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USSR: Science & Technology Policy

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Academy of Sciences Bureaucracy Growing Despite Perestroyka

18140344 Moscow IZVESTIYA in Russian
12 Sep 89 Morning Edition p 4

[Article by Corresponding Member of the USSR Academy of Sciences A. Monin under the rubric "Science and Perestroyka": "Obtain the Truth, Not Ranks"; first paragraph is IZVESTIYA introduction]

[Text] The 5-year term of office of the Presidium of the USSR Academy of Sciences ends in the spring of 1990. There will be an election. It is the right time to hold the leadership of the academy accountable for the serious lag of the basic sciences in the country behind the world level, which has increased during these 5 years.

Long ago we gave up the place of the first man on the moon to Neil Armstrong. Today it is necessary to compare the splendid Great Tour through nearly the entire solar system of the two Voyagers, which have transmitted to the United States sensational television imagines of all four large planets, their rings and satellites, and our inglorious attempt here, in the vicinity of earth, to land a descent vehicle on Phobos. Long ago we missed the discovery of practically all the microparticles—not that long ago the theory of electroweak interactions was also missed. For the present nothing is happening in our country with computerization, nothing like the programs of the development of fifth-generation computers with cognitology and knowledge bases, which are already being carried out in the United States and Japan.

We are running behind and so far have been unable to catch up with modern molecular biology. The academy's geologists are the only ones in the world not to have recognized the theory of the tectonics of lithospheric plates and are even glad to let oceanologists have it. Without the help of the Academy of Sciences and its regrettably well-known Institute of Water Problems, we gave up the ruinous and destructive plans of reversals of northern rivers. However, a theory of the reclamation of soils was never developed. The academy simply does not want to organize within it even a small department for ecology. Academic science was unable to develop if not yet programs, then thus far if only a concept of the economics of socialism. And so on. And the fact that in the USSR there are one-twentieth as many Nobel Prize winners as in the United States is not discrimination, this is, alas, a statement.

Why was the USSR Academy of Sciences not able to ensure the proper level of development of the basic sciences in the country? I, as a member of the academy, also consider myself responsible for this situation. All my reflections on the posed question lead to the same thing: the main reasons are bureaucracy and cliquishness, moreover, the latter follows from the former.

But, of course, the inadequacy of the assets, which come the way of basic science, the bad instrument supply of scientific experiments, and the low wage of scientific personnel, which deprives them of prestige in society and pushes capable young people into other types of activity, are playing their adverse role. The presence in the management of science of a significant share of insufficiently competent, unobjective people (thus far there has never been an alternative election to management positions at the USSR Academy of Sciences) is also having an unhealthy effect.

The Academy of Sciences is bureaucratic, because it is by no means only a community of scientists, but also a ministry with its own network of institutions, standardized staffs and finances, a standard ministerial apparatus, main administrations, and collegium, and developed administrative paperwork. All this is completely alien to science. This ministry is second-rate, because its budget is relatively small. And this is not a budget, not the difference of revenues and expenditures, but, in the terms of the State Planning Committee, only the sum of expenditures, inasmuch as the revenues—scientific truths—are not measured in rubles even given the recognition of the fact that science is a productive force. It has now become fashionable to say that it is necessary to put science on cost accounting. This will lead sectorial science to blossoming and will eliminate basic science, that is their difference: scientific truth is not cost accounting truth.

The academy has an excessively fragmented structure: it consists of a large number of "apanage principalities"—departments which are connected with each other in practice only through "their own" vice presidents. But there are also too many of those (while in times of old, when the academy secured Soviet science a worthy place in the world, two were enough). Here there is the same bureaucratic nonsense as everywhere: there are many "first" deputies. They deal to a considerable extent with documents from institutes on numerous administrative questions, to which for some reason the rights of neither the directors of institutes nor the academician secretaries extend.

In recent years bureaucracy at the academy has increased. The personnel, planning and finance, foreign relations, and other administrations, which at one time were simply departments, have now been turned into main administrations, so that the heads and deputies would have a little larger wage and would feel a little above rank and file academicians. The large number of bureaucrats, who were recently added to the staffs of all the departments and formed a new intermediate stage between scientists and the settlement of their questions, is being keenly felt.

Now the registration of an associate for a foreign business trip requires no longer 11, but 13 signatures of the director of the institute. To the former reporting "forms" another one has been added—for computer accounting. But on the other hand the commission for combating bureaucracy has been eliminated—apparently in connection with many years of fruitlessness and the lack of further necessity.

The academy hierarchy has become branchy. From laboratory assistants and engineers through five categories of scientific personnel, simultaneously from candidates and doctors through corresponding members and academicians, simultaneously from heads of laboratories, deputy directors, and directors of institutes through members of the bureaus of departments, simultaneously through the entire ladder of ranks of the apparatus—up to the members of the presidium, the academician secretaries, the vice presidents, and the president. Given this diversity and the corresponding servility to rank the majority of associates feel humiliated and are striving to obtain not scientific truth, but a little higher rank.

Due to excessive quantitative growth the average level of members of the academy has declined—the more it has declined, the lower it is, just as everywhere—and, in my opinion, the average difference between the levels of academicians and corresponding members has disappeared. I believe that now not only all the corresponding members, but also several academicians would vote for the abolition of the division of the members of the academy into two kind, as the Estonian SSR Academy of Sciences has already done and as the situation stands at the academies of sciences of the majority of countries.

Democratization at the academy has been carried out half-heartedly. It has not changed the structure which has not justified itself. The election of the directors of institutes by the labor collectives has been introduced, and now all the associates from messengers to doctors can together elect for themselves a chief scientific supervisor. True, the majority of these voters cannot judge the scientific strength of the candidates. But this is a preliminary election, its results are not obligatory for anyone. The real election takes place later, at the assemblies of the departments, while the directors are now approved by the presidium, not by the general assembly of the academy, as was previously the case. Why did they deprive it of this important function? The election of scientific councils by scientific associates was introduced, but for some reason in accordance with a quota ordered from above and with subsequent approval through the bureau of the department. For some reason at the academy the elections of the councils of labor collectives at institutes are not approved of.

Servility of rank gives rise of cliquishness: people unite into groups for mutual support when obtaining ranks. This affects most lamentably the election to the academy of new members, where specific group interests are much higher than the abstract interests of science and the importance of the scientific achievements of a candidate shrinks before secret group conspiracies: it is better to elect a weak, but "our own" scientist than a strong, but "not our" scientist. One of the main obstacles of the development of basic science is found precisely here.

The next election to the Academy of Sciences is being prepared for the end of this year. It is being prepared entirely in the old way: the lists of requested vacancies and desired candidates have been secretly drawn up and have already been sent for approval. That is how it was always done before, and the present leadership of the academy does not want any perestroyka in this matter. But the academy, which as a whole is most competent in the interests of basic science, should have settled precisely this question independently. And openly without fail.

For the present the apparatus is keeping these lists completely secret. But murder will out, and I all the same got the lists for the departments that interest me. I got the impression that this is the old, familiar stereotype: for the place of those who left there are people next in line from among "our people," who were prepared long ago, and no innovations. In my opinion, such an election will not speed up the development of the basic sciences in the country. On the contrary, it will reinforce the present situation. And is it necessary to let the departing leadership conduct the election? For several members of it due to age will not be able even to run for a new term. Is it not better first to hold the reelection of the leadership and then to afford it the opportunity to strengthen the new scientific strategy by the election of new members?

It seems that one should study the alternatives of relieving the academy of ministerial functions. The establishment parallel with it of a ministry of science with the administrative subordination to it of institutes raises doubts. The State Committee for Science and Technology should, apparently, be concerned with only the applied sciences. There seems to merit attention the idea of transferring academic institutes to higher educational institutions of the appropriate type—of course, with guarantees of the preservation of their integrity and with their subordination not to the ministry of higher educational institutions, but, for example, to independent councils of trustees, which are appointed by the academy, without the establishment for them of any norms of the teaching load whatsoever. This would aid the development of basic scientific research at higher educational institutions, which for the present is simply not happening in our country, and would completely solve the problem of attracting young people to scientific work.

The academy in this case will have to be concerned with scientific glasnost, that is, the organization of conferences, symposiums, and interinstitute seminars (as the famous "kapichnik" was), the publication of scientific books and journals, the establishment of special-purpose commissions, and the drawing up of expert conclusions, analytical surveys, and forecasts, that is, exclusively with activity that is unquestionably useful for the development of science.

The procedure of the election of members of the academy should be improved: it is necessary to restore the criteria of the significance of scientific achievements. To lessen the effect of cliquishness the group of voters should be enlarged. The abandonment of the division of

members of the academy into two categories will promote this. In addition it is possible, for example, to submit to the vote of the general assembly of the academy not only the candidates elected by the departments, but also all the people who ran for election. It is possible to hold two rounds: to allow to compete, then to hold the election as in the committees for Lenin and State Prizes. It is possible even to agree to the maximum democracy: to give the right of voters to all doctors of sciences of the country in the corresponding specialties.

All these arguments also apply to the other academies of sciences, which I will list in the order of the increase of their weakness: the republic academies, the medical academy, the agricultural academy, and the pedagogical academy. Having finished writing, I reread all this: Is this not extremism? But if things are looking bad, one cannot manage without radical steps: perestroyka is necessary.

Support for RSFSR Academy of Sciences Increases

18140352 Moscow SOVETSKAYA ROSSIYA in Russian 17 Sep 89 p 3

[Article by Doctor of Historical Sciences A. Degtyarev, Doctor of Chemical Sciences S. Kara-Murza, and Doctor of Physical Mathematical Sciences D. Piskunov with letters to the editor by I. Vyrodov, G. Denisov, P. Ivankov, and N. Nadolinskiy under the rubric "What Is the Russian Academy To Be Like": "The Scientific Council of the People." Passages in boldface as published]

[Text] **Get Involved in a Fight or Sit Down at Drawings?**

The discussion of the idea of establishing the Russian Academy of Sciences (RAN) has taken on a new quality. Whereas previously it existed in the scientific lobby, today the leaders of the republic have already spoken in favor of the establishment of the Russian Academy of Science, while the main Russian newspaper has launched a discussion on the fundamental questions of its formation. Moreover, it seems that already we are also coming nearer to the threshold of practical actions of state organs, departments, and enterprising groups. While this dictates the necessity of a comprehensive analysis of the problem, which in recent times, it is true, they have not regarded with very much favor. It is proposed, following the example of Napoleon, "to get involved in a fight" for the establishment of the Russian Academy of Sciences, and there it will be evident. However, what Bonaparte was permitted is not always becoming to the scientific community. Looking around ourselves today, we see everywhere numerous structures, which were erected on the fields of the homeland during similar fights, and often do not even know from which side to begin the reform of these socioeconomic monsters. Therefore, it is more expedient to follow opinion of M.V. Lomonosov, which is topical with regard to perestroyka: "For the better search of ways to reform the Academy of Sciences, one ought, first, to propose its status, then to show the causes of that there decline; finally, to declare the ways to reform it and to bring it to a flourishing state."

We want to stress unequivocally—the need for the establishment of the Russian Academy came to a head long ago. Like any country, Russia needs a brain center for the scientific interpretation and study of its own particular problems, with which the scientific system of another country will not deal (at any rate will not deal on the basis of the values and preferences of Russia). The realization of this need does not presume at all that the appearance of the Russian Academy and the means of its establishment are obvious. Nevertheless, in the majority of statements with regard to the plans of the establishment of the Russian Academy the matter is presented in a very simple way—it should become a "normal" republic Academy of Sciences. That is, it is proposed to use the approach of the good old times (roughly the late 1940's) and to supplement the complex of republic academies with another one, without having even pondered in so doing the question of whether the system of republic academies meets the present needs of the republics. At the same time this proposal is based on the need to "finish building" the RSFSR. Evidently, they are also not thinking about the special set of problems of Russia—the immediate political goal is coming to the forefront.

In this case it is being completely overlooked that the structures, which have been formed in the "finished" union republics, bear almost totally as the organizing element the same matrix that we are striving to transform—the matrix of the administrative command bureaucratic system. And if in the RSFSR we have this matrix in incomplete form, is it reasonable to finish building it following this pattern? For the opportunity exists to create what is lacking in conformity with the new thinking, by incorporating in these institutes fundamentally new organizational, economic, and legal mechanisms!

Should the Academy of Sciences Die?

The simple problem, which in part is even vulgar in its simplicity, of the **material possibilities** of forming another republic academy, which corresponds in its scale to the RSFSR, has been arising since the first discussion of the idea of establishing the Russian Academy of Sciences. The answer here is clear—it is obvious that such a possibility does not exist. The establishment of the Russian Academy is impossible in case of the preservation of the "USSR Academy of Sciences—republic academies of sciences" system. And a dilemma arises: either to preserve this system and to establish the Russian Academy as something that is **qualitatively new** and uses the resources of this system without its breakup or to break up this system, having transformed a large part of the USSR Academy of Sciences into the Russian Academy. It must be understood that in this case an already completely new conglomerate of republic academies actually without a system-forming whole—the

USSR Academy of Sciences—emerges. Such a means signifies that in case of the stereotypic "finishing of the building" of the RSFSR we are destroying an important component of the Union. We are actually trying to transform the RSFSR into an "independent" republic by means of the structures that hold the USSR together. It signifies a shift from a federation to a confederation with the establishment of a strong country—the RSFSR—which, having grown strong, will be able, perhaps, to become again, but at a different level, the center of the integration of the Union. But it is necessary to embark on it consciously, and not to regard frivolously such a formation of the Russian Academy of Sciences as the beneficial cause of one republic.

It seems to us that such a means is erroneous in principle for several reasons. The first one is: the weakening of the federation at this moment is disadvantageous for all the republics, including the economically most developed republics. Precisely the RSFSR would be able to endure this relatively less painfully, and then only in the short-range future.

The second reason is the loss by Russia of the favorable opportunity to begin the formation of qualitatively new scientific structures not by the painful reorganization (and often the breakup) of established organizations, but as an organism with a new genetic program. To take the path of the reproduction of the "typical" republic academy, even by means of the dismantling of the USSR Academy of Sciences and the change of the sign on its institutes, means to miss a unique historical chance.

Finally, the advocates of this concept very likely do not imagine all the problems—scientific organizational, financial, psychological, and others. The passions and clashes, which were encountered several years ago when forming out of six ministries the now defunct State Agroindustrial Committee, are a summer breeze as compared to the public storm which is raging about this problem. The structure of our present science in its formal and informal relations and dependences is incredibly complex, and this complexity will make itself felt through heaps of major and minor problems. Given all the versions of such an approach the further increase of the sociopolitical flutter, which now is already been felt by everyone, will be its only indisputable consequence.

History and Analogies

It is obvious that the form of the future Russian Academy as a qualitatively new structure in the scientific potential of the country should be designed on the basis of a fully realized idea of the merits and drawbacks of the existing system. Now, when people are talking more and more often about the crisis in Soviet science, it would be irresponsible to incorporate a new component in it without having ascertained the essence of the crisis, its sources, the alternatives, and the limitations which it introduces. This is a special, major theme. Not having the opportunity to develop it fully, let us note just one peculiarity of our science: during its formation in the postrevolutionary period the Russian historical tradition was taken into account—the Academy of Sciences was chosen as the nucleus of the scientific system.

Under the conditions of the early 1920's probably the best choice was made: precisely the Academy of Sciences was able to assemble and protect the old scientific personnel, to shield fragile science from burning realities of a political nature, and to give scientists material support. A certain autonomy of science was ensured by the creation of a scientific elite with extremely great authority, which was under the protection of the supreme authorities. If we take an abstract approach, such a set-up does not meet the internal needs of science, but during that period this was offset by a unique combination of factors: the revolutionary upswing and enthusiasm, the youthfulness of scientific institutions, the influx of fresh forces into science, the rapid development of the country, and the still preserved potential of the close relations of the Russian scientific intelligentsia with the world scientific community.

However, in the 1960's the majority of these factors had already ceased to have an effect, while 10 years later, when the generation of scientists who had been trained in the 1920's and 1930's began to pass from the scene, the authoritarian style of relations began to dominate. Now, when profound changes have occurred in science (as a system of knowledge and as a social organism), the contradiction of such an organization and internal essence of scientific activity has become obvious.

It is also hardly possible to consider efficient the pattern, after which the system of republic academies was established—as small copies and "satellites" of the all-union academy.

The experience of major foreign federative states (the United States, the FRG) shows that against the background of the increasing economic and political autonomy of regions science is becoming to a greater and greater degree a "national resource" and is being coordinated more and more by the federal government.

While criticizing the shortcomings and defects of the USSR Academy of Sciences (one of the fashionable themes of recent times), it is impossible not to see that the Academy of Sciences concentrates in itself a significant portion of the best scientific personnel of the country and is a most capable system with a large potential. The responsible approach to perestroyka presumes that given all the changes this potential should not be destroyed.

Through the Crystal Ball

Hardly anyone is capable today of clearly depicting the form of the future academy. But it is possible to assert that it will depend to a decisive degree on the direction taken at the outset. In our opinion, the basic means of perestroyka in science is **the creation of new organizational conditions for the mobilization of the resources of**

existing scientific institutions without their forcible deformation, as well as the consequent formation of viable alternative organizations. It is hardly possible to develop quickly alternative systems of such a scale that they could replace if only partially the old systems—the country now does not have the assets for this (in any case it is difficult to hope that legislators will give priority to science). Consequently, one will have to place the basic emphasis on the development of such organizational forms, which could "revive" the dozing resources, and switch to the intensive means of generating scientific knowledge.

If we accept these general views, the establishment of the Russian Academy of Sciences is seen no longer simply as the "defederalization" of a portion of the USSR Academy of Sciences and the transfer of its institutes to the jurisdiction of such an essentially republic academy and not as the establishment of another 10 institutes with their declaration as a new academy. It is possible to imagine the Russian Academy of Sciences first of all as an organizational mechanism, which unites the intellectual forces of Russia, as well as other republics and even other countries and aims them at the identification, study, and public discussion of primarily Russian problems.

We say **primarily,** not exclusively of Russia, since the problems of such a large part of the planet in principle cannot be studied and solved outside the context of global and common human problems. In order to understand this context and to master and "translate" into the language of exclusively Russian problems the reserves of knowledge, which has been accumulated by world science, it is necessary in one's research to go beyond "the national object." Science of the RSFSR will serve Russia well only when it begins to generate knowledge for the entire world, even if on exclusively domestic objects.

On the other hand, it is desirable from the very start to intend that the scientific forces of other republics and countries will be enlisted in the study of Russian problems. No one can get by with his own scientific forces—the intensive use of the knowledge generated throughout the world is necessary, while "outside" scientists, who have been involved in studies of our problems, serve as the best channel for this. In the world scientific community, as in the midst of the intelligentsia as a whole, the understanding of the profound interconnection of phenomena and processes in the modern world is increasing. It is more and more clear that the crises in Russia, and especially the explosion of the contradictions in this enormous country can adversely affect the entire world situation, including the most prosperous countries. And, on the other hand, the intensive enlistment of scientific knowledge for the solution of the problems of Russia and its transformation into a flourishing, healthier country will become an important factor of stability in the world.

It is obvious that the Russian Academy of Sciences will be able to fulfill its tasks only if from the very start it is formed not as a hierarchically arranged organization with the strict specification of the status of all its members, but as a flexible debureaucratized structure, in which the small research group and the personality of the scientist will be the main character. Only this will make it possible to overcome the monodisciplinary approach that is characteristic of traditional departments. No matter which of the vital problems of Russia we take, even its proper statement requires an integrated, interdisciplinary approach, which for the present is making its way into the world with difficulty, while constantly disappearing in the unstable sands of technocratic deserts. Vitally important problems are formulated by no means in conformity with the list of scientific specialties or the structure of departments.

The Russian "scientific council" is called upon to perform another important function, the absence of the organizational embodiment of which is being felt more and more keenly in our science. At first glance it seems that in it there is no lack of various "headquarters"—organs that are called upon to formulate the scientific and technical policy of the country and to provide the highest organs of power with forecasting and analytical information. The USSR Academy of Sciences, the USSR State Committee for Science and Technology, and departmental science are dealing with this. At the same time we see that at the present stage of the development of science with its dynamism, a structure, which is rapidly becoming more complex, and the interpenetration of disciplines and directions the traditional headquarters often are simply not keeping up with the course of events. For example, the obvious weakness of the scientific base of several debates, which were conducted at the first Congress of USSR People's Deputies and the session of the Supreme Soviet, was conspicuous to many people. The intellectual potential of the scientific community of the country has thus far not been "connected up" to the supreme organs of power.

The Russian Academy of Sciences, which is being established, could perform this role with respect to the forming qualitatively new political system of the RSFSR.

The new academy should actually become a "scientific council," which formulates problems and the alternatives of their solution, specifies the criteria and norms of scientific policy, and recommends some actions or others to state and public organizations. Now there is no such organ, and its absence is one of the conditions which are enabling departments and the state as a whole to generate and "successfully" put into practice absolutely utopian programs that are destructive for nature, the economy, and society.

Levers and Resources

As has already been said, it is now impracticable to obtain assets for the rapid formation of a new "working medium" of Russian science. The programs proposed by the Russian Academy of Sciences for the most part will be implemented by the uniting and coordination of the efforts of people who work at existing organizations—

academic and sectorial institutes, higher educational institutions, even tekhnikums, schools, and production enterprises. But it is necessary to pay for any coordination with something (directly with money, resources, the granting of new opportunities for self-expression, and so on). In order to be efficient, the Russian Academy of Sciences should rely on the developed system of financing. Perhaps, it will be able, if it gains much intellectual authority, to operate according to the principle of a virus—to introduce at existing organizations its own ideas and its own "genetic program," which forces the resources of these organizations to work for the benefit of this idea. True, now after so many failed initiatives and wasted fine ideas a stable immunity to unpaid good impulses has developed among personnel of all ranks.

Funds are the most developed and effective mechanism of the financing of such programs. It is possible to imagine the Fund of Russian Science, which is formed mainly from the RSFSR budget, as well as from the contributions of interested departments, enterprises, public organizations, and private individuals, as a nonprofit association which finances projects of the Russian Academy on an competitive basis. This system, apparently, should be established together with it and, perhaps, be accountable directly to the RSFSR Supreme Soviet and its corresponding committees.

Of course, in addition to uniting the efforts of existing organizations in a common program, the Russian Academy of Sciences will also gradually increase its activity as the organizer of research projects with the diversion of specialists from the "mother" organizations.

However, there should be programmed in advance as a special goal of the Russian Academy of Sciences to formulate and begin projects on the goal-oriented formation of the infrastructure of the new scientific system of the RSFSR. No new productive scientific potential will emerge until several minimum necessary prerequisites are created for the intensive type of activity with a qualitatively new technology and organization of scientific labor. Goal-oriented efforts on the establishment of scientific and technical information systems, which are fundamentally different in their structure, a network of cost accounting instrument centers, which afford all users access to modern instruments, research parks, which lease laboratory premises and equipment, and so on will be required.

About the Founding Fathers

Now it does not make sense to detail the internal set-up and structure of the future academy and to attempt to anticipate the regulations of the selection of its members, their status, the reward system, and so forth. It is more important to determine the means of forming the "nucleus," from which the entire "organism" of the academy will actually be formed.

In this connection the formation of the synod of founding fathers of the Russian Academy is a key and extremely delicate question. Taking the risk of bringing various accusations upon ourselves, we propose when forming the organizing committee not to get too hopeful that democratic procedures in themselves will ensure the appearance of a progressive "nucleus" of the Russian Academy of Sciences. Rather, **reasonable voluntarism in the selection of key individuals** is necessary. While the combination of these individuals should be determined by the real structure of social positions among the scientific intelligentsia. (However unpleasant this reality is to one group or another.) In other words, in such an important undertaking as the formation of the Russian Academy of Sciences it is necessary to divert one's attention from group preferences and urgent political interests and to consciously ensure in the organizing committee the representation of diverse, even conflicting trends. In each of such trends it is possible to name an authoritative and socially active figure of science and culture. The establishment of the organizing committee will somehow be reminiscent of the formation of a government of national consent in case of a large number of parties in the parliament. And if the process of selecting candidates is public and the rostrum is granted to the candidate for each "portfolio" in the organizing committee for the presentation of his program, a public mechanism of social monitoring will also emerge. There remains, of course, the difficult task of selecting a figure, who would have unquestionable scientific authority, broad horizons of thinking, and patience and energy, which are necessary in order to undertake this task. The powers for its fulfillment should probably be granted by the RSFSR Supreme Soviet.

More Glasnost and a Wider Circle!

The support of the public, which it is impossible to achieve without the existence **from the very start** of a broad forum for the discussion of all the stages of the establishment of the Russian Academy of Sciences, will be an absolutely mandatory condition of success. At first only authoritative newspapers and television can provide such a forum (the pioneering example of SOVETSKAYA ROSSIYA can only be welcomed). It is necessary already now to provide a forum for the advancement and discussion of those research projects which could be the first objects of the efforts of the Russian Academy of Sciences. In the final analysis people will judge not by words, but by actions the seriousness of the intentions of the new organization and the ability of its founders to see the real problems of Russia, and not their simplified "models," for we have already been convinced that the attempt to solve the equations of perestroyka through their simplification does not untie the knots, but makes them even tighter.

[Letters] The Sooner, the Better

"Thoughts on the Future of the Russian Academy" of Academician N.N. Moiseyev interested and upset me. Availing myself of the invitation of the newspaper, I will

try to state several of my views. I will adhere to the sequence that was given by the questions at the end of the article. Thus, I am convinced, first, that the dissolution ("transformation") of the Russian Academy of Sciences, which existed for 200 years, not only made Russia unequal, but also struck it an irreparable blow. It is possible to restore justice in only one way—to establish the academy over again.

What is the practical way to revive the RSFSR Academy of Sciences? First of all, in my opinion, the now operating USSR Academy of Sciences should be abolished. A large portion of the members of the USSR Academy of Sciences, who work in its system on the territory of the RSFSR, will constitute the RSFSR Academy of Sciences. The remaining members (academicians and corresponding members) could become members of republic academies. The elections to the Russian Academy of Sciences should be conducted in accordance with the system of electors, which was proposed by Academician N.N. Moiseyev. It is necessary to build on to this model the elections to other republic academies, which have accumulated traditions that are destructive for science.

The RSFSR Academy of Sciences with the center in Moscow would immediately begin the establishment of regional centers: Central Russia, North Caucasian Russia, and other regions with a population of many millions, developed industry, agriculture, and so on. Are there no assets for their establishment? Then, apparently, to start with one should establish them on a cost accounting basis, by self-financing and the abolition of a large number of scientific institutions that merely consume finances. About what equality can there be a question, if union republics, where there are 2-3 million inhabitants, have republic academies and affiliates, while regions of Russian with many millions of people have been deprived of scientific centers?

The structure of the future USSR Academy of Sciences can be patterned after the principle of additivity: all the presidents, vice presidents, and academician secretaries of the republic academies are members of the USSR Academy of Sciences. The election of the leadership of the USSR Academy of Sciences is carried out by the indicated members. Only a small number of institutes, which are connected economically with the union budget or are already working for all the republics of the Union, remain in the USSR Academy of Sciences. This especially concerns management institutes. The Russian Academy of Sciences, like the other republic academies of sciences and the All-Union Academy of Sciences, should be unified: the medical academy, say, or the agricultural academy should be a part of the unified academy as its departments. The present-day development of these sciences has brought them close to the achievements of physics, chemistry, and mathematics. Life has raised the question of the cooperation of these sciences.

The cooperation of academic, VUZ, and sectorial science should take place on the basis of the establishment of sectorial and problem (academic) laboratories at higher educational institutions, as is now being done in practice. The optimum version of cooperation has formed: higher educational institutions are bringing in academicians and corresponding members of the Academy of Sciences to head chairs and departments. The most complete cooperation can be achieved in case of the establishment of regional centers of the Academy of Sciences, especially in the Russian Federation.

In answering the question of the newspaper "Is a federation of republic academies possible?" one should take a close look at the essence of the matter. A federation exists, but it is a lopsided one, Russia has been insultingly deleted in it. Science as a whole, just as our multinational state, is losing not because of the federation, but because of its incompleteness, the ridiculous interpretation of the point of the federation, and the reluctance to follow the natural law of symmetry. The formed distortions in science, ecology, and the economy in the end have ravaged Central Russia.

And, finally, a last thing. Can the Russian Academy operate as a public organization? This question, in my opinion, has a hidden financial motive: there are no assets, they say, for the establishment of the Russian Academy of Sciences. But no one is demanding these assets either, if you act in conformity with the arrangement proposed by us. Then the doubts will disappear: Is the Russian Academy to be or not to be? Of course, it is to be! And the sooner, the better, and not just for Russia, but together with it for the entire Union!

[Signed] Doctor of Chemical Sciences Professor I. Vyrodov

Krasnodar

The Boundary in the Field of Knowledge

Within the framework of the discussion of the idea of establishing the Russian Academy of Sciences I would like to continue the discussion of the cooperation of academic and sectorial science. In my opinion, the main thing, which today is hindering such cooperation, is the reluctance, which has already become traditional among scientists, to recognize their partner's right to scientific leadership. Mutual suspicion, the dread of "miscalculating," the inability to forego what is one's own even in trivial things, and, what is the main thing, the fear of relinquishing scientific seniority are in the way of the union of "academic scientists" and "sectorial scientists." Alas, all these are sad consequences of the lack of culture of a significant portion of the corps of scientific personnel and the low standards of simply human relations.

The latent antagonism of the large academy and sectorial academies, for example, the USSR Academy of Sciences and the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, is seen well from top to bottom. A vivid illustration of this is the fact that in the last 15-20 years the practice of electing scientists of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin as

corresponding members or academicians of the USSR Academy of Sciences and vice versa has been completely halted.

It seems that during the period of perestroyka the emphases in the methods of managing science should also be changed. It is necessary to organize intra-institute work so that it would become advantageous and interesting for the heads of subdivisions, scientific supervisors, and performers to conduct integrated research. And, on the contrary, a scientist, who prefers to evade cooperation, should find himself under conditions that are not advantageous for him.

[Signed] G. Denisov, deputy director of the Institute of Biology of the Yakutsk Scientific Center of the Siberian Department of the USSR Academy of Sciences

Specify the Priorities

First of all I consider it necessary to answer the question: Can the Russian Academy operate as a public organization of scientists?

The Russian Academy as a public organization already exists, and the beginning of its existence was marked by the constituent conference on 17 June of this year in Moscow. About which the corresponding information was in the press.

The public form of the organization of the Russian Academy separates it from the departmental forms by the name "People's." The activity of the Russian People's Academy of Sciences presumes the mass participation of the working people, the use of the experience of the people in various fields of knowledge and practice, and the continuity of the humanistic traditions and culture of the peoples of Russia.

The Russian People's Academy, in our opinion, is capable of taking in more completely, as compared with the departmental academy, the folk wisdom, which was gained by preceding generations, and of attracting talented scientists, particularly young people, more completely, in order to ensure the necessary elaboration of recommendations for the practice of managing the national economy and for the spiritual life of people.

Moreover, the independent conducting of scientific evaluations by the people's academy can have a positive and substantial influence on the making of rational decisions on the management of the national economy and on the passage of legislative acts. The activity of the people's academy on the revival of national culture, the history of language, crafts, and traditions and on moral and esthetic education will strengthen substantially one of the weak links of perestroyka in our country and thereby will aid the acceleration of the development of scientific and technical progress. At the Russian People's Academy the priority directions of its activity have already been specified: the health and longevity of man, including with the use of folk medicine, ecology, anti-expenditure systems of management, energy problems, sociology, moral and esthetic education, history, ethnography, the conducting of scientific evaluations, and others. The further broadening of the problems will be determined by the staff of scientist-specialists.

[Signed] P. Ivankov, chairman of the organizing council of the Russian People's Academy of Science

Moscow

On the Credit of Trust

The Russian Academy can operate as a public organization of scientists. I believe that this will be a practicable means to obtain a scientific institution of a new, rational type....

The Russian Academy from the start should—and can—present such a research program, which will generate trust in itself on the part of the government and the Supreme Soviet and will at first be provided with sufficient credit....

As to the specification of scientific priorities, here, it seems to me, republicwide discussions and national referendums would be useful.

[Signed] N. Nadolinskiy

Taganrog

Gosplan Official Lauds MNTK's

18140342 Moscow IZVESTIYA in Russian
12 Sep 89 Morning Edition p 2

[Interview with Doctor of Technical Sciences Vladimir Viktorovich Simakov, chief of the Science Consolidated Department and a member of the Collegium of the USSR State Planning Committee, by IZVESTIYA science commentator B. Konovalov: "Interbranch Scientific Technical Complexes: A New Form and Old Barriers. A Conversation With Doctor of Technical Sciences V. Simakov, Chief of the Science Consolidated Department of the USSR State Planning Committee, on the Development of Interbranch Scientific Technical Complexes"; date and place not given; first paragraph is IZVESTIYA introduction]

[Text] In recent years the establishment of MNTK's—interbranch scientific technical complexes—was, perhaps, the most significant event in the organizational perestroyka of our science and technology. They should have provided a powerful stimulus for the development of the latest directions, which usually originate "at the meeting points" of different sciences and ministries. More than 3.5 years have already passed since the start of their organization. It is possible to draw conclusions. We asked a member of the Collegium of the USSR State Planning Committee to tell whether the hopes placed in MNTK's were justified.

V. V. Simakov: Presently 23 MNTK's have been established, Vladimir Viktorovich says. In 3.5 years in consultation with specific user clients the development of about 750 new types of equipment, technology, and materials has been completed. Moreover, 22 percent of the developments, which have been introduced in production, in technical level do not have analogs or correspond to world achievements.

As an example it is possible to cite the pipe and resistance welders, which were developed by the Institut elektrosvarki imeni Patona MNTK. They are being delivered to the United States, Canada, and the FRG. Annually with regard to developments of the complex about 400 author's certificates for inventions are issued and up to 6 licenses are sold. The production of radiation-modified textile materials with new consumer properties (hemostatic, hydrophilic, low-shrinkage, and low-stripping), the use of which in the textile, shoe, and coal industry and in health care is providing a large social and economic impact, has been assimilated at the Tekstil MNTK.

IZVESTIYA: But, in my opinion, there was a very vulnerable spot in the very concept of the new matter. Intersectorial, essentially extradepartmental organizations were made dependent on...ministries, which should have displayed consciousness and allocated everything necessary for MNTK's in a priority manner. But consciousness and ministries are, after all, incompatible concepts. Apparently, owing to this the matter is proceeding more slowly than would be liked. The notorious "introduction" remains a problem.

V. V. Simakov: MNTK's were established in 1986, when many documents and experience in the practical development of the economic independence of enterprises and scientific organizations did not yet exist.

In real life no formalized functions can eliminated "vulnerability" from the conscientious and professional work of specific managers. Therefore, at different MNTK's matters are proceeding differently. For example, developments of the Termosintez MNTK have now been introduced at 25 enterprises as compared with 11 enterprises in 1986. The output volume in accordance with the technology of self-propagating high-temperature synthesis has increased by threefold as compared with 1986. Specialists of the Poroshkovaya metallurgiya MNTK are ensuring the establishment in the country of the scientific production base of powder metallurgy. The production of iron-based powders has increased by nearly 1.5-fold, new materials are being developed and assimilated. But then such MNTK's as the Antikor and Personalnyye EVM MNTK's, unfortunately, are not yet having a decisive influence on the acceleration of science and technology in the directions attached to them. And this, of course, is discrediting the very idea of MNTK's.

During this five-year plan about 500 million rubles of centralized state capital investments have been allocated for the development of the pilot experimental bases and works of MNTK's. Today the construction of 61 facilities is being carried out. Not everything is going smoothly. Of the 19 facilities to be put into operation in 1988 only 13 were turned over. Several ministries are not displaying proper attention to the development of the pilot experimental bases of MNTK's.

We are striving to use the new levers for the rapid wide-scale introduction of developments of MNTK's. For this it is proposed to establish around the complexes a network of enterprises and organizations of a new form of integration: joint stock societies, concerns, "small" enterprises, engineering centers, cooperatives, and so on. Given such an organization of the work such tools of economic influence and stimulation as easy credits, special-purpose and indirect subsidies, the insurance of projects, compensatory steps and additional stimuli for the implementation of projects of a risky nature, and price and tax breaks for organizations and enterprises, which develop and sell science-intensive products and services, are acquiring a special role.

IZVESTIYA: The Institut elektrosvarki imeni Patona MNTK succeeded in shortening by up to 1 year the entire cycle of the development and production of prototypes of welding equipment. This cycle was also sped up at other MNTK's. But the country needs not prototypes, but series-produced output. But MNTK's are now in practice cut off from series-producing plants. Is this really wise? The workers of the Institut elektrosvarki imeni Patona MNTK in the past 2 years have provided specific proposals on the transfer to the MNTK of three series-producing enterprises. The labor collectives of these enterprises supported the proposals. But the ministries were opposed. And, of course, they won. Is it really impossible in this case at last also to use authority?

V. V. Simakov: Yes, the old structure of ministries complicated the settlement of these questions. The structure of MNTK's envisages the production of series output at operating enterprises, which are participating in the complexes, or the organization of new ones. It is also possible to subordinate some enterprises directly to MNTK's. But at the same time it must be understood that not every plant can be transferred to an MNTK. While every irregularity in the output of some equipment gives rise to an entire chain of most complicated and at times unpredictable consequences in the national economy. Therefore, I repeat, we support in every possible way the expansion of cooperation and the MNTK's own production capacities. But, of course, it is impossible to place trust only in new construction—this would ruin the country. We believe that it is possible and necessary to transfer to MNTK's unprofitable enterprises for their reorientation. A survey of unprofitable enterprises is now under way. We will first of all offer them to MNTK's for the organization of the production of new equipment and materials.

IZVESTIYA: So that MNTK's would not depend on ministries, it is necessary first of all to provide them with priority material and technical supply. Is this really an impracticable task?

V. V. Simakov: The material and technical supply of MNTK's is being organized on the basis of developing wholesale trade, as well as supply from the funds of the head ministries. By an order with regard to the USSR State Committee for Material and Technical Supply the departments of the State Committee for Material and Technical Supply and the main territorial administrations were charged to make in a priority manner decisions on the appeals connected with the additional allocation of material resources for MNTK's. The leadership of the USSR State Planning Committee also charged specific specialists of the material balances department to settle promptly the questions of the material and technical supply of MNTK's.

But this, of course, is the administrative means of solving the problem. While for the economic means it is necessary to develop wholesale trade in every possible way. This matter is new for the country, but it is picking up speed. In 1990 the total volume of products, which will pass through wholesale trade, will already amount to 200 billion rubles. And the process of changing over to wholesale trade will be intensified.

IZVESTIYA: The Mikrokhirurgiya glaza MNTK has made the most impressive gains. And this, apparently, is explained first of all by the fact that here they leased the head institute and independently distribute their revenues. Why do the other MNTK's not enjoy such broad economic freedom?

V. V. Simakov: Apparently, they are less prepared for the settlement of a wide range of economic and organizational questions and are insufficiently enterprising. Greater rights have been given to MNTK's than to ordinary scientific and technical organizations. Moreover, no one has abolished the principle "what is not prohibited is permitted."

The Mikrokhirurgiya glaza MNTK, having started in 1986 with 13,700 operations, increased their number in 1988 to 100,000. And it will double their number in 1989. There exist here an effective and qualitative increase of the work being performed and, consequently, a large profit, which ensures the high remuneration of labor. Here the growth of the productivity and quality of labor leads the growth of the wage.

If this principle is also upheld at other MNTK's, they should, of course, fully exercise economic independence.

IZVESTIYA: But it must be emphasized that the Mikrokhirurgiya glaza MNTK has mass production, the state pays them for every operation at clinics. And they derive an enormous profit from their clinical activity. By means of this they support science and pilot experimental production. The other MNTK's do not have this opportunity....

V. V. Simakov: This is not entirely so. Very much depends on the personality of the general director. S.N. Fedorov takes risks prudently, knows perfectly well what he wants, and knows how to strive for the set goal.

In the formation and development of an MNTK the general director and the activity of the council of directors and councils of labor collectives play a special role. The results of the activity of the complex depend in many respects on their professional qualities and initiative. For example, Corresponding Member of the USSR Academy of Sciences M.L. Aleksandrov, general director of the Nauchnyye pribory MNTK, since the first days of the establishment of the MNTK jointly with the council of the labor collective has been actively performing work with the necessary enterprises, ministries, and central economic departments. This made it possible on the basis of the existing scientific production potential of the USSR Academy of Sciences and the USSR Ministry of Instrument Making, Automation Equipment, and Control Systems to provide in 1988 as compared with December 1985 a 2.5-fold increase of the volume of production of single-design and especially complex instruments. Here about half of all the instruments being developed and produced do not have analogs and correspond to the world technical level. The MNTK carries out the complete cycle on the development, production, marketing, and maintenance of instruments for scientific research.

The successful interaction of the general director with the Soviet of People's Deputies and central economic organs made it possible to launch work on the development of capacities for the output of instruments for scientific research at the academies of sciences of the union republics and to give a favorable answer to the question of building ecologically clean works in Leningrad, Minsk, Krasnoyarsk, Kaunas, and Tashkent Oblast.

The Nauchnyye pribory MNTK was one of the first to establish an independent foreign trade firm for the sale on the foreign market of science-intensive products of the complex. In 1989 foreign currency allocations were allotted directly to the MNTK for conducting foreign trade operations, which will make it possible to save foreign currency and to settle questions skillfully and promptly. On the initiative of the general director a joint venture with a West German firm was established for the output of personal computers for the supply of complexes, which are delivered to clients.

IZVESTIYA: Does not the USSR State Planning Committee believe that the further development of MNTK's is the main route not only for our science and technology, but also for the entire economy? For if they had their own production and the right to sell their products and services, they would, in essence, turn into classic firms. The expansion of the sphere of their influence could become an alternative to the ministry-monopolies,

which have convincingly demonstrated their inefficiency. The question is: Will this process take an evolutionary or a revolutionary path? What is your opinion?

V. V. Simakov: I believe that in such an enormous state as ours a place will be found for all forms. I agree with you that MNTK's should become genuine complexes that have the entire "conveyor"—from the origination of an idea to the mass production and maintenance of equipment at the consumers'. MNTK's are already beginning to appear more and more clearly as a new economic form. Thus, for example, the Tekhnologicheskiye lazery MNTK believes that the conditions exist for the more complete use of the available capacities, the increase of the deliveries to the national economy of technological laser complexes, and appearance on the foreign market. But the transformation of the MNTK into an interbranch scientific technical firm for applied research, experimental design work, and the series production, marketing, and maintenance of laser equipment is necessary for this. The Antikor MNTK went to the government with the proposal to transform it into a new form, which unites the advantage of the complex and the principles of the economic mechanism, which has been adopted for interbranch state associations.

The principle of the firm structure of economic units of the national economy is now acquiring many supporters. And, of course, I would like the process of their development to take the revolutionary path.

Advantages, Problems With Lend-Leasing in R&D

18140351 Moscow TEKHNIKA I NAUKA in Russian No 7, Jul 89 pp 18-22

[Interview with Vladimir Pavlovich Gridnev, chairman of the council of leasing and contracting collectives and director of the head special design and technological bureau of automated management systems of the RSFSR Ministry of Local Industry, by A. V. Ivakhnov under the rubric "The Money Box of Experience": "What Will the Lease Give Science?"; date and place not given; first three paragraphs are TEKHNIKA I NAUKA introduction]

[Text] Have you noticed how our thinking has been changing from stage to stage of the economic reform? Long ago, was it not, the personnel of scientific research institutes and design bureaus enthusiastically prepared for the changeover to cost accounting, weighed the advantages and drawbacks of one and the other models of it, and took the first timid steps in this direction. But they burned their fingers on the draconic standards imposed by ministries, tripped over departmental instructions and methods, and began to think about other versions, which would enable collectives to manage as they themselves see it. The leasing contract has begun to shine as a new guiding start on the economic horizon.

In industry and agriculture the lease is already being introduced extensively, and if you do not know how to approach it, it is possible to appeal to colleagues for know-how. Science for the present is almost unacquainted with the lease. It has its own specific nature, special approaches are needed here. From whom is one to ask advice?

It turns out that there is someone. It is possible to obtain reliable information on the changeover to "the third model of cost accounting" from specialists of the head special design and technological bureau of automated management system of the RSFSR Ministry of Light Industry. Our guest is the chairman of the council of leasing and contracting collectives, he is the director of the bureau, Vladimir Pavlovich Gridnev. Let us listen to his account.

V. P. Gridnev: We are a typical small-size organization, in our sector along there more than 100 such organizations, while for the country as a whole there are very likely many thousands. Therefore, our experience of changing over both to the second model of cost accounting and to the leasing contract is probably of interest for very many organizations.

TEKHNIKA I NAUKA: How did the second model of cost accounting not suit you?

V. P. Gridnev: We prepared the documents with respect to the first model, but studied the experience of colleagues and were convinced that the degrees of freedom there are very few. In the second model the number of standards is significantly smaller. But in case of the second model there is also no strict connection between the results of work and the system of the remuneration of labor. In the lease the distribution of the cost accounting income is in the hands of the collective. For a small scientific organization—one that is not conservative and is developing by leaps—this is very important.

TEKHNIKA I NAUKA: How many personnel do you have?

V. P. Gridnev: Prior to the changeover to the new economic mechanism there were 300, there are now 240. The reduction was a main condition of the introduction of the new system of the remuneration of labor.

We did some splendid work in accordance with the second model and acquired experience that also made it possible to change over to the leasing contract. The changeover to the lease from the first model involves large outlays. For many it will not immediately yield the expected result until people learn to work under the new conditions.

When changing over to cost accounting, we often forget that it presumes the introduction of a collective contract of all the production subdivisions. Many are not doing this. I visit many scientific organizations and am convinced that in practice things there have not gotten as far as internal cost accounting.

We have gotten far ahead of them. In the second model all our services operated entirely on a collective contract and acquired experience of working under contractual conditions. This is very important.

TEKHNIKA I NAUKA: How did the indicators of the work of your collective change with the changeover to the second model?

V. P. Gridnev: When an enterprise chooses a model of cost accounting, to which it is expedient for it to change over, then, as a rule, it tries on each of these models—does it fit it or not. And, as a rule, it chooses the first model, because its personnel try not to change anything in their internal life.

The second model suited us more, it made it possible to increase the revenue by nearly 1.5-fold as compared with the planned revenue. There is a peculiarity of precisely our approach, which is of fundamental importance. All scientific research institutes and design bureaus on changing over to any model of cost accounting increase the wholesale factory price of their products—for the creation of profits and the formation of the payments, which are imposed by ministries, and their own funds. We did not increase the wholesale factory prices.

TEKHNIKA I NAUKA: Is this a reference to contract prices?

V. P. Gridnev: It is also a matter of them, of the contract prices for scientific and technical products. As you know, at various organizations they jumped 40-60 percent. The price increase does not suit either the client or the performer of the work, but the administrative command apparatus, which is as if sitting at a negotiating table, is instigating that.

TEKHNIKA I NAUKA: But what are you, are you disinterested people?

V. P. Gridnev: Oh, come on, it is a matter of internal causes. These are, first, the limited sources of financing. We have a specific client—a ministry, state organs. We and they do not want to work at high prices. And our small partners, the enterprises of local industry, have small financial reserves. In no case do we intend to fleece them.

Therefore, we had a sole means—having changed over to cost accounting, to reduce our own expenditures on production. We changed the structure of the organization and cut 20 percent of the personnel.

TEKHNIKA I NAUKA: Namely whom?

V. P. Gridnev: The reduction was carried out with the unconditional observance of the principle of social justice. Every subdivision, including the administrative personnel, raised salaries only by means of the rates being freed.

TEKHNIKA I NAUKA: What difficulties did you encounter after beginning to work in accordance with the second model?

V. P. Gridnev: When we were changing over to cost accounting, we set as our goal to accumulate assets for the acquisition of new equipment. We have fixed capital worth 3 million rubles, but its wear comes to 57 percent. In 1 year of operation on cost accounting we accumulated 500,000 rubles for retooling.

TEKHNIKA I NAUKA: Is there an opportunity to buy something with them?

V. P. Gridnev: The question, of course, is loaded. It is possible to use far from completely the assets which the majority of collectives are accumulating. The deliveries of equipment, especially computer hardware, unfortunately, are extremely limited. In the RSFSR all this is being produced for local industry in meager quantities. For 1,300 enterprises the sector received only 5 units of the equipment that is suitable for us.

TEKHNIKA I NAUKA: What portion of the accumulated assets was it possible to realize?

V. P. Gridnev: Each unit costs on the average about 30,000 rubles, to that for the entire system of the RSFSR Ministry of Light Industry the expenditures came to approximately 150,000 rubles. But we are willing to pay 500,000 rubles, so you be the judge....

TEKHNIKA I NAUKA: So what did the second model of cost accounting give the collective?

V. P. Gridnev: Before the changeover to cost accounting we did not have the opportunity to give staff members material assistance. The enterprises did not have a fund at all. Everything was in the hands of the ministry, and it either allocated or did not allocate something to us for social needs—depending on our "behavior" and our personal contacts with the ministerial staff. We lived, like everyone else, in accordance with the approved estimate. Now a unified fund for scientific, technical, and social development, which is very substantial, has been created here.

TEKHNIKA I NAUKA: Under cost accounting did you get an opportunity to decide anything independently?

V. P. Gridnev: No, at that time it did not get to this point. We did something on the social level: we fit out a room for the unwinding of the operators of computer hardware, where they can work out a little on training equipment and listen to music. We began to accumulate assets for the establishment of our own recreation zone.

A unified fund for the remuneration of labor has appeared here, it includes the wage fund and the material incentive fund. Whereas previously unwarranted leveling existed in practice, now there are payments, which exceed both 1,000 rubles for completed jobs and 1,500

rubles in accordance with the results of introduction. And all this is in addition to the wage. Previously we could not imagine this.

TEKHNIKA I NAUKA: Are there staff members, who under the new conditions feel uncomfortable, because they are not of much benefit, and, therefore, receive the minimum?

TEKHNIKA I NAUKA: Some of the staff members left after the reduction, because they did not fit in with the work on the new terms.

We introduced the check form of reciprocal settlements. The division receives an order, the amount of financing is determined, and a check book is written out for this amount. Each collective has checks for the total amount of the contracts concluded by it. The settlements with the subdivisions, which work together with them, are made on the basis of these checks. For each completed job a check for a specific amount is torn out. At the end of the quarter the subdivisions deliver the checks to the planning division, and there the earned assets are calculated. The check book is a specific form of the contract between the administration and the contracting collective on the fulfillment of a given amount of work.

TEKHNIKA I NAUKA: What did not suit you in the second model of cost accounting, why was it decided to change over to the leasing contract?

V. P. Gridnev: On the second model we had a collective contract of all the subdivisions, except the administrative personnel. With a collective contract the funds are attached to the subdivisions. In case of the decrease of the operating expenses for spare parts, materials, and the maintenance of this capital a check, which corresponds to the saved amount, is written out to the division. But all the same the alienation of personnel from the means of production occurred. The subdivisions did not feel like the owners to the full extent and did not think about the efficient use of these means and their development. I have in mind computer hardware and means for the duplication of documents and the preparation of data on magnetic tape. All this was acquired during the period, when we were not on cost accounting and did not think that we would have to maintain this hardware by means of our own cost accounting income.

I saw that we had considerable opportunities to increase the efficiency of use and to bring the structure of our fixed capital into the optimum correlation. While still operating on the second model, we sold hardly used equipment for 72,000 rubles. One of the main goals of the changeover to the leasing contract was to give everyone fixed capital so that his income would depend on the level of its use.

TEKHNIKA I NAUKA: You changed over to cost accounting on instructions from above, but then the lease is a personal matter of each enterprise or its subdivision. The benefit of the lease was evident to you, the director, but what did the collective think of this?

V. P. Gridnev: We discussed the merits and drawbacks of the second model of cost accounting and work on a collective contract. Already at that time, as an experiment, one brigade was working on a brigade contract. According to the economic results it worked better than the entire division, and this served as grounds for the promotion of its know-how.

TEKHNIKA I NAUKA: But what is the difference between a brigade contract and a collective contract?

V. P. Gridnev: The brigade contract presumes that a limited complement of staff members performs contractual work and puts out an end product.

TEKHNIKA I NAUKA: And is it then disbanded?

V. P. Gridnev: In accordance with our statute the establishment of temporary creative collectives, which, after completing an assignment, break up, and permanent brigades is also contemplated. The brigade, which we established as the first one, proved to be quite durable. It makes up a plan for itself, which enables it to live as long as it likes on the permanent staff.

TEKHNIKA I NAUKA: But how does the leasing contract differ from the second model and what has it given you?

V. P. Gridnev: The administrative methods of management within the organization disappeared. The collective is managed by the elected council of leasing and contracting collectives. Every supervisor of a contracting collective—from the brigade leader to the head of the subdivision and the director—today is elected here. The chief of a division leases a specific amount of fixed capital, the director manages the leasing collective as a whole. Everyone has been elected at his level. I was the approved director, but if they had not then elected me, I might not have remained him. The chief of one of our divisions did not become the supervisor of the leasing collective. They elected the chief project engineer, while the chief, although he remained in his position, performs purely administrative functions. The check book was entrusted to a completely different person.

TEKHNIKA I NAUKA: For what reasons do they elect one supervisor or another?

V. P. Gridnev: Preference is given to those who approach the concept "manager." It turned out that of the former chiefs far from many completely satisfy this requirement. Previously they assigned jobs and carried out the technical supervision of creative collectives, while now they should both find work and sell its results at a profit. These, of course, are different things.

TEKHNIKA I NAUKA: When changing over to the leasing contract, you, obviously, studied foreign experience. Are there differences between those conditions and your present conditions?

V. P. Gridnev: Our lease, of course, bears the deep mark of administrative command thinking. We, for example,

did not take the risk of fully entrusting the ownership of fixed capital to the leasing collective. It carries out the replacement of fixed capital by means of its part of the revenue, but with the consent of the council of leasing and contracting collectives.

TEKHNIKA I NAUKA: So that it would be clearer, would you explain specifically who leases what at your place?

V. P. Gridnev: The organization is broken down into leasing collectives. Specific fixed capital, on which it performs its work, is transferred to each one in accordance with a contract. Having leased it, the organization pays for everything. As before, assets are deducted for the budget for fixed capital and manpower resources. Previously we paid a specific percent to the centralized fund of the ministry, now the deductions have been replaced by a leasing fee. True, no one yet knows what should lie behind the leasing fee. The ministry establishes it, on the basis of the former amount of the payments to the centralized fund. For the 1st year it left these payments for us in approximately the former amount, but for next year this sum will be increased by fivefold. There is no one to ask whether this is fair, since we are taking an unbeaten path.

TEKHNIKA I NAUKA: What is the term of your lease?

V. P. Gridnev: Seven years.

TEKHNIKA I NAUKA: And then will the equipment be yours?

V. P. Gridnev: This question has not been settled on a state scale. We replace fixed capital by means of our own fund for scientific, technical, and social development. But the bought equipment is considered the property of whoever put us on a lease. We are waiting for a law on leasing, which, perhaps, will change something in these relations. But today we are acquiring equipment with our own money, and are still regularly paying deductions to the ministry for it.

TEKHNIKA I NAUKA: Have you yourself drafted documents on leasing?

V. P. Gridnev: Two documents, which we have used—on the organization of the leasing contract at the industrial enterprise and on the leasing by the labor collective of an enterprise or organization—have appeared. The USSR State Planning Committee published the general methods, while procedural instructions came out bearing the signatures of the Ministry of Finance, the State Committee for Labor and Social Problems, and other state organs. But both documents are intended for industrial enterprises. The question of the lease of a scientific organization is not analyzed anywhere in official documents.

The methods, which I named, were made at the level of the general principles of the formation of the revenues of an enterprise under the conditions of a lease. In them it is stated that the revenue is distributed according to the will of the labor collective. This phrase also interested us. For it is more evident to us how much money to spend on the remuneration of labor, how much on the development of production, and how much on social needs. In case of the changeover to the leasing contract no standards exist. But a new document, which clipped the wings of the lease—on the introduction of standard ratios between the rates of the growth of the payment from the fund for the remuneration of labor and the growth of income—was published in January.

TEKHNIKA I NAUKA: So is this a return to the ratio between the productivity and remuneration of labor!

V. P. Gridnev: Exactly! Four signatures—those of the State Planning Committee, the Ministry of Finance, the State Committee for Statistics, and the State Bank—are at the bottom of this document. All state enterprises, and scientific organizations are also considered such, fall under its effect. It remains to guess what labor productivity is within a scientific institution. The thesis that the leasing collective itself distributes its own cost accounting revenue, is canceled out to a significant extent by the new document. A situation may form so that in some year it is necessary to buckle down and to put the maximum amount of money into the development of production, while the next year it is necessary to compensate people for what they failed to receive in the past. The collective, which has worked a little on cost accounting, and then on a lease, acquires some wisdom, without the orders of bureaucrats it would understand what to spend and for what goals. But, as you see, bureaucratic organs are also trying to keep leasers on a short leash.

I am constantly being convinced of the collective wisdom of the organization. My suggestions far from always coincide with the decisions of the council; moreover, the decisions made by it are more correct than my suggestions. For example, several of our collectives proposed to unite individual groups, which are working on a leasing contract, into a powerful leasing collective. And to place at the head of everything the deputy director of the bureau—to take him from my personnel. I, of course, resisted, because I was losing a person who shared common concerns with me. But inasmuch as the united collective had voted for this candidate, I had to agree with it.

TEKHNIKA I NAUKA: If you had changed over to the lease without the experience of working in accordance with the second model of cost accounting, would the results of the election of the chief leasers have been the same?

V. P. Gridnev: They would undoubtedly have been different. Having gained experience, the collective understood who has the ability and desire to head the work under the conditions of the lease. They elect whoever will feed his own collective and will ensure its development.

And in case of work in accordance with the second model elected comrades headed our divisions. We arrived at the lease with personnel who had gained experience of management under the new conditions.

TEKHNIKA I NAUKA: For what is the director of the organization responsible, if each subdivision operates independently?

V. P. Gridnev: Our administrative personnel also leased a portion of the productive capital and is responsible for its use. Checks for the work, which he performs for leasing collectives, are also written out to the director. I receive money not because I am the director, but because I perform functions on management and economic service. I provide supply, planning, and accounting functions, and the subdivisions pay me for this with checks. At the end of the quarter I receive a specific revenue and distribute it among my services.

TEKHNIKA I NAUKA: What changed in the collective with the changeover from the second form of cost accounting to the leasing contract?

V. P. Gridnev: Now there are no divisions in our structure, but there are leasing and contracting collectives. We did not reduce the staff and did not change anything in our complement. The changes occurred in essence.

In leasing fixed capital to the divisions, we found that we had a lot of equipment that no one wants to take. It is either not needed or inefficient. For example, we had old telegraph sets and a large amount of keyboard calculating equipment that was hardly used. Previously it was believed that there should be a calculator on every desk. In case of the lease it turned out that far from everyone needs it. In accordance with a common decision they hung the unnecessary hardware around the neck of the director so that he would think about what to do with it. If you do not sell it, you will pay deductions from your own revenues for the fact that you are keeping this hardware.

TEKHNIKA I NAUKA: But why are some collectives called leasing collectives, while others are called contracting collectives?

V. P. Gridnev: The point is that not all collectives leased capital. For example, a brigade becomes a part of a large leasing collective, but within it works on a collective contract. For this reason it is not a leasing collective, but a contracting collective.

TEKHNIKA I NAUKA: With what does your special design and technological bureau deal, if it is not a secret?

V. P. Gridnev: Previously we did not deal in practice with what we should have dealt first of all. And we understood this after beginning to manage in the new way. We served the management staff of the ministry and other state organs. We developed automated management systems and helped to assimilate them. The new forms of management are forcing us to change reference points. The services for management organs are becoming fewer and fewer, while the development of workstations for engineering, planning, and accounting personnel of industrial enterprises is occupying more and more space in the plans. We have completely halted work for the RSFSR State Planning Committee, are ceasing to work for the Union State Planning Committee, and have reduced the amounts of work for the ministry.

TEKHNIKA I NAUKA: Did they themselves decline your services?

V. P. Gridnev: These organs are also reorganizing, knowing about our aspiration to give up these services.

TEKHNIKA I NAUKA: And what difference is it to you from whom you take money?

V. P. Gridnev: Today not the management staff, but the industrial enterprise determines economic policy. And we do not want to be outside this policy.

TEKHNIKA I NAUKA: Are you afraid of going bankrupt on the old clients?

V. P. Gridnev: I do not think that the ministries in the foreseeable future will be transformed or in general will cease their existence. The administrative apparatus is tenacious, and for all the criticism addressed to it, it will hold out for a long time yet. But we should find our place in the economic reform and work for it, and not for those who are sticking a spoke in its wheel.

One of the important achievements of the work on a lease is the marked revival of the collective. Everyone is looking for work that is promising, profitable, and effective, the wage depends directly on this. The phrase: "Write me a check for the work" has become typical for our organization. Whereas previously I tried to persuade people to take work in excess of the plan, today they are tearing it from my hands.

Breakdown of the Revenue of the Primary Leasing Collective (the Division of the Introduction of Personal Computers)

1. Receipts from the sale of scientific and technical products and services, thousands of rubles	109.7
Of them:	
the fee for services on management and general production maintenance, thousands of rubles	20.1
2. Material expenditures and expenditures equated with them, thousands of rubles	29.9
3. Revenue (total), thousands of rubles	59.7
4. Payments and deductions from revenue, thousands of rubles	12.7
Of them:	
fee for fixed production capital (according to the standard)	0.9
fee for manpower resources (according to the standard)	4.8
deductions for the budget (fixed)	0.4
lease fee (fixed)	0.2
deductions for the fund for scientific, technical, and social development (fixed)	3.9
deductions for the financial reserve	0.4
deductions for the centralized portion of the fund for the remuneration of labor (fixed)	2.1
5. Assets for the current remuneration of the labor of the personnel of the primary leasing collective (the remainder of the cost accounting revenue), thousands of rubles	7.0

TEKHNIKA I NAUKA: Are there problems with the making up of the plan?

V. P. Gridnev: Just as at any scientific organization. But not to the extent that we could be left without work.

TEKHNIKA I NAUKA: What did the rank and file engineer get from the changeover to the lease?

V. P. Gridnev: In the plan nothing was increased. But every leasing collective has the opportunity to obtain the wage that it considers necessary to it. If the revenue increases more rapidly than the wage, the payments are not limited in any way. During the first 2 months money is paid in accordance with the salaries and wage rates, while for the 3d month final settlement for the quarter is made. It is significant that during the first quarter, after starting to work on the lease, we performed a far greater amount of work during the last quarter of last year, when we worked on cost accounting. This increase testifies to the substantial increase of the amounts also for the year as a whole. For during the second quarter no one wants to receive less than it was possible to earn during the first quarter.

TEKHNIKA I NAUKA: Now many scientific organizations intend to change over to the leasing contract. Can they profit by your experience and by your developments with respect to the introduction of this economic mechanism?

V. P. Gridnev: In our system alone there are about 100 such organizations like ours. While for the country as a whole, in various sectors, there are an enormous number of similar collectives. Someone will hardly succeed in completely copying our experience, but we could avoid the mistakes. At present 99 percent of the organizations are operating in accordance with the first model of cost accounting, without getting anything useful from it for themselves. Their changeover to the new forms of management reminds me of an empty electric train: it runs, there is much noise, the light burns, but it transports no one. The majority are working that way—with the exception of those who received advantageous standards and made active use of them.

TEKHNIKA I NAUKA: Who is turning to you for know-how?

V. P. Gridnev: Many turned to us, but we did not have a service for the generalization and dissemination of know-how. Now we have established the Funktsional Cooperative, one of the basis of which consists precisely in this. But it will serve enterprises only of our sector. Light industry, the wood processing industry, the construction industry, and other sectors, where there are many small scientific organizations, remained. The Funktsional Cooperative is not capable of helping everyone. If an organization, which is willing to disseminate our know-how, is found, we will gladly deliver to it a package of documents. Of course, not for free—this development, just as any other scientific product, has a price.

Why does the information and advertising agency attached to the journal for engineers TEKHNIKA I NAUKA not take this task upon itself? The journal would make a significant contribution to economic reform.

Effect of Cost Accounting on Scientific Research

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[Article by Candidate of Economic Sciences O. L. Kozlova under the rubric "To the Aid of Economic Education": "Cost Accounting and Scientific Research"]

[Text] Cost accounting in science, as in industry, presumes the conversion of scientific research institutes and design bureaus (along with production enterprises) into socialist commodity producers and the covering of all expenses by means of the revenues from the sale of completed jobs. The assets for their maintenance should now be earned, and not be allocated by the state.

The principles, which have been made the basis for the activity of scientific organizations, under the new conditions of management are in their essence revolutionary. Scientific organizations now bear full responsibility for their economic results and ensure their activity and development by means of the assets, which have been earned by the sale of scientific and technical products to consumers. Under the conditions of full cost accounting the scientific and technical product is acquiring the status of a commodity.

The prices for the scientific and technical product are established by agreement between the client, who is willing to pay this price, and the performer, who is willing to perform for the agreed price the work specified by the technical assignment, that is, on a contractual basis. The price is determined on the basis of the production cost of the scientific and technical product subject to the efficiency, the quality and time of performance, and the profit, which is the source of the formation of economic stimulation funds and deductions for the state budget. The contract price should guarantee the scientific organization the obtaining of assets for the recovery of the material and other expenditures, which are connected with the production of the scientific and technical product (including the wage), as well as the profit that is necessary for the scientific, technical, and social development of the scientific organization and the expansion of the material and technical base. However, given the lack of competition some scientific organizations, being the monopoly producers of one type of scientific and technical product or another, for the derivation of a larger profit have the opportunity to groundlessly set prices too high, since the level of profitability and the amount of the profit are not restricted by law.

The analysis of the practice of using contract prices showed that the overwhelming majority of scientific organizations establish them on the basis of the schedule of expenses and the level of profitability, ensuring themselves the derivation of the maximum possible profit. At a number of organizations the average level of profitability comes to 90-95 percent, while the number of jobs with a profitability of up to 30 percent and more is increasing.

For the purpose of preventing these undesirable trends a number of ministries have themselves introduced for their scientific organizations the restriction of the maximum level of profitability to 30-40 percent (the Ministry of the Automotive Industry, the Ministry of Light Industry, the Ministry of Heavy, Power, and Transport Machine Building, and others) of the production cost of the scientific and technical product.

The scientific and technical product is completed scientific research, planning, design, and technological operations on the development of new equipment, technology, and materials, produced prototypes or test batches of items (a product), scientific and technical services, and other jobs, which have been performed in accordance with the type of activity of the scientific organization and in conformity with the requirements that are stipulated in the economic contract and which have been accepted and paid for in full by the client. Thus, a detail design, a scientific invention, information service, patent services, and methods developments are a scientific product, a commodity.

The USSR Council of Ministers on 15 October 1988 adopted the decree "On the Changeover of Scientific Organizations of the USSR Academy of Sciences, the Academies of Sciences of the Union Republics, and the System of the USSR State Committee for Public Education to the New Methods of Financing and Management." The decree abolished the practice of maintaining scientific organizations at the expense of the state budget and ordered the changeover to the special-purpose financing of specific programs, themes, and enterprising exploratory research on a competitive basis. Ad hoc scientific councils will deal with the determination of the specific themes with respect to each program, with the distribution of the assets allocated for their accomplishment, with the competitive selection of the scientific organizations that are the performers, and with the acceptance of the obtained results.

In addition to budget allocations, for the purpose of the more complete use of the potential of academic and VUZ scientific organizations they have been granted the right to perform work under contracts with clients. The profit of scientific organizations is formed accordingly by means of the saving of budget assets with respect to the estimates for the performance of research and development and cost accounting activity on contracts with clients.

There are reported to academic and VUZ scientific organizations:

— the state order for the development of science and technology;
— the standard of deductions from the profit for the state (including local) budget;
— the standard of the fund for scientific, technical, and social development;
— the standard of the material incentive fund;

— the standard of the wage fund, which is established with respect to the amount of work that is performed on their own (without regard for item 12 of the estimate of expenses) both by means of assets of the state budget and by means of assets that are received in accordance with contracts with clients.

Mainly the assets of associations, enterprises, and organizations, as well as the assets of the centralized funds and reserves of ministries and departments, credits of banks, and, in necessary cases, budget allocations should be the sources of financing of such operations.

Under the conditions of full cost accounting the economic relations of scientific organizations with clients are based on a contract. The contractual form also existed previously, but at that time enterprises paid for scientific developments by means of state allocations, not from their own, earned assets. A distinctive peculiarity of the contractual form under the conditions of full cost account is the fact that the clients (associations, enterprises, organizations) should themselves earn the assets for paying for contracts with scientific research institutes and design bureaus.

Contractual relations presume the increase of the responsibility of the performer for the timely and high-quality meeting of the requirements of the client and the increase of the role of the client in the settlement of questions that are connected with the formation of the themes of the scientific organization. In case of the failure to meet the obligations, which were specified by the contract, the scientific organization, association, or enterprise, which is the developer, bears material liability: it returns the received assets to the client and pays fines in conformity with the terms of the contract and prevailing legislation. The exceeding of the expenditures as compared with the contract price, which has been allowed by the performer without consultation with the client, is offset by him by means of his own assets.

The orders of scientific research organizations are specified not only by direct contracts, but also by state orders. The state order in accordance with its purpose guarantees the meeting of priority social needs. The state order is formed on the basis of the assignments of state scientific and technical goal programs, the plans of interbranch scientific technical complexes, the Comprehensive Program of Scientific and Technical Progress of the CEMA Member Countries to 2000, interbranch scientific and scientific and technical problems of statewide importance, and basic research. The financing of the work on a state order is carried out by means of the assets of the client, whose role the ministry, to which the scientific organization is subordinate, can also perform, while the centralized fund for the development of production, science, and technology, as well as the reserve fund can be the source of assets. State budget assets can be the source of financing, provided the state is the client.

With the changeover to the new conditions of management in conformity with the USSR Law on the State Enterprise (Association) scientific organizations have the right to choose the form of cost accounting. The first form, which is based on the standardized distribution of the profit, is being used at the bulk of scientific organizations (up to 90 percent). The second form is based on the standardized distribution of revenue.

Scientific organizations regardless of the chosen form of cost accounting proceed from the following economic standards:

— the fee for fixed production capital, which is established as a percent of its value (1-2 percent);
the fee for manpower resources, per worker (200 or 300 rubles);
the deductions from the accounting profit (revenue) for the state (including local) budget;
— the deductions from the accounting profit for the centralized fund for the development of production, science, and technology and the reserve of the ministry (department) for the financing of the most important jobs of a sectorwide and intersectorial nature;
— the deductions from the amortization, which is intended for the complete replacement of fixed capital, for the centralized fund for the development of production, science, and technology of the ministry (department).

Moreover, standards of the formation of the fund for scientific, technical, and social development, the material incentive fund and the general wage fund for scientific organizations, which use the form of cost accounting that is based on the standardized distribution of the profit, and the fund of foreign currency deductions are established for scientific organizations. The specific standards for scientific organizations are established by the ministry (department) with allowance made for the peculiarities of the activity of the scientific organizations.

The scientific organizations, which use the model of cost accounting that is based on the standardized distribution of the profit, are guided by long-term standards and standards that are stable until the end of the five-year plan, which are reported to them in advance. The profit to be distributed is defined as the difference (according to the plan and in fact) between the receipts from the sale of the scientific and technical product and the performed jobs and services, which have been accepted and paid for in full by the client, and the expenditures on the production of this product and the performance of these jobs and services. The planned and actual profit, which has been reduced by the amount of the fee for fixed production capital and manpower resources and the interest deductions for credit, forms the accounting profit. The deductions for the state (including local) budget and the deductions for the ministry and department for the formation of the centralized fund and reserves in accordance with established standards are made from the obtained sum of the accounting profit.

The remaining profit is placed at the disposal of the scientific organization and is channeled into the material

incentive fund and the fund for scientific, technical, and social development, with allowance made for the sums, which were received and paid as economic sanctions (unplanned revenues, expenses, and losses). The profit, which was derived on communist Saturdays, is also excluded from this sum.

Scientific organizations can establish a reserve fund by means of a portion of the planned and actual profit, which is left at their disposal prior to its channeling into economic stimulation funds, or by means of the estimates of the spending of the fund for scientific, technical, and social development. A model system of the distribution of the profit is presented in Table 1.

Table 1. Distribution of the Profit at Scientific Organizations Which Operate Under the Conditions of Full Cost Accounting and Self-Financing

Indicators	Thousands of Rubles
1. Sum of the profit from the sale of the scientific and technical product	1000
2. Fee for productive capital	180
3. Fee for manpower resources	100
4. Interest on short-term credit	20
5. Accounting profit (line 1-line 2-line 3-line 4)	700
6. Deductions from the accounting profit:	
a) for the budget (the standard is 10 percent)	70
b) for the ministry (the standard is 1 percent)	7
7. Profit left at the disposal of the scientific organization (line 5-line 6a-line 6b)	623
8. Bonuses in accordance with the results of the All-Union Socialist Competition	3
9. Balance in unrealized expenditures and revenues, which are attributable to the profit left at the disposal of the scientific organization	30
10. Financial reserve	40
11. Profit that is channeled in accordance with the standards into economic stimulation funds	550
12. Fund for scientific, technical, and social development—(60 percent)	330
13. Material incentive fund	220

The scientific organizations, for which standards have been approved and deductions for the budget from the profit have been specified, make the payment for fixed production capital and manpower resources and installments of the sums of the payments from the profit, which are stipulated in the financial plans for the quarter, on the 20th day of the 2d and 3d months of the quarter in equal parts. Scientific organizations do not make payment to the budget for working capital for which standard rates are laid down.

At the scientific organizations, which use the form of cost accounting that is based on the standardized distribution of revenue, the unified fund for the remuneration of labor is formed (after the making of mandatory payments to the budget and the superior organization) as the remainder of the cost accounting revenue of the collective after the formation of the fund for scientific, technical, and social development. Precisely the method of forming the unified fund for the remuneration of labor is the basic distinctive feature of the second form of cost accounting. In this case the saving or excess consumption of material resources directly affects the amount of the fund for the remuneration of labor (that is, the wage is not guaranteed), while in case of the first form of cost accounting the level of use of material resources influences only the amount of the fund for scientific, technical, and social development and the material incentive fund. Thus, the second form of cost accounting will interest scientific research institutes and design bureaus in the economical consumption of resources. It is presumed that with the development of cost accounting the majority of scientific organizations will operate in accordance with the second form of cost accounting.

Economic standards are established for scientific organizations with allowance made for their specific nature and type and the necessity of coordinating statewide interests with the interests of the organizations and their personnel.

However, in practice there are quite a number of problems that are leading to the disturbance of the cost accounting activity of scientific research institutes and design bureaus. Often USSR ministries and departments pursue a policy of "easy" standards of the payments to the budget, which are advantageous for scientific organizations, and use the minimum percent of the fee for capital and for manpower resources or completely exempt scientific organizations from this fee. A serious lag is being permitted in the financing of basic scientific research that is of an exploratory nature, the number of minor jobs, with a short time of fulfillment, in order to derive a profit in the shortest time, is increasing.

Taking into account the novelty and complexity of the changeover of scientific organizations to the new work

principles, the products, jobs, and services of independent scientific organizations of scientific production associations, as well as those directly subordinate to ministries and departments, in 1989 are being accepted and paid for by individual stages and accordingly are being included in the volume of scientific and technical output in accordance with the cost of the stages, which have been completed and have been accepted in accordance with established procedure.

Full cost accounting envisages the broadening of the use of credit as a source of the covering of the expenses of scientific research institutes and design bureaus. Loan capital can be attracted by scientific organizations for the covering of unfinished amounts of scientific research and planning and surveying work, for retooling, for the expansion of the scientific and technical and pilot experimental base, and for the construction of housing and social and cultural facilities with repayment by means of the assets of the fund for scientific, technical, and social development. However, credit methods thus far have not become widespread, in essence, credit on goods and loans for the purchase of check books have found the only application. The reason is that banks make strict demands on the issuing of loans, while their special-purpose and repayable nature makes the use of other sources of financing preferable for scientific organizations. The possibility of obtaining payment for the work being performed by stages, and not for the completely finished scientific and technical product, is the main reason.

The new economic mechanism at scientific organizations, which operate within associations and enterprises or are directly subordinate to ministries and departments, depending on the tasks facing them, the functions and the conditions of the introduction of the scientific and technical product, its specification and accounting can be used with allowance made for several peculiarities.

The activity of scientific organizations, which are a part of production associations and enterprises, is aimed mainly at the meeting of these associations' and enterprises' own needs, at the increase of the technical level and the improvement of the organization of production, at the perfection of technological processes, and at the assurance of the competitive ability of the product and its timely modernization, while their expenses are attributed to the product cost or are reimbursed by means of the assets of the fund for the development of production, science, and technology. The jobs, which are performed in accordance with contracts with outside clients, are taken into account in the overall results of the activity of the production associations, and accordingly the profit (revenue) of the scientific organization, which is a part of the association, is included in the total amount of the profit (revenue) and is distributed in accordance with established procedure. In similar fashion the cost of the unfinished jobs or the jobs, which have not been accepted by the client, is included in the total volume of output that failed to be delivered in accordance with contracts.

The scientific organizations within scientific production associations (NPO's) can act as its structural units or as independent organizations which enjoy the rights that are envisaged by the USSR Law on the State Enterprise (Association). Their activity is aimed at the development in the shortest time of highly efficient complexes, machine, equipment, technological processes, and so on, which determine the scientific and technical progress of the sector. The association plans the joint activity of production and scientific subdivisions on the basis of the conditions of its functioning as a unified scientific production complex. Here the scientific production association performs with respect to the indicated scientific organizations the functions of a superior organ in conformity with prevailing legislation.

The volume of work of the independent scientific organizations, which are a part of a scientific production association, is specified by them as the sum of the contracts with clients for the development, production, and delivery of new types of equipment, technology, and materials and the rendering of scientific and technical services. The scientific and technical output of the indicated organizations is taken into account along with the output for production engineering purposes in the overall results of the work of the association.

The scientific and technical products, which are developed in accordance with contracts with clients, as well as at the expense of the assets of the fund for the development of production, science, and technology, are included in the planning and reporting indicators on the total volume of industrial output of the scientific production association. In the annual reports of the association the data on the volume of output (jobs, services), the value of fixed capital, the size of the staff, and the wage fund of the indicated scientific organizations are shown in addition to the indicators that are stipulated by statistical reporting.

The scientific organizations, which are directly subordinate to ministries and departments, work on tasks of a sectorwide nature, are fully responsible for the high technical level of production, and ensure the pursuit of a unified scientific and technical policy. The amount of work is specified by the indicated scientific organizations independently as the sum of the contracts with clients for the development, production, and delivery of new equipment, technology, and materials and the rendering of scientific and technical services. Along with the scientific and technical output the output and jobs (services), which are not a part of it and have been performed for other enterprises, associations, and organizations, as well as the paid services to the population are included in the indicated amount of work. The amount of work, which has been specified in this way, is used when evaluating and analyzing the results of the

economic activity of scientific organizations, as well as when approving economic standards for them.

The new economic mechanism in scientific research is ensuring the extensive introduction of competitive principles in the scientific and technical sphere, the conducting of parallel development on the most important problems of science and technology, and the elimination of the monopoly position of individual head institutes. The existence of the scientific organization has been made dependent on the results of its activity. In the absence of clients for research work and in the case, when the steps taken by this organization and the superior organ have not yielded positive results, the scientific organization halts its activity.

Whereas the assets of associations, enterprises, and organizations, as well as the assets of the centralized funds and reserves of ministries and departments and the credits of banks and, in necessary cases, budget allocations are the basic sources of the financing of scientific research and experimental design work in the production sectors of the national economy, allocations from the state budget are the basic source of the financing of scientific research and experimental design work in ministries and departments of the nonproduction sphere.

The USSR State Committee for Science and Technology, the USSR State Planning Committee, and the USSR Ministry of Finance drafted the Procedure of Financing Scientific Research and Experimental Design Work, having stipulated in it the special-purpose financing of scientific research and experimental design work at the national economic and sectorial levels, the breakdown of the allocations for science and scientific service from the state budget by national economic complexes and directions of the development of science and technology with the primary supply of the priority directions, as well as the methodology of determining the amounts of the allocations being made from the budget for specific themes of scientific research and development.

When examining the directions of the development of science and technology at the national economic level the following priorities stand out:
— state scientific and technical goal programs;
— the Comprehensive Program of Scientific and Technical Progress of the CEMA Member Countries to 2000;
— the plans of work of interbranch scientific technical complexes;
— intersectorial scientific problems and scientific and technical problems of statewide importance with respect to the development of new equipment that revolutionizes social production;
— basic research in the area of the social, natural, and technical sciences.

Along with allocations from the budget the assets of the centralized funds and reserves of ministries (departments), as well as of organizations, enterprises, and associations with the consent of their labor collectives are the sources of the financing of this work. The sources of the financing of scientific research and experimental design work at the sectorial level are the assets of associations, enterprises, and organizations, as well as the assets of the centralized funds and reserves of ministries and departments and credits of banks and, in necessary cases, budget allocations.

Ministries and departments report to scientific organizations the financial indicators on the total amount of allocations and the wage fund, with a breakdown by basic directions of scientific activity. The scientific organization on the basis of these indicators plans and takes into account the expenses separately for each specific theme. The amount of scientific research and experimental design work, which is performed by scientific organizations that are budget-financed, in accordance with contracts with clients is determined by them independently, while the wage fund is calculated in accordance with the standard that is established for ministries and departments subject to the amount of work being performed on their own. The payment for such work is made in accordance with established procedure at contract prices.

Ministries and departments report to the scientific organizations, which perform the indicated work, the following economic standards:
— the deductions from the profit for the state (including local) budget;
— the deductions from the profit for the centralized funds of ministries and departments, which are stipulated by legislation;
— the standard of the formation of the fund for scientific, technical, and social development, the material incentive fund, and the foreign currency fund.

For the purpose of improving the financing of scientific research and development the USSR State Committee for Science and Technology, the USSR State Planning Committee, and the USSR Ministry of Finance deemed it necessary starting in 1989 to allocate the assets of the USSR State Budget, which are intended for the performance of scientific research and experimental design work in accordance with the Comprehensive Program of Scientific and Technical Progress of the USSR, state scientific and technical programs, the unified plan of interbranch scientific technical complexes, and the Comprehensive Program of Scientific and Technical Progress of the CEMA Member Countries to 2000, directly to the head organizations, interbranch scientific technical complexes, and, in necessary cases, the supervisors of individual projects. For the simplification of the process of the passage of the assets, which have been allocated from the reserve of the USSR State Committee for Science and Technology, to the immediate performers as of 1989 the committee has received the right to transfer assets to the accounts of scientists at institutions of savings banks.

The remuneration of labor at the scientific organizations, which are operating on the principles of full cost

accounting and self-financing, is carried out on the terms stipulated by Decree No 793/33-75 of the USSR State Committee for Labor and Social Problems and the Secretariat of the All-Union Central Council of Trade Unions of 31 December 1987.

In conformity with the instructions of the government the USSR State Planning Committee, the USSR Ministry of Finance, the USSR State Committee for Science and Technology, and the All-Union Central Council of Trade Unions established for 1989-1990 the standards of the formation of the wage fund and the standards of deductions for the state budget (including the local budget).

The salaries of personnel of scientific research institutes and design bureaus according to the new schedule are higher than the system previously in effect. The introduction of new conditions of the remuneration of labor made it possible to increase the average monthly wage at scientific organizations by approximately 20 percent. High contract prices, a too high standard of the formation of the wage fund, the exemption of scientific organizations from the payment of the fee for capital and manpower resources and deductions from the accounting profit, and, last of all, the amount of work, if it has been calculated according to the base (noncontract) prices, are the basic cause of such an increase.

Such a situation is due to the fact that the difference of the wage fund at scientific organizations, which operate in accordance with the first form of cost accounting, has been made directly dependent on the amounts of work, which are specified by contract prices, and they, taking advantage of their monopoly position, dictate to clients overstated prices, which often are economically groundless and are not connected with the scientific and technical level and competitive ability of developments and their effectiveness. The standards of the formation of the wage fund, which have been established by ministries, are also high. For example, the USSR Ministry of Finance set this standard for the All-Union Scientific Research Institute of the Study of Consumer Demand and Marketing Conditions at the level of 69 percent. For scientific organizations of the academies of sciences of the union republics and the departments of the USSR Academy of Sciences these standards range from 41.3 percent (the Siberian Department of the USSR Academy of Sciences) to 56.9 percent (the Azerbaijan SSR Academy of Sciences).

The role of bonuses has been increased. The economic and social significance for the national economy of the fundamentally new, highly efficient equipment and technology, which are being developed and ensure the highest world level and competitive ability, is envisaged as the main criterion when paying bonuses to personnel.

The maximum amounts of bonuses have been established at nine monthly salaries a year, moreover, 2.6 monthly salaries according to special bonus systems and 1.4 monthly salaries according to the results of all-union and republic socialist competition. Lenin Prizes, State Prizes of the USSR and the union republics, and other one-time prizes, which have been established by the USSR Council of Ministers and state and public organizations, can be paid in excess of the maximum amounts of bonuses. For collectives or individual specialists and employees the bonuses within the limits of the indicated maximum amounts are established by the manager of the scientific organization in consultation with the trade union committee. However, there are instances of the exceeding of the maximum amounts of bonuses by scientific organizations, since such limitations do not formally exist.

New forms of the organization of science, such as temporary creative collectives, the system of the scientific and technical creativity of youth, and cooperatives, are playing a more and more perceptible role in the conducting of scientific research and development. Temporary creative collectives (VTK's) are established for the purposes of the more efficient use of manpower resources and the creative potential of workers, the rapid introduction in production of promising developments, inventions, and highly efficient rationalization proposals, and the rendering of intermediary services that are aimed at the intensification of the national economy.

The councils (boards) of the All-Union Society of Inventors and Efficiency Experts (VOIR) and scientific and technical societies (NTS's) conclude on a cost accounting basis contracts for the performance of research, development, and other intermediary services with state enterprises (associations), cooperatives, as well as private individuals and establish temporary creative collectives for the performance of the work that is stipulated by these contracts.

The object of the entrusted work, the work plan, the deadline of its fulfillment, the special requirements, the procedure of the transfer and acceptance of the performed work, the mutual liability of the parties, and other terms are specified in the contract. The specialists, engineers, economists, and scientists, who participate in the activity of a temporary creative collective, conduct development during the time off from their basic job. The time of development, as a rule, should not exceed 12 months, after which the activity of the temporary creative collective ceases.

The amount and cost of the work in accordance with the orders of client enterprises are determined by expert commissions, which evaluate the complexity of the posed task and the amount of work, ascertain the necessity of a patent study, estimate the expected impact from the use of developments, and issue (after completion of the work) a conclusion on its scientific and technical level. The remuneration of the labor of the members of the temporary creative collective is carried out by means of the assets of the client, which have been transferred for the work that has been completed in accordance with economic contracts. Contract prices are at the basis of the agreement.

In recent times centers of the scientific and technical creativity of youth (centers of NTTM) have become widespread.

The basic tasks of the centers of the scientific and technical creativity of youth are: the involvement of young people in active work on the search for effective advanced, nonstandard solutions of scientific and technical problems in all spheres of production; the aiding of the introduction and extensive use in the national economy of the latest achievements of science and technology, inventions, and developments of young innovators; the strengthening and development of the material and technical base of the scientific and technical creativity of youth; the promotion of the achievements of scientific and technical creativity, the performance of information methods work, and others.

For the performance of jobs in accordance with economic contracts the center of the scientific and technical creativity of youth forms creative collectives. People, who are employed in social production, as well as undergraduates, students, and retirees can participate in the work of creative collectives. The jobs are performed during time off from work.

The contract is the basic document that regulates the relations of centers of the scientific and technical creativity of youth with clients. The centers of the scientific and technical creativity of youth use the form of cost accounting, which is based on the standardized distribution of the revenue that is obtained after reimbursing the expenses, including the remuneration of the labor of the members of creative collectives, from the receipts.

The new methods of financing and management at organizations of science are receiving support. Thus, S.N. Fedorov, general director of the Mikrokhirurgiya glaza Interbranch Scientific Technical Complex, proposed to lease to the labor collective the fixed capital of production (the building of the institute, equipment, tools, and others). The amount of the payment for fixed production capital to the budget per staff member of the complex is established by the management of the complex in consultation with the labor collective.

The existence of new forms of the development of cost accounting, which have received the name "small forms of cost accounting," and the bold conducting by scientific organizations of experiments on their perfection are creating good prerequisites for the development of the optimum version of management in science.

Science Official Defends Expenditures on Basic Research

18140336 Moscow SOVETSKAYA ROSSIYA in Russian 5 Sep 89 p 1

[Interview with Professor Viktor Antonovich Sadovnichiy, first prorector of Moscow State University, by V. Ivanitskiy, under the rubric "Our Dialog": "Will the Future Wait for Us?"; date and place not given; first five paragraphs are SOVETSKAYA ROSSIYA introduction]

[Text] "For more than 10 years we have been conducting studies of Antarctica. Several stations have been organized there; expeditions are annually sent to spend the winter. Tons of fuel, food, and expensive gear are brought in. But what do they bring from there? Well fine, emperor penguins for zoos, but what else? But we do not have extra money, especially now, when they have planned to improve the life of the simple person. In my opinion, it is necessary to halt immediately these trivial operations and waste of assets.

"[Signed] V. Savintsov, Perm"

"I have wanted to find out for a long time how much space research has cost us altogether and of what benefit, which is expressed in rubles, it has been. Let our statistics calculate how many apartments, schools, nurseries, and homes for the aged it would have been possible to build for the billions which have flown away into space. Ask anyone, who has been waiting in line many years for an apartment and who does not know how to stretch his pension for a long month, what they are for: for flights to March or for enjoying life if only a little like a human being on earth.

"[Signed] V. Polozhets, the Kabardino-Balkar ASSR"

The flow of similar letters today is not that small. People are asking more and more insistently, for what do we need scientific research and programs, on which much capital is being spent allegedly without a return for those now living. In scientific circles there are counter complaints: too little capital is being allocated for science, particularly basic science, but without this scientific and technical progress is inconceivable. Viktor Antonovich Sadovnichiy, first prorector of Moscow State University, spoke about precisely this at the last annual assembly of the higher school with regard to the results of scientific research work. Today he is continuing his reflections on this urgent theme.

SOVETSKAYA ROSSIYA: Viktor Antonovich, is the opinion about the uselessness of basic research probably not new for us?

V. A. Sadovnichiy: So that the discussion would be constructive, let us get our bearings with the concepts. Undoubtedly, a portion of the research, which is being conducted in Antarctica and in space, comes under the category of basic research, but far from all of it does. Unfortunately, one often has to be convinced that, while standing up for basic science or speaking out against it, we get confused. We forget that only the research, which serves the extension and broadening of fundamental knowledge about the structure, properties, and laws of nature, is grouped with such research. Precisely basic knowledge ensures qualitative changes and leaps in getting to know the world. And the main distinctive feature

is: it is impossible, as a rule, to use the results of basic discoveries in practice of the present moment, it is simply not clear how to use a just discovered law and effect. At times more than a decade will pass until this happens.

I would not have gone into such a detailed discussion, if I did not encounter more and more often one of the misconceptions that have become widely circulated today. By basic science people understand high technology science. It is clear in part why this is happening. A new stage of scientific and technical progress—the technological stage—has begun. The world can no longer "associate" with nature, while squandering its resources irreplaceably. The tasks of harmonious technical solutions—ultrapure materials, waste-free works, the reclamation of waste, and so on—have arisen. Undoubtedly, these are vitally important directions, they are yielding much in the knowledge of nature, but still they are secondary. Basic research is the soil, in which they are emerge. It is necessary to separate and understand this very precisely, otherwise the shortcomings in applied fields are automatically carried over to all the rest of science.

SOVETSKAYA ROSSIYA: And still, if you look at it from the point of view of the family with many children, the retiree, and the disabled person, even with allowance made for your remarks a question arises: When will there be a benefit from the multibillion ruble investments in science?

V. A. Sadovnichiy: It is a great pity if one wants to "live it up today" at the expense of science. But why not do this, let us suppose, by the improvement of the products that are being produced in the country, by the increase of the taxes on high-paid categories of the population, and by means of the assets, which to this day are in the hands of organized crime? Naturally, this is more difficult than simply reducing the allocations for the same basic research. But such an approach cannot be constructive. Yes, it is difficult to predict when some basic discovery or another will be of practical benefit. But it is also true that it will be of practical benefit without fail, exceeding in geometric progression the expenditures on it. Let us take, for example, such an abstract field of science as quantum mechanics. When physicists were developing its axiomatics, this was no more than a self-contained theory, which described phenomena in the microcosm of elementary particles. But now several decades have passed, and, say, instrument making no longer conceives of itself without the use of the laws of quantum mechanics. The law of the uncertainty principle and other laws are "working" to their utmost in industry. They have become a technology. I am certain that the scientists, who discovered them, would not have been able to predict where and when these laws would begin to be used.

Therefore, when people speak of the uselessness of the study of the Arctic or space or something else, I believe that it is necessary first of all to sound the alarm with regard to the fact that the technologies, which have been obtained on the basis of expensive basic research, are not finding application in the national economy. Now this is truly a disgrace, this is an enormous disaster. It is well known that the Americans are covering the cost of all their space programs by selling to firms and corporations the obtained technical solutions and technologies. In our country these results are often sealed with seven seals, while those, which have become widely used, are far from recovering the expenditures that were made on the programs.

I will cite another quite typical example. I have in mind the fate of the Korteweg-de Vries equation. When the Scandinavian scientists discovered it, they did not attach any significance to this and even did not include it in the list of works on the occasion of the anniversary, considering it barren rock. Fermi in the 1930's obtained the same equation in different notation when studying the nuclear reaction. Only American scientists established by means of computers that the equation describes the laws of conservation in various phenomena. And, indeed, now in case of any study—whether of shallow water in a gulf or an explosion—it is impossible to manage without the Korteweg-de Vries equation. That is, it has also become a technology, but for this we had to wait several decades.

SOVETSKAYA ROSSIYA: In my opinion, it is symbolic that precisely the Americans, who are famous for their "naked pragmatism," saw where to apply the equation that in practice was like a lost soul. Is it really impossible today to reckon when a discovery will develop into a really tangible result?

V. A. Sadovnichiy: It is impossible to reckon that, this is an axiom. But then it is possible to stimulate such a process, especially as similar experience exists in other countries. I have in mind first of all the so-called science parks that have become widespread at English universities. To put it briefly, these are small collectives of scientists of a university and businessmen, who are united by the common task to bring a scientific idea up to the development of an instrument and to transfer it to series production. The group works on very strict terms, it is given, as a rule, half a year or a year to obtain a result. In reality, such a specific organization of scientific labor also serves as a stimulus, it shortens the path from a discovery to a technology and beats a path from theory to practice. You will agree, this is fine, when in half a year a new technology is developed on the basis of a fundamental law.

It is clear that it is impossible to automatically carry this form of organization over to us if only due to the chronic shortage of everything, due to the impossibility of breaking through to series production. For in our country all the sectors are "no worse than others," that is, than scientific research institutes.

SOVETSKAYA ROSSIYA: The English have science parks, in our country scientific centers have begun to be actively organized, particularly at Moscow State University.

V. A. Sadovnichiy: These are both centers and temporary collectives. At our university, for example, they are working on other problems of high-temperature superconductivity. Without going into the details, I will say that today they are quite capable of competing with any similar collectives abroad.... But the main thing is that the principles of science parks have been incorporated in the state program of the development of Moscow State University during the coming two five-year plans. Along with the construction of educational buildings scientific centers: an ecology center, a biotechnology center, a space information processing center, a high-temperature superconductivity center, and others, will also be established. These, as you understand, are outlines. There is no uniform state policy with respect to the basic sciences. In recent times disdain for them has been sensed in public sentiments. Someone saw a way to plug the holes in the budget at the expense of their allowance, which is meager as it is.

SOVETSKAYA ROSSIYA: Do you believe that the main trouble is the lack of money?

V. A. Sadovnichiy: Not only that. There are very many problems. But one cannot manage without assets. Incidentally, not that much is being spent on the basic sciences. It is no secret that today we are about 15-20 years behind the western countries and that these processes are progressing. It is clear that, by developing science by the extensive means, we will no longer achieve anything. It is possible already today to increase the investments of basic science by about tenfold, the future will not wait.

Of course, it is necessary to take various steps. To narrow, for example, the front of priority basic research in our country, having selected from the 10,000 directions known to science about 1,000. To perform with respect to the others only exploratory and support operations. It is necessary to undertake in earnest the development of information systems on mathematics, physics, chemistry, biology, and other fields, having assigned this work to leading universities of the country.

I am not a specialist in the field of planning, and especially forecasting, but I always remember one folk wisdom: "If you want a crop, prepare the soil."

High Cost of Soviet Genome Project Discussed

18140331 Moscow POISK in Russian
No 17, Aug 89 p 3

[Article by Dmitriy Gvozdev: "Will We Argue With Fate? 'The Human Genome' Its Fantastic Possibilities. The Failure of the Program Would Signify a Catastrophe"; first paragraph is POISK introduction]

[Text] This analysis is reminiscent of an ordinary blood test. However, in a few hours medical personnel predict for a person what diseases lie in wait for him throughout life or can be transmitted to his descendants. In especially dangerous cases emergency treatment is prescribed for patents—people who appear entirely healthy. Physicians call it genotherapy. As soon as the new method became widespread at clinics, the number of cases of congenital diseases among children decreased appreciably. Infarction became a rarity. Allergic ailments subsided. At oncological centers they learned to strike "preventive blows" against various forms of cancer. At endocrinological centers they learned to "extinguish" the hereditary predisposition to diabetes. The life expectancy in the country increased by nearly 10 years.

Such a report is quite capable of appearing in the foreseeable future. Current research in the field of molecular biology promises 21st century medicine truly fantastic possibilities. Scientists are placing particular hopes in projects which in different countries are called the same—"The Human Genome." In the USSR this is 1 of 14 state scientific and technical programs that have priority in budget financing.

In the United States similar research is regarded as a kind of biological equivalent of the sensational Apollo space program. Indeed, the complexity of the tasks facing scientists are quite comparable to the difficulties of lunar expeditions. Incidentally, striking analogies in studies of the microcosm and macrocosm were noticed long ago. In much the same way as the telescope brings distant galaxies closer to us, the scanning tunnel microscope, which magnifies an image by a millionfold, makes it possible to examine molecules and atoms! By means of it American researchers were recently able to obtain the first direct image in the world of the DNA molecule, on which it is possible to make out the minute details of its spiral structure. While the 23 pairs of chromosomes, an identical set of which is contained in every cell of our body, consist precisely of DNA. All the hereditary information of man and his genome are also coded in them.

However, it is not enough for scientists only "to feast their eyes" on DNA—they need a "soil sample." Only a scrupulous chemical analysis will make it possible to read from cover to cover the "book of life," which consists of 3 billion "letters"—the nitrogenous bases of molecules. Without a knowledge of this "text" one cannot understand the mechanism of the transmission of hereditary traits and the causes of the occurrence of 3,000 diseases that can pass from generation to generation. Without this one also cannot develop new methods of treating hereditary ailments and many oncological diseases, which have, as scientists say, an essential genetic component.

Researchers of different countries are of the common opinion: the progress of laboratory equipment and computer hardware made the decoding of the human genome a practicable task. Now automatic machines are performing this work. However, given such technology

billions in expenditures will be required. For today biologists have succeeded in reading less than 30 million chemical "letters," and the annual increase of this data bank for the present does not exceed 30 percent. In the United States about $90 million are being spent annually on such research. Our allocations in 1989 are a little less, but also impressive—25 million rubles.

However, a question arises: Is it worthwhile for us to direct our attention to transatlantic science spending, when the budget of Soviet health care is less than a tenth of the American budget? For we have quite a number of urgent problems, first of all in practical medicine. And as soon as the conversation turns to research programs, the proverb "cut your coat according to the cloth" comes to mind, like it or not.

Under the conditions of a 100 billion ruble budget deficit we have to count even kopeck. But without substantial assets you will not cope with a new biological, as well as any other major scientific project—it requires millions and millions. It hardly makes sense to invest lots of money in research which is intended for long years (according to foreign estimates, not less than 15 years), if the intermediate results will not be used.

"Having developed jointly with a number of organizations the Diapuls instrument, we have already saved the state tens of thousands of foreign currency rubles," David Beritashvili, a senior scientific associate of the Institute of Molecular Biology imeni Engelgardt of the USSR Academy of Sciences, believes. "Previously they paid $10,000 each for analogs of such an instrument. This year 30 domestic devices costing 4,000 rubles were produced. But hundreds are needed. Diapulses are extremely necessary in studies of the DNA of man, animals, plants, and microorganisms. They make it possible to divide molecules into fragments, which are convenient for analysis, and to obtain scientific results that are applicable both in medicine and in agriculture. The new instrument is protected by an inventor's certificate and has been patented in the United States, the FRG, Japan, Sweden, and other countries. The demand for similar equipment is great throughout the world. Another innovation, which is intended for the accomplishment of a key task of the project, has also been patented. This is a joint development of specialists of our institute and scientists from Alma-Ata headed by Valeriy Gross. Mock-up tests showed that our unit makes it possible to calculate the genome tenfold more rapidly than the latest American instruments do. And here is the trouble—we simply cannot produce a prototype which is suitable for series production. Some foreign optical devices and reagents are needed—domestic industry, alas, has not yet come up to them. It is impossible for the present when producing complex equipment to rely only on the domestic market. And is this necessary? For throughout the world the making up of items with assemblies and parts of other firms is being widely practiced. The earlier you 'astound' the market with an innovation, the greater the profit is. In order to 'refine' the unit and to arrange its international presentation (perhaps, we will organize joint production with some firm), we need many fold less foreign currency assets than the cost of one imported device. However, thus far they are not allocating foreign currency. I consider this incorrect. For the Human Genome Project is first of all the competition of technologies."

It is difficult not to agree with the conclusions of D. Beritashvili. Of course, it is pointless to set up a state program only based on imported equipment, but one must also not ignore the possibilities of international cooperation. Hundreds of automated units are needed, but their price on the world market "stings"—$250,000. Thus far we have bought only two—with them the project is more capable than the American and Japanese systems.

But if that is so, in the new program substantial elements of cost recovery will appear already with its first steps. Not without reason in the United States do they intend to derive from a similar project a considerable commercial profit, as they did from the same Apollo project. Here we need to learn to do business and to display initiative and efficiency. Clearly, we will not get by here without a certain risk. But then the prize is great—scientific apparatus, just as, incidentally, everything in which intelligence is incorporated, today is valued especially highly.

In molecular biology the situation for such exchange is extremely favorable, all serious achievements in this field instantaneously spread through the world and become well known. This was spoken about, for example, at the consultative meeting, which was recently held in Moscow, of members of the International Human Genome Organization (HUGO), UNESCO representatives headed by its general director F. Mayor, and leading Soviet specialists. HUGO Council Chairman Professor V. McKusick informed journalists that the establishment of a fourth regional center of this organization in Moscow is quite possible.

Of course, international cooperation does not yield benefits automatically—it is necessary to obtain them by one's own efforts. And we need to count first of all on ourselves. The research results when ready should without fail sustain our medicine and pharmacology—such feedback, undoubtedly, will make the project more viable even in the difficult economic situation. But failure in this area would signify a catastrophe of no less a scale than the badly reputed devastation of genetics.

Here is the opinion of Academician Aleksandr Bayev, chairman of the Scientific Council of the State Committee for Science and Technology and the USSR Academy of Sciences "The Human Genome":

"Even the most advanced methods make it possible to diagnose reliably only a negligible portion of hereditary diseases. But their number is tending to increase as a consequence of the pollution of the environment with all kinds of chemical substances—mutagens. This is a real danger, with which all of us have to reckon. Knowledge

of the genetic code is leading to the more in-depth study of the human body and is affording new opportunities for diagnosis, including so-called prenatal, antenatal diagnosis. It is no less important to learn to treat hereditary diseases, the isolation of our country in the study of the human genome, if such a thing happens, can have far-reaching adverse consequences."

Yes, in the final analysis it is a question precisely of the problems of the survival of man under changing conditions, which influence our life at times according to an unpredictable "scenario" (an example of this is the AIDS pandemia, which has spread all over the planet). In order to survive, mankind must be prepared for any turn of events. And only a comprehensive approach to the study of man himself can help here—Academician Ivan Frolov dwelt in detail on this question in an article published by our newspaper (POISK, No 16). Of course, we need to compare our needs and industrial ambitions with the ecological limiters and to live in harmony with surrounding nature. But one must also not disregard the possibilities of modern science to strengthen the reserve forces of the human body and its capacities for self-protection.

For the first time in history the opportunity to get to know himself to the smallest "helixes" has begun to appear before man. It is a crime to miss this chance, but here one must also not diminish the difficulties. First of all we need our own material and technical base. This concerns, of course, not only automatic instruments for decoding the genome—so-called sequenators. Computers, of which there is also an acute shortage for conventional diagnostic methods, are required. Alas, this list, as they say, is "to be continued...."

It would be awful if scientific knowledge were to be dead weight. Thus far the return from the ideas already gained by scientists about the nature of hereditary diseases is negligible, in our country, in contrast to developed countries of the West, genetic consultation centers are weak and few. It is necessary to correct the situation immediately.

Otherwise other people will read the "book of life," while in our country if they get through some pages, for the broad audience they will remain all the same a secret sealed with seven seals.

Statistics on Science Institutions, Employees

18140337b Moscow ARGUMENTY I FAKTY in Russian No 33, 19-25 Aug 89 p 8

[Text] "How many people, who have the academic degree of candidate or doctor of sciences, are there in the country? Is the monitoring of the number of scientific institutions and the number of people working at them being carried out?

"[Signed] A. Selivanov, Kharkov"

According to the data of the USSR State Committee for Statistics, at the end of 1988 in our country there were 5,111 scientific establishments, at which 1,342,000 scientific personnel worked. In all 1,128 organizations belong to the USSR Academy of Sciences, the academies of sciences of the union republics, and sectorial academies, 1,258 are higher educational institutions, archives, libraries, museums, and so on, the rest—2,725—are scientific institutions of ministries and departments.

As compared with 1985 there were 54 more scientific institutions, but an increase of the total number of people working at them did not occur. In the USSR 493,100 people have the academic degree of candidate of sciences and 49,700 people have the academic decree of doctor of sciences. In the last 3 years 29,600 candidate dissertations and 5,400 doctoral dissertations were defended.

The largest number of people with an academic degree work in the RSFSR—33,400 doctors of sciences and 315,600 candidates of sciences, the Ukraine—respectively 6,800 and 73,700, Uzbekistan—1,400 and 16,700, Belorussia—1,200 and 14,600, Georgia—1,500 and 11,800, and Kazakhstan—1,000 and 14,800.

As to the total number of scientific personnel, it has increased in all the republics except Azerbaijan.

The data on the age of doctors of sciences are also known. Of them 40.2 percent are over 61, 40.3 percent are 51-60 years old, 18.4 percent are 40-50 years old, and 1.1 percent are under 40.

USSR Academy of Sciences Creates Arctic Research Commission

18140337a Moscow SOVETSKAYA ROSSIYA in Russian 12 Aug 89 p 3

[Article by a TASS correspondent: "The Object of Concern Is the Arctic"]

[Text] The Standing Commission for the Study of the Arctic has been established under the Presidium of the USSR Academy of Sciences. Vice President of the USSR Academy of Sciences Academician N. Laverov has been approved as its chairman.

The commission was organized in conformity with a decision of the CPSU Central Committee and the USSR Council of Ministers and will be an organ that helps the Academy of Science to coordinate research in the area of the economic and social development of the regions of the Soviet Arctic, geology, oceanology, biology, ecology, as well as legal problems and special questions concerning the Arctic region. Jointly with the USSR State Committee for Science and Technology and the USSR State Planning Committee the commission will also ensure the coordination of research of academic, sectorial, and departmental science, increasing its effectiveness and practical orientation, will cooperate closely with the State Commission for Arctic Affairs attached to the USSR Council of Ministers, and will strengthen international scientific ties.

Problems in Equipping Schools With Computers

18140333 Moscow POISK in Russian
No 17, Aug 89 pp 1, 8

[Article by Dmitriy Leonidov: "The Incomparable Yamaha"; first paragraph is POISK introduction]

[Text] The Japanese firm Yamaha is well known in our country not only from musical instruments at rock concerts. We have been buying its computers for schools for more than a year. We value them first of all for reliability. Therefore, at Moscow Secondary School No 206, to which before the start of the school year they delivered 10 Yamahas, they decided to test out an experimental program on precisely these machines. The computers will help teachers to conduct lessons of not only mathematics, but also history.

But the new Soviet item, the UKNTs computer, is not noted for such "survivability." At School No 206 they became convinced of this from their own experience: two computer classrooms here are equipped with domestic hardware. So that it would be possible to work with it, local skilled workers had to fit each computer with a nonstandard fan—and the computers in a flash ceased to "heat up." The only thing to do is to go to the plant with an efficiency proposal. Strange things are happening: the respectable firm is producing electronic equipment, but is not getting around to testing out the net item in all modes.

Alas, many people will regard as simply tactless the above-cited example of relatively well-off School No 209: about 90 percent of Soviet schools do not have computer classrooms at all!

But School No 209 is not a simple school. This is one of five program method centers of educational computers of the capital. Here the most experienced specialists work with the children. As center director Mikhail Petrov related, the school children during the last school year earned 10,000 rubles on the computer programs that were written by them for several enterprises. No, our children are not inferior in their talents to foreign children of their age, who from childhood have been raised on electronic games.

What is hindering the extensive spread of computer literacy? After all, several years ago the corresponding decisions were made at the highest level, ministries and plants were involved....

"Whereas the main trouble for the country is the banal lack of hardware or its poor quality," says Vasiliy Urnov, a specialist of the department of information science and electronic computer technology of the Moscow City Committee for Public Education, "in the capital, where provision with computers is significantly greater, first of all the poorness of the software of information science lessons and the inadequate training of teachers worry us. The instances, when they attempt to pass off primitive manipulations with a machine as the height of perfection, are frequent. People, unfortunately, have even never seen a normal teaching program and have no idea of what this is."

That is why we also took the route of establishing base method centers. Due to the "incompatibility" of various domestic computer systems great efforts are required for the preparation of programs. And when it comes to the great magnitude of programs, financial questions arise with all urgency. For software—I will repeat the well-known truth—usually costs many fold more than the computer itself. Meanwhile, the price, which the manufacturing plants set for computers, as it stands is at the limit of the possibilities of the public education system.

So, the experience of the capital should also not be ignored in outlying areas, in order not to repeat the mistakes of the first years of school computerization. At the Prosveshcheniye Publishing House the book "Prepodavaniye informatiki v kompyuternom klasse" [The Teaching of Information Science in the Computer Classroom] has been prepared for publication. Its expected run is 200,000 copies. Any moment they will turn over to the publishing house another book: "Uchebnyy kompyuter UKNTs" [The UKNTs Educational Computer]. We will hope that these publications will supplement the library of methods literature, of whose meagerness teachers are complaining.

The path to computer literacy proved to be difficult. Successful organizational solutions in Moscow or, say, Novosibirsk are not capable of changing the overall situation. On 1 September at the overwhelming majority of our schools a computer will be the same pipe dream it was a year ago. The production plans on the output of educational computers are constantly being upset—a fivefold lag behind the once planned schedule is occurring. Do we perhaps need a revision of the entire strategy of the computerization of the school?

Here is the opinion of Viktor Zakharov, director of the All-Union Scientific Research Institute of Problems of Computer Technology and Information Science of the USSR State Committee for Computer Technology and Information Science:

"What the school computer should be like is determined by the available resources. One will not settle this question with entreaties. It is correct that a special educational computer is being developed. It should have neither a record nor even an average professional performance. But then the keyboard and several other features of the 'appearance' of the machine should without fail be such that the procedure of communicating with it would not differ from work on a professional computer. At one time we calculated that the country needs about 18 million educational computers. Even a negligible increase of the cost of each of them will come as a result to an enormous amount.

"From the standpoint of the information 'filling' of this machine an entire set of programs, which support the

teaching of information science and a number of other subjects, as well as the cultivation of skills of work with a computer, should be developed. The school child should not fear the computer, he needs to get used to it as a tool of knowledge. This is also the basic goal of instruction.

"We have turned the task upside down, by teaching programming on the personal computer. While in the West the majority of people do not engaging in programming at all. They use information databases, spreadsheets, word processing packages.... Precisely this also became the basis of the extensive use of personal computers.

"People of very high skill should teach school children to work on a computer. It is impossible to achieve it simultaneously throughout the country. Of course, it is also necessary to increase the output of hardware itself. In my opinion, a machine like the UKNTs has quite great prospects. Given the competent organization of production it is possible to 'shape up' this computer and to make it quite inexpensive. And, consequently, popular."

Bureaucracy Continues To Impede Publication of S&T Articles

18140349 Moscow NTR: PROBLEMY I RESHENIYA in Russian No 16, Aug 89 p 2

[Article by V. Pokrovskiy under the rubric "Panorama": "Again About the Certificates of Examination"; first paragraph is NTR: PROBLEMY I RESHENIYA introduction]

[Text] A year has passed since we reported the substantial changes of the procedure, to which a scientific and technical article is subjected before it receives permission for publication (NTR, Nos 14, 19). In particular, it is a matter of the multipage certificate of examination, which requires a large number of official stamps, having been replaced by a one-page certificate, which requires only one official stamp. We spoke about the broadening of the group of people who have the right to sign such a certificate. We also spoke about the lifting of a large number of restrictions that regulate the activity of expert commissions. This news was received by our readers with satisfaction, while if someone did voice discontent, it was only with the fact that this is an insufficient step, that the attitude toward secrecy must be changed radically. With which, of course, it is difficult not to agree.

And now, a year later, we received the following letter:

"When preparing a scientific and technical article for publication," writes reader Yu. Glazkov from Lyubertsy of Moscow Oblast, "one has to prepare a certificate of examination (on four types pages), minutes of the meeting of the expert commission, and an author's reference. At least 1.5-2 workdays are required for the preparation and drawing up of these documents. According to my calculations, the expenses for the preparation of one article for publication come to 130-170 rubles. What losses on the drawing up of these documents do enterprises of the entire country incur?

"Last year in your newspaper there was a report on the simplification of the procedure of drawing up the certificate of examination and on the reduction of its length. However, everything remains as before. What is the reason? Why have the useful innovations not gotten to enterprises and organizations?"

And simultaneously another letter. Reader V. Sizov from Moscow advances a large number of suggestions which would help to simplify the procedure of the passing of publications in sectorial journals. A portion of his suggestions concern the four-page certificate of examination. The author of the letter demands that the content of the certificate of examination be revised and that it be shortened to one page. In the majority of cases he proposes to confine oneself to the author's reference, although it, as we have already reported, was abolished more than 10 years ago.

We turned for clarifications to N. Glazatov, deputy chief of the USSR Main Administration for Safeguarding State Secrets in the Press. He is puzzled together with us.

"Last year we already sent out the new statute on the procedure of passing manuscripts for open publication to all interested organizations and repeatedly reported the changes through the central press. We did everything possible to get this information to everyone. How else can we help? Let comrades appeal to us, and we will look into it. In spite of all our efforts, the information probably did not get to several organizations or was not grasped."

Thus, we once again remind you: all the documentation and all the procedures, which concern the passing of articles, are regulated by the Statute on the Procedure of the Preparation of Materials That Are Intended for Open Publication. This statute has been in effect since May 1988. The four-page certificates of examination and, all the more so, the author's references are not even mentioned in it.

Slow Recovery Rate for Automation Investments

18140338 Tbilisi ZARYA VOSTOKA in Russian 20 Aug 89 p 1

[Article under the rubric "The Georgian SSR State Committee for Statistics Comments on a Fact": "Use Computer Hardware Better"; first paragraph is ZARYA VOSTOKA introduction]

[Text] The computing and data processing center of the Transcaucasian Railroad, where the capital investments in the establishment of an automated system came to 7.3 million rubles, derived a profit in the amount of 298,000 rubles, that is, the payback period came to 24 years. In similar manner the payback period of introduced individual automated systems or individual subsystems came to: at the computing and data processing center of the Ministry of Trade—22 years, at the Tbilisi Motor Vehicle Maintenance Center—23 years, and in the Administration of Geology—even 72 years.

The Georgian SSR State Committee for Statistics recently completed the processing of a one-time survey of the availability and use of automated control systems and computer hardware in the Georgian SSR national economy.

In all 144 industrial associations and enterprises of computer centers, ministries and departments, scientific research institutes, educational institutions, and other organizations, which have and operate computer hardware, were covered by the survey.

As of 1 January 1989, as the inventory showed, 107 automated control systems for various purposes were in operation in the republic, including: 12 automated control systems of ministries and departments, 15 automated control systems of scientific production and production associations, 20 automation control systems for

information processing, 12 computer-aided design systems, 16 automated process control systems, and other systems, as well as 66 individual complexes of subsystems. More than 1,280 computer complexes and computers are in operation in the republic, of them 146 are computer complexes based on general-purpose processors, 139 are complexes based on miniprocessors, 125 are complexes based on microprocessors, 846 are personal computers, and so on.

For the most part the computer hardware and, accordingly, the automated control systems are concentrated in the capital of our republic—the city of Tbilisi. From 80 to 95 percent of all the computer hardware and 90 percent of the automated control systems are installed and are being used here.

The expenditures on the purchase of all this computer hardware and on the introduction of automated control systems came to a considerable sum—285 million rubles (with allowance made for expenditures of past years). These expenditures, as the survey showed, in case of the good organization of the matter are recovered in 2-3 years. But what is to be done, if data on their yield are not cited?

For example, the computer center of the Georgian SSR State Planning Committee, having spent more than 20 million rubles on the introduction of an automated control system, did not cite data on the increase of the profit or the saving of assets, which were obtained from the introduction and use of this system. The republic computer center of the Georgian SSR Ministry of Health, having spent 7.9 million rubles, the data processing and computing center of the Georgian SSR State Committee for Television and Radio Broadcasting, having spent 7.7 million rubles, the computer center of the Georgian SSR Ministry of Communications, having spent 6.7 million rubles, the collective-use republic sectorial computer center of the Georgian SSR State Agroindustrial Committee, having spent 6.7 million rubles, the data processing and computing center of the Georgian SSR State Agroindustrial Committee, having spent 11.8 million rubles, and a number of others similarly did not report back on the saving.

Many organizations, as is evident from the cited fact, in a very restrained manner cited data on the derived saving, and the estimate of the payback period at them was implausibly large. As a result, of the 107 introduced automated systems and 66 subsystems an annual saving was shown for only 27 systems and 12 subsystems.

There are many examples of the sufficiently intensive use of computer hardware, machines are often utilized during two and more shifts, their average daily utilization exceeds 10 and more hours in terms of calendar time. However, high-power electronic machines are not being kept busy everywhere.

For example, the electronic machines operated with a small load at the computer center of the Georgian SSR State Planning Committee—the two YeS-1033 machines operated on the average 3.9 hours a day, while the two YeS-1042 machines operated 5.4 hours a day; at the republic data processing and computing center of the Georgian SSR Goskomtoplivo the YeS-1020 computer operates 0.8 hour a day, the other computer, a YeS-2036, operates 5.4 hours a day; at the united dispatch administration of the Georgian SSR Main Production Administration of Power and Electrification the YeS-1050 computer in 1988 was utilized not more than 2.7 hours a day, at the Elva Scientific Production Association the YeS-1035 computer was utilized 4.4 hours a day. At the institutes of physics, machine mechanics, and metallurgy of the Georgian SSR Academy of Sciences a number of machines were utilized from 3.6 to 4.4 hours a day.

Downtimes of machines for technical reasons influence the use of computer hardware. Just for computer complexes based on general-purpose processors and complexes based on miniprocessors the downtimes came to about 57,000 hours, which is equal to 6.9 percent of the worked time, while when converted to the cost of a machine-hour this is 4.5 million rubles.

The republic is preparing for the changeover to cost accounting. To use computer hardware better is an urgent requirement of the day.

Establishment of Patent Court System Supported

18140348 Moscow IZOBRETATEL I RATSIONALIZATOR in Russian No 7, Jul 89 pp 18-19

[Article by V. Smirnov, head of the Department of the Protection of the Rights of Authors of the Central Council of the All-Union Society of Inventors and Efficiency Experts, under the rubric "The Position": "The Patent Court Is a New Level of Legal Protection in Invention"; first paragraph is IZOBRETATEL I RATSIONALIZATOR introduction]

[Text] The conspicuous role of the All-Union Society of Inventors and Efficiency Experts as the defender of the rights of innovators, as an expert in patent disputes, and, finally, as the authorized representative of the public in questions of invention law is recognized even by the critics of our organization. Incidentally, the explanation of why inventors bluntly opposed the merger of the All-Union Society of Inventors and Efficiency Experts with the All-Union Council of Scientific and Technical Societies, when "from above" such an attempt was made "as an experiment," lies in this reputation. The All-Union Society of Inventors and Efficiency Experts to this day is also maintaining its positions in the legal field. The article published below gives the reader an idea of what the views of the Central Council of the All-Union Society of Inventors and Efficiency Experts are on the structure, composition, and functions of the patent court, the establishment of which is envisaged in the Draft of the Law on Inventive Activity.

Article 47 of the USSR Constitution (Fundamental Law) states that the rights of the authors of inventions and efficiency proposals are protected by the state. In conformity with prevailing legislation inventors have many rights. Only these rights are being exercised very poorly. Thus, from state statistical reporting it is possible to see that in the 1st year authors receive less than 38 percent of the sums of the payment, which are due to them during the 1st year of use of their inventions. In all 62 percent of the inventors do not receive at all from the state the reward for the 1st year of use. For the protection of his legal rights the inventor is forced to appeal to the people's court. On the average for the country up to 500 claims of inventors against enterprises are considered in a year. Up to 100-120 claims of inventors against ministries come before the people's courts of Moscow. On the courts there are no skilled specialists in patent studies and patent affairs and this leads to situations that at times are very dramatic. For example, the case of the claim of inventor S.F. Sikharulidze against the Rustavi Metallurgical Plant for the payment of the author's reward for an introduced invention had been in legal proceedings now for...21 years.

Sikharulidze invented "A Synthetic Slag for the Lining of Hot Tops." After many years of ordeals of the author among various juridical instances the Judicial Collegium for Civil Cases of the Georgian SSR Supreme Court settled the claim in 1987, having awarded Sikharulidze about 13,000 rubles. The money was paid. The Presidium of the Georgian SSR Supreme Court rejected the protest of the Georgian SSR deputy procurator, who considered this decision unfounded.

In 1988 a protest on the part of the first deputy chairman of the USSR Supreme Court came up before the plenum of the Georgian SSR Supreme Court. He posed the question of repealing the decision of the Judicial Collegium for Civil Cases of the Georgian SSR Supreme Court and of sending the case for reconsideration.

What is going on? It turns out that the court checked whether all the attributes of the formula of the invention of the plaintiff, including the chemical composition of the slag, had been used at the Rustavi Metallurgical Plant. The defendant asserted that the composition of the slag at the plant was different. Moreover, in the findings of specialists of the State Committee for Inventions and Discoveries, the Georgian SSR State Committee for Science and Technology, the Institute of Metallurgy of the Georgian SSR Academy of Sciences, and the Georgian SSR Republic Council of the All-Union Society of Inventors and Efficiency Experts, who were acquainted with the case, it was noted that the invention of Sikharulidze had not been introduced, the plant was using a slag of a different chemical composition. Having taking this into account, the plenum of the Georgian SSR Supreme Court in 1988 satisfied the protest of the deputy chairman of the USSR Supreme Court and repealed the decision of the Judicial Collegium for Civil Cases of the Georgian SSR Supreme Court and the decree of the Presidium of the Georgian SSR Supreme Court. In case of the reconsideration of the case it will be necessary to verify the circumstances which are connected with the use of all the attributes that are listed in both parts of the formula of the invention. It is not clear whether the invention was used, but the reward and bonuses for promotion have been received. In 20 years the judicial organs were unable to figure things out, an additional technical forensic evaluation is required.

Not having been able to see beyond the end of its nose, the Georgian SSR Supreme Court took this entire case (five volumes!) and sent it to the Central Council of the All-Union Society of Inventors and Efficiency Experts for evaluation. This was a gesture of despair. But the Georgian Supreme Court knew that the Central Council "would not play football" with such a case for anything. That is how it turned out. The Central Council of the All-Union Society of Inventors and Efficiency Experts took the case. Specialists of excellent skill were enlisted. Together we prepared a public conclusion. If a special court had considered the case, the time would have been shortened by tens of fold. Thus, if from the very start a specialized court, not a general civil court, had conducted such cases, the time of consideration would have been tens of fold shorter.

Law enforcement organs at times attempt to prove that managers incorrectly appraise some technical solutions

as rationalization solutions. It must be said at once that organs of the militia are not authorized to qualify technical solutions. If you add up incorrectly, in the opinion of law enforcement organs, the paid reward, you will see nearly always "embezzlement in particularly large amounts" by means of rationalization.

By means of such a conclusion they charged, if you remember, M. Osinovskiy, the former chief of a repair and construction administration (IZOBRETATEL I RATSIONALIZATOR, No 5, 1988), with stealing more than 17,000 rubles from the state. Only after the intervention of the Central Council of the All-Union Society of Inventors and Efficiency Experts was the criminal case against Osinovskiy dropped for lack of a corpus delicti. Three years were struck out of the life of the man. Did anyone receive punishment for the costs of the judicial proceedings? No answer followed.

This case is not the only one. In 1987 after the intervention of the Central Council of the All-Union Society of Inventors and Efficiency Experts in Leningrad six people were released from custody. The same year in Magadan Feldman was released. The Central Council of the All-Union Society of Inventors and Efficiency Experts also did much in 1988 for the establishment of the truth in the case of V.P. Kalin. Now the materials of the case have been returned for further investigation. In general, the overwhelming majority of cases are decided in favor of inventors, but after many years, after the making of a number of additional evaluations. The trouble is that the people's courts nearly always are not prepared to consider such disputes. I will cite a few more examples from another sphere, where the infringement of the legal rights of inventors is possible. It is a question of the scientific and technical evaluation.

The Central Council of the All-Union Society of Inventors and Efficiency Experts analyzed the practice of appeals of inventors to the regional councils of our society and to the central apparatus. From this survey it became evident that the procedure of registering the rights to inventions has been made excessively complex and that the dialog of applicants with organs of scientific and technical patent evaluation has been organized very imperfectly. In many cases hasty and unfounded decisions in rejection are made on applications for inventions. For example, in January 1988 the Collegium of the Control Council of the State Committee for Inventions and Discoveries considered the question of the possibility of issuing to I.A. Rakhlevskiy an inventor's certificate in accordance with the application for an automatic machine that checks for the presence in bottles with fluids of foreign inclusions. In all 77 letters were sent to the leadership of the State Committee for Inventions and Discoveries, the Control Council, and the All-Union Scientific Research Institute of State Patent Examination, the amount of correspondence on the application came to about 500 pages. Two specialists from the Central Council of the All-Union Society of Inventors and Efficiency Experts (one of them is the author of these lines) conducted the defense of the rights of the author in the Control Council. The Control Council decided to issue an inventor's certificate. But this happened 16 years after the author submitted the application!

There are a large number of such examples. And no people's court will be able to settle such technical disputes. And where is the arbitrator? He does not exist. Today conflicts of inventors are resolved both administratively and judicially. Moreover, the administrative method is envisaged mainly when settling disputes, which arise at the stage of the registration of the rights to an invention, that is, the qualification of the technical solution, and disputes about the formula of an invention.

For the accomplishment of such tasks the establishment of a completely new organ for our country—the Higher Appellate Council attached to the USSR State Committee for Science and Technology—is envisaged by the draft of the USSR Law on Inventive Activity in the USSR (Article 21 of the draft of the Law). The council should check the correctness of the decisions that are made by the state patent expert commission. At the same time after the consideration of disputes in the administrative manner the draft of the Law makes it possible to consider the dispute in court. Judicial legal defense, which is controversial, with a greater degree of glasnost, is characterized by a collective nature of the decisions being made. The guarantees of the protection of the rights of inventors thereby increase.

All this is fine. However, such cases presume that experts will deal with them. Legal procedure will assume the settlement of inventors' disputes of great complexity, which are usually a tangle of legal, technical, and economic materials.

Abundant foreign practical experience confirms the necessity of introducing patent courts. Thus, in the United States patent disputes are considered in the Federal Court of Appeals (FCA), which began to operate in 1982. The U.S. Federal Court of Appeals should "fill the vacuum in the legal system by the establishment of a forum for the review of disputes...in those fields of law, where, at the determination of Congress, there is a particular need for the establishment of uniformity on the scale of the country; improve the management of patent legislation by the centralized consideration of complaints on patent matters; ensure better quality and well-organized judicial review on government claims."

In Sweden an appeals court for patent affairs has also been established. This is an independent judicial organ, which is completely independent of the patent department. The judges—engineering and technical specialists and lawyers—are appointed by the government. Both categories have equal rights and duties. The decisions of the appeals court can be appealed to the Supreme Administrative Court.

In 1961 the Patent Court was formed in the FRG. The judges are appointed by the FRG president for life. The activity of the Patent Court is conducted in senates (departments) publicly and is carried out in collegiums

made up of three members. The Patent Court pronounces judgments in accordance with its own free conviction, basing itself only on facts and specific results.

Similar practical experience also exists in the socialist countries. For example, in Hungary, the legislation of which provides for a single form of the protection of inventions—the patent, only the judicial procedure has been established for the consideration of the overwhelming majority of disputes. The decisions of the State Department for Inventions can be reviewed only by a capital court of Budapest.

In the GDR the Leipzig Bezirke Court (the collegium for civil cases) performs the functions of a patent court. Its existence is envisaged by the GDR Constitution.

In China there are no independent specialized judicial organs for the consideration of patent disputes. But specialists for the people's courts, who are competent to consider such cases, are trained in 2 years. In our country there are neither specialized courts for the consideration of inventors' cases nor even personnel for their consideration in ordinary people's courts. Therefore, they consider inventors' cases in our courts "by 5-year periods." The courts are experiencing difficulties in the selection of experts (in patent study, economic, and technical examinations)—we do not have, after all, an official expert institution that conducts similar examinations. It is necessary to train specialists.

In February of this year at a conference in the USSR Procuracy, at which there were representatives of the Supreme Court, the Ministry of Justice, the State Committee for Labor and Social Problems, and the Central Council of the All-Union Society of Inventors and Efficiency Experts, the question of a patent court in the USSR was settled. The working group made in Article 56 completely new changes. For example, Paragraph 3 of Article 56: "The USSR Patent Court consists of a collegium for patent cases and the Presidium of the USSR Patent Court. A decision, which has been made by the collegium for patent cases, can be reviewed by way of supervision in accordance with the protest of the Chairman of the USSR Patent Court or the USSR Procurator General, by the Presidium of the USSR Patent Court."

Paragraph 4 of this article:

"The chairman, the deputy chairmen, the members of the presidium, and the members of the collegium of the USSR Patent Court are elected by the USSR Supreme Soviet."

What is new here? The collegium for patent cases and the Presidium of the USSR Patent Court appeared in Paragraph 3. Further, the protest can be on the part of not only the Chairman of the USSR Patent Court, but also the Procurator General and the Presidium of the USSR Patent Court. But what does the procurator have to do with it? The fact that there should also be monitoring of the activity of the USSR Patent Court. Why did the people's assessors disappear from Paragraph 4 of Article 56? I think it is clear: the patent court requires special knowledge on the the fundamentals of scientific and technical examination, invention law, the economics of invention, and patent and license work.

Of course, the patent courts will not consider all disputes that are connected with inventive activity, the judicial collegiums for civil cases of the people's courts will consider a portion.

It is of no small importance that in case of the introduction of patent courts in our country industrialists and businessmen of the capitalist countries would agree without fear to the expansion of trade with our country, would invest their capital in joint ventures, especially with respect to technology that is protected by patents, and would buy and sell licenses.

Problems With Soviet-Hungarian S&T Cooperation

18140339 Moscow PRAVDA in Russian 30 Aug 89 p 4

[Article by PRAVDA correspondent V. Gerasimov under the rubric "The World of the Eighties" (Budapest): "Will the Joint Ones Pick Up Speed? On the Problems of Soviet-Hungarian Scientific and Technical Cooperation"; first paragraph is PRAVDA introduction]

[Text] The range of cooperation of TAKI, a Hungarian institute which with Soviet partners is dealing with problems of communications, contains not only bright tones.

"Our participation in the Comprehensive Program of Scientific and Technical Progress of the CEMA Member Countries has longstanding traditions," relates TAKI General Director Istvan Kiss. "Back in the 1960's the well-known Druzhba microwave radio communications system, which gained recognition, was established jointly with Soviet colleagues from the Scientific Research Institute of Radio. The joint development of highly economical, reliable, relay devices based on integrated circuits took place in the 1980's. Then TAKI joined in the production of equipment for Soviet ground stations of long-range communications, which were carried out via satellites, and in the fulfillment of a number of assignments of Intersputnik [the International Organization for Space Communications]."

Let us add to what has been said: much recent research and development has also involved satellite communications. "The Equipment of Telephone Channels" is what one of the themes is called. Its essence is: spoken language, before "going out" into space, is converted into microwaves. In the report, with which they familiarized me at the representative of the USSR State Committee for Science and Technology in Budapest, about 100 themes figure, the dates of the completion of jobs and the start of series production are named. The equipment for the most part was tested last year and is now being successfully introduced.

"But we have already switched to the development of the 'filling' of a new generation," I. Kiss reports to me. "To what is this due? Although we quickly filled the order in accordance with the Comprehensive Program of Scientific and Technical Progress, we are producing only three or four units a year, and they already lag behind the world level by about 2 years. So that it is necessary to hurry."

As I. Kiss believes, a certain one-sidedness exists in the development of communications, the losses of time are large—deliveries are being dragged out for long years. Everyone is at ease. Neither the international market, its demands, nor the competitive struggle as if has any effect on the partners. The requirement to look ahead constantly and to strive for qualitatively new achievements, which make it possible to reduce the lag, is not being set for the developers.

Deputy Chairman of the Hungarian National Technological Development Commission Laszlo Muller, adding to this idea, directed my attention to the fact that in the already detailed programs of the Comprehensive Program of Scientific and Technical Progress and in concluded contracts there have been set goals of...yesterday.

Most often this is connected with the fact that the methods of planning within CEMA are bureaucratic. Tasks, which had already been accomplished in part or are secondary, were specified. On their part, it was also easier for the performers to accept easily filled orders. The assignments by no means make it incumbent to follow the other, far more difficult, innovative path.

The light and shadows of the work on the implementation of the Comprehensive Program of Scientific and Technical Progress appeared from the very start. The Soviet head organizations, which were appointed "from above," without knowing the terms, the prices for items, the condition of activity, and the potential of Hungarian enterprises, found partners with difficulty. While they in turn also had little interest or were not interested at all in the best end results. In contrast to this the formed relations of TAKI and the Scientific Research Institute of Radio conform far more to the goals of the Comprehensive Program of Scientific and Technical Progress, because the partners from the very start were interested in joint results, discussed in detail the financial aspect of the matter, and outlined clear prospects and deadlines.

L. Muller cited the following example. In all about 200 contracts were concluded by Hungarian institutes and enterprises. Some 470 developments were carried out and are being carried out. This is less than was expected. Of course, there are also significant, important achievements. But if the head organizations were to change over to direct cooperation with the performers of the tasks, bypassing the mediation of various coordinating services and getting rid of unnecessary instructions and orders, it would be possible to speed up significantly the implementation of the Comprehensive Program of Scientific and Technical Progress.

I sensed the advantageousness of direct contacts when I visited the Budapest Vilatiavtomatik Enterprise. Here longstanding relations have been established with Soviet partners—railroad workers and the All-Union Scientific Research Institute of Rail Transport. In the early 1970's the people of Budapest took part in the development for the USSR of the Ekspress-1 automated ticket sale and seat reservation system. But now Jozsef Szabo, head of a main division of this enterprise, is showing me the colorful prospectuses, which tell about the operation of the Ekspress-2 electronic system, which has united 16 regional systems with Moscow. Thus, it was possible to complete quickly the joint developments that were specified by the Comprehensive Program of Scientific and Technical Progress. In all 3,000 sets of electronic ticket teller equipment have been delivered to the Soviet Union.

"It is necessary to produce another 20,000 sets. We are prepared to do this quickly, we have the capacities. But then we were not included in the 'quota'," Jozsef Szabo immediately adds sadly.

Were not included in the "quota" means that as before barriers are being erected against the direct ties of enterprises. The Soviet-Hungarian trade turnover and the purchases of goods in Hungary are decreasing due to the decline of prices for petroleum and the inability of Soviet industry to fill the forming "breach" with deliveries of competitive machines, equipment, and household items; therefore, we have fewer and fewer forints. The Ministry of Railways and its institute, the All-Union Scientific Research Institute of Rail Transport, are not receiving them.

Other extremely necessary equipment is also being developed for the Ekspress-2. The fulfillment of the assignments, which are recorded in the Comprehensive Program of Scientific and Technical Progress and which are aimed at helping the Ministry of Railways to manage better the railroad car fleet, freight transportation, and repair operations, to organize a dispatch service, and to shorten the layover of railroad cars, is also under way. The Uralsk Branch of the All-Union Scientific Research Institute of Rail Transport has already been involved in this development.

But we are beginning to think that this "express" will also not pick up speed, that we are working in vain. Will the Ministry of Railways have the opportunity to buy our items any longer?

This question worries not only Jozsef Szabo. At the large Hiradastechnika Industrial Cooperative chief engineer Istvan Petoc told how 250 million forints were spent on one of the developments in accordance with a Soviet "head" order. For this money was borrowed, all the demands were met, but now it turns out that the "green light" has been blocked—the Soviet party has nothing with which to buy what was ordered. The rigid "nailing together" of reciprocal deliveries is hindering the fulfillment of the Comprehensive Program of Scientific and Technical Progress and the development of priority science-intensive dynamic sectors.

"The criticism, which is now being heard with regard to the implementation of the Comprehensive Program of Scientific and Technical Progress, concerns not only individual participants," Laszlo Muller states. "The overall problems of cooperation are also getting worse. Qualitative changes in the economic, currency, and financial mechanism of interaction are necessary.

"It is possible, it seems, to see the light at the end of the 'tunnel' we have built, if we rely on joint ventures and international production cooperation. Although, of course, this is just one of the means of solving the problems that have arisen."

Now 19 joint scientific collectives and laboratories are in operation. There are also joint ventures which are connected with the Comprehensive Program of Scientific and Technical Progress. Energotechno (the efforts of the Institute of High Temperatures of the USSR Academy of Sciences and seven Hungarian scientific research institutes, enterprises, and one bank were united), for example, is earning forints well, by implementing orders in Hungary. Inmash Mechatronika (two Soviet scientific institutes—the Institute of Machine Science and the Institute of Problems of Mechanics—and three Hungarian partners, including the Budapest Bank, belong to it) has outlined 24 different areas of activity, while the Elmaco Joint Venture also has a West German partner. The organization of the production of robots and electronic and machine building equipment, the purchase and sale of licenses and technologies, and the carrying out of other transactions—this polytechnical firm will be a kind of trade house, where science, production, and trade are joined into a single unit.

Direct ties, joint ventures and institutions, an interest of the partners in economic gain, and as a result appearance on the international market with advanced technology and items—precisely this, and not assignments, projects, plans, studies, and agreements, which are sent down "from above," can become the motive force of scientific and technical progress.

Soviet Programmers Form Joint Venture With Olivetti

18140346 Moscow POISK in Russian
No 19, Sep 89 pp 1, 3

[Interview with Doctor of Economic Sciences Professor V. Solomatin, director of the All-Union Scientific Research Institute of the Automation of Management in the Nonindustrial Sphere, by POISK correspondent Sergey Brusin, under the rubric "What Is Science To Be Like?": "Intelligence for Export"; date and place not given; first two paragraphs are POISK introduction]

[Text] Scientists are calling the reports of the press about the experience of this institute a quiet sensation. Its associates were among the first in the country to lease an institute and to appear on the international market. And not without any particular reason, take a look: they have concluded several contracts for the sale of software and scientific and technical services. And as a result there is the establishment of a joint venture. Not with just anyone—with the famous Olivetti company, which holds first place in Europe in the production of personal computers, while among software suppliers it is among the 10 leaders. It is a fact that really deserves amazement. For the institute is selling not petroleum, not lumber, not rare metals, but the skills of Soviet specialists.

The interview of our correspondent with Doctor of Economic Sciences Professor V. Solomatin, director of

the All-Union Scientific Research Institute of the Automation of Management in the Nonindustrial Sphere, concerns these "paradoxes."

V. Solomatin: The establishment of the joint venture International Information Service (INIS) is by no means the beginning, but a new stage in the development of 10 years of cooperation with foreign partners. Our institute knows the Soviet market. Olivetti knows the West European market. We proved to be useful to each other. Together we will develop and supply management systems and make scientific and technical consultation services in the area of data processing available to Soviet and western enterprises, which are organizing joint ventures in the USSR.

It must be said that for the VNIINS—the All-Union Scientific Research Institute of the Automation of Management in the Nonindustrial Sphere—there is nothing new in this work. We specialize in the development of advanced automated systems and software for organs of state management and party supervision and for a number of most important sectors—construction, agriculture, transportation, health care, and trade.

POISK: Thus, are you claiming that the skills of Soviet specialists are not lower than those of European class?

V. Solomatin: The 10-year path, which was covered by our institute, was required for this. We realized perfectly well the full degree of "neglect" of domestic specialists both in skills and, what is the main thing, in the lack of preparation for competitive labor.

POISK: How was it possible to achieve the changes?

V. Solomatin: We understood: it is necessary to begin with the manager. Subsequently, when changing over to leasing, the fact that I had broken myself of the "tried" methods of management—the order and pressure—proved very useful to me. You must know yourself how to do what you want to get from others. In general, I would call the ability to work with people and to carry out the placement of personnel the main demands on the manager of the scientific collective.

Incidentally, the habit of crash work, rush work, and labor triumphs, which was cultivated for decades, is nothing but a feature of the obvious backwardness of Soviet specialists. At all the famous firms, where I had occasion to go, I saw only measured labor, conscientiousness, moderation, and punctuality. Precisely they, and not a fuss and hysteria, yield a world result.

When the Olivetti company concluded with us the agreement on the establishment of the joint venture, the Italians gave the following as the reason for their choice: at the All-Union Scientific Research Institute of the Automation of Management in the Nonindustrial Sphere the skills, reliability, businesslike approach, and a realistic view of things impress them.

Only these and no other qualities will enable the director of the institute, which has changed over to leasing, to constantly provide a world-level result. Alas, such activity, in essence, is not even recognized by public opinion as scientific activity. Newspapers often play up the activity of the organizers of science only as scientists. In my deep conviction, the modern organizer of science is a specialist who is able to use various methods of research and, first of all, the art of managing the scientific collective.

In the time that we have been working on a lease the people themselves have changed very greatly. I see how they are freeing themselves from obvious subordination to the administrator and administrative discipline. The attainment by our firm of a competitive level made it possible to forget discipline problems in the collective. This criterion determines the powers of the director as an organizer.

The aptitude for competition, the rejection of administration by mere decree.... These qualities have not been required of us for decades. The changeover to leasing is affording just the first chance to begin eliminating the gaps.

POISK: How is it the "first chance"? Should the lease really not solve all the problems of the enterprise, as well as of scientific and technical progress and the economy as a whole?

V. Solomatin: The fact that a person wanted to work does not yet solve all the problems. Let us take the famous Ford company. There 100 years ago all the staff members wanted to work, they promoted the best ones and equipped their labor most carefully. However, the daily efforts of everyone are still required in order not find oneself tomorrow among the outsiders.

The same kind of picture now exists in our country. Suppose today at the enterprise, which has changed over to leasing, everyone wanted to work. Now it is necessary to make it—the enterprise (!), not the product—competitive and to develop a mechanism that focuses the interests of the director and the entire collective on this goal.

At the ordinary, not leased enterprise staff members often receive a wage simply for reporting to work. But what if in this case the position of the director is an elected one? Does it turn out that they elect him so that he would maintain this tradition? So, he should reject national economic interests or seek compromises. In my opinion, it is entirely a matter of one widespread mistake. It consists in the fact that we create material stimulation funds, but adhere here to the canons of unwarranted leveling. And, hence, we never achieve the main goal: to interest each specific person in the end result. It is necessary to pay in accordance with the end result. Otherwise the product will not be profitable and will not conform to world standards. Therefore, we at the institute decided to regard the wage received by the worker as the advanced portion and to define the bonus as the difference between the earned money and the

money received as an advance. A varying salary is also an evaluation of your activity. That is what the essence of our experiment is.

In case of the organization of sectorial science in general it is necessary to begin with the economic result. Work and the result are different things. Sectorial science is a large area of the national economy with many billions of rubles of expenditures, in which more than 1 million specialists are employed, and its tasks are the same as those of society as a whole. However, in no area of the national economy, except for science, does a lifetime wage exist. A doctor of sciences receives once and for always a guaranteed 500 rubles.

The changeover to the new system of material stimulation at our institute was discussed by the entire collective. Everyone understood what it threatens, but agreed to it. But the social guarantees in this case were increased. We made the decision to increase the payments to retirees. As a result good workers in 10 years will receive practically double the pension. If the council of the labor collective decides to dismiss one of the staff members, in this case he is paid the wage of 6 months. Is it generous? No, this is more profitable for us than to pay him unearned money for life.

But I would like to warn: if such methods are introduced in an unprepared collective, it will explode. The quarterly distribution of revenues is a very painful operation. It is rather dangerous to agree to it. But all this is repaid with interest. In the collective a new psychological and economic atmosphere has formed, the attitude toward the client has changed fundamentally, an interest in increasing the amount and quality of work has appeared. Previously it was difficult to "hammer" an unplanned theme into a department, now all undertake it themselves. For the first time I saw that the staff serves not itself and not the director, but the collective: contracts of the collective with the staff have become a part of practice. We are also discussing how many managers we need in general.

Laboratory plans and reports are not taking root here. It has become clear that they are also not that necessary. And are laboratories themselves needed? They began to decrease, and now at the institute there are no longer any of them at all. In our situation such a structure has proved to be far more productive. This led as a result to the decrease of the number of managers to less than one-half. And, what is very important, they were released only at their personal requests, no administrative steps were taken.

POISK: But your example thus far has not inspired many. The majority of collectives expect, apparently, that instructions will come to them from above to lease their own enterprise. That is how they cultivated the idea that under "wise management" we will achieve all the goals....

V. Solomatin: It is necessary to talk not about wise management, but rather about the insufficiently skilled actions of the government in its old makeup. Lawmaking, which was not corroborated by experience and practice, took place. That is how the Law on Elections originated. The same thing happened with the Law on the State Enterprise, which was adopted without an experiment. This had the result that the quantity of goods is decreasing, their quality is growing worse, and prices are increasing.

Our institute is organizing, in essence, an experiment, which was not ordered by anyone above, with respect to ownership and on appearance on the world market. But this is also an experiment on the organization of service of the Soviet individual at an international-class level. It is a question, of course, not of the repair of a roof with holes or the delivery of furniture, but of information systems, which improve indirectly, but significantly medical, transportation, food, financial and credit, and other service. Are the results of this experiment really not of interest to science and the economy? Alas, we are not encountering any support, more often we are encountering obstacles. We are asking permission to give our associates additional paid leaves as a step of encouragement. They refused us. Because...it does not conform to the legislation. Although precisely such leave is envisaged in the academic sphere.... Like the institute of S.N. Fedorov, in some departments they not so much analyze us as criticize us. Or, for example, we are proposing, in strict conformity with the principle of remuneration from the end result, to distribute a portion of the foreign currency, which was received by the institute, among the developers whose labor contribution is also bringing the institute (and at the same time the state) to the world level. However, in the state foreign economic commission of the USSR Council of Ministers they replied: what you have thought up does not conform to prevailing legislation!

Our economic problems are already becoming more than painful, and just the reconstruction of superior organs will not change the situation. It is necessary to settle the question of ownership. When state organs, be it the people's control or financial organs, deal with our institute, they consider us property and believe that they have the right to evaluate our actions and to halt them at any moment. Until common sense triumphs in the question of ownership, all laws will simply hang in the air.

Georgia Seeks Local Control Over Patents, Defense Contracts

18140340a Tbilisi ZARYA VOSTOKA in Russian 10 Aug 89 p 1

[Article: "'Intellectual' Sovereignty"; passages in boldface as published]

[Text] [Boxed item: Our Position: Without the establishment of republic ownership of the fruits of science, real economic independence cannot be achieved.]

The economic sovereignty of the republic includes not only questions of the efficiency of production and the mechanism of cost accounting, but also an important legal aspect: for genuine sovereignty it is necessary that all the means of production, which are located on its territory, objects of the infrastructure, and raw material resources, such as mineral resources, land, water, and air, would be owned by the republic. Georgian economists have repeatedly spoken out on these questions in the press, including our newspaper. Let us try to unravel and define more precisely the provisions, which have been incorporated in the draft of the Basic Principles of Economic Sovereignty of the Georgian SSR. The questions of the ownership of the results of the labor of scientists thus far have not come under the sights of the public. It is possible that several decades ago such an approach would have been justified. Science-intensive works held a modest place in the economy; raw materials and large machine building complexes were considered the basic wealth of one nation or another. Meanwhile today the situation has changed radically, a radical turn has occurred: the scientific potential of any society is recognized as the basis of its wealth. The scientific component is a necessary ingredient of any health economy and ensures its dynamism and competitive ability on the markets of the world. While under the conditions of the competition of nations it also ensures a higher standard of living wherever the share of scientific output in overall production is higher. Science is the dearest commodity.

Now let us see who today is exercising sovereignty over the scientific output being produced in the republic. It is well known that Georgian science has made many important breakthroughs in various fields of knowledge. It is also well known that an excellent reserve of science has been created in the republic, a significant portion of the republic budget is being spent on its maintenance. However, the procedure of using the results of scientific development is totally unsatisfactory. Today in the republic not one invention is registered, inventor's certificates are not issued. Inasmuch as all-union legislative acts established the all-union ownership of scientific developments, a paradoxical situation is arising. Georgia, of course, cannot introduce all the discoveries and inventions, which have been made in its academic and VUZ [Higher Educational Institution] laboratories. This is impossible, inasmuch as scientific creativity is a subtle object, which is not always perceptible to planning networks. Besides, nowhere in the world does a situation arise, when all scientific results are used within a country—no society has such a universe of possibilities of introduction. Everywhere the fruits of science have become an object of active export and import. At the same time, for the republic for all the abundance of "lucid minds" the outlet to this bountiful market for the present is almost completely shut. The all-union legislation states that ownership of the Union is established for scientific developments—we have already spoken about this. The ownership of the Union in this area, just as in many others, signifies the ownership of the central scientific bureaucracy. According to this law, any registered scientific achievement—rationalization, invention, discovery—for 15 years is actually a prisoner of the bureaucratic structures of the central department. During these 15 years the bureaucracy of the center can introduce an invention, but might not introduce it, and can shelve it or use it in an international bid. In any of these versions the republic receives almost nothing. The following fact attests to how in the center the bureaucracy is dealing with the scientific wealth obtained from the republic: only 32 percent of the efficiency proposals from Georgia are introduced.

The following anecdote (an absolutely true story) is well known: one enterprising Japanese man published a selection of a rubric of the journal NAUKA I ZHIZN, which gave advise to self-employed designers and housewives. In Japan the book had enormous success, inasmuch as it contained, if you look into it, an encyclopedia of Soviet "know-hows." This case demonstrates fully the competence and commercial gumption of those who today are responsible in the country for trade in science for export. It would be logical to put in the hands of the republic trade abroad in the results of the work of its scientists and to establish complete national sovereignty over the scientific component of production.

Indeed, is it wise to demand the ownership of plants, half of which it is safe to turn into scrap metal, and rather depleted mineral resources, but not to demand the full right to dispose of what tomorrow may become a significant source of foreign currency for the republic?

A serious legislative breakthrough is necessary: first, to register inventions, efficiency proposals, and discoveries precisely in the republic. Second, to establish a powerful organization which is capable of carrying out the international promotion of Georgian "know-hows." Moreover, national sovereignty in science presumes that foreign inventors will be able to patent their achievements in Georgia, which in itself is a profitable business. It is necessary, of course, to take all this into account when preparing the draft of the new republic Constitution, as well as to strive for the removal from all-union legislation of the provisions which are at variance with the national ownership of science.

It is also worth talking a little about another paradox. If we actually place the national ownership of "gray matter" among the important, burning tasks, we will

have to reform the entire structure of such spheres as patent studies, technical information, work with inventors, and their training. Today in the republic **THERE ARE NO ECONOMIC ORGANS THAT ARE RESPONSIBLE FOR THE INTRODUCTION OF SCIENTIFIC DEVELOPMENTS.** Practical experience has shown that not an organizational administrative monster like the Committee for Science and Technology, but a number of independent commercial firms are needed. Their task is not to impose introduction decisions, but to ensure the normal functioning of the market. And if an invention does not find application in the republic, to sell it at as high a price as possible.

Finally, it is necessary to get the republic All-Union Society of Inventors and Efficiency Experts out from under the tutelage of trade unions, into which this organization, as they say, got through the impulsive decision of N. Khrushchev, who did not know where to stick a single persistent efficiency expert. No, the time of impulsive decisions has passed. The persistent work of lawyers and managers and a special, independent tax policy in the area of science are needed so that it would serve first of all the interests of the republic.

In particular, such cooperation is also necessary in the following matter. Today a large number of scientists of the republic are working on what are called "closed" themes. Not only the themes, which are being fulfilled in accordance with an order of the Ministry of Defense, but also any themes of scientific research, which in principle could be used for the needs of the military complex, are actually closed by an order from above. As a rule, the developers never know: whether or not their achievements have been introduced, how extensive an application their discoveries are finding. This procedure of classification has been established for a long time, and today it is necessary to revise it. It will probably be advisable to establish the procedure that is accepted throughout the world: only jobs, which have been ordered and paid for by the Ministry of Defense from its own budget, should be liable to classification. It goes without saying that such a payment should be included in that portion of our deductions for the all-union budget, which is used for defense. Moreover, apparently, the right to decide what volume of such "closed" orders it can fulfill should belong only to the republic. Otherwise such a situation, when given the existence of its own urgent production problems the republic science corps will be kept busy with other "closed" orders, might result.

The USSR Supreme Soviet has considered the proposals of the Baltic republics on the changeover to cost accounting as of 1 January of next year. At the same time work is under way on an all-union law on the cost accounting of republics and regions.

GSSR Buro Criticizes Republic Academy on Personnel Issues

18140340b Tbilisi ZARYA VOSTOKA in Russian 3 Aug 89 pp 1, 3

[Article: "In the Georgian CP Central Committee"]

[Excerpt] At its regular meeting, which was held on 1 August, the Buro of the Georgian CP Central Committee discussed the question of the work of the Georgian SSR Academy of Sciences on the training and use of young scientific personnel of the republic. Having noted that the Academy of Sciences is implementing steps on the improvement of personnel policy for the purpose of the more extensive enlistment of young scientific personnel in the accomplishment of the urgent tasks of science and scientific and technical progress and the increase of the effectiveness of scientific research, the Buro of the Central Committee at the same time stressed that a radical change had still not occurred in the use of young scientific personnel as a powerful reserve of the increase of the scientific and technical potential of the republic. The work of the Academy of Sciences in this direction was recognized as unsatisfactory.

CPSU member and President of the Georgian SSR Academy of Sciences A. Tavkhelidze was commissioned by the end of this year, on the basis mainly of all-union and republic scientific programs and scientific and technical programs, to ensure the formulation and, subsequently, the annual updating of a consolidated list of urgent scientific themes with the preferential participation in their accomplishment of graduate students and young scientists and specialists.

The leadership of the Georgian Academy of Sciences and the Ministry of Public Education were ordered by the end of the 3d quarter of this year to ensure the development of a system of interaction with general educational schools, including in alpine areas, for the purposes of improving the process of the training of students and selecting talented young people for their subsequent scientific and technical orientation; for the purpose of promoting the implementation of the principles of individualized instruction to organize annually summer specialized schools for upper grade students of general educational schools, tekhnikums, and vocational and technical schools and to enlist in this work, along with leading scientists of the republic, promising young scientists. It was deemed necessary to expand the participation of scientists of the Academy of Sciences in teaching work at higher educational institutions of the republic and the practice of conducting conferences, symposiums, and other scientific and scientific and technical measures of young scientists, specialists, and students. The training of scientific personnel for the autonomous formations of the republic for the rapid increase of their scientific potential and their bringing closer together on the basis of common scientific interests should be improved. Regular meetings of young scientists of various regions and autonomous formations for the purpose

of discussing the urgent problems of the present situation of the republic have to be ensured, young scientists have to be enlisted more extensively in the work on the development of a long-range economic political model of Georgia and in the settlement of the most important questions of the life of the Academy of Sciences.

CPSU members A. Tavkhelidze, Minister of Public Education G. Yenukidze, and Georgian SSR Minister of Foreign Affairs G. Dzhavakhishvili were commissioned to ensure the significant expansion of direct scientific and technical ties with leading foreign scientific and educational centers both on the level of the training and the improvement of the skills of specialists and on the level of the extension of cooperation in the most urgent directions of the development of the national economy with allowance made for the prospects of the socioeconomic development of the republic.

Steps were outlined on the improvement of the social support of young scientists, including the increase of the amounts of available housing and the allocation of a parcel of land for the construction of a cooperative or communal apartment house. [Passage omitted]

Scientists Debate Reoccupation of Chernobyl Radiation Zones

18140334 Moscow POISK in Russian
No 17, Aug 89 pp 4-5

[Article by Svetlana Savrasova under the rubric "An Examination Is Required" (Minsk): "Opposition"; first five paragraphs are POISK introduction; passages in boldface as published]

[Text] Today the opposition of two scientific concepts is at the center of attention of the Belorussian community.

Vice President of the USSR Academy of Medical Sciences Academician L. Ilin, chairman of the National Committee on Radiation Protection (NKRZ), and his supporters defend the so-called concept of safe residence in radioactively contaminated regions, where the cumulative radiation dose will not exceed 35 rem over 70 years.

President of the Belorussian SSR Academy of Sciences Academician V. Platonov and his allies assert that radiation in any, even the smallest quantity is harmful to a living organism and that safe residence is possible only in a radiation-free area.

At a recent session of the republic Supreme Soviet the people's deputies, including prominent Belorussian scientists, discussed the State Program on the Elimination of the Consequences of the Accident at the Chernobyl Nuclear Power Plant in the Belorussian SSR.

"Let scientists come to an agreement among themselves and voice their opinion!"—the republic leadership is adhering to such a position. But let us try to understand whether it is actually a question of a scientific problem, of the clash to two scientific concepts.

Ilin Versus Ilin

Before the accident at the Chernobyl Nuclear Power Plant Leonid Andreyevich Ilin and many of his present supporters asserted: "In radiobiological experiments at the cell and molecular level the ability of even individual acts of ionization of cause disturbances of some hereditary mechanisms has been shown. ...With allowance made for the necessity of a cautious, humane approach to the standardization of radiation exposure when elaborating norms of radiation safety the hypothesis of the absence of a threshold for random radiation effects and of a linear dependence between the dose and the effect in the area of small doses was taken as the basis."

More simply speaking, one gamma-quantum may be sufficient, for example, to cause the mutation of some gene and to trigger the duplication of an altered DNA molecule. So that it is better not to receive this very gamma-quantum.

However, a natural radiation background, from which there is no getting away, exists. According to the information of Academician Ilin, which was published in 1981, the natural exposure comes to approximately 0.1 rem a year per person. As a result of this we have 21.3 fatal cancer cases per 1 million people.

In such a case just how "safe" is it to live in a region, where in addition to the natural background fivefold greater exposure occurs: 35 rem over 70 years—this is on the average 0.5 rem a year? Or has the linear dependence of the detriment to health from a radiation dose, which Academician Ilin defended, already been reversed?

USSR People's Deputy S. Shushkevich asks:

"In 1976 the health regulations of the designing and operation of nuclear power plants (SPAES-76) established the maximum radiation doses for individuals of the population at 0.5 rem a year. In the new version, SPAES-79, 3 years later this norm was made twentyfold more strict! A dose of 25 millirem a year began to be considered the maximum dose.

"How is one to coordinate these strict instructions with the fact that since the fall of 1988 it has been persistently suggested to the USSR Academy of Medical Sciences to consider safe a four-hundredfold greater dose?! In a year 10 rem! For according to the new concept the 'safe' 35 rem over 70 years accumulate after the pattern: 10 rem the 1st year, 3.5 rem the 2d year, 2.5 rem the 3d year, and so on.

"In 1969 a list of illnesses, which are contraindications to work with radiation—30 diseases—was included in the radiation safety norms. In the new norms, which were published in 1988, this list was supplemented by another four ailments.

"At the request of Gomel deputy V. Korniyenko physicians of Braginskiy Rayon compiled a list of the diseases, which 'resonated' after the accident at the Chernobyl Nuclear Power Plant. And, imagine, we had in our hands confirmation of the correctness of the norms—the number of precisely the diseases (excluding metal diseases), with which one must not allow a person to work with radiation, increased.

"It remains unclear why the Ministry of Health and the USSR Academy of Medical Sciences prohibit sick people to **work** 8 hours a day with an exposure of 0.025 rem a year and permit these sick people to **live** all 24 hours a day with an incomparably higher level of radiation. Where is the logic here?"

The Truth and Only the Truth

"Everyone, who was fated to die, has died. And no one is suffering any more from the consequences of the explosions at Hiroshima and Nagasaki." On 3 September 1945 American General Thomas Farell made this sententious utterance at a meeting with foreign journalists, and it spread through the world as the official opinion of American scientists. Life showed that, when dealing with radiation, one must not jump to conclusions. The consequences of the explosions at Hiroshima and Nagasaki

are still being carefully studied by Japanese and American scientists. And they, while formulating some recommendations, thus far are refraining from adopting any scientific concept of the possibility of the safe existence of man under the conditions of radiation.

We in Belorussia have heard and read much about the tragedy of the hibakusha—the Japanese victims of the nuclear bombardment. Our country has consistently come out in favor of the banning of nuclear weapons, and the lethal nature of ionizing radiation was one of the often used arguments in the promotion of disarmament. Now it turns out that it is impossible to confine the truth to the framework of some argument. It is manysided.

And it turns out that radiation is not such a dangerous thing. More and more often "positive" examples are turning up now in the press, now on television. In July, for example, the journal BELARUS interviewed republic Deputy Minister of Health and Chief Public Health Physician Viktor Buryak. In the material it was mentioned, incidentally, that in Brazil and India many residents "receive a dose of up to 60-100 rem over 70 years of life, and no abnormalities in the state of their health have been identified."

"We immediately verify each such statement," said USSR People's Deputy Professor S. Shushkevich, prorector of the Belorussian State University imeni Lenin. "And it turns out that they by no means 'work' for the concept of safe residence. Indeed, in Kerala and Tamil Nadu states in India there are territories with an increased radiation level. Thus, for example, in Kerala State 70,000 people live on such a territory, on the average they receive 0.376 rem a year. Only a small group, approximately 500 people, receive 2 rem a year, but this is a negligible statistical sample for serious observations. Moreover, it is well known that ailments caused by radiation have a latent period of tens of years. In India the life expectancy is such that a person, on the average, does not have time to die from the consequences of radiation damage. As to Brazil, there actually are there volcanic mountains, one of which, Minas Gerais, 'generates a background' of 25 rem a year! And this is simply not worsening the general condition of Brazilians. For no one ever lived or lives on this mountain! As you see, the truth about how well man gets accustomed to radiation is cheap.... And it is very regrettable to find similar examples not only in popular journals, but also in serious scientific works. I have in mind, in particular, the paper 'The Experience of Chernobyl in the Context of Modern Problems of Radiation Protection,' which was delivered by Academician L. Ilin at an international conference on radiation protection in Sidney last year. It is asserted in it that 'the effective collective cumulative equivalent dose for the entire population comes to 326,000 man-sieverts (that is, 32.6 million man-rem—Author's note). If we use the thresholdless dependence "dose-effect" and the risk factors, which are suggested by the International Committee on Radiation Protection (MKRZ) for random effects, the surplus (additional) death rate from cancers may theoretically come to several hundredths of a percent of the spontaneous level, while the corresponding number of genetic effects of the first two generations of people, who have been born of exposed parents, will come to several hundredths or thousandths of a percent.'

"I am by no means questioning the correctness of this prediction. I want only to find out why were all the data cited in terms of the entire USSR population, and not its exposed portion? The population of Belorussia makes up 3.8 percent of the number of citizens of the country, and if our republic yields these very 'several hundredths of a percent of the spontaneous level,' for the nation this will turn into a far less comforting statistic. If we take the oblasts, which suffered most and in which about 300,000 people live, for this population Chernobyl will prove to be a disaster which, perhaps, will ruin at least 1 in 10 people!

"Moreover, it is disconcerting that the USSR National Committee on Radiation Protection is not taking the new risk factors into account. American and Japanese scientists proposed them in 1986. Prior to this the T65D dosimetry system, which was developed in 1965, was used. The new system—the DS86—indicates the necessity of serious upward corrections of the dangerous consequences of radiation. For example, for small doses the number of leukemias given a collective dose of 1 million man-rem will come not to 20 cases, as they calculated in the International Committee on Radiation Protection, but to 40-80 cases. The number of other lethal oncological ailments will jump from 105 to 300-700 per million people. In general, if we use the new dosimetry, the total number will reach from 340 to 780 deaths per million, but taking into account that we received 32.6 million man-rem, it goes from 11,000 to 28,000! This is by no means 'hundredths of a percent'! Specialists of the National Committee on Radiation Protection for some reason did not consider it necessary to recalculate all this for Belorussia with its 10 million people, and all the more for the three contaminated oblasts."

"These calculations, unfortunately, are not the only thing that can be disconcerting in the paper at the international forum in Sidney," Academician of the Belorussian SSR Academy of Sciences A. Stepanenko, USSR People's Deputy and vice president of the Belorussian SSR Academy of Sciences, shared his doubts. "I do not know what to think of the assumption that 'preventive iodine treatment was carried out with respect to those, who took part in eliminating the consequences of the accident, the residents of the city of Pripyat, and the population of the region, which lives in the 30-kilometer zone.' In another publication, 4 months after the statement in Sidney, Academician L. Ilin reported that 'in all 5.4 million people were covered by preventive iodine treatment, of them 1.7 million were children.' More than 115,000 people were evacuated from the 30-kilometer zone. I doubt that all of them were covered by preventive iodine treatment. The newspaper

PRIPYATSKAYA PRAVDA, for example, informed its readers about the accident only on 9 May: '...Some leaking of radioactive substances is occurring.... The formed radiation situation is improving.' In several rayons of the republic on 4 May they undertook the prompt evacuation of...cattle, they began to rescue children 3-4 days later. Tens of surveyed evacuees do not recall being given any preparations. Who underwent preventive iodine treatment and when? In Belorussia at any rate they did not hear about this. How could the number of people covered by this step come to 5.4 million? For stable iodine for preventive purposes should enter the body 2 hours before anticipated exposure, '...if its taking is postponed an entire day, the decrease of the dose (of received radiation) is expected to be small.' All these questions, which were addressed to the chairman of the National Committee on Radiation Protection, for the present are up in the air."

The meeting with deputies enabled me to become familiar with the statement of Ilin at the conference in Sidney and, availing myself of the opportunity, I want to clarify several things both as a journalist and as a witness and participants in the events 3 years ago.

From the Verbatim Report of the Discussion of the paper of Academician I. Ilin in Sidney:

P. Mursi, a specialist of the atomic research center in Bombay, India:

"What number of women in the 30-kilometer zone were pregnant at the time of the accident, how many of them decided to bear the child to full term...and is there information on the children who were exposed in utero?"

L. Ilin:

"Among the 115,000 people, who were evacuated as a result of the Chernobyl accident, there were approximately 4,000 pregnant women. On the basis of performed medical analyses it is possible to conclude that the accident did not have an effect on the frequency of the termination of pregnancies...."

Thus, in such a case the women from the 30-kilometer zone were in a better position than women of Minsk. In the capital of Belorussia gynecologists, obeying a secret order and certain oral instructions, persistently advised pregnancy to be terminated at an early stage, before 3 months. I know this for certain, since a month after the accident I regularly visited a maternity advice bureau and on 30 May gave birth to a child. They made out for pregnant women a certificate for an abortion and said: "If you want to bear a deformed baby, go ahead! If you do not want to, we are giving you a chance." Only a month later, while in the prenatal ward, did I hear that the first "public" instruction had appeared. The American Gale at the end of May instructed gynecologists that the first days of the accident were of the greatest danger not to early pregnancies, but to 7- to 9-month old fetuses, in which the thyroid gland had already formed—radioactive iodine dominated in the release. We and our infants received precisely it, and not preventive stable iodine, while those, who terminated an early pregnancy, more often than usual ended up with inflammatory processes and infertility—the abortion clinics did not cope with the load, and sanitation at them suffered noticeably....

Do the scientists from the National Committee on Radiation Protection know this side of the truth? Or will time pass and they, like some members of the government, on whom the fate of an entire people depended, say: "We did not know this"? Is it possible to be truthful, without having been informed?

What Kind of Commission Is It?...

A group of experts of the World Health Organization, which was invited for the evaluation of the concept of safe residence in radiation-contaminated rayons with a cumulative radiation dose for a person of 35 rem over 70 years, was in the USSR from 19 to 25 June 1989.

The group included: Professor D. Beninson, chairman of the International Commission on Radiation Protection and director of a department of the atomic energy commission of Argentina; Professor P. Pelleren, director of the radiation protection service of the ministry of health of France; and Doctor P. Waite of Canada, supervisor of the radiation protection group of the WHO Secretariat. The experts visited two rayons of Gomel and Mogilev oblasts and took part in a conference that was organized by the Belorussian SSR Academy of Sciences on 23 June.

The commission fully supported the concept of Academician L. Ilin and his supporters.

Moreover, the experts declared "that if they were asked to establish levels of the lifetime dose, they would choose values two- to threefold greater than 35 rem"! It must be said that such liberality simply stunned those present. For at this discussion Corresponding Member of the USSR Academy of Medical Sciences A. Guskova in her statement with figures and facts in hand convincingly demonstrated to the audience that "obvious changes occur given a strength of the dose of more than 25 rem a year or a cumulative dose of more than 75-120 rem in a lifetime." But a dose "two- to threefold greater than 35 rem" comes precisely to 70-105 rem. Let us note that Professor A. Guskova is a supporter of the concept of L. Ilin. Such a spread of evaluations in the group of like-minded people forced the Belorussian opponents to evaluate the competence of the experts very closely.

"I do not question the authoritativeness of the foreign scientists," S. Shushkevich said, "but Professors D. Beninson and P. Pelleren are civil servants of countries that refuse to sign the nuclear nonproliferation treaty. Obviously, the state underestimation of the consequences of the use of nuclear weapons, like it or not, affects the world outlook of citizens, even if they are evaluating the radiation of the 'peaceful atom.' I grant

that while visiting the contaminated rayons the experts were not able to investigate in detail the state of affairs. Their impressions would hardly have been so optimistic, if they had additionally visualized the daily life of the peasants living in the contaminated area. It differs appreciably from the daily life of, say, the French peasant, who has, in contrast to the Belorussian, the opportunity to take a shower daily, and not 'to indulge in a bath' once a week. Obviously, the experts also do not visualize all the details of our passport system. They, in conformity with their ideas of human rights, provide conclusions of a recommendatory nature according to the principle: 'If you do not believe my words, leave!' Thousands of our citizens have been deprived today of such an opportunity. The instances, when leaving certificates were not issued to those wishing to move from the contaminated zones, they are not registered in other areas, and they are fined for violating passport procedure, are well known. The WHO experts probably did not completely appreciate the degree of responsibility of their mission, and this is not their fault."

A. Stepanenko:

"In our opinion, the invitation here of specialists in radiobiology, radiation genetics, and ecology would be useful. I believe that the arrival of staff members of, for example, the Japanese Radiation Effects Research Foundation—researchers who know the consequences of Hiroshima and Nagasaki—would be of great benefit to us. I hope that since it was decided to invite foreign specialists for the evaluation of the position of Academician Ilin, we will also be afforded such an opportunity."

In addition to the opinion of the USSR people's deputies I want to add the opinion of many simple citizens of Belorussia. Literally 2-3 weeks before the arrival in the republic of the foreign experts the book of Maria-Theresa and Bengt Danielsson "Contaminated Paradise"—a study on the life of French Polynesia, which at present has become a proving ground for French nuclear weapons tests—appeared in all bookstores and instantaneously sold out. Many thousands of readers learned from this book that Professor P. Pelleren had already once performed the role of such an expert. But he did not cope in an entirely fitting manner with this mission in his own homeland, since "he knew nothing of the radiation situation in French Polynesia.... So that it is possible to explain his inclusion on the commission only by the desire to use the name of Pelleren for propaganda purposes." Of course, such information did not increase the confidence in the French expert among those whose safety he decided to protect....

Our Map Is Broken

In many of their statements the supporters of the concept "35 rem over 70 years" complain that nearly the main misfortune of the residents of Belorussia is radiophobia. It would be ridiculous to deny such a psychological phenomenon, for they directed our attention so often to the sad experience of Hiroshima and Nagasaki. But why did radiophobia bloom with an especially magnificent flower only now, in the 4th year after the accident? In many respect the publication of a map of the contaminated rayons catalyzed it. Radiophobia succeeded radioignorance. The residents of the rayons, which were encircled on the map by a bold continuous curve—contamination higher than 40 curies per square kilometer—got worried first of all.... Even in conformity with the concept "35 rem over 70 years" danger threatens them, they should be immediately moved. Rather, they should have been moved 3 years ago, but at that time we did not yet have a map.

"Unfortunately, the map not only did not clarify the radiation situation for us, but in many respects also confused it," USSR People's Deputy Yu. Voronezhtsev, senior scientific associate of the Institute of Mechanics of Metal Polymer Systems of the Belorussian SSR Academy of Sciences, believes. "First, it was compiled only for cesium, although, as is known, the reactor released up to 200 isotopes. Second, the accuracy of the estimate was not established anywhere by any official documents. Academician Yu. Izrael, director of the USSR Hydrometeorological Scientific Research Center, whom I respect as a specialist, stated the error of the map to be 30 percent. But the personal authority of Izrael is still not a guarantee of accuracy. While 30 percent is 10.3 curies per kilometer for a territory with an average level of contamination of 40 curies per square kilometer. That is, it is necessary to single out at once for movement farther away rayons with 29.3 curies per square kilometer. Third, in general, for the most part, it is impossible to use average values, when it is a question of the mosaic fallout of radioactive substances. I have an official letter of Academician of the USSR Academy of Medical Sciences A. Vorobyev, director of the All-Union Hematological Scientific Center of the USSR Ministry of Health, concerning the fact that several people, who received a much larger dose of radiation than they should have received according to the map, had been found. In the village of Tulgovichi, as IZVESTIYA writes, lives a girl 'who has already accumulated 13 microcuries per kilogram of weight.' This comes to more than 100 rem a year due to internal radiation."

It is important to understand that, say, 40 curies "on the average" is, perhaps, 39 curies in one corner of a field, 41 curies in the second corner, 0 curie in the third corner, and 80 curies in the fourth corner. Where is the guarantee that your child is playing at the "zero" point, and not at the "peak" point? There is no such guarantee, since we also do not have sufficient instruments, specialists, and economic and technical resources to make a check of a contaminated area directly. And even not to make a check, but to check regularly, for the picture "floats." Winds, rains, dust storms, migrations of animals and insects—everything changes the picture of contamination. The decontamination of soils and the removal of a 5-centimeter layer of earth absolutely do not justify themselves, the results are negligible. Contaminated town residences live such a life, from which it

is hardly worth expecting a decrease of the level of contamination. Roads are washed by water that runs into the shoulders. The pouring over roofs of water, which together with radioactive dust runs into the yard, is called their decontamination. Promised pure milk at the rate of 1.2 liters a person a day, as a rule, is delivered to villages once a week. What is one to say here about firewood? They heat with what they did earlier—whatever grows around. If they waited for clean firewood, they would freeze. So that now in every furnace the radiation level is like in a nuclear reactor. A portion of the "wood" radiation is carried away with the smoke, to settle somewhere in a neighboring yard, a portion remains in the furnace, from which the owners scrape it out with a shovel and from force of habit carry it to the garden.... Given our level of the conducting of cleaning decontamination, the intentional concealing of the real state of affairs, and the lack of the normal, honest, qualified notification of the population economic activity in the contaminated rayons is leading not to the decrease of the level, but to self-contamination. In such a situation to take the concept of safe residence as a guide means literally to throw people to the mercy of fate.

One of the scientists I interviewed, who was at the Chernobyl Nuclear Power Plant this spring, related:

"Posters: 'A fine of 100 rubles for not having a personal dosimeter' hang everywhere in the building of the plant. They say that there were instances, when those who worked in the zone hid their dosimeters under lead objects so that the dosimeters would show a smaller dose than the maximum. For as soon as a person went over this norm, they dismissed him from the job. But people held on to it with both hands, because from the day of the accident up to March 1988 they paid them six salaries a month."

These strict demands are absolutely incompatible with the fact that outside the plant grounds the population receives a large dose of radiation and at best 30 rubles. Even this meager grant in conformity with the concept of the Ministry of Health and the USSR Academy of Medical Sciences should be abolished as of 1 January 1990. The monitoring of the contamination of food products will supposedly also be abolished, it will be possible to drink milk and eat vegetables, which now have to be thrown out. Other restrictions will also be lifted. And everything will be in order! Chief Scientific Secretary of the Belorussian SSR Academy of Sciences Academician A. Goncharenko clearly expressed the attitude of the residents of Belorussia toward this plan at the session of the Belorussian SSR Supreme Soviet: he proposed to switch the order desk of the Ministry of Health and the USSR Academy of Medical Sciences to products, which are produced in the zone that for the present is still contaminated, but may as of 1 January become by the efforts of capital specialists "safe." He also proposed to turn over to the children and grandchildren of executives of the Ministry of Health and the USSR Academy of Medical Sciences the Pioneer camp in Mogilev Oblast. But such proposals did not arouse enthusiasm either among gourmets or among physicians from Moscow, who are parents. And this did not increase the belief in their assertions. Although, perhaps, such arguments in a dispute of scientists are also not entirely appropriate....

USSR People's Deputy V. Kashperko:

"I myself am a resident of the zone of so-called strict monitoring. While working in the fields, we feel the effect of radiation. These are a burning on the tongue and in the mouth cavity, heavy salivation, drowsiness, and headaches. When I spoke about this in the oblast soviet executive committee at a meeting with representatives of the staff, the deputy chief of the oblast health department replied that such a thing cannot be. In books on radiation medicine such symptoms are not described."

Yes, there are actually not enough arguments for a scientific dispute.

Not the Truth, But Truth. Not a Concept, But a Position

S. Shushkevich:

"When at the session of the Belorussian SSR Supreme Soviet composer Igor Luchenok, the USSR people's deputy from public organizations, demanded an answer as to why Belorussian scientists thus far had not submitted to the verdict of citizens the scientific concept of residence in the rayons, which had suffered from the Chernobyl accident, several deputies began to smile, without concealing the irony. These were scientists, although, generally speaking, it is no laughing matter for all of us. The public at large should understand well: there is no scientific concept in this area and in the immediate decades there cannot be one. Scientists do not have any analogs in world practice! In many respect the knowledge of Americans and Japanese, who thus far are studying the consequences of the atomic explosions in Hiroshima and Nagasaki, also does not suit us. There it was a question of tens of kilograms of radiation products that were dispersed in the air. While in our country, according to various estimates, many hundreds of kilograms were released. In the immediate decades, perhaps, scientists will be able merely to observe, study, and summarize the experience in fragments. Today it is known about ionizing radiation only that it is harmful for biological systems. And what following the example of journalists is called 'the concept of eviction,' in reality is the civic position of Belorussian scientists. Which you would not say about the 'concept of safe residence,' which was proposed by the Ministry of Health and the USSR Academy of Medical Sciences. No one thus far has seen an official document of the Ministry of Health and the USSR Academy of Medical Sciences, in which this concept has been presented, so that it would be possible to check how well-reasoned and valid it is.

"The world community realized earlier than we did that there is not real alternative to nuclear power engineering. Precisely for this reason in such countries as the United States nuclear power plants continue to be built and operate, but the Environmental Protection Agency (EPA) monitors them strictly. Our economic managers and nuclear industry workers, who are interested in the development of nuclear power engineering, at international conferences have been raising the question of the 'threshold' dose that is safe for man. And no international congress of scientists, including the conference in Sidney, accepted this 'threshold' idea.

"We understand perfectly well that the problem here is not whether radiation is harmful or harmless, but whether we have the money to make the population safe or do not have this money. Incidentally, the same WHO experts believe that the 'safety threshold' for West Germans...will not come to even 1 rem a year—the country will have enough money to resettle people even in case of such a background! Why should we call our own material helplessness someone's 'safety'?"

A. Stepanenko:

"For many people it is advantageous to depict the matter as follows: scientists, they say, cannot reach agreement among themselves. Let them gather and develop a common opinion.... At best this is a failure to understand that we have civic, human differences with the opponents. It is by no means a question of disagreements, which it would be possible to resolve in lobbies of scientists of the academies. Incidentally, the Ukrainian SSR Academy of Sciences also categorically does not accept the concept of 'safe' residence in the contaminated area. The acceptance of this concept would enable economic managers to relax and to halt any activity on saving people who are under dangerous conditions. We cannot allow this. In the opinion of many authorities of the capital, the closer you get to Chernobyl, the stronger the radiophobia is. No, I dare say, the stronger the radiation and the threat to human lives are. While the farther you get from the epicenter, the weaker, I dare say, the voice of conscience is.

"In addition to economic difficulties—and they will exist—the victims of radiation contamination have the right to present bills, compensation for the harm to their health should be paid in full to them. The point of view '35 rem over 70 years,' if it triumphs, would save many high functionaries from responsibility for the fact that rescue, preventive treatment, and decontamination steps were taken late and not fully."

S. Shushkevich:

"By our position we are defending first of all the rights of man! Man should know: under what conditions he is living, under what conditions it is actually safe to live. He should have a choice: to jeopardize his health (consciously and, of course, free of charge) or not to jeopardize it. In Mogilev Oblast they calculated that it would be one-fifth to one-third as expensive to move all the people from the zone of risk than to conduct limited economic activity and to attempt to cure potential patients. But even if it were more expensive, we do not have the right to keep people under dangerous conditions by concealment, by passport procedure, or by the threat of poverty. For today's migrants are abandoning all their goods and chattels in the contaminated rayons and at the very best are receiving from the Main Administration of State Insurance not more than 40 percent of the value of structures (and this, as a rule, is not more than 500 rubles). Moreover, how will we look in the eyes of the world community, if already now in private conversations foreigners are remarking: 'An amazing country, now entire peoples migrated from Europe to Asia, now it is a problem for you to move thousands of people hundreds of kilometers....'"

But differences actually exist among scientists, I have in mind not our noncoincidence of positions with the Ministry of Health and the USSR Academy of Medical Sciences, but the state of affairs in the ministry itself. While its executives are insisting on the safety of residence in the contaminated area, their immediate subordinates, physicians, are the first to be leaving these very "safe" areas. Is it not because they understand the real danger better than the representatives of other specialties? While the situation today is such that one has to expect rescuing from people with a clean conscience, with a benevolent soul, and with a compassionate heart.

Scientists Discuss 'Brain Drain,' Other Issues

18140332a Moscow POISK in Russian
No 17, Aug 89 pp 1-2

[Article by Yelizaveta Ponarina under the rubric "What Is Science To Be Like?": "The Talented Person Requires Protection"; first paragraph is POISK introduction; last paragraph is POISK conclusion]

[Text] More than 100 letters of scientists arrived at the editorial office following the statement in the newspaper of President of the USSR Academy of Sciences G. Marchuk on the directions of restructuring in basic science.

"Soviet science is faced with the problem of a 'brain drain.' It has now become easier to go abroad, which can only be welcomed. From a conversation with one foreign physicist about 2 months ago I understood best of all to what this has already led here and there and can lead on a broader scale. This physicist, who had come to Moscow, said with some surprise and bewilderment: 'You know, no one is here, everyone is abroad.' Since 1987 I have myself been going quite a lot and all the more do not have the moral right to cast stones at others. But recently a phenomenon of a complete different type appeared—they are leaving for a year, 3 years, even 5 years!..."

Such a response is also among the responses to the article of President of the USSR Academy of Sciences G. Marchuk "What Is Science to Be Like?" (POISK, No

12). Academician V. Ginzburg, a well-known Soviet physicist and a USSR people's deputy, sent it. He names as the main cause of the "brain drain" the high wages abroad: on the average there they pay a good professor $7,000 a month as against our 450-500 rubles. But, it seems, it is a matter not only of this. Judging from many other letters, the atmosphere in our society and its attitude toward science and toward the labor and the results of the labor of scientists gave rise to the longing to go abroad.

"An atmosphere of psychological elevation is absent in our science," Corresponding Member of the USSR Academy of Sciences G. Zavarzin writes in his letter. "People, who have devoted themselves to basic science, are losing confidence under the conditions of the opportunistic use of science. The prestige of the occupation of scientist is declining. The moods of depression and an inferiority complex with respect to western science are growing stronger."

"In point of fact science has already been lost as a productive force of society," G. Pleshakov of Saratov continues this thought. "Neither local administrative and economic organs nor the government are taking it into consideration. The recent Congress of People's Deputies and especially the first session of the Supreme Soviet, at which the opinion of science at best 'was taken note of,' but was not taken into account, clearly demonstrated this."

There are a large number of causes of the formed situation. Quite a number of suggestions with regard to how to correct the situation are also expressed in the letters. Which of them are to be made the basis of restructuring in science? In the search for an answer in one of the letters the program words of M.S. Gorbachev are recalled: "Man—he is the goal, means, and main character of our policy."

In science the role of man is unambiguous: new knowledge is the product only of the human mind. Moreover, in point of fact every discovery is a repudiation of what has been done thus far. And, hence, a challenge to colleagues, managers, and teachers.

"In our country it is customary to turn justified anger at the past, when under the conditions of tsarism Tsiolkovskiy, Mozhayskiy, Lobachevskiy, and others did not receive proper recognition and support. But, indeed, today it is no easier for a scientist to become 'a prophet in his own country,' if he does not follow the lead of the 'all-powerful.' And it is altogether bad if he turned out to be a competitor of recognized leaders," writes Professor S. Belotserkovskiy.

In recent years we have been discussing much the necessity of putting an end to monopolism in science and to the dominating influence of formed scientific schools. We are placing great hopes in the competitive financing of ideas and projects, in impartial evaluations, and in the independence of temporary creative formations. But real life is transforming many of our efforts into pointless spurts.

"The peremptoriness, with which they are now undertaking to correct old mistakes, disturbs me," says Doctor of Technical Sciences A. Rozental. "The aplomb of T. Lysenko automatically comes to mind. Owing to his ability to make fantastic promises active restructuring in the matter of organizing science took place, some institutes and laboratories were wiped out and others were formed. The themes of research were changed arbitrarily (from the word 'arbitrariness').... Do you not recognize it? These approaches of Lysenko also exist today...."

There are also complaints against competitions. "Only necessary people know about this chance for an unknown talented person," V. Sibirtsev believes, "while a public information system is needed for genuine competition."

Indeed, many people are placing hopes in glasnost as a technically feasible process of speeding up the exchange of information. Corresponding Member G. Zavarzin believes that this can have a comprehensive normalizing effect on the scientific environment. The psychology of secrecy, which was promoted to the rank of a cult, undermined the atmosphere of trust even among scientists.

"Now you wait 2-2.5 years to get published in an ordinary academic journal," writes Georgiy Aleksandrovich. "Even in the reports of the USSR Academy of Sciences this time for a member of the academy comes to nearly a year. It is longer than at the beginning of the century! This is humiliating and corrupting: in the United States and the FRG they trust countrymen more. Is that not why, after promptly receiving a report on a discovery, its validity can be easily ascertained? It is sufficient to go and take a look. There is no point is coming to us in more than 2 years: people have been busy for a long time with a new matter.

"The impossibility of getting a work published quickly and intelligibly in our journals is intensifying the psychological inferiority complex with respect to western science and is responsible for the aspiration to get one's works published in English-language journals and to strengthen contacts with western laboratories," Zavarzin writes.

Strictly speaking, there is nothing bad in this. On the contrary, it is well known that the successes of Russian science in the second half of the 19th century were directly connected with mass trips for work at foreign scientific centers of young people directly from the university. But now luminaries are going not so much to acquire wisdom and to develop thinking as to share what has been earned in the Union. But we must think about the future of our country and pull our science out of the hole.

So, are we to "hold back and keep out"? We have already covered this path, which led to the "fall back of science." Today not only professors and rank and file researchers believe, as, for example, Ya. Kerner of Kishinev does, "that it is time to grant Soviet scientists and specialists the right to decide independently the question of going to work at foreign universities and firms (of course, within the framework of Soviet laws)."

It is difficult not to agree with such a proposal. It is time. Only for this it is actually necessary to legalize the interrelations of the creative individual and the state, I would say, to balance their interest in foreign contacts. For example, our professors, whom in the United States they pay ten- to twentyfold more in foreign currency than in rubles the Union, V. Ginzburg, with whose words we began the discussion on the protection of the talented person, argues in his letter, should spend on themselves in accordance with existing regulations not more than $20-30 a day and turn over the rest to the state. The requirement is ridiculous. Of course, they are not fulfilling it. Everyone remembers how many years ago in response to the request to turn over foreign currency V. Fok said: "An academician is not a peasant on quitrent." And he was right.

On the other hand, argues Vitaliy Lazarevich, a place on the staff is usually retained for a person going away, and they pay him a part of the wage in the USSR. Is it really not natural to turn over a portion of the foreign currency for this? The academy was not prepared to solve such puzzles. It is necessary to immediately discuss and solve these problems in order not to interfere with foreign business trips, but at the same time not to stimulate emigration and to protect the interests of Soviet science.

Life itself is forcing us to ponder over a system of guarantees of the talented person and the creative individual—over contracts which can help us to regulate the interrelations of the scientist with society through agreements with the scientific center, at the base of which the researcher is performing his work.

We somehow have not grown accustomed to comparing academicians with soccer players, but a direct analogy of the contracts of sportsmen with foreign teams suggests itself. When leaving for abroad to fight for the honor of a foreign team, our masters as compensation for their absence and, perhaps, the losses during this time deduct a portion of the foreign currency to the accounts of their clubs. There is nothing insulting in this. On the contrary, this is a legal, economic, and social guarantee of the protection of the individual.

Just as the scientist. In the contract, which he will conclude with his scientific research institute or university, it is necessary to stipulate what the scientific center will get, if the scientist suspends work at it early and goes abroad or to another center (something like a forfeit). And, on the contrary, how the losses will be compensated, if the administration does not create for the scientist the proper conditions for his creative work. Of course, the dollars or marks, which are deducted in accordance with such contracts, should end up in the account of the firm, which let the scientist go "at liberty," in order to use them for the strengthening of the base and the training of the rising generation of servants of science. In short, it is necessary to give a talented person rights, then it is possible to expect a result from him.

The questions, which were raised in this first selection of letters, do not, of course, encompass all the aspects of urgent restructuring in science. We will continue this discussion in subsequent issues.

Academy of Sciences Opens Hotel for Visiting Scientists

18140332b Moscow POISK in Russian
No 17, Aug 89 p 2

[Article by Sergey Osinin and Sergey Shakhov (photographs [photographs not reproduced]) under the rubric "Details for POISK": "...And Guests of the Capital"; first paragraph is POISK introduction]

[Text] The new hotel of the Academy of Sciences has opened in Moscow.

The exciting act of greeting the first guest, as is proper, was very festive: a red ribbon fluttering in the wind, which was cut ruthlessly with scissors, a Russian round loaf of bread on a towel, warm words of parting, as well as smiles, flowers, and white tablecloths.

The honor of being the opener of the hotel fell to Leningrad Academician V. Glukhikh, who was in the capital en route to Japan. Vasiliy Andreyevich was in a great hurry. And nevertheless together with the cordial proprietors he took a stroll through the spacious halls and vestibules, politely admired the comfort and coziness, and was pleased for the Soviet and foreign science colleagues, who will live and create here.

We also made a short excursion through the new hotel and can testify: it is good! In the lovely rooms there are refrigerators, televisions, and other conveniences. A high-class restaurant is at the disposal of the residents. There are also other advantages. The hotel is located on the edge of a forest, a long way from the dusty and smoky Moscow main roads, although within the city limits.

We would like to conclude the report on an optimistic note. But.... The Uzkoye Hotel is designed for only 156 people. But it is well known that today thousands of scientific associates, candidates and doctors, docents and professors, who have very serious reasons for visiting academic institutions, arrive in Moscow daily.

Administrator of Affairs of the USSR Academy of Sciences V. Volkov acquainted us with the figures. It turns out that at present the academy can make available to its wards from outlying areas about 1,500 rooms in hotels. Is this a lot or a little? In any case the real need is

approximately twofold more. The difficulty of the situation is being aggravated by the fact that Inturist, which previously heeded the requests of the scientific department, now requires for services only hard currency, of which, of course, there is not enough as it is. The Moscow City Soviet instead of the required 300 rooms usually allocates less than 50. In short, the placement of the new small hotel into operation is only barely alleviating the urgency of the problem.

The prospects? The renovation of an old building on Ulitsa Gorkogo should yield 250 additional rooms. Our specialists will carry it out jointly with colleagues from Austria. While the construction of a new 1,000-room hotel on Leninskiy Prospekt, in the opinion of V. Volkov, will make it possible to seriously improve the situation. True, now it is only at the predesign stage.

Is it really a hopeless situation? It seems that the Academy of Sciences all the same is poorly realizing its own possibilities. As is known, the inefficient use of Moscow hotels is connected with the lack of normal monitoring of the occupation of rooms. Throughout the world the reservation and the issuing of vouchers for lodging were automated long ago. In Moscow this is the lot of only a few hotels. So could institutes of the academy really not undertake the simple order of establishing the Hotel general-purpose computer system? And after this would the Moscow City Soviet Executive Committee really not allot the academy the necessary 300 rooms?

And a last thing. In telling about the Uzkoye Hotel, we almost missed one essential thing. Its construction was begun in 1974 and lasted—did you count it up? correct!—15 years so that the opening of the hotel coincided with a kind of anniversary.

Privileged Position of Academy 'Elite' Attacked

18140335 Moscow IZVESTIYA in Russian
23 Aug 89 Morning edition p 3

[Article by Vice President of the All-Union Astronomical and Geophysical Society G. Khromov: "Science Needs Protection"; first paragraph is IZVESTIYA introduction]

[Text] Something has also begun to change in our scientific life. Of course, not yet in practice, but in some situations words, which have been spoken out loud, are also an event. And they have finally begun to speak about science, about its problems and troubles.

The impression, however, is being created that there is a certain boundary of journalistic openness, which speakers and writers thus far have not decided to cross.

It is impossible to argue with the obvious thesis that science is susceptible to the same ailments as society as a whole. However, it is a very complex social institution, and social troubles are refracted in it in a quite whimsical manner. It hardly makes sense, for example, to draw parallels between the monopolism in our production sphere and in scientific life. The names are the same, but the essence of the phenomena is completely different.

Or here they are talking about the bureaucratization of science. It may appear from outside that some crafty bureaucrats are penetrating science and its management from outside and are beginning, without knowing the matter, to "manage" science—just as, for example, bureaucrats of the agroindustrial complex attempted to manage the producers.

All right, let us try to understand. First of all concerning monopolism.

In its essence science as a whole is the embodiment of free intellectual inquiry, which implies the coexistence of various opinions, methods, and approaches to problems. Scientific monopolism is the forcible (forcible without fail!) appropriation of the right to scientific truth by individual scientists or a group of scientists. Genuine science ends wherever monopolism begins.

Indeed, monopolism is an old scourge of our science. I am afraid that it is an old scourge of only and precisely our science. Unfortunately, it is not fateful luck that precisely Soviet science enriched the lexicon of the world scientific community with the offensive term "Lysenkoism." In point of fact, Lysenkoism is scientific monopolism which has been carried to its logical conclusion—to the support of the group monopoly to scientific truth by all the authority and might of the centralized state. The fact that we did not have recurrences of "genuine" Lysenkoism in various fields of science, recurrences with all the ensuing consequences, up to the physical elimination of opponents, is the service, alas, not of science, but of society and the state, which repudiated the abominable practice of mass repressions. And the respected D.S. Likhachev is thrice correct in asserting that our scientific environment is continuously reproducing the virus of Lysenkoism.

Thus, the predisposition to the fatal ailment remains, in spite of the radical change of the external conditions of the existence of science. Does this not mean that it is necessary to seek the original cause in the internal peculiarities of its being and in the principles of organization? And it seems that the boundary of openness of nearly everyone, who has publicly voiced his opinion on the problems of our science, lies precisely here. So what are they avoiding or, perhaps, about what are they even simply afraid to talk?

Why, here is about what—about the fact that the entire organizational structure of our science is the offspring of the era of the emergence of the administrative command system. It formed during the same 1930's, beginning with the imparting to the Academy of Sciences of its present form and functions and ending with the institution of the system of academic degrees and titles, which is in effect to this day. Since then for already half a

century (!) now the organizational structure of our science has remained unchanged, having accordingly trained several generations of scientists and having accustomed the public to the idea that other forms of the organization of scientific research simply were not allowed and cannot exist.

Like all the public structures and institutions, which were established during those years, our science acquired the organizational appearance of a multistage bureaucratized pyramid, which is particularly stable owing to the concentration of power and benefits in the privileged upper crust, in accordance with the principle "the higher you go, the more you get." The members of the Academy of Sciences, whose material status and internal privileges in scientific surroundings differ qualitatively from what "simply scientists" enjoy, became this upper crust, the official scientific elite of the country. Using contemporary language, a multilayer nomenclature, which is entirely like the party and economic nomenclature, was imposed on our science.

The reader, who is experienced in the analysis of sociopolitical problems, can imagine without special explanations the subsequent evolution of such a bureaucratic structure. With all the inevitable consequences—such as the ingrained violations of social justice in scientific surroundings, the replacement of the interests of a cause by the career interests of "figures," the degradation of the systems of professional and moral values, the aspiration for self-isolation from society, and so forth.

This list is already sufficient to understand the main sources of nearly all the troubles of our modern science, including the notorious monopolism. It is quite clear that the scientific system, where the route to influence, power, material prosperity, privileges, and awards is equivalent to climbing the ladder of a formal professional career, is simply bound to give rise to the temptation of monopolism—every hour, every minute!

I do not want to burden the reader with the details of the mechanism of the establishment of scientific monopolism. I will merely note that our system of academic degrees and titles turns out to be the most powerful tool in this unjust matter. It is sufficient to seize control over some specialized scientific council, and immediately the expanded reproduction of "one's own" candidates and doctors of sciences with the indispensable oppression of those of "other people" begins. The Higher Certification Commission is powerless against such creeping expansion.

It is customary to proudly call what results a scientific school, although at times it would be more appropriate to speak of a scientific clan, or else a mafia. Its leaders acquire in scientific surroundings much real power, receiving the opportunity to hold or control the highest hierarchical posts, to participate in the secret distribution of resources, and, finally, to flatter their own excessive vanities. Science proper, its interests, and the social return actually recede in this case into the background.

The most alarming thing in all this is, perhaps, the fact that the monopolism and cliquishness in our science are continuing to grow and are unchecked by anything. It is becoming more and more difficult for the independent, separate scientist to make his way between the fences of the numerous feudal estates. I believe that a larger and larger number of people with pronounced individual qualities and abilities will leave basic science. On the other hand, personnel of average merits and a low moral status are adapting splendidly to this suffocating atmosphere and are beginning to determine the character of our present science.

Scientific monopolism and bureaucratization are the deformed fruits of the same defective organizational structure of our science. Incidentally, the latter of these troubles yields with greater difficulty to study. It is more diverse and more whimsical in its manifestations.

I would like in connection with this to direct the attention of the reader to one general peculiarity of the existence of our scientific and cultural spheres, which is customary, but obviously unique on a world scale. It is a question of the phenomenon of the fusing of the professional and bureaucratic elites, which is typical of our country. Indeed, the uniting of power and the formal attributes of high skill in the form of lifetime professional titles, which are so prevalent in our country and are conferred on behalf of the state, creates completely "impenetrable," monolithic professional bureaucratic structures. Not by chance did any outside attempts to criticize the actions of the Academy of Sciences as a department evoke just recently an irritated rebuke with accusations of scientific incompetence being made against the critics.

We already know all too well to what this led, for example, in ecological affairs. Have not all the attempts of the public to interfere in the activity of the Academy of Pedagogical Sciences or the Academy of Medical Sciences thus far crashed into such a wall?

The corresponding duality, which was incorporated in the charter of the USSR Academy of Sciences, makes it an unnatural hybrid of a department (with all, so to speak, the ensuing consequences) and a scientific society. Incidentally, this duality appeared on national review during the election campaign and gave rise to the frankly scandalous form, into which this campaign developed at the USSR Academy of Sciences.

There follows from what has been said the shocking conclusion that at the Academy of Sciences its members themselves are objectively the main bureaucrats. At any rate, those of them, who hold numerous posts in the academic leadership. And it is difficult to refrain from a puzzled question: Of just what bureaucratic domination is the president of the Academy of Sciences complaining?

For the sake of objectivity it is necessary to admit that during the decades of domination of the administrative command system the activity of the USSR Academy of

Sciences itself and its scientific institutes was entangled by an uncountable number of restrictive statutes, directives, and instructions—mainly in the spheres of labor and financial and economic work. In this sense the academy had not an easier, but also not a more difficult time than any other of our departments. It would seem that now, on the same level as others, the USSR Academy of Sciences could use its considerable authority for the repeal of the most burdensome bureaucratic instructions and directives. Is this happening, who or what is interfering?

Well, of course, like any department, the USSR Academy of Sciences became overgrown with its own bureaucratic apparatus, which is manned to a significant extent by unlucky scientific personnel. This apparatus, which grew uncontrollably during the postwar decades, gradually established and has been maintaining and developing senseless parascientific paper shuffling—all these pseudoplans, current and long-range, reports, summaries, applications, inquiries, and other similar documents, which are duly accumulated by the presidium and its organs with academic institutes. Incidentally, an entirely analogous situation also existed until recently in the VUZ [Higher Educational Institution] system. But this apparatus and its activity and fate are entirely in the power of the executives of the academy. Is it really also impossible to cope with this?

Thus, to the question concerning who is contributing to the bureaucratization of our science, it has to be repeated: the executives and members of the academy themselves, and the system, which they personify. Any consistent struggle against bureaucracy in domestic basic science and its genuine democratization will inevitably lead to the collapse of the system, having also called into question the very existence of the academic hierarchy with all its lifetime privileges and income. That is why they also remained silent earlier. That is why they are avoiding specificity now.

Without a doubt, among our academicians there are most prominent scientists, patriots, and citizens. But it is impossible not to begin to suspect that clan opportunism, which is based on an artificial system of privileges that is common to everyone, has soaked deep into this small, but influential social group.

One must not overestimate the inclination for any decisive changes also at the next level of the scientific pyramid, in the internal elite of academic institutes, from which new members of the academy are recruited. The recent timid discussions on the democratization of the management of academic institutes reflected only the discontent of this milieu with the authoritarianism and hierarchical inaccessibility of the members of the academy. It would be possible to liken these statements to the polite rebellion of the third estate against the aristocracy with the dreary conclusions about the authenticity of such elitist democracy. This tiff of the two self-affirming scientific elites does not have a direct bearing either on the interests of domestic science or on the rising pains and concerns of the "scientific proletariat"—the army of rank and file personnel of science.

A flourishing modern state is inconceivable without advanced, dynamic science which is responsive to social needs. Our own science, first of all its base—basic science—is now in a critical state. There are serious scientists, efficient scientific collectives have remained, journals and books are being published, reports and lectures are being given. But lofty science as an orderly system of the accumulation and use of advanced knowledge, which works for the good of society, in our country has remained at the level of the middle 1970's.

It is necessary to help science, it is necessary to protect it against destructive processes and trends. Soviet science—forgive me for this paradox—must now be protected from itself, from its unviable organizational structure, and from its bureaucratized nomenclatural elite, which has been infected with monopolism.

Not especially progressive academicians and not doctors, who aspire to become academicians, but our entire society should help science. The same one, which supports science, is prepared to take pride in it and is so responsive to the achievements of our scientists.

Young Geneticist Struggles With Institute Bureaucracy

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12 Sep 89 Morning Edition p 3]

[Article by T. Durasova (Leningrad): "Superfluous People. What 'Virus' Is Destroying the Traditions of Academician Vavilov at the Institute Named After Him"; first two paragraphs are IZVESTIYA introduction]

[Text] A picket line appeared in front of the All-Union Institute of Plant Growing. A streamer was opened at the memorial plaque with the name of N.I. Vavilov: "The spirit of Lysenkoism reigns at the institute of Vavilov. Shame!"

The people, who had exhausted all other possibilities to protest, had taken to the street. Who are they?

The doctoral dissertation, which was written by L. Ivanyukovich at the All-Union Scientific Research Institute of Plant Growing, was discussed at the university. The colleagues from the chair of higher plants agreed with the new botanical classification of the genus sorghum. They approved of the mathematical methods.

Having learned of the approval of the work at Leningrad State University, G. Shmarayev, head of the department of groat crops, asked Lyudmila Konstantinovna a strange question: "Who permitted you to go with your dissertation beyond the walls of the All-Union Institute of Plant Growing?" But at the All-Union Institute of Plant Growing they did not intend to hear it.

For 20 years Ivanyukovich had worked with the crop sorghum. Her works had been published in publications of the USSR Academy of Sciences and under the rubrics "Original Articles" and "Important Articles" in the journal DIE KULTURPFLANZE of the GDR Great Academy. From her own institute she had messages of appreciation, an honorary diploma, and monetary prizes. Her treatment changed suddenly. On the surface the reason is the doctoral dissertation.

I can name the scientists, with whom everything was in order, but only up to this point. People became superfluous at the institute, when their dissertations were ready for defense. If age permitted, they forced them to retire. They transferred them a little farther from Leningrad. They dismissed them, having seized upon minor disciplinary infractions. One person was unable to endure the blow, became gravely ill, and passed away. These pages of the history of the All-Union Institute of Plant Growing, which are unknown to the public, are not from times of old, but from your and my times.

Lyudmila Konstantinovna was also no exception. Just recently an irreproachable worker, in 3 months she managed to receive two reprimands—one of them for being 12 minutes late (she was at the library). And immediately in the scientific council the question of the early (by a year) reelection of Ivanyukovich was raised, after which they dismissed her as not suitable for the position.

But with Ivanyukovich everything proved to be not that simple. She did not evade the gruelling struggle and in 9 months achieved the establishment of a commission with a legal inspection board of the All-Union Central Council of Trade Unions. As a result there was the conclusion of the illegality of the early reelection of Ivanyukovich. She was again at the All-Union Institute of Plant Growing. But she was not reinstated, rather she was rehired as a senior scientific associate. In a different department. Her theme and materials were already in the hands of others.

Is there now to be a defense? Certainly not. A person who understands would say: it is also possible to defend a work at another place. But one who understands also knows another thing. From his own institute the seeker of a degree should bring: the first thing is an extract concerning the hearing of the work, the second thing is a reference.

How many methods of dragging out any matter are known! V. Burenin, head of the department of fodder crops, for a long time did not accept the work. Then he delayed an entire year with the discussion. Finally the discussion took place. Doctor of Biological Sciences I. Satyperova found in the work a modern scientific level and a strong practical orientation. Candidate of Biological Sciences A. Bukhteyeva (a specialist in spruce-fir forests of Eastern Siberia) did not agree with this.

The opinion of a doctor of sciences obviously carries more weight. The voting remained. But Burenin did not let a vote be taken. "An important procedural requirement has been violated," he suddenly remembered, "the work is not bound."

Valentin Ivanovich had been cunning. Binding is needed 10 days prior to the scientific council, so that each person could familiarize himself with the dissertation. They delayed a long time. There was talk that the dissertation had been seen with T. Teplyakova, who had just been transferred from laboratory assistant to junior scientific associate. Ivanyukovich went to her. Yes, B. Malinovskiy, deputy director of the All-Union Institute of Plant Growing, had turned the dissertation over to Teplyakova for a review. What is unusual about that? She had also written a review for Doctor of Sciences M. Agayev.

An embarrassment. However, the instinct for the perversion of ethical norms has been deadened in many people. The public was shocked not by the fact that yesterday's laboratory assistant was reviewing a doctoral dissertation. The scathing note of Ivanyukovich addressed to the director was shocking. The scientific production conference of the department discussed precisely this memorandum instead of the dissertation. Standing before the tables, the degree candidate waited in vain for them to let her speak. Finally she said: "I am going to the newspaper!" "In a week," they immediately promised her.

And punctually, in a week 12 people voted against her work, 12 abstained. Only one person dared to support her. Ivanyukovich was not too distressed: she needed, after all, only an extract from the minutes.

The reference. It made no sense without it not only to go to defend her doctoral dissertation, but also to aspire to the position of janitor. At the same time another reference, for certification, was being written. And both questioned the scientific potential and conscientiousness of the worker. It is all the same 12 minutes late. Not a word about the doctoral dissertation and about authorship of the strain. Ivanyukovich appealed to the court. The proceedings went on for 8 months, her suit was rejected.

For 5 years Ivanyukovich was not able to defend her dissertation. For months the work was in the hands of others. Lyudmila Konstantinovna was certain that they had taken it apart piecemeal. I do not presume to judge. However, there were several young graduate students who devoted themselves to sorghum. And the scientific theme of T. Teplyakova coincided with the theme of Ivanyukovich: "The Classification of the Genus Sorghum." True, in contrast to Ivanyukovich, Teplyakova wrote on the basis of literature.

We spoke with L. Simakina (until recently the scientific secretary of the All-Union Institute of Plant Growing). In her opinion, Ivanyukovich is an honest person and a good specialist. Why did she suddenly become unwelcome? Because she is an active, creative person who is

capable of raising her voice against arbitrariness. She does not know how to keep silent when everyone else is silent.

Only a spiritually independent person is independent in his creative work. A slave mentality erodes the creative element.

Is it surprising that Ivanyukovich was among the participants in the picket line?

When starting this work, I saw before me an ethical problem: the defenselessness of a person in the face of administrative arbitrariness. The thesis of L. Simakina provides another direction of thought: the consequences of deformed relations at a scientific institution are disastrous for science itself.

The All-Union Institute of Plant Growing lost Tatyana Mikhaylovna Khokhryakova. Her doctoral dissertation, in which a new approach to the theory of the immunity of plants was set forth, was already ready. She had read a book of N.I. Vavilov, which had been banned until 1964, and was consumed with his idea. Immunologists work, as a rule, on the study of the gene fund on a regional basis. Khokhryakova assessed this direction as a dead end and engaged in the mobilization of plant resources and the creation of a genetic bank. This was an original elaboration of the ideas of Vavilov. "I am going out in the planet and am determining from where to bring a donor!" she said. An introducer-immunologist is the rarest specialization. Khokhryakova is its only representative.

And what of it? She was defamed through an absurd accusation of the everyday type and was "sent into exile" at the Pavlovo Experimental Station. In the end she left the All-Union Institute of Plant Growing.

Immunologists of the country—entomologists, phytopathologists—work in isolation. I have a list of 13 people who worked fruitfully at the All-Union Institute of Plant Growing in the department of immunity. All of them during the 1970's and 1980's were forced to give up the cause of their life. Might it be that one specialist—institute director V. Krivchenko himself, who simultaneously heads the department of immunity—is enough for the All-Union Institute of Plant Growing?

Science lost, practice lost. Our agriculture is going through a catastrophic situation. The losses from harmful insects and viral, bacterial, and mycoplasma parasites are big. Especially under the conditions of a one-crop system. Toxic chemicals are being poured on plants. Ground waters are being contaminated. In the United States, by the way, it is envisaged by the end of the century to switch to the biological protection of plants. An example of such a solution also exists in our country: in the 1930's sunflowers were protected for decades against the moth.

Z. Zotova, a scientific associate of the All-Union Institute of Plant Growing, after a trip to Ethiopia made specific proposals on biological protection—they immediately removed her from the study of this problem. M. Mokritskaya is a prominent phytopathologist and mycologist, whose works on the resistance of wheat to fungous diseases are well known both in the country and abroad. She developed source material for selection. She was forced to go to another city and to retire.

Is this the persecution of dissidents? It is, I dare say, something else. The persecution of brilliant and independent people, who are dangerous as a rival. If N.I. Vavilov were at his institute today, they would hardly allow him to defend the dissertation "The Evolutionary Concept in the Immunity of Plants."

People will disagree with me: but doctoral dissertations are being defended. Yes. And some with amazing ease. The immortal phrase of one associate, whose doctoral dissertation was written collectively, spread through the All-Union Institute of Plant Growing. Coming to graduate students once a week, he asked: "Well, how is my work progressing?" Now he is a doctor of sciences and, incidentally, the hero of an international scandal. In Bulgaria they proved him guilty of plagiarism.

Plagiarism at the All-Union Institute of Plant Growing does not seem to be anything extraordinary. Endless pamphlets, which are based on the adaptation of the ideas of others, are being written here. It is a stone's throw from here to the appropriation of what belongs to others. M. Plekhanova, after defending a dissertation based on materials of Doctor of Sciences F. Teterev, who was fired from the All-Union Institute of Plant Growing, decided also to appropriate his strain of honeysuckle. She got caught. Nevertheless, for more than 3 years now Teterev has been unable to get from her the journals with his observations. While after publication they immediately consoled Plekhanova, having transferred her from junior to senior scientific associate. Her photograph is on the Honor Roll.

Bukhteyeva, a specialist in spruce-fir crops, who questioned the level of work of Ivanyukovich, published as her own the articles of E. Bazylev "Polygonum weihrichum" and "Oil-Bearing Radish." Do you think there was a scandal? Nothing of the sort. The director reproved her. And soon A. Sinyakov discovered that Bukhteyeva had submitted to a collection under her own name an article on awnless bromegrass, which was written by him in collaboration with A. Kolpakova.

There is another category of very protected associates of the All-Union Institute of Plant Growing. Children. The sons, daughters, sons-in-law, brothers-in-law, and nephews of academicians and executives of departments and laboratories. They carefully remove the pebbles from their path to a career. The entire collective is filled with family ties. Institute wits called the training of scientific personnel at the All-Union Institute of Plant Growing a family contract. The son of Academician of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin V. Konarev, while registered as a graduate

student, and then an associate of the department of genetics, worked in a different department—his father's. The work went quickly, because graduate students of his father worked on his themes. The younger Konarev turned out to be the coauthor of their articles. The materials of their candidate dissertations were subsequently included in the doctoral dissertation of the young Konarev. The second son of the academician, while registered as a graduate student of the All-Union Institute of Plant Protection, also completed in the department of his father (at another institute) his candidate dissertation, using both the themes of the laboratory and its material base.

It is curious: when the children were still preparing to ascend the job ladder, no one else in the department of their father succeeded in defending a doctoral dissertation. An exception was made only for the female associate who...took care both sons of the academician. What a coincidence.

Family ties make any criticism dangerous—you would not purposely offend the person, on whom various benefits, a dissertation, a trip abroad depend. When the impetuous Ivanyukovich, having grown angry, called young colleague Ch. an infantile relative, this offended not only the colleague, but also the omnipotent doctor of sciences, of whose niece the latter was the husband.

For the sake of the career of a "relative" at the All-Union Institute of Plant Growing they can crush a person who has gotten in the way. The story of N. Shestakova is indicative. A biochemist and candidate of biological sciences, she engaged in the study of the reserve proteins of wheat and barley. She mastered advanced biochemical methods at institutes of the Academy of Sciences and in courses of the Swedish firm Pharmacia. While doing practical studies at the Institute of Biochemistry imeni Bakh, she became the coauthor of a new method of the strain identification of barley. It makes it possible simultaneously to determine the molecular weight of the polypeptide chains and to carry out the genetic checking of proteins, by which it differs favorably from the method of V. Konarev. Is that not why the academician decided to close down the protein theme altogether?

After some time, incidentally, he restored it. However, they did not return the theme of Shestakova, they gave it to the son of the academician. The attempts to get justice ended with the summons of a psychiatrist. "Gross truth seeking"—such was the psychiatric diagnosis. Now Shestakova is in the department of introduction, but without any theme.

I asked V. Krivchenko to comment on the facts. The director of the institute agreed to answer my questions and fixed the meeting. Suddenly he declined to meet. As it turned out later, that is what the council of the labor collective decided.

I am not surprised. I know exactly how this council was formed at the All-Union Institute of Plant Growing. I saw with my own eyes two lists of its "desirable" members. On the first list, which was turned over by the deputy director for inclusion on the ballot, there are the names of the director, his two deputies, the scientific secretary, and three heads of departments. On the second list, which was drawn up on behalf of the director, the candidacies of the secretary of the party committee, the chairman of the trade union committee, and five heads of departments and laboratories were also offered.

It is the simulation of democracy, but, in essence, impenetrable mutual protection.

All this is not going unpunished. Who today at the Institute imeni Vavilov remembers the words of the great scientist: "We will go to the stake, but will not renounce our convictions"? A slave mentality is contraindicated to science. Precisely science, but not the increase of the number of doctors and academicians. An enormous portion of the output of the All-Union Institute of Plant Growing is compilations. But send to the All-Union Institute of Plant Growing 100 commissions if you like—what will they understand, if in our country they have become accustomed to judging a scientist by the number of printed works?! Where are one's own ideas, where are those of others?

They told me that a letter had arrived from abroad. One of the countries had asked the institute not to send publications.

It would be a mistake not to connect this circumstance with the moral trouble of the institute.

BBC Films Documentary on Soviet Science

18140345 Moscow POISK in Russian No 19, Sep 89 p 7

[Interview with BBC producer Ed Briffa by POISK correspondent Arkadiy Sosnov under the rubric "What They Are Saying About Us": "A Laser...for Supper"; date and place not given; first three paragraphs are POISK introduction]

[Text] Is it difficult to film science in the USSR?

BBC producer Ed Briffa share his impressions with our correspondent.

Ed is 32 years old, completed a course in experimental psychology at Oxford, and since then has worked at BBC for 10 year . One fine day it simply occurred to him that it is possible to combine an interest in science and television by scientific journalism.

"In the West the interest in Soviet science is very large, and thus far it has been possible to meet it only in part," he explains the goal of his business trip. "We hope to fill this gap...."

But our acquaintance began with Ed politely, but firmly turning me out of the doors of the laboratory—do not disturb the shootings. But I saw how carefully at the

rehearsal he explained to Soviet scientists their task and how absorbed popular director Judith Hann was with the text of her commentary.

Thus, the celebrated broadcast of British television "The World Tomorrow" (it is seen in 32 countries) had arrived for the first time in the Soviet Union. "The World Tomorrow" is a 30-minute block of entertaining subjects on science, which for 25 years now, to the joy of the broadest audience, is broadcast once a week.

"Every Thursday at the most popular time, somewhere in the middle of supper," my companion specified. "So that for Soviet scientists this is a rather good opportunity to associate with the world."

POISK: What came into the lenses of your cameras?

E. Briffa: We shot three subjects each in Moscow and Leningrad, we will devote the seventh to statements of Soviet scientists about perestroyka. At the Design Bureau imeni Tupolev they showed us aircraft that operate on liquified gas. The shootings were made on the ground and in the air. Moreover, owing to the skill of the pilots we flew so close to the experimental model that, it seemed, we could touch it. It is possible to judge the ecological nature of this fuel of tomorrow from that fact that Judith made reports in a light flight suit.

One of the global problems facing mankind is the control of the weather. We shot the subject on this theme at the Central Aerological Laboratory, where they are influencing rain clouds with particles of cement and silver iodide. At the Physics Institute imeni Lebedev they showed us television systems of the future. Imagine that by means of a laser it is possible to project an image on a screen of enormous dimensions, for example, 3 by 4 meters. A very promising development! It is strange that it has not interested our industry.

Incidentally, one of the all-round themes of our series is the difficulties of scientists when embodying their ideas. We observed that often they seek understanding and a response in the West, and not in their own country. And, as in this case, they are preparing to sign a contract with a British firm. Of course, this is a sign of the times—perestroyka and glasnost are opening wider the gates of international cooperation. But I am convinced that your scientists have to display miraculous inventiveness and patience, conjuring up instruments or equipment, which are readily accessible to us.

Large-scale engineering projects, which are intended "for centuries," also interested us. Such ones as the Leningrad levee. In my opinion, this is a splendid structure, which has been professionally designed and is being built in a big way. Scientists made a large number of hydrological calculations, but the ecological consequences, it seems, are unpredictable. I am not an expert and will not tell you whether Leningrad needs such protection against floods, but the people, who are trying to prove its expedience, for the present have not been too successful—the opposition, including on the part of scientists, is great.

Perhaps the most difficult subject is connected with the theoretical work of Professor Lobashev from the Institute of Nuclear Physics in Gatchino. We filmed a device for the obtaining of ultracold neutrons on the basis of a nuclear reactor. Its authors have learned to measure the electric dipole moment of the neutron and are rightfully proud of the record sensitivity of the method.

POISK: It is possible to sympathize with you. In order to present such material from the screen in an easily understandable manner, every time you probably have to seek an equivalent for basic scientific ideas.

E. Briffa: Certainly! It is possible, to course, to allow scientists themselves to speak. For example, our commentator interviewed Professor Lobashev. But in general this task is not among the easy ones—to explain abstract concepts to the television viewer. Incidentally, in Gatchino they told us that approximately 50 people in the world understand with what they are dealing.

POISK: Did you become the 51st?

E. Briffa: Hardly, and it would be useless to pretend. But I understood a little. But the main thing is that I take comfort in the fact that we found analogies when filming the beautiful mirrors in the halls of Petrodvorets. Now it will be easier for the viewer to understand that the laws of symmetry in the everyday world that surrounds us are the same as the ones elementary particle physics studies by means of its enormous devices.

Unfortunately, we also had problems of a different sort, which at times were insoluble. We also felt the strength of bureaucracy, which you are combating.

POISK: Can you cite a specific example?

E. Briffa: Oh, yes. After contemplating this series, we sent telexes to many of your scientific institutions. But we received only two replies—from the Institute imeni Shemyakin in Moscow and the Institute imeni Paton in Kiev. In order to save our project, we had to get on the telephone immediately, because it proved to be easier to find out about the successes of Soviet scientists from their foreign colleagues. Do not consider it a lecture: learn to advertise your fine works.... But the greatest disappointment of this trip is the reluctance of the Main Administration for the Development and Use of Space Equipment to show us any achievements in this area. Although scientists from the Institute of Space Research put in a word for us. As a whole I should note the invaluable help of Professor Sergey Kapitsa and the assistance of the USSR State Committee for Television and Radio Broadcasting.

You know, one colleague of mine, who 8 years ago visited the Academy Campus near Novosibirsk, warned me: it is very difficult to film science in the USSR, they will not show you anything. Fortunately, he was only half

right: bureaucrats actually did hinder us, but scientists always met us halfway. They are very open, frank people.

POISK: And what can you say on this level about British scientists?

E. Briffa: They are simply happy when we turn to them. After all, the prestige of our broadcast in the scientific world is very high. But there is another difficulty with them: given the extreme interest in publicity they are very cautious in statements about what may constitute the subject of a commercial secret.

POISK: Do you want to say that Soviet scientists share information more generously?

E. Briffa: This is true. Perhaps, this also comes from less experience in international contacts. We happened to be told: you are the first foreign journalists who have come to us. At any rate, Soviet scientists easily state their ideas. Although far from every researcher is capable of stating the essence of his work in 5-7 minutes. It is worst of all for a television journalist, when to a simple question there follows a half-hour response, from which it is difficult to extract a rational kernel. But these are our professional problems....

Lithuanian State Prizes for S&T Awarded

18140350 Vilnius SOVETSKAYA LITVA in Russian
19 Jul 89 pp 1, 3

[Article under the rubric "In the Lithuanian CP Central Committee and the Lithuanian SSR Council of Ministers": "On the Awarding of the 1989 Lithuanian SSR State Prizes in Science and Technology"]

[Text] The Lithuanian CP Central Committee and the Lithuanian SSR Council of Ministers, having considered the representations of the Committee for Lithuanian SSR State Prizes in Science and Technology, resolved to award the 1989 Lithuanian SSR State Prizes in Science and Technology to:

Doctor of Chemical Sciences Professor P. A. Vashkyalis, supervisor of the laboratory of the functional metallization of dielectrics of the Institute of Chemistry and Chemical Technology of the Lithuanian SSR Academy of Sciences—for the series of works "The Study of the Processes of the Catalytic Reduction of Ions of Metals" (1966-1988).

Doctor of Technical Sciences Professor K. Krishchyunas, head of the chair of industrial automation of Kaunas Polytechnical Institute imeni Antanas Snechkus; Candidate of Technical Sciences Docent V. Laurutis, head of the chair of radio engineering of the Shyaulyay Faculty of this institute; Candidate of Technical Sciences V. Laurushka, acting docent of the same chair of this institute—for the work "New Methods and Means of the Information Interaction of Man and Machine (Theory, Designs, Application)" (1974-1987).

G. Baltakis, chief of a subdivision of the experimental production base of the Institute of Biochemistry of the Lithuanian SSR Academy of Sciences; P. Vasilyaskas, lead designer of the Scientific Research Institute of Computer Technology and Information Science of the Lithuanian Sigma Production Association; R. G. Grigalyunas, lead designer of the same institute of this association; V. Guryavichene, process engineer of the experimental production section of the Institute of Biochemistry of the Lithuanian SSR Academy of Sciences; G. L. Kayris, chief designer of consumer items of the Scientific Research Institute of Computer Technology and Information Science of the Lithuanian Sigma Production Association; Candidate of Biological Sciences V. S. Laurinavichyus, supervisor of the sector of the introduction of enzyme analyzers of the Institute of Biochemistry of the Lithuanian SSR Academy of Sciences; A. Yu. Myakas, chief of the design bureau of consumer items of the Panevezhis Plant of Precision Mechanics of the Lithuanian Sigma Production Association—for the development and introduction of the Eksan-G glucose proximate analyzer.

Doctor of Biological Sciences I. Balchyunene, docent of the chair of stomatology of the faculty for the advanced training of physicians of Vilnius State University imeni V. Kapsukas; Doctor of Biological Sciences Professor G. Yu. Chesnis, head of the chair of anatomy, histology, and anthropology of the medical faculty of this university—for the series of works "The Development of the Foundations of the Ethnic Anthropology of Lithuanians" (1975-1988).

Candidate of Agricultural Sciences D. Kukyanis, docent of the Lithuanian Agricultural Academy; A. Shyaulis, instructor of the Klaypeda Sovkhoz-Tekhnikum—for the textbook "The Anatomy and Physiology of Agricultural Animals" (Vilnius, "Mokslas", 1985, 3d edition).

Doctor of Biological Sciences Professor V. P. Panchyalis, head of the chair of botany and genetics of the natural science faculty of Vilnius State University imeni V. Kapsukas—for the textbook "General Genetics" (Vilnius, "Mokslas", 1986).

Doctor of Philological Sciences N. Velyus, senior scientific associate of the department of folklore of the Institute of the Lithuanian Language and Literature of the Lithuanian SSR Academy of Sciences—for the monographs: "Mythical Beings in Lithuanian Legends" (Vilnius, "Vaga", 1977), "The World Outlook of the Ancient Balts" (Vilnius, "Mintis", 1983), and "The Chthonian World in Lithuanian Mythology" (Vilnius, "Vaga", 1987).

Doctor of Economic Sciences Professor R. L. Rayatskas, full member of the Lithuanian SSR Academy of Sciences, academician secretary of the Social Sciences Department of the Lithuanian SSR Academy of Sciences—for the series of works "Methods and Models of the Forecasting of the National Economy" (1972-1987).

L. V. Furmonavichyus, head of the laboratory of substructures and foundations of the Vilnius Construction Engineering Institute (supervisor of the work); Candidate of Technical Sciences Docent A. A. Alikonis, head of the chair of substructures and foundations of this institute; A. Vazgis, geologist of the Kaunas Affiliate of the Institute of Engineering Surveys; Yu. Zikus, chief designer of the Planning and Design Institute; M. Kaminskas, chief of the technical division of the Kaunasstroy Construction and Installation Trust; V. Knistautas, superintendent of the administration of the mechanization of excavation and earth moving No 4 of the Shyaulyay Construction Trust; A. Reventas, chief designer and chief of a sector of the Institute of Planning of Industrial Construction; A. Rekashyus, chief of a division of the Klaypedastroy Construction and Installation Trust; V. B. Elenbergas, chief of the Main Scientific and Technical Administration of the State Committee for Construction Affairs—for the development and introduction of a system of efficient foundations of framed buildings.

D. B. Astrauskene, chairman of the trade union committee; A. Zhalgyavichyus, deputy director for social questions; A. Zavistanavichyus, chief of the weaving

and dyeing works; Y. Karchyauskas, director of the factory; Ch. Lenkevich, weaver of the weaving shop; A. Lvovskiy, chief of the machine repair division; V. Mayauskas, chief engineer; I. Rutkauskene, senior process engineer; V. Yakuchenis, chief mechanic—for the solution of social, cultural, and production problems at the Vilnius Audesyas Spinning and Weaving Factory.

K. Gudlyauskas, chief mechanical engineer; P. Dzhyuva, chairman of the kolkhoz; P. Kizis, landscape architect; Yu. Ladyga, chief operator; Y. Lazitskas, chief power engineer; Yu. Steponas, deputy chairman of the kolkhoz; P. Shimolyunas, chief agronomist—for the settlement of social questions on the basis of the achievements of science and technology at the Istra Kolkhoz of Pasvalskiy Rayon.

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Yevgeniy Ivanovich Chazov

18140341 Moscow KLINICHESKAYA MEDITSINA in Russian Vol 67 No 6, Jun 89 pp 13-15

[Article under the rubric "Celebration": "Academician Yevgeniy Ivanovich Chazov (On His 60th Birthday)"]

[Text] The 60th birthday of Academician Ye.I. Chazov, a leading scientist and therapist of our country, a prominent organizer of health care, a public figure, and a Hero of Socialist Labor, is in June of this year.

In 1953, Ye.I. Chazov graduated with honors from the Kiev Medical Institute. From 1953 to 1955, he studied in clinical residency at the Chair of Hospital Therapy of the 1st Moscow Medical Institute imeni I.M. Sechenov. While in residency he completed and in 1956 defended his candidate dissertation. During 1957-1958, he worked as a physician at Hospital No 1 of the Fourth Main Administration attached to the USSR Ministry of Health, while in 1959 he transferred to a scientific job at the Institute of Therapy of the USSR Academy of Medical Sciences (since 1965 the Institute of Cardiology imeni A.L. Myasnikov), where he worked in succession in the position of junior and senior scientific associate, from 1963 in the position of deputy director for scientific work, and from 1965 in the position of director. In 1967, Ye.I. Chazov was appointed chief of the Fourth Main Administration attached to the USSR Ministry of Health.

In 1963, he defended his doctoral dissertation and since 1965 has been a professor. In 1967, Ye.I. Chazov was elected a corresponding member and in 1971 an academician of the USSR Academy of Medical Sciences and in 1979 an academician of the USSR Academy of Sciences.

In 1975, with the organization of the All-Union Cardiological Scientific Center of the USSR Academy of Medical Sciences Ye.I. Chazov became its first director, while remaining chief of the Fourth Main Administration and USSR deputy minister of health. In 1987, he was appointed USSR minister of health.

Ye.I. Chazov is the author of more than 370 printed works and 9 monographs. His articles and books have been published not only in the Soviet press, but also in the United States, England, Italy, the FRG, the CSSR, the GDR, Romania, and other countries.

The scientific interests of Academician Ye.I. Chazov concern the most different aspects of the functioning of the cardiovascular system. First of all one should indicate the successful elaboration by him of the problem of myocardial infarction, the relationship between damage of the walls of arteries, their spasm, and disorders of the blood coagulation system and the anticoagulant system, and intravascular thrombogenesis. This research was generalized in the monographs "Eksperimentalnyye nekrozy miokarda" [Experimental Necroses of the Myocardium] (1963), "Trombozy i embolii v klinike vnutrennikh bolezney" [Thromboses and Embolisms in the Clinic of Internal Diseases] (1966), which was awarded the S.P. Botkin Prize of the USSR Academy of Medical Sciences, "Infarkt miokarda" [Myocardial Infarction] (1971), and "Ocherki neotlozhnoy kardiologii" [Essays on Urgent Cardiology] (1973), which was awarded the A.L. Myasnikov Prize of the USSR Academy of Medical Sciences. In addition to the detailed elaboration of the theoretical aspects of the problem, he did much for its practical implementation. Thus, the anticoagulant fibrinolysin and the first immobilized thromolytic enzyme in the world—streptodecasum—were developed and introduced in clinical practice under his supervision and with his direct participation. For the theoretical, experimental, and clinical substantiation of the use of immobilized enzymes in the treatment of cardiovascular diseases Ye.I. Chazov was awarded the Lenin Prize.

Much attention is being devoted by Ye.I. Chazov and the students of his school to improving the control of life-threatening complications of a myocardial infarction. Under his supervision the intracoronary administration of thrombolytic preparations was carried out for the first time in the world; much attention is being devoted by him to intracoronary interventions, including laser angioplasty. Methods of controlling irregularities of the rhythm and conductivity in the critical period of a myocardial infarction were elaborated in detail, which made it possible to formulate indications for the use of drugs and to work out diagrams of their administration, as well as to establish the indications for the electropulse therapy and stimulation of the heart. The system of the resuscitation of patients after a myocardial infarction, which was proposed by Ye.I. Chazov and his students, has been widely introduced in our country and has shown its great medical and economic effectiveness. The scientific research in the area of the clinic and treatment of a myocardial infarction made it possible to develop a system of step-by-step treatment, which has been introduced at all medical institutions. For these works Ye.I. Chazov with a group of colleagues was awarded the USSR State PRize.

On the basis of the detailed formulation of the principles of the primary and secondary prophylaxis of cardiovascular diseases Ye.I. Chazov for the first time in the world established the Institute of Prophylactic Cardiology. The work of the associates of this institute, which is being performed under his supervision, made it possible to formulate the principles of the integral prophylaxis of basic noninfectious diseases. This served as the basis for the establishment of the All-Union Scientific Center of Preventive Medicine of the USSR Ministry of Health.

Ye.I. Chazov is the founder of the Soviet school of theoretical cardiology, which studies the functioning of the heart muscle at the cellular, subcellular, and molecular levels. Under his supervision the phosphocreatine pathway of the transport of energy in the myocardium

was studied for the first time. This work was registered as a discovery. The research in the field of molecular biology, which is being conducted under the supervision of Academician Ye.I. Chazov, goes far beyond cardiology and concerns a wide range of questions of the study of biologically active substances and the development of new medicines. At present under the supervision of Ye.I. Chazov extensive scientific research is being conducted on the pathogenesis of atherosclerosis, its immunology, molecular genetics, the diagnosis of the atherosclerotic damage of vessels, and the development of new methods of treating atherosclerosis, including extracorporeal methods with the use of biotechnological approaches.

Ye.I. Chazov is performing much scientific organizational work. On his initiative and under his supervision republic scientific research institutes of cardiology have been established, the State Program of Scientific Research on Cardiology was formulated, and the cardiological service of the country was organized. In the position of USSR minister of health he is devoting much attention to the development and introduction of new organizational and economic forms of providing medical assistance. Thus, on his suggestion and under his supervision a network of diagnostic centers is being set up, a number of economic experiments are being conducted, and the system of instruction at medical institutes is being improved.

The school of Academician Ye.I. Chazov has formed in cardiology. Under his supervision 22 doctors of medical sciences and 40 candidates of medical sciences have been trained. The works of his students were the basis for a multivolume guide on cardiology (edited by Ye.I. Chazov), which has become a handbook of every cardiologist in our country. In recent times Ye.I. Chazov in his works has been appealing more and more often to young physicians and students of medical institutes. The books "Serdtse i XX vek" [The Heart and the 20th Century] (1985) and "Ocherki diagnostiki" [Essays on Diagnosis] (1988) acquaint young people, who are taking the first steps in the difficult field of medicine, with the reflections and experience of the scientist, physician, man, and citizen.

The scientific and public activity of Academician Ye.I. Chazov has received extensive international recognition. He is an honorary member of the academies of sciences of the GDR and Bulgaria, an honorary member of the Colombian Academy of Medical Sciences, an honorary member of the society of cardiologists of Hungary, Bulgaria, the GDR, Yugoslavia, and England, an honorary doctor of sciences of Jena University, an honorary doctor of Friedrich Schiller University (the GDR), an honorary member of Charles University (the CSSR), an honorary doctor of law of Queen's University (Canada), and an honorary member of the International Collegium for Higher Nervous Activity. He has also been decorated with government awards of a number of foreign countries.

Ye.I. Chazov is editor in chief of the journal TERAPEVTICHESKIY ARKHIV, a member of the scientific editorial council of "Bolshaya sovetskaya entsiklopediya" [The Great Soviet Encyclopedia] and "Bolshaya meditsinskaya entsiklopediya" [The Great Medical Encyclopedia], and a member of the editorial board of THE CANADIAN JOURNAL OF CARDIOLOGY.

Yevgeniy Ivanovich is performing much public work. He was a deputy of the USSR Supreme Soviet of the 9th, 10th, and 11th Convocations and a delegate of the 25th, 26th, and 27th CPSU congresses and the 19th party conference. Ye.I. Chazov is a member of the CPSU Central Committee, a member of the All-Union Central Council of Trade Unions, and a member of the Soviet Committee for the Defense of Peace.

Ye.I. Chazov has been awarded many awards of the homeland for an outstanding contribution to the development of medical science and practice. In 1980 jointly with Professor B. Lown (the United States) he was the organizer of International Physicians for the Prevention of Nuclear War, to which the Nobel Peace Prize was awarded in 1985. Since 1987, Ye.I. Chazov has been honorary cochairman for life of this movement.

Yevgeniy Ivanovich is greeting his celebration at the prime of his talent as a scientist, physician, and organizer of health care. The editorial board of the journal KLINICHESKAYA MEDITSINA heartily congratulates the celebrator and wishes him creative successes and many years of work for the good of the Soviet people.