under the rubric "Exhibitions" (Chelyabinsk): "In a Single Copy"]

[Text] Having gotten the small plastic box, Veniamin Vasilyevich Shubin turned to those who had gathered:

"With this instruments I can determine from your ear the state of many of your organs. Are there volunteers?"

One of the women came forward. Shubin began to touch by turns the electrodes, which were protruding from the box, to specific points of her ear. The indicator light flashed from time to time in the instrument. Veniamin Vasilyevich explained at once:

"You have a deposit of salts in the shoulder joint.... A small highmoritis...."

I also took the risk to test the instrument on myself. An amazing thing: the electrode "sniffed out" a knee injury and a cardiac arrhythmia, which has been worrisome in recent times.

Veniamin Vasilyevich Shubin works as chief of a shop of the Minyar Hardware and Metallurgical Plant and does not have, of course, medical equipment. And this instrument initially originated not for medical needs.

In the shop, in which he works, there are a large number of different pipes, which from time to time need repair; cracks and breaks appear in them. It is good if the main is before one's eyes, but what if the ill-fated hole is hidden under insulation or, even worse, the pipe has been laid under ground?

Shubin designed the small electrical instrument for these purposes. The idea of using the found principle for the diagnosis of human organs emerged later. The invention is based on the fact that a sick organ sends signals in the form of electric voltage. It is possible to detect them at certain spots on the human ear. These points are well known to medicine, the effect on them is based on reflex therapy.

"My instrument can aid in work not only the physician, but also the veterinarian, the motorist, and the amateur radio operator. Everyone, who has ever availed himself of it, gives excellent reports. Only our medical industry, as, incidentally, other sectors of production, remains indifferent to the innovation."

I happened to observe this scene of improvised tests of the invention the other day in the foyer of the Chelyabinsk Center of Scientific and Technical Information and Propaganda, where the oblast exhibition of the scientific developments of independent authors had opened. "Everyday life, relaxation, health"—this is how the thematic orientation of the display was defined. The oblast council of the All-Union Society of Inventors and Efficiency Experts, which organized the exhibition, accepted any exhibits—from a wrench to a helicopter, but with one condition: they should not be similar to introduced developments. And the independent makers displayed exceptional aptitude, a keen mind, and talent.

Here, for example, is an innovation which remains a dream for leaseholders, farmers. The minitractor, which was developed by Chelyabinsk driver V.A. Chugayev, is good in that it is capable of operating with any pull-type agricultural equipment and implements. But its high transport speed—up to 60 kilometers an hour—which for the present is unapproachable by other similar tractors and motorized units, is a no smaller merit.

A.S. Amsharik, chief of a division of the rayon contact network from the Chernyavskaya Station, exhibits a four-wheel cargo motor scooter of his own design. While elegant yachts, which were designed by the base club of amateur technical creativity attached to the oblast council of the All-Union Society of Inventors and Efficiency Experts, were exhibited nearby. Here are bicycles and buggy cars, juice squeezers and folding balcony furniture, an air ionizer and medical instruments of original design.

The developments of L.G. Rogova, an engineer of the Polet Association, take up an entire section of the exhibition. This is a set of sports furniture for the rehabilitation of children with disorders of the locomotor system. Lyudmila Georgiyevna herself by means of physical culture overcame a serious ailment and now is helping children, who have cerebral palsy, to obtain the joy of movement.

While in all about 200 independent authors took part in the exhibition. It aroused great interest among the people of Chelyabinsk.

USSR State Prizes for Science and Technology for 1989 Awarded

907A0043A Moscow PRAVDA in Russian
7 Nov 89 pp 1, 3

[Announcement signed by CPSU Central Committee Secretary M. Gorbachev and USSR Council of Ministers Chairman N. Ryzhkov: "Awarding the 1989 USSR State Prizes in Science and Technology"]

[Text] Having examined the proposal by the Committee on Lenin and USSR State Prizes in Science and Technology under the USSR Council of Ministers, the CPSU Central Committee and USSR Council of Ministers decree:

To award USSR State Prizes for 1989 to:

I. In Science and Technology

1. Lev Mitrofanovich Barkov, academician, Aleksey Pavlovich Onuchin, doctor of physical and mathematical sciences, Igor Yakovlevich Protopopov, Yuriy Mikhaylovich Shatunov, candidates of physical and mathematical sciences, laboratory chiefs at the USSR Academy of Sciences [AS] Siberian Department Institute of Nuclear Physics, Aleksandr Nikolayevich Skrinskiy, academician, director, Veniamin Aleksandrovich Sidorov, USSR AS corresponding member, deputy director, German Mikhaylovich Tumaykin, doctor of physical and mathematical sciences, chief scientific associate, Svyatoslav Igorovich Myshnev, Yuriy Anatolyevich Tikhonov, candidates of physical and mathematical sciences, leading scientific associates, Valeriy Vladimirovich Petrov, Vladimir Petrovich Smakhtin, candidates of physical and mathematical sciences, senior scientific associates, employees at the above institute, and Leri Mikhaylovich Kurdadze, doctor of physical and mathematical sciences, head of department at Tbilisi State University—for the precision measurement of the masses of elementary particles in crossed electron-positron beams.

2. Nikolay Nikolayevich Gorkavyy, candidate of physical and mathematical sciences, scientific associate at the Simeiz Scientific Base of the USSR AS Astronomical Council, and Aleksey Maksimovich Fridman, doctor of physical and mathematical sciences, department chief at the same astronomical council—for the prediction of a system of new satellites for Uranus on the basis of an established theory of collective and collision processes in planetary rings.

3. Vladimir Dmitriyevich Rusanov, USSR AS corresponding member, department chief at the Institute of Atomic Energy imeni I.V. Kurchatov, Viktor Konstaninovich Zhivotov, candidate of physical and mathematical sciences, laboratory chief, Aleksandr Arkadyevich Fridman, doctor of physical and mathematical sciences, Mikhail Fedorovich Krotov, candidate of physical and mathematical sciences, leading scientific associates, Yevgeniy Gennadyevich Krasheninnikov, candidate of physical and mathematical sciences, senior scientific associate, employees at the same institute, Nikolay Gennadiyevich Vasov, academician, department head at the USSR AS Physics Institute imeni P.N. Lebedev, Eduard Mikhaylovich Bekhenov, doctor of physical and mathematical sciences, Viktor Ivanovich Panteleyev, candidate of physical and mathematical sciences, leading scientific associates at the same institute, Dmitriy Ippolitovich Slovetskiy, doctor of physical and mathematical sciences, laboratory chief, USSR AS Institute for Petrochemical Synthesis imeni A.V. Topchiyev, Lev Solomonovich Polak, doctor of physical and mathematical sciences, chief scientific associate at the same institute, and Georgiy Vasilyevich Lysov, candidate of technical sciences, department chief at a scientific research institute—for research on the non-equilibrium disassociation and synthesis of inorganic molecules in the plasma of electro-ionization and super-high frequency discharges.

4. Aleksey Alekseyevich Arsenyev, doctor of physical and mathematical sciences, professor at Moscow State University imeni M.V. Lomonosov, Aleksandr Vasilyevich Bobylev, doctor of physical and mathematical sciences, leading scientific associate at the USSR AS Institute of Applied Mathematics imeni M.V. Keldysh, Viktor Valentinovich Vedenyapin, candidate of physical and mathematical sciences, senior scientific associate at the same institute, and Nina Borisovna Maslova, doctor of physical and mathematical sciences, leading scientific associate at the Leningrad department of the USSR AS Institute for Oceanology imeni P.P. Shirshov—for mathematical methods of studying the Boltzmann equation.

5. Aleksey Fedorovich Leontyev, USSR AS corresponding member—for the monograph "*Ryady Eksponent*" [Exponential Series] and "*Posledovatelnosti Polinomov iz Eksponent*" [Sequences of Polynomials from Exponentials], published in 1976 and 1980.

6. Ivan Vasilyevich Bodrikov, doctor of chemical sciences, department head at the Gorki Polytechnical Institute, Nikolay Serafimovich Zefirov, academician, professor at Moscow State University imeni M.V. Lomonosov, Anatoliy Semenovich Kozmin, doctor of chemical sciences, leading scientific associate at the same university, Vitaliy Konstantinovich Belskiy, candidate of chemical sciences, deputy director of the Scientific Research Physical-Chemical Institute imeni L.Ye. Karpov, Anatoliy Aleksandrovich Mukhanov, director of the Dzerzhinsk "Kaprolaktam" Production Association, Gennadiy Leonidovich Groshev, candidate of chemical sciences, chief of the central laboratory, Svetlana Vasilyevna Spiridonova, candidate of chemical sciences, laboratory chief, Veniamin Konstantinovich Semanov, deputy production chief, employees at the same association—for the creation and industrial implementation of principles for controlling the electrophilic reactions of alkenes.

7. Natalya Pavlovna Boreyko, candidate of chemical sciences, laboratory chief at the Nizhne-Kamsk "Nizhnekamskneftekhim" Production Association, Aleksey Pavlovich Vorozheykin, chief engineer, Nikolay Grigoryevich Cherkasov, department chief, employees at the same association, Boris Yevgenyevich Ivanov, doctor of chemical sciences, laboratory chief, USSR AS Kazan Branch Institute of Organic and Physical Chemistry

imeni A.Ye. Arbuzov, Petr Anatolyevich Kirpichnikov, USSR AS corresponding member, advisor to the rectorate of the Kazan Chemical and Technological Institute imeni S.M. Kirov, Aleksandr Grigoryevich Liakumovich, doctor of technical sciences, head of department at the same institute, Vladimir Anatolyevich Kurbatov, doctor of technical sciences, chief of Main Administration of the USSR Ministry of the Chemical and Petroleum Processing Industry, Vitaliy Ivanovich Butin, candidate of technical sciences, deputy chief of Main Administration of the same ministry, Boris Izraylevich Pantukh, doctor of technical sciences, deputy director of the Sterlitamakskiy Experimental Production Petrochemical Plant—for the development and application of new methods for intensifying the production of synthetic rubber monomers.

8. Aleksandr Tikhonovich Bazilevskiy, doctor of geomineral sciences, laboratory chief, USSR AS Institute of Geochemistry and Analytical Chemistry imeni V.I. Vernadskiy, Georgiy Aleksandrovich Burbe, candidate of geographical sciences, senior scientific associate, Aleksey Aleksandrovich Pronin, scientific associate, employees of the same institute, Stanislav Fedorovich Zagorodnyy, chief of the computer center, USSR AS Institute for Radio Engineering and Electronics, Aleksandr Ivanovich Zakharov, candidate of technical sciences, senior scientific associate, Aleksandr Anatolyevich Krymov, scientific associate, employees of the same institute, Sergey Pakhomovich Ignatov, sector chief, Scientific Research Institute for Space Instrument Building, Yuriy Sergeyevich Tyuflin, doctor of technical sciences, department chief, Central Scientific Research Institute for Geodesy, Aerial Photography and Cartography imeni F.N. Krasovskiy, Mikhail Vladimirovich Ostrovskiy, Candidate of Technical Sciences, senior scientific associate of the same institute, Aleksey Lvovich Fukhanov, candidate of geomineral sciences, senior scientific associate, USSR AS Geological Institute, Andrey Georgiyevich Puchin, candidate of physical and mathematical sciences, leading scientific associate, USSR AS Institute of Applied Mathematics imeni M.V. Keldysh, Boris Yakovlevich Feldman, candidate of technical sciences, laboratory chief, Institute for Electronic Control Machines—for the creation of the first detailed maps of the surface of Venus using digital methods and the analysis of Venusian geology on their basis.

9. Sergey Viktorovich Meyen, doctor of geomineral sciences—for the scientific work "*Osnovy Paleobotaniki*" [Basics of Paleobotany], published in 1987.

10. Vladimir Ivanovich Skok, academician, department chief, UkSSR Academy of Sciences Institute of Physiology imeni A.A. Bogomolets, Aleksandr Aleksandrovich Selyanko, doctor of biological sciences, senior scientific associate, Viktor Aleksandrovich Derkach, candidate of biological sciences, junior scientific associate, employees of the same institute, Lev Girshevich Magazanik, doctor of biological sciences, laboratory chief, USSR AS Institute for Evolutionary Physiology and Biochemistry imeni I.N. Sechenov, Vladimir Aleksandrovich Snetkov, candidate of biological sciences, senior scientific associate, Sergey Mikhaylovich Antonov, candidate of biological sciences, scientific associate, employees of the same institute, Valeriy Yevgenyevich Gmiro, candidate of chemical sciences, junior scientific associate at the USSR Academy of Medical Sciences [AMS] Scientific Research Institute for Experimental Medicine—for the study of mechanisms to block chemically controllable ion channels in peripheral synapses.

11. Boris Aleksandrovich Yurtsev, doctor of biological sciences, laboratory chief, USSR AS Botanical Institute imeni V.L. Komarov, Aleksandr Aleksandrovich Korobkov, candidate of biological sciences, deputy director, Nikolay Nikolayevich Tsvelev, doctor of biological sciences, department chief, Tatyana Vladimirovna Yegorova, doctor of biological sciences, leading scientific associate, Olga Vladimirovna Rebrista, candidate of biological sciences, senior scientific associate, employees of the same institute, Aleksey Konstantinovich Skvortsov, doctor of biological sciences, chief scientific associate of the USSR AS Botanical Garden, Aleksandr Innokentyevich Tolmachev, doctor of biological sciences—for the monograph "*Arkticheskaya Flora SSSR. Kriticheskiy Obzor Sosudistykh Rasteniy, Vstrechayushchikhsya v Arkticheskykh Rayonakh SSSR*" [Arctic Flora of the USSR. Critical Review of Vascular Plants Found in the Arctic Regions of the USSR] in 10 volumes, published in 1980-1987.

12. Ivan Dmitriyevich Kovalchenko, academician, department head, Moscow State University imeni M.V. Lomonosov—for the monograph "*Metody Istoricheskogo Issledovaniya*" [Methods for Historical Research], published in 1987.

13. Aleksandr Ivanovich Anchishkin, academician—for developing the theory for forecasting the growth of the socialist economy and scientific and technical progress.

14. Yuriy Nikitich Belenkov, doctor of medical sciences, director of the Scientific Research Institute for Cardiology imeni A.L. Myasnikov of the All-Union Cardiology Scientific Center of the USSR AMS, Oleg Yuryevich Atkov, doctor of medical sciences, department leader at the same institute, Vasiliy Vasilyevich Zaretskiy, doctor of medical sciences, chief scientific associate at the USSR Academy of Medical Sciences All-Union Scientific Center for Surgery, Vladimir Vasilyevich Bobkov, doctor of medical sciences, leading scientific associate at the same scientific center, Lyubov Ilinichna Olbinskaya, doctor of medical sciences, professor at the First Moscow Medical Institute imeni I.N. Sechenov, Yelena Pavlovna Milova, leading engineer at the Institute of Medical and Biological Problems, Vyacheslav Maksimovich Chistyakov, head of sector for the Scientific Production Association for Measurement Equipment, Vladimir Fedorovich Baranov, department head at the same association, and Nurmukhamed

Mukhamedovich Mukharlyanov, doctor of medical sciences—for the development of methods for exocardiographic diagnosis and for monitoring the condition of the cardiovascular system and their application in health care practice.

15. Ivan Mikhaylovich Korochkin, doctor of medical sciences, department chief, Second Moscow State Medical Institute imeni N.I. Pirogov, Galina Mikhaylovna Kapustina, candidate of medical sciences, assistant at the same institute, Nodar Nikolayevich Kipshidze, USSR AMS academician, director of the Scientific Research Institute for Experimental and Clinical Therapy, Gyulnara Emilyevna Chapidze, doctor of medical sciences, department leader, Merab Razhdenovich Bokhua, Luiza Aleksandrovna Marsagishvili, candidates of medical sciences, senior scientific associates, employees at the same institute, Nina Ivanovna Stepakishcheva, leading engineer at the scientific production association, Vladislav Sergeyevich Sergiyevskiy, doctor of medical sciences, senior scientific associate at the Scientific Research Institute for Circulatory Pathology, and Boris Samsonovich Agov, candidate of medical sciences, assistant at the Leningrad Sanitary and Hygienic Medical Institute—for the development and introduction in clinical practice of a method for the treatment of different forms of ischemic heart disease using a helium-neon laser.

16. Georgiy Pavlovich Somov, USSR AMS academician, advisor to the board of directors of the USSR AMS Siberian Department's Scientific Research Institute for Epidemiology and Microbiology, Natalia Nikolayevna Besednova, doctor of medical sciences, director, Maya Fominichna Dzadziyeva, doctor of biological sciences, Tatyana Nikolayevna Varvashevich, candidate of biological sciences, Nelli Fedorovna Timchenko, Feliks Nikolayevich Shubin, candidates of medical sciences, laboratory leaders, associates at the same institute, Mariya Alekseyevna Borisova, doctor of medical sciences, department chief of Vladivostok State Medical Institute, Vladimir Aleksandrovich Znamenskiy, doctor of medical sciences, department chief at the Kiev State Institute for the Improvement of Doctors, Gennadiy Dmitriyevich Serov, candidate of medical sciences, head of laboratory at Scientific Research Design and Technological Institute for Biologically Active Substances, Galina Vasilyevna Yushchenko, candidate of medical sciences, laboratory chief, Central Scientific Research Institute for Epidemiology—for the development and introduction in practice of new methods for the diagnosis, prevention and treatment of pseudotuberculosis.

17. Boris Ivanovich Tkachenko, USSR AMS academician, department leader at the Scientific Research Institute for Experimental Medicine of the USSR AMS, Anatoliy Vasilyevich Samoylenko, doctor of medical sciences, senior scientific associate at the same institute, Horst Hein, corresponding member of the German Democratic Republic Academy of Sciences, director of the GDR Academy of Sciences Central Institute for Cardiovascular Research, and Gerhardt Zeshk, doctor of natural sciences, leader of a scientific group at the same institute—for the establishment of new laws for regulating the circulatory system based on the development of implantable measurement devices.

18. Valeriy Ivanovich Abramov, deputy chief designer, Moscow Machine Construction Plant imeni S.V. Ilyushin, Boris Vasilyevich Boytsov, doctor of technical sciences, department chief at Moscow Aviation Institute imeni Sergo Ordzhonikidze, Georgiy Nikolayevich Kravchenko, candidate of technical sciences, head of sector at the same institute, Anatoliy Petrovich Gusenkov, doctor of technical sciences, deputy director of the Institute of Machine Sciences imeni A.A. Vlagonravov of the USSR AS, Yuriy Nikolayevich Drozdov, doctor of technical sciences, department chief, Vladimir Petrovich Kogayev, doctor of technical sciences, laboratory chief, employees at the same institute, Mikhail Gavrilovich Zhuchkov, candidate of technical sciences, laboratory head at the All-Union Scientific Research Institute for Transport Machine Building, Vitaliy Gennadiyevich Lebov, deputy head of department, Central Aerohydrodynamics Institute imeni Professor M.Ye. Zhukovskiy, Grigoriy Ilich Nesterenko, doctor of technical sciences, head of sector, Veniamin Lvovich Raykher, doctor of technical sciences, head of department, employees at the above institute, Igor Viktorovich Kragelskiy, doctor of technical sciences, senior scientific associate and consultant to the USSR AS Institute of Problems in Mechanics, and Aleksandr Sergeyevich Pronikov, doctor of technical sciences, department chief at Moscow State Technical University imeni N.E. Bauman—for developing methods and creating systems to ensure the service life of machines.

19. Yevgeniy Aleksandrovich Nikitin, doctor of technical sciences, chief designer at "Kolomenskiy Zavod" Production Association, Vadim Mikhaylovich Shiryayev, candidate of technical sciences, deputy chief designer, Anatoliy Ivanovich Korobenkov, department head, Mikhail Alekseyevich Saltykov, doctor of technical sciences, Eduard Aleksandrovich Ulanovskiy, candidate of technical sciences, heads of sectors, Yuriy Dmitriyevich Profimov, chief production engineer, Boris Andreyevich Stryukov, deputy chief of department, employees at the same association, Rafael Nzhdeyevich Arutyunov, USSR first deputy minister of heavy machine building, Valentin Pavlovich Strelnikov, director of the All-Union Scientific Research Locomotive Institute, Vladilen Ivanovich Balakiv, candidate of technical sciences, director of the Central Scientific Research Diesel Institute, Albert Nikolayevich Bevzenko, chairman of the USSR Gosplan, Aleksandr Sergeyevich Nestrakhov, candidate of technical sciences, department chief at the All-Union Scientific Research Institute for Railway Transport—for the creation and introduction in the economy of a powerful series of standard economical type D49 diesel engines.

20. Vitaliy Pavlovich Avdeyev, doctor of technical sciences, department chief, Siberian Metallurgical Institute

imeni Sergo Ordzhonikidze, Leonid Pavlovich Myshlyayev, candidate of technical sciences, docent of the same institute, Vladimir Nikolayevich Burkov, doctor of technical sciences, laboratory chief at the Institute for Control Problems (Automation and Telemechanics), Anatoliy Grigoryevich Dyachko, doctor of technical sciences, department chief at Moscow Institute for Steel and Alloys, Valeriy Ivanovich Salyg, doctor of technical sciences, general director of the "Soyuznauka" All-Union Intersectorial Cost-Accounting Scientific Coordination Center, Mikhail Fomich Maryasov, deputy chief engineer at the West Siberian Metallurgical Combine imeni 50th Anniversary of Great October, Yuriy Aleksandrovich Sarapulov, candidate of technical sciences, department chief, Valeriy Viktorovich Zimin, candidate of technical sciences, deputy head of department, employees at the same combine, Vladimir Ivanovich Nosyrev, candidate of technical sciences, general director of the Kemerovo "Promavtomatika" Scientific Production Association, Viktor Ivanovich Solovyev, candidate of technical sciences, general director of a scientific production association for the automation of ferrous metallurgy, and Vladimir Aleksandrovich Myamlin, deputy head of department at the Novolipetsk Metallurgical Combine imeni Yu.V. Andropov—for creating automated systems with a multi-variant structure for the control of industrial complexes.

21. Leonid Leonidovich Valyberdin, candidate of technical sciences, chief of department at the Scientific Research Institute for Transmission of Direct-Current High-Voltage Electrical Energy, Viktor Ivanovich Yemelyanov, candidate of technical sciences, leading scientific associate at the same institute, Mengert Akoshovich Biki, candidate of technical sciences, chief designer at the "Zaporozhtransformator" Production Association imeni V.I. Lenin, Igor Petrovich Taratut, candidate of technical sciences, Anatoliy Grigoryevich Vikulin, heads of departments at the All-Union Electrical Engineering Institute imeni V.I. Lenin, Boris Aleksandrovich Kornilov, chief designer for the Leningrad "Elektropult" Plant, Viktor Stepanovich Lishenko, chief engineer at the All-Union State Exploratory Design and Scientific Research Institute for Power and Electrical Systems, Yuriy Mikhaylovich Rezov, general director of the Srednevolzhskiy "Transformator" Production Association, Vladimir Nikolayevich Yushkin, chief designer of buro at the All-Union Scientific Research, Design and Technological Institute for Transformer Building, Igor Ivanovich Kostsov, brigade leader at the All-Union "Gidroelektromontazh" Assembly Trust, Sergey Semenovich Kazarov, candidate of technical sciences, head of substation at the Vyborg Transformer Complex, Gennadiy Gavrilovich Prochan, head of service at the same substation—for the development and application of a complex of electrical engineering equipment for superpowerful asynchronous electrical transmission.

22. Sergey Stepanovich Aksenov, head of State Union Design Institute, Vladimir Aleksandrovich Blokhin, leading designer at the State Scientific Research Institute for Radio, Stanislav Artashesovich Danielin, candidate of technical sciences, head of department, Viktor Semenovich Byakov, Yuriy Dmitriyevich Kolokolov, candidates of technical sciences and heads of departments, Viktor Yakovlevich Maltsev, head of sector, employees at the scientific research institute, Leonid Sergeyevich Pchelyakov, candidate of technical sciences, head of department at the All-Union "Morsvyazsputnik" Association, Valdis Karlovich Sedvald, director of the Scientific Research Institute of the Riga Production Association VEF imeni V.I. Lenin, Vladimir Ivanovich Khalimanovich, deputy head of complex for the scientific production association, Dmitriy Fedotovich Cherevach, chief engineer at the Main Administration of the USSR Ministry of Transport Construction, Leonid Sergeyich Karpov, comprehensive brigade leader at the Krasnoyarsk Television Plant—for the creation of centers for automated, oceanic global satellite communications.

23. Ilgiz Aytmatov, academician of the Kirgiz SSR Academy of Science, director of the KiSSR AS Institute for Physics and Mechanics of Mountain Rock, Vitaliy Ivanovich Borshch-Komponiyets, doctor of technical sciences, chief of department at the Moscow Geological Prospecting Institute imeni Sergo Ordzhonikidze, Nikolay Petrovich Blokh, doctor of technical sciences, department chief at the Institute of Mining, Petr Vasilyevich Yegorov, doctor of technical sciences, prorector of the Kuzbass Polytechnical Institute, Anatoliy Aleksandrovich Kozyrev, candidate of technical sciences, laboratory chief at the Mining Institute of the USSR AS Kolsk Scientific Center imeni S.M. Kirov, Sergey Vasilyevich Kuznetsov, doctor of technical sciences, laboratory chief at the USSR AS Institute for Problems of the Comprehensive Mastery of Mineral Resources, Mikhail Vladimirovich Kurlen, USSR AS corresponding member, director of the USSR AS Siberian Department Institute of Mining, Arkadiy Vasilyevich Leontyev, candidate of technical sciences, laboratory chief at the same institute, Valeriy Sergeyevich Yamshchikov, doctor of technical sciences, department chief of the Moscow Mining Institute, Gennadiy Aleksandrovich Markov, doctor of technical sciences, department chief at the All-Union Correspondence Polytechnical Institute, Igor Aleksandrovich Turchaninov, USSR AS corresponding member—for the creation and application of methods for controlling mine pressure during the subterranean mining of ore deposits on the basis of studies of the stress state of the rock mass.

24. Anatoliy Aleksandrovich Orlov, doctor of technical sciences, deputy director of the All-Union Scientific Research Institute for Mining Geomechanics and Surveying, Sergey Grigoryevich Baranov, Yuriy Viktorovich Gromov, candidates of technical sciences, Stepan Timofeyevich Kuznetsov, doctor of technical sciences, chiefs of laboratories at the same institute, Yevgeniy Dmitriyevich Dubov, candidate of technical sciences, laboratory chief at the Donetsk Scientific Research Coal Institute, Nikolay Ilich Makarov, chief project designer,

State Design and Technological Institute for Elevator-Transport Machine Building, Svyatoslav Viktorovich Mamontov, candidate of technical sciences, laboratory chief, Institute for Mining imeni A.A. Skochinskiy, Boris Konstantinovich Myshlyayev, candidate of technical sciences, chief engineer, State Design and Experimental Institute for Coal Machine Building, Valeriy Lvovich Popov, doctor of technical sciences, professor at Moscow Mining Institute, Leonid Iosifovich Fedorov, candidate of technical sciences, department chief of All-Union Scientific Research and Design Institute for Coal, Nikolay Ilich Yakovlev, candidate of technical sciences, scientific associate at the Central Scientific Research Institute for Economics and Scientific and Technical Information in the Coal Industry—for developing the scientific foundations of the interaction between mechanized supports and the rock mass and their application in the practice of controlling the supports in mines.

25. Andrey Dmitriyevich Belyanskiy, candidate of technical sciences, chief engineer at the Novolipetsk Metallurgical Combine imeni Yu.V. Andropov, Viktor Markiyanovich Suprunyuk, senior foreman at the same combine, Yevgeniy Mikhaylovich Shelkov, doctor of technical sciences, deputy director of the USSR Academy of Sciences High Temperatures Institute, Vladislav Kuzmich Kondratyev, department chief, Anatoliy Pavlovich Kvartalnov, deputy department chief, Sergey Andreyevich Pashkov, deputy head of department, associates at the same institute, Aleksandr Alekseyevich Perimov, director of the State Union Institute for Designing Machines for the Steel Smelting and Rolling Industry in Ferrous Metallurgy, Aleksandr Dmitriyevich Krivoshein, head of department at the same institute, Yuriy Aleksandrovich Petrov, head of laboratory at the Sherepovetskiy Metallurgical Combine imeni 50th Anniversary of the USSR, Viktor Yakovlevich Tishkov, head of department at the same plant, Stanislav Semenovich Syrtsov, chief mechanic at the Moscow "Serp i Molot" Metallurgical Plant, Nodar Shalvovich Ordzhonikidze, director of the "Krasnyy Oktyabr" Metallurgical Plant—for the reconstruction of heat-treatment furnaces for the rolling shops, ensuring a significant increase in their efficiency and the rolling quality.

26. Yuriy Ivanovich Blinov, doctor of technical sciences, director of the Uralsk Scientific Research Institute for the Pipe Industry, Aklim Kasimovich Mukhametzyanov, general director of the "Tatneft" Production Association imeni V.D. Shashin, Abrik Fazliakhmetovich Magalimov, head of department at the same association, Izil Galimzyanovich Yusupov, doctor of technical sciences, deputy director of the Tatar State Scientific Research and Design Institute for the Petroleum Industry, Magsum Mudarisovich Zagirov, doctor of technical sciences, department chief, Anatoliy Grigoryevich Stebletsov, candidate of technical sciences, laboratory chief, Leonard Nikolayevich Grinyuk, head of department, associates at the same institute, Boris Stepanovich Lobanov, deputy general director of the All-Union Petroleum and Gas Scientific Research Institute imeni A.P. Krylov, Rafkhat Akhmetovich Maksutov, doctor of technical sciences, chief scientific associate at the same institute, Viktor Vladimirovich Bykov, general director of the Klin "Termopribor" Production Association, Aleksandr Konstantinovich Vedernikov, chief department specialist, USSR Ministry of Metallurgy, Dmitriy Lvovich Orlov, candidate of technical sciences, deputy director of the State Scientific Research Institute for Glass—for the development and industrial assimilation of a technology for protective coatings for the inner surface of pipelines for petroleum and gas deposits.

27. Lel Veniaminovich Smirnov, candidate of technical sciences, laboratory chief, USSR AS Urals Department Institute of Metal Physics, Sofya Nikolayevna Petrova, candidate of technical sciences, group leader at the same institute, Mikhail Anatolyevich Smirnov, doctor of technical sciences, chief of department at Chelyabinsk Polytechnical Institute imeni Leninist Komsomol, Oktay Vitalyevich Samedov, candidate of technical sciences, senior scientific associate at the Moscow Institute for Steel and Alloys, Vitaliy Lavrentyevich Pilyushenko, doctor of technical sciences, director of the Institute of Ferrous Metallurgy, Vitaliy Aleksandrovich Pirogov, candidate of technical sciences, laboratory chief at the same institute, Gennadiy Vasilyevich Shcherbedinskiy, doctor of physical and mathematical sciences, director, Institute of Metal Sciences and Metal Physics of the Central Scientific Research Institute for Ferrous Metallurgy imeni I.P. Bardin, Anatoliy Pavlovich Bashchenko, candidate of technical sciences, laboratory chief at the same institute, Boris Georgiyevich Solyanikov, chief engineer of the Metallurgical Plant imeni A.K. Serov, Anatoliy Borisovich Pokrovskiy, director of the Zlatoustovsk Metallurgical Plant, Yuriy Mikhaylovich Karakin, head of shop, Cherepovetsk Metallurgical Combine imeni 50th Anniversary of the USSR, Mark Lvovich Bernshteyn, doctor of technical sciences—for creating the scientific bases and technologies for the thermomechanical strengthening of steels and alloys.

28. Ernest Zalmanovich Zhukovskiy, doctor of technical sciences, laboratory chief at the Moscow Scientific Research and Design Institute for Standard and Experimental Design, Viktor Fedorovich Shable, candidate of technical sciences, sector chief at the same institute, Yuriy Aleksandrovich Shilobreyev, executive committee deputy chairman, Moscow City Soviet of People's Deputies, Vladimir Vasilyevich Shugayev, doctor of technical sciences, laboratory chief of the Scientific Research, Design and Technological Institute of Concrete and Ferroconcrete, Stepan Grigoryevich Goryachiy, deputy head of Main Administration for Passenger Transport under the Moscow Gorispolkom, Anatoliy Nikolayevich Kolomiytsev, head of administration at the First Construction and Assembly Trust, Aleksey Stepanovich Chupikin, comprehensive brigade leader at the same trust, Nikolay Nikolayevich Nikonov, candidate of technical sciences, main administration head, Moscow Construction Committee under the

Moscow Gorispolkom, Vladimir Vasilyevich Sapozhnikov, former deputy head of department, "Mosprom-stroy" Design and Construction Association, Nikolay Nikolayevich Skladnev, USSR AS corresponding member, director of the Central Scientific Research and Design Institute for Comprehensive Problems in Construction Structures and Buildings imeni V.A. Kucherenko, Nikolay Vladimirovich Shevchuk, assembly worker brigade leader for the "Stalkonstruktsiya" Trust, and Yuriy Semenovich Gurevich, chief engineer at Ferroconcrete Items Plant No 18—for the creation and application in construction of a system for new ferroconcrete industrial thin-walled spatial structures.

29. Konstantin Sergeyevich Silin, doctor of technical sciences, chief scientific associate at the All-Union Scientific Research Institute for Transport Construction, Konstantin Petrovich Bolshakov, Aleksandr Lvovich Tseytlin, doctors of technical sciences, laboratory chiefs at the same institute, Oleg Nikolayevich Makarov, USSR first deputy minister of transport construction, Boris Fedorovich Lebedev, doctor of technical sciences, head of department, UkSSR AS Institute of Electric Welding imeni Ye.O. Paton, Yevgeniy Nikolayevich Pustokhod, manager of Bridge-Building Trust No 1, Maks Isaak-Ayzikovich Rodov, deputy director of the State Design and Engineering Institute for Bridge Construction Design, Georgiy Petrovich Solovyev, doctor of technical sciences, chief of department, Moscow Institute of Railway Transport Engineers imeni S.E. Dzerzhinskiy, Vladimir Ivanovich Kopyrin, chief engineer of the Kurgan Plant for Metal Bridge Structures, Georgiy Borisovich Fuks, candidate of technical sciences, chief project engineer at the Kiev Branch of the State Institute for the Design and Survey of Automotive Roads, Igor Fedorovich Tsarikovskiy, chief engineer, main administration of the USSR Ministry of Transport Construction, Nikolay Dmitriyevich Shipov, chief project engineer of the State Institute for the Study and Design of Bridges—for the development of flexible (universal) technology for the construction of road and city bridges.

II. For Textbooks

For Higher Educational Institutions

1. Nikolay Sergeyevich Yegorov, doctor of biological sciences, chief of department at the Moscow State University imeni M.V. Lomonosov—for the textbook "*Osnovy Ucheniya ob Antibiotikakh*" [Basics of Instruction on Antibiotics], published in 1986 (4th edition).

2. Aleksey Nikolayevich Matveyev, doctor of physical and mathematical sciences, chief of department, Moscow State University imeni M.V. Lomonosov—for the textbook "*Molekulyarnaya Fizika*" [Molecular Physics], published in 1987 (2nd edition).

3. Nikolay Georgiyevich Rassokhin, doctor of technical sciences, chief of department at the Moscow Energy Institute—for the textbook "*Parogeneratornyye Ustanovki Atomnykh Elektrostantsiy*" [Steam Generator Installations for Nuclear Electric Power Stations], published in 1987 (3rd edition).

4. Samuil Petrovich Yarmonenko, doctor of biological sciences, scientific consultant at the All-Union Oncology Scientific Center—for the textbook "*Radiobiologiya Cheloveka i Zhivotnykh*" [Human and Animal Radiobiology], published in 1984 (2nd edition).

For Secondary Specialized Educational Institutions

Sergey Vasilyevich Yakovlev, academician, director of the All-Union Scientific Research Institute for Water Supply, Sewer and Hydrotechnical Installations and Engineering Hydrogeology, and Yuriy Mikhaylovich Laskov, doctor of technical sciences, chief of department at the Moscow Engineering and Construction Institute imeni V.V. Kuybyshev—for the textbook "*Kanalizatsiya*" [Sewer Systems], published in 1987 (7th edition).

GSSR State S&T Prize Committee Accepts Competition Themes

907A0061A Tbilisi ZARYA VOSTOKA in Russian 5 Nov 89 p 1

[Article: "From the Committee for Georgian SSR State Prizes in Science and Technology Attached to the Georgian SSR Council of Ministers"]

[Text] The Committee for Georgian SSR State Prizes in Science and Technology attached to the Georgian SSR Council of Ministers reports that the following works have been permitted to compete for the 1990 Georgian SSR State Prize:

In Science

1. L.A. Abuladze, L.G. Glonti, A.G. Kakuliya, Z.V. Kobakhidze, I.D. Tarkhnishvili, G.A. Ushveridze, N.M. Khatiashvili. The series of works: "New Effective Methods of Treatment by Physical Factors," 1977-1987.

Submitted by the Scientific Research Institute of Health Resort Studies and Physiotherapy imeni I.G. Koniashvili.

2. E.S. Dvalishvili. The monograph: "New Methods of the Diagnosis and Sanatorium and Health Resort Treatment of Diseases of Digestive Organs," Izdatelstvo "Sabchota Sakartvelo", 1988.

Submitted by the Likani Base Sanatorium of the Borzhomi Health Resort Council of Trade Unions of the Georgian SSR.

3. N.N. Kipshidze, D.L. Tsiskarishvili, T.I. Davarashvili. "An Atlas of Echocardiography," Izdatelstvo "Sabchota Sakartvelo", 1988.

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4. M.S. Machabeli (supervisor), O.I. Burdzhanadze, G.S. Daneliya, N.M. Makhviladze, I.Sh. Nadiradze, I.V.

Samkharadze, Z.A. Chiladze. The series of works: "The Development of the Theory of Thrombohemorrhagic Syndrome, the Development and Introduction in Clinical Practice of Methods of Its Prevention, Diagnosis, and Treatment," 1962-1988.

Submitted by the Tbilisi Institute of the Advanced Training of Physicians of the Georgian SSR Ministry of Health.

5. P.P. Naskidashvili (supervisor), A.D. Gorgidze (posthumously), V.L. Menabde (posthumously), M.A. Sikharulidze, G.A. Khutsishvili, Ye.S. Chernysh, G.G. Yashagasvhili—"The Genetics, Selection, and Seed Growing of Wheat in Georgia and the Introduction of Strains in Production," 1960-1989.

Submitted by the Georgian Agricultural Institute.

6. G.G. Svanidze, V.P. Gagua, E.V. Sukhishvili. The monograph: "Vozobnovlyayemyye energoresursy Gruzii (gelio-, vetro- i gidroenergeticheskiye resursy)" [The Renewable Energy Resources of Georgia (Solar, Wind, and Water Power Resources)], Leningrad, "Gidrometeoizdat", 1987.

Submitted by the Transcaucasian Regional Scientific Research Hydrometeorological Institute of the USSR State Committee for Hydrometeorology.

7. Arn.S. Chikobava, D.L. Vateishvili. The monograph: "The First Georgian Printed Publications," Izdatelstvo "Khelovneba", 1983.

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In Technology

1. Z.G. Balamtsarashvili (supervisor), S.A. Antonyan, P.V. Dundua, G.G. Kokaya, N.V. Latariya, A.V. Tskhovrebashvili, V.M. Yakushev—"The Development, Production, and Introduction of Equipment for the Automation of Artistic Wood Cutting," 1978-1989.

Submitted by the Tbilisi Scientific Research, Planning, and Design Institute of the Timber Industry of the Gruzlesprom Territorial Scientific Production Association.

2. V.V. Gvakhariya (supervisor), M.P. Apakidze, Sh.D. Grigalasvhili, T.I. Sharabidze. "The Development and Introduction of the Kvirila Device for the Determination of the Content of Manganese in Manganese Ores and the Products of Their Dressing," 1974-1988.

Submitted by the Institute of Physics of the Georgian SSR Academy of Sciences.

3. Z.A. Gumberidze, Yu.S. Meishvili, A.I. Prangishvili, A.G. Kevkhishvili, D.Ts. Keniya, M.G. Tsuladze, Z.I. Chkheidze. "The Alioni Microcomputer System With Georgian Notation and Interaction in Georgian; Development and Introduction," 1981-1989.

Submitted by the Georgian Komsomol Central Committee.

4. N.G. Grigoliya, D.G. Dzhobava, N.N. Kacheishvili, G.V. Kiziriya, M.A. Mardzhanishvili. "The Development and Introduction of New Designs of Cast-in-Place and Precast Prestressed Foundations for Framed and Frame-Connection Skeleton Buildings and Structures," 1980-1989.

Submitted by the Institute of Construction Mechanics and Seismic Stability imeni K.S. Zavriyev of the Georgian SSR Academy of Sciences.

5. I.Sh. Kherodinashvili. "New, Advanced, and Highly Efficient Systems of the Gas Supply of Small Cities and Rural Population Centers," 1985-1989.

Submitted by the Gruztransgaz Georgian Production Association for the Transportation and Delivery of Gas of the Gazprom State Gas Concern.

6. N.Sh. Tskhakaya (supervisor), O.Sh. Gogishvili, A.V. Kakabadze (posthumously), S.P. Lalykin, R.I. Tsanava, A.G. Chalidze, Yu.A. Chelidze. "The Study, Development, and Introduction of a New Technological Process of the Purification of Arsenic for Semiconductor Equipment by the Thermosorption Method," 1978-1989.

Submitted by the Sukhumi Physical Technical Institute imeni I.N. Vekua.

For Textbooks

1. E.Sh. Botsvadze. "Infectious Diseases," Izdatelstvo "Ganatleba", 1987.

Submitted by the Georgian SSR Ministry of Public Education.

2. G.M. Zaridze. "Petrology," Izdatelstvo "Ganatleba", 1988.

Submitted by the Georgian SSR Ministry of Public Education.

3. V.F. Katsitadze. "Hygiene," Izdatelstvo "Ganatleba", in two volumes, 1983 and 1985.

Submitted by the Georgian SSR Ministry of Public Education.

4. Z.I. Katsitadze. "Human Anatomy," in two volumes, Izdatelstvo "Ganatleba", 1986 and 1988.

Submitted by the Georgian SSR Ministry of Public Education.

5. B.M. Chikvasvhili. "Hydrology, Hydrometry, and the Regulation of Runoff," Izdatelstvo "Ganatleba", 1986.

Submitted by the Georgian SSR Ministry of Public Education.

In publishing the list of works, which have been allowed to participate in the competition for the 1990 Georgian SSR State Prize in Science and Technology, the Committee addresses to the community the request to report its opinion both on the content of these works and on the composition of the represented collectives of authors.

The Committee asks the executives of scientific and scientific and technical societies, scientific institutions,

enterprises, and higher educational institutions to organize the public discussion of the indicated works and the compositions of the collectives of authors.

Please send the opinions and remarks, as well as the materials of the public discussion to the Committee by 1 February 1990 at the address: 380008, Tbilisi, Prospekt Rustaveli, 52, the Presidium of the Georgian SSR Academy of Sciences, the Committee for Georgian SSR State Prizes attached to the Georgian SSR Council of Ministers, 5th floor, room 525, telephone numbers: 99-93-29, 93-88-72.

S&T Cooperatives Hold Exposition in Leningrad

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No 27, 2-8 Nov 89 p 2

[Article by Andrey Koptyayev under the rubric "Pictures From an Exhibition": "Believe It or Not"; first paragraph is POISK introduction]

[Text] Similar doubts overpowered many participants in the All-Union Exhibition of Scientific, Technical, and Production Cooperatives in Leningrad.

"I got sick of working 'for the shelf'," Andrey Gette, in the past a chief engineer, explained the reasons for his transfer from the state sector to the cooperative.

He was able not to go on: at the cooperative work "for the shelf" is ruled out. When no one is eager to finance your research, the abstract problem of "the establishment of closer contacts of science with production" turns into the most objective search for clients there is.

Incidentally, the Kompleks-KVO Scientific and Technical Cooperative from Alma-Ata, which A. Gette heads, is coping with this very successfully. If the Ioneks device for the treatment of industrial sewage and the establishment of circulating water supply systems is one-tenth as expensive and twentyfold more compact than the analogs and is in no way inferior to them in technical characteristics, which would you take? At the exhibition the Ioneks introduced itself in a very original manner: an operating mockup of the device removed admixtures of heavy metals from the water for an aquarium, and the little fish swimming in it, to all appearances, felt fine. The result is tentative understandings with the Leningrad Kirovskiy zavod Association and other enterprises.

Tentative, because the cooperative prefers to conclude contracts "at home": let the specialists, who have been sent by the client, see for themselves that they are offering them not "a pig in a poke"—in Alma-Ata Ioneks devices are already operating.

However, the approving opinions of specialists far from always prompt the plant management to sign a contract with a cooperative. The enterprise is far from always interested in the introduction of advanced technologies. Reliance today is more on the fact that ecological problems worry not just managers alone, but also the public at large—on political levers thus far, not on economic levers. And, as throughout the world, on advertising and skilled agents.

The seven-day exhibition for all the abundance of business proposals, which its participants and invited, including foreign, specialists exchanged, is not capable of replacing permanent commercial contacts.

Meanwhile, even at this all-union review the unique items and developments of cooperative members stood next to advertising posters, which do not stand up to any criticism. Our traditional contempt for the ability to trade led to a natural result: today you will hardly find authoritative or competent agents. Especially among cooperative members—it has become frankly fashionable to decry (recall if only the statements of several USSR people's deputies) and close their intermediary offices.

Andrey Solovey represented at the exhibition the scientific research laboratory of inventing machines from Minsk. The system, which is based on the theory of the solution of invention problems, was rated highly by professors of the University of Arizona and Georgetown University and is useful in any field of technology.

In the opinion of Andrey Mikhaylovich, the necessity of engaging in commerce is hindering the creative growth of the cooperative, and the best way out of this contradiction is to establish a joint venture. Yet not with Soviet state organizations, which as before are skeptical about the cooperative movement, but with foreign firms.

Tell me, is it unpatriotic? But what am I to do, if state enterprises take the liberty, to put it mildly, to look down on cooperatives? I inquired specially at the state board of arbitration of Leningrad—there are more than enough instances, when managers of state organizations without hesitation violate contracts that have been concluded with cooperatives. Such a lack of legal discipline often gives rise to a lack of economic discipline—to mismanagement.

But the shortage of production areas and capacities is all but the basic problem of scientific and technical cooperatives. Not all of them, of course, have lost confidence in potential partners from the state sector. On the contrary, the search for such partners was the main task of the majority of exhibition participants.

I do not presume to guess whether the series production of the low-pressure central fuel injection system with electronic control for motor vehicle gasoline engines (the Pulsar Cooperative attached to the Leningrad Impuls Scientific Production Association) will be organized. Or the infrared imagers, which make it possible, in particular, to predict the appearance of cancerous tumors (the Malaya zemlya Cooperative, Novosibirsk). Or the laser therapy instruments which operate in automatic mode (the Poisk-KVI Cooperative, Moscow). Or the contactless flowmeters which are intended for the measurement of the speed of a flow of particles in any conducting systems (the Znaniye Cooperative, Gorkiy)....

It would be possible to take up an entire newspaper page with this list: 180 cooperatives, which were selected from the 1,500 which submitted applications, were represented at the exhibition. But how many cooperatives did not submit applications?

However strange, among the latter are the members of the Leningrad Association of Scientific, Scientific and Technical, and Scientific Production Cooperatives. Among the other reasons there is also a familiar reason: the establishment of joint ventures with foreign firms thus far is more preferable. At any rate, it is not necessary to try to prove for many months to western businessmen the significance of some inventions or others and to convince them of one's scientific and business reliability—they are quick to grasp everything.

It is still unknown how the civil "war" with cooperatives, reflections of which we are observing in the reports from the session of the USSR Supreme Soviet, will end, but the most desperate countermeasures are already being taken! "Reduce the production volume to a minimum, cease the delivery of cash to banks"—this is from the draft of the appeal of the USSR Union of United Cooperatives to the cooperative community....

But the exhibition, meanwhile, demonstrated such a surge of the inventiveness of cooperatives that it was simply humanly offensive—how long we forced talented and enterprising people to hide in the shadow. And for what, for the sake of what advantage? Well all right, those were the times of the now stigmatized administrative system. But why do not only the economy, but also society itself not wish now to recognize these people as their assistants and can they not perceive in them their own gain?....