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18140073 Alma-Ata VESTNIK AKADEMII NAUK KAZAKHSKOY SSR in Russian No 8, Aug 87 pp 3-8

[Article: "In the Presidium of the Kazakh SSR Academy of Sciences"]

[Text]

On the Formulation of the Kazakhstan Regional Scientific Research Program

In conformity with the decree of the General Assembly of the Kazakh SSR Academy of Sciences of 24 April 1987 the Presidium of the Kazakh SSR Academy of Sciences considered the plan of the structure and the basis directions of research in accordance with the Kazakhstan Regional Scientific Research Program, which is called upon to unite scientific development of a basic and applied nature, which is being conducted by institutes of the Kazakh SSR Academy of Sciences, higher educational institutions, and sectorial institutes.

The Kazakhstan Program is being formulated for the purposes of the complete use of the natural resources and the development of the productive forces of the republic and includes a number of programs that encompass research on individual sectors of the national economy.

The implementation of the Kazakhstan Regional program will be a real contribution to the restructuring of republic science, will increase its contribution to scientific and technical progress, will strengthen the contact with production, and will speed up the process of introduction.

The Presidium of the Kazakh SSR Academy of Sciences discussed and approved the structure and the basic directions of the Kazakhstan Comprehensive Program, as well as the composition of the Permanent Coordinating Council attached to the Presidium of the Kazakh SSR Academy of Sciences for the Kazakhstan Program.

On the Training of Scientists Through Graduate Studies at Institutes of the Kazakh SSR Academy of Sciences During 1981-1985 and 1986

The Presidium of the Kazakh SSR Academy of Sciences notes that on 1 January 1987 485 graduate students, including 186 with leave from work and 299 without leave from work, are studying in graduate studies of the academy. Mainly associates of academic institutes and higher educational institutions of Alma-Ata enroll on common grounds in graduate studies, representatives of all other areas study in special-purpose graduate studies.

During the 11th Five-Year Plan 730 people were admitted to graduate studies of the academy, of them 638 were admitted with a length of service of 2 years and more and 92 were admitted on the recommendation of higher educational institutions. More than 60 percent of the graduated students were taken on with partially or completely passed examinations at the level of the minimum requirements for a candidate degree, about 50 percent have published works. A total of 681 people completed graduated studies, of them 346 (50.8 percent) defended dissertations, including 50 (7 percent) on the set date.

With respect to practically all the departments of sciences the indicators on the defense of dissertations in 1986 as compared with the preceding five-year plan declined. In all during the 11th Five-Year Plan graduate students and degree seekers, including graduate students of the graduating class of past years, defended 644 candidate dissertations (in 1986, 121).

At present special-purpose graduate students for institutes of the Kazakh SSR Academy of Sciences are being educated in scarce specialties in graduate studies of scientific institutions of the USSR Academy of Sciences and the USSR Ministry of Higher and Secondary Specialized Education.

The scientific institutions of the Kazakh SSR Academy of Sciences are engaging in the special-purpose training of scientists for scientific research institutes and higher educational institutions of Kazakhstan. During 1981-1985, 126 people completed intrarepublic special-purpose graduate studies, of them 37 did so successfully (29 percent).

The analysis of the work during 1981-1986 shows that serious shortcomings exist in the training of scientists through graduate studies. Thus, the planning of admission to graduate studies by institutes is being carried out formally, which is leading to frequent changes of specialties and types of instruction. As a rule, scientific supervisors and directors of institutes do not bear responsibility for the results of the training of personnel.

There are supervisors, for whom not one of those who completed graduate studies during the 11th Five-Year Plan defended and submitted a dissertation work for defense; the statute on graduate studies, Paragraph 25 of which permits a scientific supervisor to conduct the training of not more than five graduate students, is being violated. However, during the 11th Five-Year Plan not one scientific supervisor was deprived of the right of the scientific supervision of graduate students. The efficiency of the work of scientific supervisors was not examined at the meetings of the Presidium of the Kazakh SSR Academy of Sciences.

The failure to fulfill the plan of graduation from graduate studies is most often connected with the early discharge of graduates students of the 3d and 4th years of instruction, who have already been included in the plan of graduation, mainly due to the failure to fulfill the individual plan, loss of contact with the institutes, due to health, and others.

The boards of directors of the institutes are not devoting proper attention to questions of the personal assignment of the graduates of graduate studies: the graduate students, who were specially trained for institutes, are not being taken on the staff (the Institute of Literature and Art), while the graduate students, who were specially trained for higher educational institutions of Kazakhstan, are being taken on the staff of institutes (the Institute of History, Archeology, and Ethnography). The certification of graduate students during 1986 showed that these shortcomings have not yet been eliminated.

For the purposes of the further improvement of the work of graduate studies the Presidium of the Kazakh SSR Academy of Sciences obliged the academician secretaries of the departments and the executives of the scientific institutions of the Academy of Sciences to follow unswervingly the requirements of the decree of the CPSU Central Committee and the USSR Council of Ministers "On Steps on the Improvement of the Training and Use of Science Teachers and Scientists."

The presidium approved measures on the improvement of the training of scientists through graduate studies at institutions of the Kazakh SSR Academy of Sciences.

A number of specific assignments were specified for the departments of the Kazakh SSR Academy of Sciences.

The boards of directors of institutions and the Department of Graduate Studies, guided by the long-range program of the training of scientists at the Kazakh SSR Academy of Sciences to 2000 and taking into account in the plan the needs for the most important specialists, need to create all the conditions for the provision of graduate students with highly skilled scientific supervision and with the necessary conditions for work.

On the Progress of the Implementation of the Decision of the Party Control Committee Attached to the CPSU Central Committee on Serious Shortcomings in the Activity of the Institute of Metallurgy and Ore Dressing of the Kazakh SSR Academy of Sciences

As a result of the check of the activity of the Institute of Metallurgy and Ore Dressing of the Kazakh SSR Academy of Sciences by the Party Control Committee attached to the CPSU Central Committee a number of shortcomings were established: the institute is elaborating themes, which are not fundamentally new and urgent (for example, refractories); the amount of general theoretical and general technological research is inadequate; the existence of minor themes (economic contractual) is leading to the dispersal of scientific forces; the possibilities of the practical study of young associates at the USSR Academy of Sciences and higher educational institutions are not being used; the themes are of an exclusively technological nature, there are no themes on the theory of metallurgical processes; the scientific level of the work does not always meet the demands being made on the academic institute; there is no development in the plan of the economic and social development of the Kazakh SSR; attention is not being devoted to work in the area of ore dressing; during the 11th Five-Year Plan the number of laboratories was reduced to one-half; few dissertations were defended.

The Presidium of the Kazakh SSR Academy of Sciences notes that at present some work on the elimination of the indicated shortcomings has been performed at the institute. The corresponding measures have been elaborated and a comprehensive program on restructuring has been prepared. The themes for the 12th Five-Year Plan have been revised, the priority scientific directions have been specified, and a working council has been established for each of them. Seven nonurgent and uncharacteristic themes have been eliminated from the plan of scientific research work. With respect to the laboratory of refractories the theme on the study of methods of the activation of aggregates of concretes was completed ahead of time in 1986 and starting in 1987 the themes are completely oriented toward the solution of problems of nonferrous metallurgy. The number of themes in the area of the natural sciences, which by 1988 will come to more than 30 percent, has been increased.

The reorganization of the structural subdivisions was carried out, two specialized technological groups were eliminated. The new scientific direction on silicon carbide composites was organized.

Starting in 1986 the institute joined in the fulfillment of five all-union, five republic, and two sectorial scientific and technical programs. In accordance with the plan of the economic and social development of the Kazakh SSR in 1987 six themes and five assignments are being fulfilled, in accordance with the section of introduction three jobs are being performed. Two themes and one assignment have been included in the plan of scientific research work, which is being fulfilled in accordance with the decree of the State Committee for Science and Technology and the USSR Council of Ministers "The Development of the Scientific Principles and Methods of the Increase of the Efficient, Comprehensive Development of Deposits of Solid Minerals and the Protection of Mineral Resources for 1986-1990 and the Period to 2000." The institute is a part of the union Avtogennyye protsessy Scientific Technical Complex and the republic Tsvetnaya metallurgiya Scientific Technical Complex and is participating in the work of the creative youth collective for the automation of scientific research attached to the Kazakh SSR Academy of Sciences.

The work on the matter of the practical training of young scientific associates improved. In 1986, 16 people underwent practical training at institutions of the USSR Academy of Sciences, higher educational institutions, and other scientific centers, the same number is also planned for 1987.

For the development of work in the area of ore dressing the staff of the laboratory is being strengthened with young scientists, the themes of the laboratory are oriented toward the dressing of rare metal ores of Kazakhstan and are being included in the plan of the State Committee for Science and Technology.

A long-range plan of the training of doctors of sciences has been drafted.

The Council of Directors, which coordinates the work of all institutes on the establishment of pilot-scale plants and the conducting of tests at the pilot experimental metallurgical works (OEMP), was organized. The plan of the work of the Institute of Metallurgy and Ore Dressing, the Institute of Chemical Sciences, and the Institute of Organic Catalysis and Electrochemistry at the pilot experimental metallurgical works for 1987 and the five-year plan as a whole was drafted and approved. Steps were taken on the manning and reinforcement with personnel of the design bureau and the sections of assembly and wiring work. For the purpose of attracting young skilled workers the question of assigning graduates of schools of vocational and technical education to the pilot experimental metallurgical works was submitted for approval to the Kazakh SSR State Committee for Vocational and Technical Education.

Along with this still unresolved questions exist at the Institute of Metallurgy and Ore Dressing. The Presidium of the Kazakh SSR Academy of Sciences obliged the management of the institute to continue the work:

—on the elimination of the shortcomings, which were noted in the decree of the Party Control Committee attached to the CPSU Central Committee, having devoted particular attention to the development of basic research in the priority directions, the improvement of the structure, the training of personnel, and the shortening of the time of the introduction of developments in production;

—on the assimilation of the production areas of the pilot experimental metallurgical works and the placement into operation of the pilot works with the output in 1988 of small-tonnage and small-series products;

—on the integration of its work with the work of other institutions of the department.

On the Progress of the Fulfillment of the Decision of the Kazakh SSR Committee of People's Control on Serious Shortcomings in the Activity of the Institute of Petroleum and Natural Salts Chemistry

It was established by the check of a commission of the Kazakh SSR Committee of People's Control of the activity of the Institute of Petroleum and Natural Salts Chemistry of the Kazakh SSR Academy of Sciences that the results of scientific research and their introduction do not meet the demands of the 27th CPSU Congress and the 16th Kazakh CP Congress. The efforts of the collective were not mobilized for the maximum satisfaction of the requirements of the oil drilling and petroleum refining industry. The institute did not become the leading institution in case of the forecasting and determination of advanced directions of the development of these sectors of the region and is not participating in the comprehensive solution of the problems which are connected with the petrochemical industry of Mangyshlak, Guryev, Aktyubinsk, and Ural oblasts. Contact with sectorial and VUZ science is being carried out at a low level.

The decree of the Kazakh SSR Committee of People's Control and the article "Not a Special Case" in the newspaper *Pravda* of 20 August 1986 were examined by a commission of the Chemical and Technological Sciences Department, which went to the Institute of Petroleum and Natural Salts Chemistry of the Kazakh SSR Academy of Sciences in June 1986, as well as were discussed at the meetings of the bureau of the department and the session of the General Assembly of the Chemical and Technological Sciences Department. The people responsible for these violations were severely punished. A number of steps, which are aimed at the normalization of the work of the institute, are being implemented.

The certification of the scientific associates of the institute was carried out in strict conformity with the Statutes on Certification and a principled evaluation of the scientific and public activity of each scientific associate was given. Work on the establishment of a stable labor collective is being carried out, the institute has gotten rid of unenterprising and fruitless personnel.

The scientific themes were revised and the following priority scientific directions of the institute were specified: advanced methods of the refining of heavy resinous and secondary petroleums and petroleum residues; the development of new and the improvement of existing methods of the separation and refining of the nonhydrocarbon portion of petroleums and gas condensates of the Caspian Sea Zone; the study of the conditions of the formation of borates and the separation of special-purpose products from lean boric raw materials.

At present the work on the concentration of the basic forces and assets in these scientific directions is continuing. The structure of the institute has accordingly been revised.

For the intensification of basic research in the area of petrochemical synthesis and the obtaining of new organic compounds with a set of useful properties a new scientific subdivision—the laboratory of physical organic chemistry—has been established in the structure of the institute.

However, given some regulation of research work serious shortcomings and unsolved problems exist in the activity of the Institute of Petroleum and Natural Salts Chemistry.

The moral and psychological climate in the collective of the institute continues to remain unsatisfactory—the flow of complaints to republic and union instances (especially from the group which is in Shevchenko) is not abating. The attempts of the new director to establish order are not receiving the support of a certain portion of the associates. The group for the study of high-viscosity petroleums is not fulfilling the planned scientific research work, is constantly creating conflict situations, and is not fulfilling the orders of the board of directors, the party buro, and the trade union committee. The group of laser spectroscopy in Alma-Ata has existed a long time without supervision. The republic Kiry Scientific Technical Program, which was formulated and approved in strong-willed manner, is not being fulfilled, since the majority of coperformers and the main organization—the Institute of Petroleum and Natural Salts Chemistry—do not have financial and manpower resources for work on the program.

The Presidium of the Kazakh SSR Academy of Sciences obliged the management of the Institute of Petroleum and Natural Salts Chemistry of the Kazakh SSR Academy of Sciences to achieve a decisive change in its activity, for which it is:

—to take steps on the increase of the efficiency of research, to increase the demandingness on the managers of subdivisions and all scientific associates, and to evaluate strictly the results of their work, using if necessary extraordinary certification;

—to transfer the group of laser spectroscopy from Alma-Ata to Guryev at the site of the institute, having left two staff units for the maintenance of the Koultroniks instrument;

—in conformity with the petition of the Guryev Oblast Committee of the Communist Party of Kazakhstan to transfer the group for the study of high-viscosity petroleums from Shevchenko to Guryev at the site of the institute;

—to petition the Kazakh SSR State Planning Committee for the adjustment of the republic Kiry Scientific Technical Program and its transfer to the Kazakh SSR Ministry of Highways as one of sectorial importance.

7807

Scientific, Technical Information in Uzbek SSR

18140044b Tashkent EKONOMIKA I ZHIZN in Russian No 5, May 87, pp 54-56

[Article by Candidate of Economic Sciences A. Samoylov: "How to Duplicate an Innovation. Several Problems of the Mutual Use of Scientific and Technical Achievements"; first paragraph is *Ekonomika i Zhizn* introduction]

[Text] Of those inventions, which are considered introduced, 97 percent are used at only one enterprise. And only 0.5 percent of them have been "duplicated" at three to five enterprises.

Such are the data of statistics. But omnipotent statistics will also not be able to calculate the harm, which is being done to the state by such an unpractical attitude toward the major and minor achievements of scientific and technical thought, which, having originated in one department, cannot surmount the barrier that separates it from others....

The system of the mutual use of scientific and technical achievements, which is presently in operation, should be one of the important tools of the "breaking open" of departmental barriers. Let us attempt to analyze how effectively this system is operating in our republic.

If we examine the dynamics of the results of the mutual use of scientific and technical achievements in Uzbekistan in recent years, it is possible to conclude that things here are quite good. Let us recall, for example, that for ministries and departments of republic subordination the economic impact from the use of such achievements during the years of the past five-year plan increased by threefold. Such results of work may seem more than satisfactory. But this is if we compare them with past and, moreover, our own results. For the objectivity of the evaluations let us look at ourselves in a detached manner.

A comparison with another republic affords such an opportunity. Let us see, for example, how the matter has been organized in the Ukraine and compare it with how it has been arranged here.

Let us take the data for the same year. According to the information of the Ukrainian Scientific Research Institute of Scientific and Technical Information and Technical and Economic Research (UkrNIINTI), enterprises and organizations of the republic introduced in production 11,115 borrowed achievements with a total annual economic impact of 156 million rubles. According to the reports, which were received by the UzNIINTI [the Uzbek Scientific Research Institute of Scientific and Technical Information and Technical and Economic Research], there were accordingly 791 achievements with an economic impact of 13.8 million rubles. That is,

in Uzbekistan one-fourteenth as many borrowed innovations were introduced and an economic impact, that was smaller by a factor of 11.3, was obtained.

Such a difference is explained not only by the differences in the scale and structure of the economy (although they are quite significant and it is simply impossible to disregard this factor), but first of all by the organization of the mutual use of scientific and technical achievements. And precisely this will be discussed.

It should be stipulated that, perhaps, at enterprises and organizations of Uzbekistan more significant work was done than was recorded in the reports. It is necessary to say "perhaps," because there are no data for the territory of the republic. According to the Statute on the Mutual Use of Scientific and Technical Achievements, enterprises and organizations are obliged to submit reports on their work to the oblast Scientific and Technical Information Centers (TsNTI's). The UzNIINTI puts together the data received from the oblast centers. But such centers operate in only 4 of the 12 oblasts. There is also no scientific and technical information center in the Karakalpak ASSR. That is precisely why the above-cited data are incomplete. But without a knowledge of the real state of affairs it is impossible to formulate measures on the stimulation of the mutual use of scientific and technical achievements throughout the republic.

In the Ukraine scientific and technical information ceenterss operate in practically all oblasts. Moreover, these are large organizations, at which from 70 to 250 workers are employed. This makes it possible to have in their structure special subdivisions for the organization of the mutual use of scientific and technical achievements. Even in our oblasts, where such centers exist, they can allot for the organization of work in this area not more than one worker each, who is incapable of supervising in a high quality manner on the scale of the oblast the multidimensional activity on the transfer and introduction of scientific and technical innovations.

Not only organizational and procedural work determines the results of the functioning of the system of the mutual use of scientific and technical achievements. Publications and the duplication of materials on these achievements constitute its basis. In the Ukraine during the past five-year plan on the average per year more than 900 information leaflets were published and turned over to the system of intersectorial exchange, in Uzbekistan 150 were. The weak possibilities of the oblast scientific and technical information centers of the Uzbek SSR do not make it possible to prepare materials at the necessary qualitative level, and that is why their publication is carried out only at the UzNIINTI. It is natural that a large portion of the oblasts do not submit their achievements at all for introduction in other sectors of the national economy. There is no one there to organize the gathering of the corresponding materials. How many innovations, which are worthy of extensive introduction, have been buried because of this? We do not even know this.

According to the prevailing statutes, which govern the work of scientific and technical information centers, they not only should publish materials on scientific and technical achievements, but are also obliged to acquire collections of drafting and design documentation. At first request this documentation should be copied and sent out to enterprises and organizations for introduction. This is possible only if the centers of scientific and technical information have been provided with the necessary copying and duplicating equipment and the conditions exist there for the creation of collections of technical documentation. But such conditions and equipment are lacking not only at the Andizhan, Bukhara, and Fergana centers (they exist only in Samarkand), but also at the UzNIINTI itself. Therefore, in these organizations the filling of orders for technical documentation is not carried out, and this cannot but affect the efficiency of the mutual exchange of innovations that are of intersectorial importance.

Such a situation is the result of inadequate attention to the development of territorial information organs in the republic. Let us turn once again to the experience of the Ukraine, where when supplying copying, duplicating, and typographic equipment the Ukrainian Scientific Research Institute of Scientific and Technical Information and Technical and Economic Research and its oblast centers have priority over any other enterprises and organizations.

It seems that one cannot talk about a serious attitude toward the problems of scientific and technical progress without a developed network of territorial centers. In those republics and regions, where the acceleration of scientific and technical progress is especially appreciable, such centers are an important element of its support. In particular, the large Leningrad Scientific and Technical Information Ceenter is a serious help in the implementation of the well-known Intensification-90 Territorial Program. Of course, it is a fantasy to raise the question of establishing information organs in the rayons of the republic, as is being done, for example, in Belorussia, but such a need has obviously arisen for the oblasts.

The republic institutes of scientific and technical information and technical and economic research jointly with the network of oblast scientific and technical information centers are called upon to serve as the basis of the information system. All the information, from which the achievements of scientific and technical progress should be drawn for use in the national economy, is concentrated precisely here. That is how it was contemplated.

But the scale of the activity on the mutual use of scientific and technical achievements in many respects is also determined by the activity of enterprises and organizations on the use of the information collections available in the republic, in which information leaflets on scientific and technical achievements, which have been published throughout the territory of the country, are accumulated. The system of the mutual use of achievements envisages the identical completeness of all the territorial collections regardless of in which republic they are located. Since all enterprises and organizations have identical access to these collections, from the number of requests for the copying of information leaflets on scientific and technical achievements it is possible to judge quite objectively the interest of enterprises and organizations in the search for innovations for the purpose of their assimilation by production. Let us once again take the liberty of returning to the comparison with the Ukraine: during the past five-year plan the number of such requests here came to only 3 percent of their number in the fraternal republic. Such results, despite the difference in the scale and structure of the economy of the two republics, testifies to the low level of interest of our enterprises and organizations in the search for innovations of science and technology.

For the sake of fairness it is necessary to say that the comparative analysis also makes it possible to draw the conclusion that for individual items the situation with respect to the mutual use of scientific and technical achievements in Uzbekistan is better than in the Ukrainian SSR. This pertains to ministries and departments of republic subordination, in which the economic impact from the introduction of borrowed innovations is nearly twofold greater. It is possible to say that on the average more significant innovations have been introduced here: whereas in the Ukraine one introduction yielded an economic impact of 10,100 rubles, in Uzbekistan it yielded an economic impact of 27,400 rubles.

This is a consequence of the fact that the UzNIINTI was given the right to the procedural supervision of the mutual use of scientific and technical achievements in ministries and departments of republic subordination. In past years the organization, registration, and monitoring of the introduction of borrowed innovations were developed. Particular attention was devoted to the formulation of recommendations on the inclusion in the plans of science and technology of the most important scientific and technical achievements for production. During the years of the past five-year plan from 500 to 900 such recommendations were annually sent to these ministries and departments.

Nevertheless the overall results of the work in all directions of intersectorial exchange, as has already been said above, cannot satisfy us.

When people want to stress that a job is being fulfilled at a high level, they say that it was done professionally. But about what professionalism in the work with modern information, which is enormous in scale, is it possible to speak, if at enterprises they deal with it in passing. Thus, according to the reports for 1985 in ministries and departments of republic subordination 506 people dealt with the mutual use of scientific and technical achievements. But of them this activity was basic only for 31 workers. For the others this was a secondary makeweight to some other job. The results are also not accidental: during the year 122 borrowed scientific and technical achievements were introduced in these ministries. It is clear that this result obviously "does not match up" with the assertion that more than 500 people are ostensibly dealing with this matter. It turns out that there are more than four information workers per introduced innovation!

What is more, the analysis of the reporting data, which were submitted by ministries and departments of republic subordination, makes it possible to draw a paradoxical conclusion. There is no more or less strict dependence between the number of people, who are engaged in the mutual use of achievements, and the results of the introduction of these achievements. For example, in the Ministry of Consumer Services and the Ministry of Local Industry several fold more specialists are engaged in this work than in the Ministry of Housing and Municipal Services and the Ministry of Highway Construction and Maintenance. But the results in the first two are tens of folds less than in the last two. Precisely the lack of such a dependence also reveals the formalism in this matter: information work is being assigned to engineering and technical personnel, for whom it is an additional load, and for this reason is being performed here and there or is not being performed at all.

The lack of professionalism of workers also shows in how the requests for information services are formulated. Often they arrive in such a form that it is simply impossible to fill them.

It is also impossible not to dwell on another problem that is hindering the mutual use of scientific and technical innovations.

Many enterprises and organizations would also be happy to introduce an innovation, but where are the accessories to be made and the equipment, which is not characteristic of the sector, to be produced? Several approaches are possible here.

It is worth thinking about establishing on the basis of cooperation for ministries and departments of republic subordination a quite powerful enterprise of nonstandard equipment.

It seems advisable to organize a system of patronage assistance of large and quite strong machine building enterprises to smaller and weaker ones, which are located in the same oblast, city, or rayon. For considerable experience in patronage assistance of the city to the countryside has been gained here. But here the results

can be substantially greater, since the patronizing enterprise should give assistance in an area that is closer to the type of its basic production.

And a last thing. Why not establish here following the experience of the German Democratic Republic councils of chief engineers, mechanics, and so forth? For such councils could check at a high professional level the works on the territory of the city or rayon and organize mutual assistance in the work on the increase of their technical level.

All this, without a doubt, would contribute to the more complete use of the scientific and technical potential that the republic has.

7807

Problems of Introducing Invention of Uzbek Electronics Institute

18140044a Tashkent EKONOMIKA I ZHIZN in Russian No 5, May 87 pp 51-53

[Article by L. Shabshay under the rubric "The Key Task Is Introduction": "While We Mark Time, Western Firms Have Taken an Interest in an Invention of Tashkent Scientists"; first two paragraphs are *Ekonomika i Zhizn* introduction]

[Text] At a Leningrad plant the need arose to drill very fine and very deep holes in the blades of turbines. They turned to one of the West German firms. And they received from this firm the response: today only the Institute of Electronics of the Academy of Sciences of Uzbekistan is capable of performing such work....

An impressive fact, is it not? It is just from what standpoint you look at it: it is possible, of course, to be pleased with our own achievements, but it is possible the next time to be astonished by how poorly we know our own achievements and possibilities and, hence, how impractically we are dealing with them. And whereas for the Leningrad plant it is still possible to find some explanation, which justifies its lack of information, how is one to explain that the invention, which originated several years ago in Tashkent, thus far has not found application at a single enterprise of the city? Moreover, it is not being used anywhere in the republic. Here you will not plead lack of information: criticism meant for production workers, who did not take an interest in so significant a technical innovation, has already been heard from the highest tribunes. And when the editorial board ordered an article on this theme, it was assumed that it would be a question in it of the perennial conflict of the old with the new, which today in light of the concept of acceleration is acquiring particular vital urgency. And we set a simple and specific goal—to speed up the movement of a specific scientific development from the institute to production. But the real situation, as often happens, did not fit the customary scheme. The problem proved to be more complex, broader, and more serious.

First about the invention itself.

Specialists know: the existing methods of drilling metals make it possible, if the diameter of the hole is small, to obtain a length which will be only twentyfold greater than this diameter—it is impossible to make a hole deeper. In other words, given a diameter of 2 millimeters the achievable depth of the hole is equal to 40 millimeters, given a diameter of 3 millimeters—60 millimeters....

But if in a part, which is intended for a machine and the thickness of which is 60 millimeters, it is necessary to have a 1-millimeter hole, what then? Then it has to be assembled from three components, in which holes have already been drilled in advance. Instances, when there can be up to 10 such assembly elements, are also not ruled out.

At the Institute of Electronics imeni Arifov of the Uzbek SSR Academy of Sciences they developed their own method of solving this technical problem. A small collective of scientists under the supervision of E.T. Abdukarimov found in the presently used electro-erosion method of broaching conducting materials new possibilities that had previously not been detected by anyone.

The possibility, which appeared for the first time, of obtaining blind and through holes of even a diameter that varies by depth, as well as cavities of different configuration with the retention of the small diameter of the inlet (and if necessary, the outlet) is an unquestionable merit of the proposed method. The results of the figure machining and broaching of deep holes are equally good when working with materials of different hardness and ductility: from copper to tungsten. The smoothness of the machining of the walls of the obtained holes for some materials corresponds to class 6-8. The surfaces of the walls do not differ in their physical and chemical properties from the material of the part, in which the hole was broached.

The idea of the scientists was embodied in devices of three versions: a nonportable device (its weight is 150-200 kilograms), a portable device (10-15 kilograms) for work directly on large parts, and in a device like a "gun," which in dimensions is similar to a hand-held electric drill. All three versions do not require special vats for the dielectric fluid—ordinary water is sufficient.

The devices are technologically effective, mobile, compact, and easy to use, have a long service life, and require minimal maintenance.

Where can they be used? In case of the production of lubricating and cooling systems in various engines; the drilling of through and blind holes in cutting tools, for example, bits, reamers, and countersinks—for the feeding of the coolant and the removal of chips; the removal of a broken tool of small diameters (taps, drills); the machining of large parts in hard to reach places; the production of dies and hollow cathodes; the drilling of holes in the blades of various turbines.

Other areas of use of the invention, which today its authors themselves cannot specify, are also possible: it originated in a laboratory of processes near the electrode of an academic institute, and not in a laboratory of metal working.

Nevertheless, having relegated its further scientific research for some time to the background, the collective of the laboratory is attempting to achieve the introduction of the development at the largest enterprises of the republic, where the volume of metal working is quite large.

Specialists from the Tashkent Agricultural Machinery Plant, the Tool Plant, the Tashkentskiy traktornyy zavod Production Association, and the Tashkent Aircraft Production Association imeni V.P. Chkalov examined the machine tools and finished items with various holes and cavities, rated enthusiastically what they had seen, acknowledged the unconditional importance of the development, and...left it at that.

We will not jump to conclusions and accuse them of conservatism and the neglect of state interests. Everything is much more complicated than it seems at first glance.

The existing methods of metal working and the types of machine tools, which correspond to them, determine the choice by planning and technological institutes of the entire technological chain and the pool of machine tools. A plant is built and "fitted" with specific equipment in conformity with the design decision, the means of modernizing an operating enterprise are determined in the same way.

Therefore, in order to use the described method of electro-erosion drilling with all its previously unattainable possibilities, for example, at a motor plant, it is necessary to change the mode of production and the number and configuration of several parts and assemblies and, moreover, to arrange the assembly line in a new way. For this not only new planning documentation is needed, but the revision of all-union state standards and sectorial and plant standards will also be necessary. New tasks will arise for the workers of the material and technical supply service. It is necessary to test without fail on stands the test run of engines, which was assembled with the use of the new technology, and to check how the power, fuel consumption, the operating life, and so on have changed. Tractors with these engines will need field tests. Do you see how broad the group of problems is?

And this is not everything. The special design and technological bureau of the Institute of Electronics is capable of producing several laboratory models, but is unable to meet the potential need of industry for the machine tools. Hence, it is still necessary to find a producer plant, to turn over to it the design documentation for the machine tool, and to include it in the production plan. And to "attach" to this plan introduction at specific priority enterprises with allowance made for the maximum achievable technical and economic impact.

Were the named enterprises and associations able to solve independently this entire difficult bundle of problems? Of course not. And even now, under the new conditions of management, having acquired broad rights and independence, hardly anyone (we will face the truth) will bring himself to so revolutionary a change of production. Tasks of such a scale should be accomplished at a different, state level—the sectorial and even the intersectorial level.

An industry of introduction is needed.

This need arose not today. They began to speak many years ago about the fact that the "demand" of industry ceased to conform to the "supply" of science. They attempted by various means to connect the broken "science-technology-production" chain. Several of them, such as, for example, the organization of scientific production associations, where the time of the development and introduction of new equipment is shortened to one-third to one-half, to a significant extent have justified themselves, and now, under the conditions of restructuring, many scientific production associations are successfully implementing the found forms of the integration of science and production and are seeking new ones. Others proved to be entirely unviable and were justly forgotten. Still others, having played a definite positive role, under the new conditions of management "work" far from always. The Tashkent Scientific Center, which was established at one time under the oblast committee of the Communist Party of Uzbekistan and was called upon to contribute to the acceleration of scientific and technical progress, did and is doing much for the implementation of technical innovations, but in the incident with the development of the Institute of Electronics of the Uzbek SSR Academy of Sciences, about which we are speaking, the Tashkent Scientific Center turned out to be in the role of a passive observer, although scientists also turn to it for assistance. Incidentally, does such a distribution of forces—when scientists are forced to appeal "for assistance"—conform to the

very spirit of restructuring? Were scientific centers really not established precisely to identify the most promising developments and to seek the optimum versions of their practical implementation?

Thus far such an optimum version for the development of the Institute of Electronics has not been found. And it is a matter not of this invention alone, which is skidding on the way to possible users (although we also cannot tolerate this!)—the point is that such a fate is in store for many of its colleagues, for the acceptance of which present-day production frequently turns out simply not to be ready.

Let us repeat once again: an industry of introduction is needed. At the present stage its formation is proceeding in various directions. Much is being said about the establishment of cost accounting introducing firms. Perhaps, they are needed. But personally it seems to me that this is not the best form of the introduction of the achievements of science and technology in production. Can an introducing firm solve the set of problems, which we named above in connection with the invention of the Institute of Electronics? It is obvious that this is beyond its power.

Here it is necessary to seek other means....

Today the republic is simply not using this invention. But meanwhile one of the Swiss firms has already taken an interest in it....

7807

Transcaucasus Academies Restructure Joint, Individual Scientific Work

Yerevan KOMMUNIST in Russian 24 Jul 87 p 3

[Article (*Armenpress*): "Academies Integrate Efforts"]

[Text] The tasks of institutes of the academies of sciences of the Transcaucasus republics relating to joint development of regional problems were discussed at a meeting of the Council of Presidents of the Academies of Sciences of Georgia, Azerbaijan and Armenia held in Yerevan.

At the meeting, there were present the presidents of the academies of sciences of the Transcaucasus republics—Academician V.A. Ambartsumyan, Academician of the Azerbaijan SSR Academy of Sciences E.Yu. Salayev and Academician of the Georgian SSR Academy of Sciences A.N. Tavkhelidze, members of the delegations headed by them and also S.P. Gubin, the deputy chairman of the Council for Coordination of Scientific Work of Academies of Sciences attached to the presidium of the USSR Academy of Sciences.

At the expanded session of the presidium of the Armenian SSR Academy of Sciences, R. Arzumanyan, secretary of the Central Committee of the Communist Party of Armenia, and A. Melkonyan, chief of the Department of Science and Educational Institutions of the Central Committee of the Communist Party of Armenia, were present.

A broad spectrum of problems of joint developments was approved. They included in particular problems such as "The Transcaucasus Becoming Part of Russia," "Working out Systems of Indicators, Methods and Means of Predicting Earthquakes as well as Research on Seismology and Seismic Regionalization of the Territory of the Transcaucasus" and "Problems of Further Social and Economic Development of the Mountainous Regions of the Transcaucasus."

The meeting's participants approved proposals on research on international relations and the effectiveness of patriotic and international education. The joint-work plans reflected the problems of metallogenic regionalization of the Transcaucasus in the light of the latest geodynamic concepts and development of the hydropower resources of the Transcaucasus in the interest of the economy. Research will also be conducted on the topic "The Peoples of the Caucasus—Problems of Caucasian Civilizations."

The Council of Presidents commissioned the appropriate departments of the academies of sciences of the Transcaucasus republics to prepare proposals on unifying efforts in the fields of astronomy, mathematics, applied mathematics, mechanics, physics, biology and physiology and chemistry.

An expanded session was held of the presidium of the Armenian SSR Academy of Sciences with the participation of the presidents of the academies of sciences of Georgia and Azerbaijan and members of the delegations headed by them. Academician V.A. Ambartsumyan, Academician of the Azerbaijan SSR Academy of Sciences E.Yu. Salayev and Academician of the Georgian SSR Academy of Sciences A.N. Tavkhelidze provided information on the reorganization of scientific work in the national academies, further work on improving the structure of academic institutes and selection of priority directions of scientific research.

S.P. Gubin, deputy chairman of the Council for Coordination of Scientific Work of the Academies of Sciences attached to the presidium of the USSR Academy of Sciences, acquainted the meeting's participants on the course of restructuring scientific work at the USSR Academy of Sciences.

The participants of the meeting of the Council of Presidents of the Academies of Sciences of the Transcaucasus Republics visited a number of scientific institutions of the Armenian SSR Academy of Sciences. At the Byurakan Astrophysics Observatory, they became acquainted

with the new organization of scientific work of this leading scientific center of the country and visited the Institute of Radiophysics and Radioelectronics of the Armenian Academy of Sciences.

The guests found of major interest achievements of the collective of the Institute of Applied Problems of Physics of the Armenian SSR Academy of Sciences, which has produced a number of unique achievements that have no precedent in world science. Lively interest was evoked by the demonstration of new-generation physics instruments created on the basis of secured effects and also the program of scientific instrument making being realized at the institute.

7697

Abolition of Azerbaijan's Institute of Economy

18140062 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 Oct 87 p 2

[Article: "At the USSR Council of Ministers"]

[Text] The USSR Council of Ministers enacted a decree concerning serious defects in the work of the Azerbaijan Institute of Economy imeni D. Buniat-Zade. It is pointed out in the decree that the Azerbaijan Institute of Economy imeni D. Buniat-Zade does not fully provide for the accomplishment of its chief task—training of specialists with higher education.

A check carried out by the USSR Ministry of Higher and Secondary Specialized Education disclosed extremely gross violations of prescribed procedure in admission of students. The level of ideological and theoretical training is intolerably low. In state examinations on scientific communism and political economy practically every fourth graduate in 1987 received an unsatisfactory grade. The quality of professional training of specialists being graduated by the institute does not meet the required level. Most theses are done on a descriptive level and a portion of them do not have an independent character.

The institute's material and technical base is in a neglected state. Classroom facilities are below standard by a factor of two. Practically no modern equipment or technical teaching aids exist at the institute. A significant portion of the instructors do not provide qualitative conducting of teaching and educational work as it has lost contact with science and its qualifications. Phenomena of stagnation in the work of the VUZ have led to an unsatisfactory moral and psychological atmosphere in its collective. Scientific unconscientiousness, violation of teaching ethics and work discipline, nepotism, favoritism and other abuses have become prevalent.

The main reasons for the serious defects in the institute's operation institute are persistent violations of state discipline, manifestations of absence of principle in work, an uncritical attitude toward the state of affairs, formalism and pretentiousness permitted by the institute's administrative staff.

The USSR Council of Ministers has declared its agreement with the USSR Ministry of Higher and Secondary Specialized Education, the USSR Committee of People's Control and the Central Committee of the Communist Party of Azerbaijan on abolishing the Azerbaijan Institute of Economy imeni D. Buniat-Zade of the Azerbaijan Ministry of Higher and Secondary Specialized Education. The attention of Chairman of the Azerbaijan Council of Ministers Comrade G.N. Seidov to the fact that over the course of a long time a tolerant attitude has been displayed to major defects in the work of the said institute and measures have not been provided for the necessary professional and ideo-theoretical level of specialists' training, for raising effectiveness in the work of the institute and adhering to prescribed procedure in recruitment of the student contingent and allocation of graduates. It was considered necessary for the Azerbaijan SSR Council of Ministers to examine the question of the personal responsibility of the republic's Ministry of Higher and Secondary Specialized Education for mistakes permitted in work.

For the purpose of satisfying the needs of the economy of Azerbaijan SSR for economic personnel, the USSR Ministry of Higher and Secondary Specialized Education and the RSFSR Council of Ministers have been commissioned to create in the city of Baku an affiliate of the Leningrad Financial and Economic Institute imeni N.A. Voznesenskiy of the RSFSR Ministry of Higher and Secondary Specialized Education with instruction in day, evening and correspondence forms.

It was proposed to the Azerbaijan SSR Council of Ministers to provide according to prescribed procedure for turnover of the buildings, structures, machines and equipment of the abolished Azerbaijan Institute of Economy imeni D. Buniat-Zade to the affiliate of the Leningrad Financial and Economic Institute imeni N.A. Voznesenskiy being opened in the city of Baku as well as creating during 1987-1990 a modern material and technical base for this affiliate in accordance with prescribed norms. It was recommended to provide assistance in job placement of personnel released in connection with the abolition of the Azerbaijan Institute of Economy imeni D. Buniat-Zade, keeping in mind assurance of their use in the economy in accordance with qualifications and work experience as well as rational placement of students of the abolished VUZ; to adopt measures for effective utilization of economic personnel in the republic's economy and to initiate work on upgrading the economists' qualifications and retraining, renewing and adding to the economic knowledge of all the specialists.

It was entrusted to the USSR Ministry of Higher and Secondary Specialized Education to increase the personal responsibility of rectors of VUZ's for the level of training of specialists, maintenance of teaching and educational and scientific-research work, qualitative makeup of teacher cadres and the state of the material base and to carry out regular certification of higher educational institutions.

7697

Work of Pilot Production Facilities Analyzed

Moscow EKONOMIKA SOVETSKOY UKRAINY in Russian No 6, Jun 87 pp43-46

[Article by V. Smalin and V. Pogosyan, docents, candidates of economic sciences (Vinnitsa): "Intensification Reserves of Pilot and Experimental Production Facilities"]

[Text] In the cycle "science—production," pilot and experimental production facilities occupy an intermediate position. On the one hand, difficulties in research work can have a negative effect on their operation, and, on the other, it is essential to develop production processes and new types of devices of the greatest possible precision and stability. They act in the role of a bridge connecting science with production. The work of pilot and experimental production facilities is objectively complicated by the fact that, under the conditions of carrying out all production operations in one system, even with successfully developed production operations, machines, apparatus and components, new problems appear connected with the development of automation, control instruments and communications.

Pilot production facilities (OP) in the system of scientific institutions perform the work of creating models of pieces of new equipment, complexes and systems of machines, units, machine tools, instruments and of introducing programmed control, electronics and computer technology, comprehensive mechanization and automation of basic and auxiliary processes. Pilot production facilities belonging to industrial enterprises work out an optimal scheme of production, select the most economical forms of raw and other materials, improve the construction structure of production equipment, reduce its materials intensiveness, conduct testing work, put out small series of products, ensure normal conditions in regard to labor-safety practices and training cadres of future operators. The data of pilot facilities is used as the primary basis for the production of initial data of standards used in working up the Unified System of Technological Preparation of Production for plant technical documentation, calculation of cost norms and selection of a scheme of control and organization of labor.

The tasks performed by pilot production facilities stem from the special features of industrial sectors. For example, whereas in machine building the result of pilot production is a pilot model serving as a sample for the manufacture of series products in their actual size, in pilot production with chemical technology, an industrial model is designed whose experimental development consists of the stages: the model (pilot) stage, the consolidated [ukrepnennaya] stage and the experimental industrial [opytno-promyshlennaya] stage. And at each stage, the production process is reproduced on a larger scale compared to the preceding stage. Skipping individual stages without due validation can lead to multiple costs, which is confirmed by practice.

Though the study of technological aspects under the conditions of pilot production operations is done rather fully, it is made difficult in regard to the economic problems of pilot work. At the same time, as shown by the work experience of 36 pilot and experimental production facilities (OEP) located on the territories of four oblasts of the UkSSR—Lvov, Ternopol, Khmelnitskiy and Vinnitsa (including 5 pilot production facilities of scientific organizations: 25 pilot and experimental production facilities at industrial enterprises; 6 pilot plants possessing an independent balance), the study and use of the results of economic developments at the stage of pilot testing contribute not only to fast attainment of planned technico-economic indicators but also to their improvement and development in the process of operation of new production facilities.

Our data shows that at enterprises possessing pilot production facilities, the time for creation of new developments is reduced by a factor of 1.4-2 and costs by 50-60 percent. Despite the obvious benefit and the practical inability and limitation of a successful transition to series industrial production while bypassing the pilot and experimental stage, not all industrial enterprises (sometimes even large ones) are provided with an appropriate experimental base. Its absence under conditions of production operations that have become complicated results in unfinished designs and production processes and numerous alterations even in the process of product production, which is connected with large additional costs, significantly exceeding the expenditures on existing pilot production operations. It follows from this that at the stage of making a planned assignment, the requirement should be taken into account without fail: "Not to take a step without pilot and experimental confirmation!," but unfortunately this is not always done. Let us get down to examples.

At the Khmelnitskiy Temp Plant (became operational in 1977), a basic hindrance to the development and introduction of new types of productshas been the lack of a testing and experimental base, as a consequence of which new items are introduced without testing of the technological scheme and prior working out to the last detail of components for reliability, which in turn has a negative effect on quality indicators. According to testimony of specialists of enterprises, 3-4 variants are frequently put forth for the resolution of a number of technical questions at the pilot development stage, but the selection of

the most effective of them (by reason of lack of a testing base) becomes quite difficult, while the time periods for the introduction of new models into series production drags out on the average to 1.5-2 years.

There can be no justification for the lack of a model installation or testing production facility at the Vinnitsa Order of the Labor Red Banner Chemical Combine imeni Ya.M. Sverdlov. For a long time the combine has maintained creative contacts with 9 scientific-research institutes and higher educational institutions but lacks the capability of approving on the spot recommendations received from them and effectively influencing the process of introduction of new chemicals (the construction of a testing base is planned only in the course of the current 5-year plan).

A lack of testing bases or their inadequate capacity results in violation of schedules for the introduction of proposed developments. The capacities of testing and experimental bases in plans of new production facilities in our view should have the long term as an aim, since growth of plants' capacities in the future and expansion of the list of products being put out urgently requires a corresponding increase in testing and experimental capacities. Expansion of a testing and experimental base has become one of the important directions in acceleration of introduction of new developments for the Vinnitsa Terminal Plant imeni XXVI Syezd KPSS. Over the past 5-7 years, the number of issued prototypes, which were first approved in the testing sector while taking into account a high level of automatization, economical design, esthetic quality and other indicators, has been increased more than tenfold.

This has made necessary optimal planning of pilot and experimental production facilities. What should be their sizes (capacities)? So far no precise methods have been proposed for determination of the optimal correlation of expenditures on research, development and introduction, but each individual case should proceed from the specific features of the sector and the need of timely approval of the results of scientific-research work. The difficulty of solving the question lies in the fact that at the stage of planning pilot production operations it is impossible when calculating capacity to take into consideration all the factors influencing its size. They include: size and composition of testing equipment, labor intensiveness of fabricating and testing a pilot model, coefficient of complexity and newness of the item, number of samples in the series, number and qualifications of workers and others. On the basis of domestic and foreign data, it would be useful to use for pilot and experimental production facilities not less than 5 percent of the funds designated for the capital construction of individual enterprises and the sector as a whole.

The organization of testing work is relatively more complex in sectors with a chemical technology. We know from practice that pilot plants in their size do not exceed laboratories by more than three- to fivefold. On the basis of this data, semiplant pilot installations with a capacity of approximentally 1 to 10 percent of the capacity of the respective industrial plant are planned. Moreover, processes of synthesis correspond to the lower limit and processes of processing chemical products to the upper limit.

At the scientific-research work stage, special attention is paid to preparation of economic substantiation of created pilot production facilities for the purpose of selecting the most effective directions of their work. For the purpose analysis, it is necessary to have data on production cost and capital investment. For example, if it is known that in making a comparable product 75 percent of the total of all expenditures is required for raw and other materials in existing production, then it is also easy to determine the production cost of the item.

An important reserve for raising the efficiency of experimental testing production facilities is stimulation of their construction and start-up in normative time periods. At the same time, cases are to be found of violation of the time periods of their integrated start-up and lag in turning over for operation facilities of the testing pilot base. For example, the pilot sector of the Vinnitsa Plant of Gas-Analysis Instruments went into production with testing production 5-6 years after the facility became operational, although in the plan the pilot production operation was considered an integral part of the enterprise.

The study of pilot production facilities shows that in estimates of the construction and installation work of industrial enterprises not more than 1-15 percent of the total structure of expenditures is required for the creation of testing pilot bases, while for the equipment of industrial enterprises with testing bases the present size of capital investment should be increased two- to threefold and their first priority construction ensured. Expenditures on pilot production facilities as part of new enterprises should be included in the total amount of capital investment and as a rule put into operation prior to turning over of the enterprises for operation rather than afterward. This will provide the possibility in advance, even before basic production goes into operation, to approve the findings of developers under the conditions of experimental testing production, to introduce the necessary revisions and corrections and to immediately train operating personnel at the location.

Pilot production facilities should always be functioning and become the principal bases for making more precise the causes of arising complications without halting basic production, including the stage of further improvement of production under conditions of well-organized production (after the stage of economic development). This requires only small labor and material outlays. Violations of the overall rhythm of the production process are not allowed and production personnel are not diverted from the fulfillment of intensive production asignments.

Observance of this requirement is especially important for production operations with continuous production processes. The fixed use of pilot plants does not involve large outlays of fixed production capital (for example, pilot semiplant installations in the chemical industry have from 1.5 to 4 percent of the capacity of the basic plant equipment).

In accordance with existing regulations, experimental testing production facilities have a particularly goal-oriented function and for this reason they cannot be used for the performance of current production tasks of serious production operations. With a minor exception, this requirement is being violated at all examined production operations (not less 20-30 percent of the capacities of the examined pilot production facilities are engaged in work not intrinsic to them), which cannot but help create doubts concerning the objectivity of performance of plan assignments by existing production capacities. This circumstance diverts collectives of experimental testing production facilities from their direct tasks, affects negatively qualitative preparation for priority experiments and tests and results in time loss and lowering of the level of cadre training with respect to the basic speciality.

Under the conditions of experimental pilot production, the condition of production equipment is of special importance. More than half of all research production facilities possess obsolete equipment (10-15 years in operation) and for this reason the question of capital renewal and its modernization is most urgent at this time. Equipping experimental pilot production facilities with the latest equipment should be done on a first priority basis. Without this testing production operation, a decisive task at the special stage of scientific and technical preparation of innovations, it would be difficult to ensure a high level of effectiveness for all the subsequent stages of production (technological, design, material and documentary).

An important reserve in raising the effectiveness of pilot work is improvement of existing forms of labor organization, reduction of the length of time of pilot verification, the issue of recommendations and boosting of their quality. At the studied production facilities, testing work takes up 3-4 years on the average. At the same time, as shown by leading domestic and foreign pratice, this time could be reduced by a minimum of 1.5- to twofold, accelerating thereby the startup of new production operations and reducing the amortization time of capital investment. This is all the more important because among the development stages of new equipment 50-60 percent of the cost goes into the experimental testing stage, which is characterized by high labor intensiveness. This is the main direction of raising the effectiveness of pilot production facilities since according to the method of computation an economic effect will only be produced when economy of expenditures on development work added to the profit exceeds the total outlays on the creation and operation of pilot production operations. The ratios of expenditures to the effect of the production operations we studied on an annual basis is 1:2, 1:3, 1:5 and 1:6.

A decisive and expecially important indicator in the operation of pilot production facilities is the quality of issued developments. The issuing of high-quality developments is complicated by the specific nature of pilot production facilities—small production scale, frequent replacement and nonrepeatability of models, instability of technology and marked fluctuations in the labor intensiveness of work.

In conformity with "Supplementary Methodological Recommendations for Development of the State Plan of USSR Economic and Social Development for 1986-1990,"1 a position on such planning of new products by years is being introduced into the practical work of developing 5-year and annual plans. Here in the initial period of introduction their production volume was especially significant and by the start of their obsolesence, the production of these products had stopped. In this connection, requirements are becoming more stringent in regard to the quality of new products at the stage of pilot development as the foundations are being laid here for the manufacture of high quality products.

Many examples are to be found at the studied production facilities where high quality of developments comes from pilot work, that is, when at the stage of scientific research designers and technologists are recruited for integrated and all-round development of a subject. But their cooperation does not stop with this. It continues in joint work with production people at the starting stage of testing and production. Such a parallel and systematic method of work cuts down on the time of creation and pilot introduction of new kinds of products by a factor of approximately 2.0-2.5 and makes it possible to provide for designers checked and technically based data for high quality planning of series or mass production. Integrated planning is especially effective when it involves the whole cycle of development from the birth of a scientific idea to its practical embodiment.

Other forms of effective production organization also exist at the stage of pilot development of new kinds of products and production processes. In recent years, a form of organization of joint work has begun to be more frequently practiced in pilot production that includes all specialists engaged in the development of new equipment (scientists, designers, planners, technologists, installers, adjusters and others). Such brigades (consisting of 10-15 persons) make possible the issue of recommendations for the entire process—from scientific research to series production—involving 3.0-3.5 years, which is frequently beyond the scope of many large scientific organizations and industrial enterprises. Here we are dealing with a "collective specialist" which provides for all stages of development exclusively in parallel and make possible "mutual penetration of specialties" at

all stages of development and the most skillful solution of arising problems. At the same time, each member of the collective is a coauthor of the innovation, which increases the feeling of responsibility of each one for the end results and personal interest in their successful attainment.

In this connection, an example of the work of the experimental testing sector of the Ternopol Vatra Production Association is characteristic. For the purpose accelerating development and introduction of new kinds of products, temporary special-purpose program groups of specialists and worker innovators are created there. They are assigned all work relating to the fabrication and introduction of special equipment, machine-tool attachments, automation, regulation and control equipment. One such group made a big contribution to the development and introduction of a new production line for processing glass. The group, consisting of 14 persons, included representatives of sectoral institutes, specialists and workers from the enterprise. Such creative cooperation made it possible to make and introduce exceptionally complex equipment and attachments at the pilot and experimental production facility, and normative time was reduced 1.5- to twofold. As a result of systematic improvement of the forms of labor organization at this stage of development at the production association, the time of development and introduction of new items is 2.5-fold shorter than for the sector as a whole, Eighty percent of the lighting fixtures are being put out with the Seal of Quality.

Instructive in this regard also is the work experience of the pilot production facility of the Lvov Kineskop Plant. In recent years, combining individual stages of production preparation and output of introductory batches of new models prior to full completion of production preparation has become a rule there. With such organization, considerable economy of time is achieved in the issue of prototype examples with full documentation and their high quality under conditions of approval and elimination of noted defects in the introductory batches. This method is being used for the modernization and improvement of technical parameters of products put out earlier.

Under the conditions of increasingly complex production processes and high requirements made on the quality of developed products, it is frequently necessary to solve scientific and technical problems through a combination of a number of sciences. In this connection, the fullest possible use of the potential of VUZ science is of great importance. Let us cite the positive experience of the creative ties established by the Vinnitsa Polytechnic Institute with the local Terminal Enterprise. Coordination of efforts by departments of the institute is being done by the Department of Automated Control Systems in accordance with the Nadezhnost Special Goal Program. As early as in the initial stages of development of new products, work is done on mathematical modeling of new products. The obtained information is entered into computers, bottlenecks are found on the basis of their data and the causes of the defects are eliminated. Such fruitful work ensures high quality of printboards [pechatnyye platy] and contributes to improvement of production organization in the early stages of production. The institute also maintains close creative contacts with other city enterprises (the experimental model production facility at the Gidrogregat Planning-Design and Technological Institute, the Production Association imeni 60-Letiye Oktyabrya, the electrical equipment plant and others). This has become possible due to the creation of an experimental testing base as a functional unit of the institute—the student Modul Design Technological Bureau where scientists of the institute have been able to effectively approve their developments.

An important factor in intensification of experimental testing production is searching for methods of reducing outlays of raw and other materials, fuel and power resources, improving the operation of equipment and its design and determining optimal parameters for the operation of production processes. Moreover, expenditures on implementation of these measures are significantly lower here than in subsequent stages. The longer defects and deficiencies in the cycle "science—production" are not eliminated, the greater are the losses and costs and the smaller the economy.

Domestic and foreign experience confirms the special importance of conducting functional cost analysis (FSA). Functional cost analysis brings up and solves problems relating to development of measures aimed at the fuller use of all types of resources—labor, power, raw and other materials, equipment and production capacities, reduction of losses and waste and elimination of nonproductive expenditures. For example, at the Vinnitsa Electrical Equipment Plant, a standard design was developed with the use of functional cost analysis for an electric spindle of the EVV-05 type for machine production of chemical fibers. In the analysis process, the most effective of four proposed variants was chosen, units were improved and cast iron and bronze were replaced by aluminum. The economic effect amounted to more than 5 million rubles. The plant's new products are being shown at the Exhibition of National Economic Achievements in the "Machine Building" and "USSR Standards" pavilions. At the All-Union Competition of Scientific and Technical Societies, their collective of developers was awarded the second prize.

An important reserve in raising the efficiency of pilot production facilities is improvement of the system of material incentives for all the personnel engaged in the development of new products. The relative share of engineering and technical personnel at the pilot production facilities is higher than at enterprises as a whole (the ratio of the number of engineering and technical personnel to workers at the studied production facilities is on the average 1:4 and under ordinary conditions 1:5). The relative share of auxiliary workers is 30-40 percent, which is markedly lower than the indicator under the

conditions of well-organized production operations. These data attest to the relatively high skill-level of personnel at the pilot production facility.

Careful selection and retention of personnel at pilot production facilities is of special importance as special demands are made on them: engineering and technical personnel and workers must be able to promptly shift from one kind of work to another (flexibility), possess strong powers of observation, accuracy and conscientiousness, quickness of reaction and implementation of right decisions under unforeseen circumstances. Of course, the pay system must correspond to the indicated requirements. The importance of the problems is intensified there where the relative share of the wage fund in the production cost structure of experimental work amounts to 40-50 percent. At the same time, in practice the pay level of workers and engineering and technical personnel in pilot and experimental production operations is significantly lower in a number of cases than at other sectors of the enterprise. Of the 36 studied enterprises only at two was the average monthly pay of pilot production personnel 8-15 percent higher, at 21, it was at the same level and at 13 pilot production facilities it was 20-30 percent lower compared to the pay of personnel of organized production operations. Engineering and technical personnel are the initiators of scientific and technical progress and undoubtedly the system for remuneration of their labor under conditions of experimental pilot production facilities is in need of radical improvement. It is also necessary to improve the system of material incentives of personnel of pilot production facilities for accelaration of testing work and provision of a higher economic effect. In connection with the introduction of flexible automated systems (GAS), the question of unification and standardization of components and elements should be linked to bonus rewards at the stage of experimental developments.

The stimulus for raising work quality and reducing the time periods of pilot developments is provision of unity of interests of personnel of scientific-research institutes, design bureaus and production workers. At the same time, scientific workers, designers and planners are motivated weakly or not at all in regard to the end results of developments that have been tested and introduced into production. The material-incentive fund should be a single fund subject to distribution among the participants of the processes of development, testing and introduction in proportion to the creative contribution to acceleration of the time periods of development, testing verification, production start with undeviating raising of the technical level of the products being put out.

At pilot production facilities, the most promising of the progressive forms of labor organization is brigade cost accounting, which so far has been taking its first steps under the specific conditions of pilot production. Noteworthy in this regard is the work experience of the Lvov pilot plant of the REMA Scientific-Production Association where formerly the time rate plus bonus wage system was used. Its introduction was preceded by some training work. On the initiative of the workers of the installation area of the plant, an integrated production brigade (consisting of installation workers, regulators, press operators, female assemblers) was created for the production of electrodes and sensing devices. Staff workers of the Lvov department of the Institute of Economics of the UkSSR Academy of Sciences jointly with engineering and technical personnel of the pilot plant worked out a position on the cost-accounting brigade, taking into consideration the specific nature of pilot production and regulating the production work of brigades. For them, a time rate plus bonus wage system was established. The collective earnings are distributed according to given grades and time worked and the bonuses by taking into consideration the labor-participation coefficient computed on the basis of performance of the norm-set daily assignment by each worker (correspondingly by the brigade of the plan set for the month and quarter). Special attention in the calculations is paid to the coefficient of labor quality.

In the quarterly work plan of the brigade, indicators are included which ensure to the greatest possible degree accomplishment of the end objective: volume of commodity production in norm-hours (while taking into account rush orders and work on the thematic plan); the product mix; regularity of turning over products by 10-day periods of the month (in percent); output per basic worker (in norm-hours). On the basis of this system, a single worker's output grew (compared to workers engaged individually in similar work) 9.9 percent and the pay—4.5-6.0 percent (and now amounts to 160 rubles on the average). In practice, real material prerequisites are being created for conversion to cost accounting not only of individual brigades but also of production operations. This calls for expanding the legal base of experimental pilot work and providing it greater independence. For example, at experimental pilot enterprises for the production of work on electric-transmission lines without discontinuing voltage, the Vinnitsaenergo Production Association produces on the averfage in 5-6 months experimental samples of new kinds of equipment, devices, component parts for work with a different class of voltage, but prices for these items manufactured at the small-series production facility of the same enterprise are determined after a lag of 1.5-2 years, which cannot stimulate work at the enterprise. Such a situation is to be explained by the fact that not only the Vinnitsaenergo Production Association but also the UkSSR Ministry of Power and Electrification are deprived of the right to even set temporary prices for them. These rights were turned over to the Production Association for Adjustment and Improvement of the Technology and Operation of Electric Power Stations and Networks of the USSR Ministry of Power and Electrification. A great deal of time is spent on coordination and compilation of documentation. At the same time, the enterprise's developments are in great demand at all power systems of the country. The economic effect from the introduction of experimental models has been 4

million rubles a year. At the pilot enterprise, an educational and training combine was created where on a contractual basis the qualifications of electrician line workers from all the country's power systems are upgraded and the studies are conducted by the authors of the developments.

Improvement of the forms and methods of production organization is complicated by the specific nature of pilot production and a lack of clear-cut expenditure norms and service norms and of definitively worked out technological rules. Moreover, here the possibilities of using generally accepted methods of calculating labor productivity, work cost and the use of fixed production capital and other indicators are limited. This is due to a large extent to the one-time character and indefiniteness of pilot work and its diversity and probability character.

The small-series character of production and the equating of the active part of fixed capital according to the nature and method of computing expenditures with working capital (the cost of this part of the capital is carried over to the cost of development at one time rather than in partials as is ordinarily done) also comes under the special features of pilot production operations, reflecting the method of computing and analyzing technical and economic indicators. Unlike industrial enterprises experimental statistical norms are basically used here and the level of use of production capacities is relatively low, but not due to any fault of the collective.

The specific character of the work of pilot production operations must also take into account organs of material and technical supply. The fact is that here individual unforeseen circumstances connected with the need of replacing raw and other materials, billets and so forth are not precluded. For the purpose of preventing losses from time and work interruptions, it is necessary to have capital reserves for the most likely products list. For this, trade depots supplying specially to pilot and experimental production facilities should be opened on a regional basis. In fact at the present time, because of delay in orders of materials and their receipt, developers frequently have to hold up their fabrication of pilot models up to 1.0-1.5 years. True, pilot production facilities need them (raw and other materials) in insignificant quantities but practice shows that this question remains unsolved so far, and without its positive solution, it would be difficult to count on boosting work efficiency.

In the work of pilot production facilities, rights granted them for creating temporary special-purpose units for development and introduction of scientific and technical innovations and for rewarding individuals not on the staff of the given enterprise for cooperation in the creation and use of industrial models of new equipment are weakly employed. The existing procedure of determining the work efficiency of pilot and experimental production facilities cannot be considered perfect. Evaluation of their work does not fully take into account the level of development of pilot models, their newness, complexity and importance. For this reason pertinent methodological instructions under the new conditions are in need of supplementation and improvement. The absence of a full-valued methodological literature creates major complications in practice for an objective evaluation of the level of effectiveness of new developments. Moreover, work has not been organized with respect to accounting, monitoring and totaling results of operation of pilot and experimental production facilities either in individual sectors of industry or in individual economic regions. The attention of statistical organs should be directed to this.

The use of pointed out and other reserves and levers contributing to improving the work of pilot production facilities and raising their effectiveness will be a powerful incentive to scientific and technical progress at this stage of intensification of public production.

Footnote

1. See *Ekonomicheskaya gazeta*, No 41, 1984.

7697

Annual General Assembly Of BSSR Academy Of Sciences

18140161c Minsk SOVETSKAYA BELORUSSIYA in Russian 19 Apr 87 p 3

[Article (BELTA): "The Scientific Base of Reorganization. From the Session of the Annual General Assembly of the BSSR Academy of Sciences"]

[Text] Reorganization is posing fundamentally new tasks for scientists. At the session of the Annual General Assembly of the BSSR Academy of Sciences, which concluded April 17 in Minsk, an exacting discussion took place concerning how to more successfully accomplish them, to more fully and more effectively use the rich potential of Belorussian science, and to raise the level and quality of scientific inquiry and its return.

Opening the session, President of the republic Academy of Sciences Academician of the BSSR Academy of Sciences V.P. Platonov according to tradition named the most significant results obtained by academy scientists during the past year. For example, the research conducted at the Institute of Physics made an appreciable contribution to the development of a new scientific direction—the spectroscopy of the "photoburning of valleys." This phenomenon can be used in developing memories with the frequency-selective optical recording of information. Doctor of Physical Mathematical Sciences K.N. Solovyev as member of the collective of authors was awarded the USSR State Prize for work in this field.

At the Institute of Mathematics new approaches to solving problems in mathematical physics and linear programming were proposed. Efficient algorithms and sets of programs for solving a wide range of problems of nonstationary thermodynamics, nonlinear optics, mathematical programming, and optimal control were developed on their basis. For the development and introduction of these multipurpose software complexes Doctors of Physical Mathematical Sciences V.N. Abrashin and F.M. Kirillova as members of the collective of authors were awarded the prize of the USSR Council of Ministers.

At the Physical Technical Institute a cycle of studies, which made it possible to reveal the basic factors which cause the high structural strength of materials, was conducted. On their basis highly productive technologies of the heat treatment of materials were developed and introduced at enterprises of the USSR Ministry of Ferrous Metallurgy. Academician of the BSSR Academy of Sciences S.A. Astapchik as a member of the collective of authors was also awarded the USSR State Prize for this work.

At the Institute of Physical and Chemistry new theoretical concepts on the formation of porous polymeric bodies were developed and a method of obtaining microfiltration polyamide fabric with a variable pore size was proposed. The organization of the extensive production of this material will make it possible to discontinue purchases of imported filters.

Scientists of the Institute of General and Inorganic Chemistry developed the scientific principles of obtaining new organic mineral coatings. For the first time in the country special engraving films with a thermal fixing layer were developed.

At the Institute of Bioorganic Chemistry a simple method of extracting certain DNA molecules from higher organisms, which affords potential opportunities for using them in genetic engineering, was found. The Institute of Genetics and Cytology began work on the study of the structural organization of molecules—the carriers of hereditary information. At the Institute of Microbiology biocatalytic methods for synthesizing a number of compounds, which are necessary for agriculture and medicine, were developed. The Institute of Experimental Botany jointly with the Institute of Zoology prepared scientific substantiations on the additional organization of 40 game reserves and the the establishment of protection over 6 natural monuments of republic significance.

Among the most notable works of social scientists are the published fourth and fifth volumes of the seven-volume "Svod pamyatnikov istorii i kultury Belorussii" [A Compendium of Monuments of History and Culture of Belorussia]. The BSSR State Prize was awarded to a group of associates of the Institute of Art Criticism, Ethnography, and Folklore for a fundamental 30-volume publication devoted to Belorussian folk art.

Particular attention was devoted to solving the problems connected with eliminating the consequences of the accident at the Chernobyl Nuclear Electric Power Plant. In all 18 institutions of the academy were enlisted in the work on eliminating the consequences. A scientific research program, which encompasses the entire set of questions, was approved. The Institute of Radiobiology of the BSSR Academy of Sciences was established.

In the speech of V.P. Platonov, as well as the reports of academician secretaries of the departments of the BSSR Academy of Sciences Academicians of the BSSR Academy of Sciences V.A. Labunov, S.A. Astapchik, V.S. Komarov, L.M. Sushchena, and N.V. Birillo and of Chief Scientific Secretary of the Presidium of the BSSR Academy of Sciences Academician of the BSSR Academy of Sciences A.M. Goncharenko it was noted that many shortcomings have also accumulated in the work of the academy. The most important of them is the decrease of attention to basic research.

There are institutes at which the level of research is declining. One of the reasons is that that prominent scientists of the older generation can no longer work as actively as before, and young researchers capable of generating new scientific ideas have not succeeded them. At the academy they have used inadequately the changeover to the new system of remuneration for the improvement of the the structure of scientists. Much additional work to overcome leveling in the remuneration of labor lies ahead.

The fact that only 5 percent of the heads of laboratories and departments are under 40 years old, cannot but cause alarm. Among workers of the academy only 0.9 percent are research trainees. In 1986 the reinforcement of scientific institutions of the BSSR Academy of Sciences by means of young specialists came to only 1.8 percent. The session participants noted with alarm that at present in the overwhelming majority the institutes of the academy are being manned with undistinguished persons from whom one cannot expect much. Therefore, it is necessary already during the years at a higher educational institution to select people, who want to work in science and are capable of contributing to it. One should recall that the BSSR Academy of Sciences holds far from first place among the academies of the union republics in being provided with personnel of the highest skill, and the situation here has not improved for years. In essence no system of the instruction and preparation of graduate students and degree seekers for passing the qualifying examinations for a candidate degree in their specialties has been developed in the BSSR Academy of Sciences.

The need for the fundamental improvement of the material base of science was spoken about at the session. Today it is very modest even in monetary terms. The quality of this base is even more important. In many cases biologists, for example, are working with extremely obsolete instruments and equipment, and at the present rate of their updating the complete replacement of the stock will occur no earlier than the year 2000.

There is also another "sore point." In past decades the institutes of the Academy of Sciences have grown several fold in number and in the volume of research, yet the publication limits on the output of monographs have not been increased by a single page. Enormous assets are being spent on conducting scientific research, yet it is becoming more and more difficult to publish its results. For example, the Institute of Zoology has only 18 printer's sheets for a little more than 90 scientific associates—less than half a printer's sheet per person annually.

The speakers said that the task of achieving the leading levels requires constant analysis of the world level of science and the objective evaluation of one's own results. Scientific problem councils should play a considerable role in such evaluations. Therefore, it is necessary to carry out their reorganization and to create a new network, to orient their activity toward the formulation of scientific forecasts, the identification of priority trends, the appraisal of the plans and results of research, and their coordination.

The basic directions of basic research at the BSSR Academy of Sciences should be balanced in such a way so that they would meet the needs of the scientific support of the priority directions of the national economy of the republic. Experience in cooperating with enterprises of various sectors of the national economy has already been gained at the BSSR Academy of Sciences. However, unfortunately, an orientation toward solving special problems and isolated introduction is continuing in such cooperation. Therefore, the set of relations with ministries should be more broadly developed. Experience in such work exists.

Suggestions were made concerning the advisability of the certification of all scientific research institutes on the territory of the republic and the attachment of sectorial institutes to departments of the BSSR Academy of Sciences in accordance with their themes.

Greater attention should be paid to the development of the forms of cooperation of scientists and production workers, which have given a good account of themselves, such as interbranch scientific technical complexes, engineering centers, temporary creative collectives, and laboratories of dual subordination.

From the rostrum of the session it was stated that along with the directions of research in the fields of physics and mathematics, which are highly developed in BSSR Academy of Sciences, it is necessary to develop rapidly and on a large scale work on information science, which today determines not only the level of advanced technology, but also the progress of science in general.

As the speakers noted, the reorganization of the existing intellectual forces of the republic is necessary for the solution of the problems connected with information technology. New capital investments should be made in this area and new institutes and laboratories should be established. At the academy no one is now dealing with computer reliability problems, and there are no subdivisions which are working on the basic questions of computer equipment, including equipment of new generations.

It was noted that patents, licenses, and contracts are a good reference to the level of applied research. At the same time, in practice two institutes—the Physical Technical Institute and the Institute of Applied Physics, which have concluded, respectively, 14 and 8 licensing agreements and contracts—are successfully carrying out and are constantly busy with patent and licensing work at the academy.

In 1987 it is necessary to certify scientific trends, to identify those of them, which can make the greatest contribution to the solution of important problems, and to ensure their priority development.

The work of the institutes of the Social Sciences Department was analyzed at the session. It was noted that the scientific forecasts, analytical reports, and recommendations, which are being drawn up, require greater substantiation and a specific address nature.

In the unanimous opinion of the speakers, it is necessary to revise the existing system of planning of the BSSR Academy of sciences of the economic impact from the introduction of scientific research results and to eliminate the corresponding indicator from the BSSR State Plan of Economic and Social Development.

The formed policy of planning the impact, the speakers said, does not correspond to the tasks of the academy in the development of long-range basic research, orients scientific institutions toward the fulfillment of work which solves special problems of individual enterprises and is profitable from the viewpoint of obtaining an economic impact, and diverts scientists for compiling a large number of documents. The one-sided planning of the economic impact for scientific institutions and their accountability to statistical organs for this indicator reduce the responsibility of the enterprises, directly at which this impact is realized, for the introduction of academic developments. The aspiration to fulfill excessively high plan assignments gives rise at scientific institutions to such negative phenomena as the overstatement of the efficiency of introduced developments and the use of conditional indicators in reporting.

The accomplishment of the difficult and large-scale tasks, which have been set for the BSSR Academy of Sciences, is impossible without the serious reform of the style and methods of work of the Presidium of the BSSR Academy of Sciences, departments, institutes, and laboratories, it was noted at the session. But first of all the internal change of scientists workers themselves, their consciousness, and attitude toward work is necessary. The reform of the work style of the Presidium of the BSSR Academy of Sciences and its staff has already begun. The rights of the vice presidents and academician secretaries have been considerably expanded. Full responsibility for the development of the corresponding directions of science in the republic has been assigned to the departments of the academy. This should promote the increase of the scientific return from institutes as the main link of science. The rights and duties of institutes will also be expanded.

Academician of the BSSR Academy of Sciences V.S. Soldatov, director of the Institute of Physical Organic Chemistry; Academician of the BSSR Academy of Sciences L.I. Kiselevskiy, rector of the Belorussian State University imeni V.I. Lenin; Academician of the BSSR Academy of Sciences A.I. Sviridenok, member of the Presidium of the BSSR Academy of Sciences; Academician of the BSSR Academy of Sciences R.G. Garetskiy, director of the Institute of Geochemistry and Geophysics; Corresponding Member of the BSSR Academy of Sciences Ye.M. Babosov, director of the Institute of Philosophy and Law; Corresponding Member of the BSSR Academy of Sciences Ye.F. Konoplya, director of the Institute of Radiobiology; I.N. Nikitchenko, deputy chairman of the BSSR State Agroindustrial Committee; and others took part in discussing the report on the activity of the BSSR Academy of Sciences in 1986.

13362

Tallinn Conference on Lasers

18140066 Tallinn SOVETSKAYA ESTONIYA in Russian 17 Nov 87 p 3

[Article by Candidate of Technical Sciences Kh. Khinrikus: "Lasers in Service"; first two paragraphs are *Sovetskaya Estoniya* introduction]

[Text] Lasers in service—in technology and systems of information transmission and processing—were the theme of the 3d All-Union Conference that ended in Tallinn on 13 November.

In addition to the USSR and Estonian SSR Ministries of Higher and Secondary Specialized Education, the Scientific Council of the USSR Academy of Sciences for the Problem "Coherent and Nonlinear Optics," and the Leningrad Electrical Engineering Institute imeni V.I. Ulyanov (Lenin), the Institute of Physics of the Estonian SSR Academy of Sciences and Tallinn Polytechnical Institute were also among its organizers.

The honor of receiving laser specialists from 9 union republics and 47 cities of the country fell to Tallinn not by chance. Laser themes have been present for a long time in works of Estonian scientists. The research, which a group of associates of the Institute of Physics of the Estonian SSR Academy of Sciences conducted jointly with colleagues from the Institute of Spectroscopy of the USSR Academy of Sciences, the State Optics Institute imeni S.I. Vavilov, and the Institute of Physics of the Belorussian Academy of Sciences, was awarded the USSR State Prize. The Estonian SSR State Prize has just been awarded to an entire collective of designers of the special design bureau of the Estonian SSR Academy of Sciences for the development of a family of standardized models of excimer lasers with the assimilation of production. Work on the use of lasers in optical communications systems and measuring systems is being performed at Tallinn Polytechnical Institute. The communications systems developed here have been awarded medals of the Exhibition of National Economic Achievements and have been displayed at exhibitions in the United States, Italy, France, the FRG, and other countries.

Engineers of the RET Scientific Production Association are engaged in the development of a laser player and the preparation of its series production. Work on the laser diagnosis of natural media is being performed by scientists of the Institute of Thermal Physics and Electrophysics of the Estonian SSR Academy of Sciences. They are dealing with the use of lasers in biology and medicine at the Institute of Chemical and Biological Physics of the Estonian SSR Academy of Sciences and Tartu State University.

If we recall that the laser soon after its development in 1960 ceased to be an object of purely laboratory research and began to serve the national economy, it must be emphasized that today the pace of development of laser technology also remains extremely high: it—President of the Estonian SSR Academy of Sciences K. Rebane also noted this when addressing the conference—is higher than, for example, in computer technology. The different areas of use of lasers (such as holography and others) have already been formed into separate sciences. And this is understandable: laser technology is new and promising, and its rapid development is a necessary condition of the assurance of scientific and technical progress. As the conference also showed, a large reserve has already been produced by science in this field of knowledge. Tartu physical scientists, for example, reported on the prospects of the use of space-time holography in optical information science. The attention of scientists to questions of the measurement of parameters of the environment has increased, the amount of research on the problems of a optical fiber communications line has grown. The laser program, which is being fulfilled by scientists of our republic, poses very important tasks. However, as before a large gap is still observed between scientific achievements and the introduction of their results in production. If we are unable to overcome it, we will also not be able to ensure scientific and technical progress. Many valuable developments exist for a long time in single copies, because no one undertakes their series production. Here, it was noted at the conference, the closer cooperation of scientists and experienced workers—of academic and sectorial institutes, higher educational institutions, and scientific production associations—is necessary. It is also necessary to broaden more resolutely the rights of higher educational institutions in their use for the speeding up of work of their own assets, which have been earned by research in accordance with economic contracts.

The laser "cutter" of metals and "drill" of precision holes, the laser beam scalpel, the laser implantation of metals, the spraying of films, the processing of semiconductors, heat treatment and welding, the laser cutting of polymer and composite materials, laser measuring systems, devices for the transformation and processing of materials—all this is already finding use. But all this and much more should fully serve the national economy.

7807

September Seminar Held on Quality Groups

18140055 Moscow NTR: PROBLEMY I RESHENIYA in Russian No 19 No 19, 6-19 Oct 87 p 2

[Article by A. Yezhova: "It Depends on Everyone"; first paragraph is NTR: PROBLEMY I RESHENIYA introduction]

[Text] On 22-23 September, a seminar "The Work Experience of Quality Groups at Associations, Enterprises and Sectors" was held at the Exhibition of USSR

Economic Achievements. Representatives of 65 enterprises, 36 ministries, trade unions, the All-Union Council of Scientific and Technical Societies and the All-Union Society of Inventors and Efficiency Experts participated in its work.

It is hardly necessary to convince anyone that Japanese goods stand out from others primarily by reason of high quality and reliability. Japan's persisting leadership is the result of a specially implemented policy. At one time, the objective was set—to teach everyone without exception the methods of quality control.

For us, the question of quality is exceptionally important. For this reason, the adoption of advanced experience is a vital necessity. Especially since the idea itself is attractive—to stimulate workers' activity to improve the results of labor.

Today, tens of thousands quality groups have already been created. And now the first intersectorial seminar has been held.

Its organizers themselves did not suspect that the problem has become so acute. It all became clear in the course of speeches and discussions. When a report was not presented formally, it immediately evoked a lively interest and questions.

The seminar participants were presented in detail with the experience of Latvia where quality groups work intensively at most enterprises.

The report on organization of work at the USSR Ministry of Electrical Equipment Industry was interesting.

The sector utilizes many different forms of raising production quality.In particular, a ministry order introduced at enterprises "5 minutes of quality." After the shift, managers and members of the collective discuss the results of the day: the level of production turnover on first presentation, they analyze who let the work down and why. A task is set for the next day. A representative of the technical-control department keeps track of the proposals.

At the seminar, questions were discussed of the structure and organization of quality groups, the technology of realizing proposals, relations with management and trade-union committees, problems of training specialists and others.

What are the main difficulties at the present stage of creation of quality groups in the country? First of all, quite likely, methodological. A methodological handbook is only now being developed. The speech of I.A. Samoylenko of All-Union Scientific-Research Institute of Standardization did not inspire optimism. A monumental work is apparently being prepared. But training needs to be organized now, with instructors being trained. And the handbook needs to be leaner, more compact so as not to frighten off a person.

On the other hand, many have become accustomed to having everything explained to the smallest detail. S.A. Roginko's speech on international experience was greeted with excitement. People asked that there be no interruptions. When the time expired, others inquired if it would be published. But there are already such publications at NTR, at *Sotsialisticheskaya Industriya* and at *Pravda*. This year the U.S.A. and Canada Institute published a work on foreign experience. For some this was a revelation....

Or another example. The representative of a Vinnitsa enterprise asked about the directive document so as to organize material incentives in quality groups. K. Turysov, secretary of AUCCTU, was at a loss: "You are an independent cost-accounting association and you have all the rights!"

And last. The movement is only getting under way but skeptics already consider it far-fetched. Well, things are not the same everywhere and the same is true of the degree of optimism.

At the Moscow Furniture Combine No 3, for example, where the work of quality groups has been tied in to occupational and economic training, they do not think so. Here half of the enterprise's workers are involved in efficiency and quality circles, furthermore, not in connection with the campaign, but on their own.

Thus a lot depends on ourselves and on ability to organize work. It is also important to more frequently arrange such meetings. The results of the seminar are being generalized. Proposals will be formulated in a memorandum and sent to sectors.

7697

Ignoring of Scientific, Technical Proposals in Azerbaijan Criticized

18140053 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Jul 87 p 2

[Article by D. Mekhtiyev, director of Scientific-Research Institute of Technical Information and Technical Economic Research of Azerbaijan SSR Gosplan, Baku: "Prohibition on Knowledge Bank"; first paragraph is SOTSIALISTICHESKAYA INDUSTRIYA introduction]

[Text] The state system of information resources, concentrating in itself a considerable intellectual potential, had according to statistical data 2.2 billion documents even at the beginning of the last 5-year plan. But only 1.4 billion of them were issued and apparently found useful. That is, use of the resources did not exceed 0.65. The

situation is even worse in regard to the practical use of scientific and technical achievements and advanced experience obtained from the information materials.

And how are things in our Azerbaijan SSR?

Each year at the time of preparing plans of economic and social development, we send to ministries and departments proposals relating to scientific and technical progress for inclusion in these plans. Last year alone, 600 such new ideas were recommended for machine building, petrochemistry and light and other sectors of industry. We assume that their use would permit the economy to produce an economic effect of 50 million rubles. But for some reason those ideas were introduced into the plans which cannot seriously influence retooling of production and technological processes.

Furthermore, we know of many cases where valuable information was not used at all. For example, the intersectorial council of experts confirmed that it would be useful to introduce a new alloy with improved machinability at two plants. The expected effect was estimated at 468,000 rubles. But the engineering services of these enterprises displayed no interest and the recommendations just remained in the realm of good wishes.

Or another example. In the republic, waste is great in the production and use of polyethylene film (bags for mineral fertilizers and other chemicals), formerly used film coverings and the like). Many, certainly, have seen that they are not used but only clutter up the area. Our institute provided recommendations to republic ministries and departments on introducing units for making containers from such waste. In addition, the effectiveness of each amounts to more than one quarter of a million rubles. However, no interest was shown likewise in this proposal. Including from the Ministry of Local Industry at whose enterprises the use of a such unit would have been advantageous.

There are two main reasons for all this. First, the low level of activity of the actual organs of scientific and technical information. And this I believe is not only their fault but also their dilemma. Scientific and technical information units are obvious stepchildren in their sectors. Where, for example, are "reserves" seen first of all when it is necessary to cut down on staff? It does not take long to find the answer. In the past 5-year plan, our information network in Azerbaijan not only did not expand but was even reduced somewhat. Its organs are few and not provided with the necessary technical resources or personnel. The situation existing today in which information services do not belong to basic services limits the influx of highly skilled specialists.

This is also complicated by the fact that in the republic not a single VUZ trains specialists for work in the information sphere. Moreover, no information course exists even on an elective basis. At the same time, all specialists in the economy must have to some degree a knowledge of its fundamentals.

Let us consider the second reason why enterprises make poor use of information "raw material" and fail to fulfill state plans for the introduction of new equipment. It would be difficult to expect a different attitude toward information resources with the old economic mechanism. Its cardinal restructuring, outlined at the June Plenum of the CPSU Central Committee, I am convinced will force managers to look on information with new eyes. Especially with the transition to cost accounting and self-financing. But so far the attitude of many managers in regard to use of information remains as of old.

How can this be corrected in comparatively a short period of time?

It is extremely necessary for scientific and technical information organs to actively change over to the most progressive conditions of services and to have tele-access to data bases. Even today several such bases have been formed within the framework of the republic's automated system of scientific and technical information. Including at arrays of patent information totaling more than 20 million documents on 52 countries of the world. It is just unfortunate that the republic today has only five information services capable of working under these conditions. Most of them lack the necessary technical resources. And a way out can be seen from this situation. It would be worth it to undertake the creation of a special organization that would concern itself with putting hardware into operation and servicing it in remote regions.

The solution of this problem lies in the creation of data arrays and transmission of data to all enterprises included in the network. This would make it possible to radically boost the efficiency of the state information system and, of course, its regional subsystems. However, the enthusiasm for gross indicators in preparation of information is making itself increasing felt. Outlays of regional organs of scientific and technical information are growing precipitously with acquisition of an increasingly growing volume of data. Thus even by 1990, the total volume of abstract information could reach 4 million documents. Consequently, the republic information institute will have to spend on this alone no less than 800,000 rubles.

Is there a possibility of significantly reducing expenditures? There is. In addition to wide-scale cooperation within the framework of associations of scientific and technical information, this possibility also lies in possessors of information issuing it to a client not in its full volume but selectively. Of course, charging payment in this case should not be for an entire base but only for the ordered part. Calculations show that it would be possible to reduce expenditures by 30-40 percent in this way.

Even with this, the reserves are not exhausted. One of them is to entrust to scientific and technical information cost-accounting organs intermediary functions of establishing connections for enterprises introducing new technological processes with those interested in adopting them.

Incidentally, we already have a first experience. Specifically, the institute, taking into consideration the significant expenditures of the Baku Glazed Pottery Plant on lining small rail cars, proposed a method from the Ukrainian SSR of using red mud for this purpose. Outlays on the repair of small rail cars are being reduced sixfold and the economic effect for one such car of a tunnel kiln will amount to 30,999 rubles. With wide use of bauxite mud in different sectors of industry, it is possible to significantly curtail and subsequently to completely eliminate waste from alumina production. This is also very important from the point of view of protection of the environment: for example, at the Kirovabad Aluminum Plant, more than 8 million tons of this substance have accumulated.

The institute intends to broaden the practice of intermediary services, attracting to it scientists and specialists of the most diverse sectors of the economy.

Development of new forms and methods of work and closer cooperation with developers of new equipment and installations of the economy where this technique can be effectively used constitute the formula for our work under the conditions of restructuring. Forward progress and a common interest are required. Under the conditions of transition of enterprises to self-financing, the forms of relationships of scientific and technical information organs with users of information and also standards for all forms of information services should be looked at anew. In a word, conditions have been prepared for the transition of scientific and technical information organs to full cost accounting.

7697

Cooperation Through International Economic Contracts Discussed

18140272 Moscow EKONOMICHESKAYA GAZETA in Russian No 29, Jul 86 p 12

[Article by V. Gavrilov, candidate of economic sciences: "The Economic Contract Through Direct Ties"]

[Text] In his speech at the 11th Congress of the Socialist Unity Party of Germany, M.S. Gorbachev, speaking of the problems of expanding economic cooperation of socialist countries, stressed: "The main thing is broad development of direct ties between scientific organizations, enterprises and associations, creation of joint firms and solution of a number of legal and financial problems. In fact, the question is the new economic mechanism of our cooperation."

At the present stage of integration, direct ties are not just a form of establishment of direct contacts, which take place in any form of cooperation. The question is forming an organizational economic mechanism of scientific and production cooperation based on economic-contract relationships existing between the basic (primary) units of management of production. The basic element of the reproduction process in CEMA countries ought to be the basic element of their production cooperation.

The principal system-forming element of the new mechanism becomes the economic contract between national scientific and production organizations of different countries. Only after such an international contract is signed will it be possible to speak of establishment of direct ties between the cooperating parties.

The Contract's Mobilizing Role

An international economic contract in our opinion should contain the specific obligations of the parties in creation and development of new equipment, its joint manufacture and the time periods and order of performance of individual stages of work, volume and economic conditions of reciprocal deliveries of cooperative products and services, guarantees of fulfillment of assumed obligations and penalties for their violation. As can be seen from what was said, the economic contract combines a cooperative work plan and commercial contracts relating to its fulfillment.

Cooperation on the basis of contracts should be based on unified design, technological documentation and standardized components and parts.

Cooperation within the CEMA framework on an economic-contract basis would create the possibility of qualitatively transforming the entire system of organizing international cooperation. Contractual cooperation presupposes that economic organizations taking part in the realization of intergovernmental agreements conclude and realize economic contracts without mediating work by departments and other organizations. This makes it possible for them to carry out joint economic activity, that is, to directly adopt coordinated decisions and to immediately embark on the fulfillment of assumed commitments.

It is natural that such an approach to the establishment of scientific-production cooperation would require the creation of necessary conditions and prerequisites both in national economic systems and in the international economic mechanism of cooperation. Significant changes are needed in the practical work of national planning, in coordination of national economic plans and in upgrading the role of commoditymoney instruments in organization of cooperation.

Each country resolves these problems in its own way, but a general tendency is displayed to having participants in cooperation conduct economic acts independently

within the framework of certain norms and limits, utilizing allotted funds and resources. This is possible in the event the partners complete an entire cycle of expanded reproduction under the conditions of full cost accounting and have at their disposal a material base with which to bear legal responsibility for the fulfillment of commitments they have made.

Fully Empowered Partners

The parties of an international economic contract must act as fully competent partners, able to independently resolve a whole complex of questions connected with the subject of the contract. Because of this, the partners cannot not just coordinate their economic activities but must do joint planning of the cooperative process, relying on its self-financing.

This is a way of forming an essentially new organizational economic mechanism of cooperation in which commodity money relations are an organic element of the system of planned management of production. In the proposed mechanism, the economic contract fulfills a dual function. On the one hand, it directly determines the production program of the cooperating participants and thus performs a planned function. On the other hand, the economic contract has a cost-accounting function which makes it possible to reveal and to realize the economic interest of the parties. This is possible because the economic contract provides for an examination of the economic conditions of exchange indissolubly connected to the specific production and economic conditions of cooperation.

Thus the appearance of new subjects of cooperation—cost-accounting production organizations—will contribute to the transformation of not only the structure but also the economic instruments of international economic relations within the CEMA framework.

International economic contracts of intrasectorial cooperation regulate a qualitatively new type in their organizational and legal aspect of deliveries. They can be concluded on the initiative of the production organizations themselves, which are guided by their own criteria of effectiveness of cooperative relations. Such contracts can be concluded within the framework of the limits of export-import cooperative operations established jointly by central planning and foreign-trade organs. These limits are coordinated by the parties as a share of quotaless exchange in the annual trade record. General balancing of cooperative deliveries is accomplished in the process of coordination of national-economic plans. Here it should be stressed once more that production economic organizations independently determine the structure of their cooperative relations in the system of control instruments and indicators influencing the correctness of solutions they have adopted from the standpoint of state interests. Joining the interests of collectives of enterprises and of society is accomplished with the aid of cost-accounting levers and stimuli.

Joint Economic Operation

Contractual cooperation is one of the prerequisites of the transition to joint enterprises. Any cooperative complex, as already pointed out above, consists of joint production and is a form of indirect informal socialized production, an intermediate stage between the cooperation of independent partners and their joint economic operation within the framework of an international scientific-production system. Joint production is to be distinguished from a joint enterprise primarily in the fact that in the first case the cooperating parties do not share profit or loss among themselves, while in the second they do so share, As for the rest their operation is quite similar.

Under the conditions of a unified planning center, contractual cooperation and joint enterprises are essentially possible forms of joint economic operation of producers and cooperative operation directly in the sphere of science and production. A basic feature of these forms of cooperation is that the subjects of cooperative planning are at the same time the performers of jointly worked out plans.

In this respect, it would be incorrect to draw a total analogy between international and internal economic contracts. An international contract has an independent plan importance. Consequently its subjects must possess the necessary rights.

It is natural for such rights not to apply to all economic organizations but primarily to those which serve in the role of head organizations in the course of realization of the Comprehensive Program of Scientific and Technical Progress of CEMA Member Countries.

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Conference Discusses Mechanical Drives

18140048 Moscow VESTNIK MASHINOSTROYENIYA in Russian No 9 1987 pp 77-78

[Article by V. F. Maltsev, doctor of technical sciences, I. F. Soroka and V. I. Krupskiy, candidates of technical sciences

[Text] In order to exchange experience, thoroughly discuss problems in improving regulated drives and transmissions with flexible couplings and to solve tasks in their production and effective use in equipment, the Seventh All-Union Scientific Technical Conference on Controlled and Automatic Drives and Transmissions with Flexible Coupling was held in Odessa in September 1986. It was organized by the USSR Academy of Sciences' Scientific Council on Problems of Machine Building and Technological Processes, the USSR and Ukrainian SSR Ministries of Higher and Secondary Specialized Education, the Technological Institute for the Food Industry (OTIPP) imeni M. V. Lomonosov in Odessa,

the Odessa Oblast Board of the Machine Building Industry Scientific and Technical Society and the Odessa Oblast Organization of the Znaniye Society.

More than 240 specialists from machine building and other sectors, scientific research institutes, VUZ's and design offices from 45 cities in the country participated in the work of the conference.

At a plenary session and 7 sections ("Automatic Drives", "Dynamics of Variable Speed Drives", "V-belt, Chain and Friction Variable Drives", "Pulse Transmissions", "Drives with Idler Mechanisms and Dynamic Clutches", "Drives with Flexible Coupling (Friction)", and "Toothed Belt and Chain Transmissions") 250 reports were heard and discussed. These covered new research, design, testing and introduction.

In their reports to the plenary session, doctors of technical sciences V. F. Maltsev and B. A. Pronin covered the current state of research, methods for designing, manufacturing and introducing various variable drives and transmissions with flexible couplings with constant drive ratios and drives for modern machines. They noted the importance of introducing regulated transmissions in flexible machinery systems, the the prospects for drives with automatic and remote control using microprocessors. At the sections proposals were made about coordinating work, comprehensive research and development of variable speed drives with control systems and organizing specialized production.

At the "Automatic Drive" section reports were heard on the research and synthesis of controlled and self-adjusting adaptive variable speed drives. Special attention was given to the creation of efficient automatic transmissions for self-propelled machines. At this section there were discussions of general questions on research and development, specific designs such as self-controlled V-belt drives, inertial-pulse transmissions, hydromechanical and geared automatic transmissions. Some of the reports were dedicated to showing the need to use automatically controlled drives and to studying and testing them for use on machinery in the food industry. Several works examined the control of mechanical variable speed drives by using microprocessors.

At the "Dynamics of Variable Speed Drives" section conclusions were drawn from research on machinery units with variable speed drives and analyses of controlled drives for various machinery (metallurgical equipment, metal cutting and rock crushing machinery, rolling mills, etc). There were also reports on dynamic studies of units with differential, pulse, variable speed drives, chain and multi-disk variable speed drives and an examination of ways to improve variable speed drive characteristics and select rational parameters. These reports also touched upon estimating the speed of variable speed drives, cyclic strength of parts, calculating the anholonomity of couplings and variations in the structure and elasticity of system components.

The "V-belt, Chain and Friction Variable Speed Drives" section examined theoretical and experimental research on the creation of variable speed drives with a wide range of speeds and precision speed regulation, designs with improved working indicators and improved V-belts for grain combines, looms and other machines.

Theoretical and experimental work on pulse transmissions (the "Pulse Transmissions" section) has been directed towards synthesizing new layouts for pulse variable speed drives, improving the dynamic characteristics of automatic inertial pulse transmissions to improve their use in drives for various machinery and towards the creation of pulsers for technological processes and fatigue testing stands.

At the "Drives with Idler Mechanisms and Dynamic Clutches" section a considerable number of the reports were dedicated to research on drives with idler mechanisms. This section examined the basic functioning of roller separator drives with idler mechanisms with increased load capabilities, rachet and pawl and wedge mechanisms, the dynamic characteristics and strength of parts in automatic action drives, engine starter drives, experience with V-belt drives in tractors and in feed units for drawing machines; theoretical and experimental research on eccentric drives with idler mechanisms for gear engagement, mechanisms with evolute rollers. The section also looked at research on dynamic clutches with variable rigidity.

At the "Transmissions with flexible couplings (friction)" section considerable attention was given to research on dynamic processes in V-belt transmissions, taking into account manufacturing errors, deviations in belt and pulleys on belt load in multishaft transmissions, loads on flat belt transmissions with polyamide belts. It also examined designs for higher power drives, and automated systems for designing belt transmissions.

At the "Toothed Belt and Chain Transmissions" section there were discussions of questions in the theory of engagement, load determination, improved operating characteristics and methods for computer aided optimal design of transmissions.

Conference participants noted the slowness in improvements and the introduction of controlled and automatic mechanical drives for machinery and transmissions with flexible couplings; and the lack of a coordinated plan for research and its often narrowly departmental character. A long term assortment of modern variable speed drives has not been provided, there is insufficient research on regulated drives with remote and automatic control in combination with control devices and operating machinery and on higher power belts made from new materials.

The production of variable speed drives and other transmissions does not meet the national economy's needs. There is no specialized production of drives with idler

mechanisms as components for general machine building use which are needed for controlled and automatic drives. Industry is not meeting the demand for variable speed drives belts and has still not mastered the production of toothed belts, flat belts from friction materials with synthetic coatings, narrow and semi-wedge belts. This delays the introduction of new types of transmissions with flexible couplings. The introduction of friction variable speed drives is hindered by the lack of special heavy duty oils.

The resolutions approved by the conference pointed out the need to coordinate and accelerate work on these problems in machine building. With this goal in mind it recommended developing, for the 12th Five-Year Plan and up until the year 2000, an all-union scientific-technical program for the creation and introduction of regulated mechanical drives and automated systems for their control, reliable drives with idler mechanisms and transmissions with flexible couplings. Also, it noted the advisability of organizing an all-union scientific production association for research, development and specialized production of mechanical drives and their components to be used in general machinery building. This association would include plants and research institutes involved with variable speed drives.

It was deemed necessary to immediately start producing variable speed drives and other belts for general use and to begin producing heavy duty oils for friction variable speed drives.

Conference participants recommende continuing research and design work on more progressive variable speed drives and that this work be expanded to analysis, synthesis, experimental research and high level experiments especially on questions of on comprehensive research and design methods for variable speed drives together with their control systems.

The conference's resolutions indicated the advisability of opening problem oriented and sectoral laboratories on regulated drives at VUZ's and to have permanently active seminars: on transmissions with flexible couplings at MAMI [Moscow Automechanical Institute] on regulated drives and drives with idler mechanisms at the OTIPP imeni M. V. Lomonosov and on automatic inertial-pulse systems at the Polytechnic Institute imeni Leninist Komsomol at Chelyabinsk.

The implementation of these measures will make a weighty contribution to further improvements in machinery now produced and to the creation of fundamentally new types of equipment.

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Ukrainian Comprehensive Program of Scientific, Technical Progress

18140183 EKONOMIKA SOVETSKOY UKRAINY in Russian No 5, May 87 pp 94-95

[Article by L. Pisarenko and S. Turchin under the rubric "Information": "The Formulation of the Comprehensive Program of Scientific and Technical Progress of the Ukrainian SSR for 1991-2010"]

[Text] On 3 December 1986 a meeting of the Interdepartmental Scientific Council for Problems of Scientific, Technical, and Socioeconomic Forecasting attached to the Presidium of the UkSSR Academy of Sciences and the UkSSR State Planning Committee was held in Kiev under the chairmanship of President of the UkSSR Academy of Sciences Academician B.Ye. Paton. At the meeting questions of the improvement of the formulation of the Comprehensive Program of Scientific and Technical Progress (KP NTP) of the Ukrainian SSR for 1991-2010 as the basis of the existing system of long-range planning were examined.

This preplanning document is being drafted for a future period of 20 years and is revised every 5 years for the country as a whole and in all union republics. The Comprehensive Program of Scientific and Technical Progress of the Ukrainian SSR for 1991-2010 is one of the regional sections of the Comprehensive Program of Scientific and Technical Progress of the USSR. The Interdepartmental Scientific Council, to which leading scientists and specialists and executives of ministries and departments of the republic belong, is coordinating the formulation of the republic program of scientific and technical progress.

S.I. Doroguntsov, deputy chairman of the Interdepartmental Scientific Council and chairman of the Council for the Study of Productive Forces of the Ukrainian SSR of the UkSSR Academy of Sciences, presented the report "On the Results of the Drafting of the Preliminary Version of the Comprehensive Program of Scientific and Technical Progress of the Ukrainian SSR for 1991-2010." In the report the peculiarities of the preliminary version of the Comprehensive Program as a new form of long-range planning were noted. It is envisaged that increase of the gross social product and the national income will occur with the simultaneous reduction of the resource intensiveness of production. In particular, the increase of production should be achieved under the conditions of the decrease of water-output and power-output ratios of the national income. As a whole the preliminary version of the Comprehensive Program, which was formulated by scientists and specialists of the republic, is oriented toward the acceleration of scientific and technical progress as a most important factor of the development of the national economy.

Leading scientists and specialists of the republic participated in a discussion on forecasting elaborations.

G.A. Bogdanov, academician of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin and chairman of the Presidium of the Southern Department of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, revealed the peculiarities of the development of the agroindustrial complex during the coming period. The speaker stressed the need to intensify research on new technologies in agricultural production and on the use highly productive strains and hybrids in plant growing and to improve the theory and practice of the location of plant growing and animal husbandry and the development of machine systems for the complete mechanization of agriculture. The questions of the further development of land reclamation, as well as the efficiency of the use of the existing fund of reclaimed land require thorough study.

Academician V.S. Mikhalevich, director of the Institute of Cybernetics imeni V.M. Glushkov of the UkSSR Academy of Sciences, dwelt on urgent questions of the development of computer technology, control systems, and information science. A critical analysis of the present use of computer equipment was given and its effectiveness at the sectorial and regional levels was evaluated. The mass use of integrated systems of automation and mechanization on the basis of computer facilities is an important means of the increase of the efficiency of the national economy, the introduction of resource- and energy-saving technologies, and the decrease of manual labor. It is planned to ensure a fast pace of production of personal computers.

In his statement Deputy Chairman of the UkSSR State Planning Committee Yu.A. Sarnatskiy stressed the need to develop the construction complex at a leading pace on the basis of retooling, production intensification, the improvement of organization and planning, and the increase of the effectiveness of the economic mechanism and methods of management. It is planned to eliminate the disproportions between the capacities of enterprises of the construction industry and contracting organizations with a breakdown by regions, to improve the structure of the pool of construction equipment, to increase the unit capacity of construction machinery, and to improve the system of supply and outfitting.

The decisive influence of the fuel and power complex on the development of all sectors of the economy was revealed in the statement of Academician of the UkSSR Academy of Sciences A.K. Shidlovskiy, director of the Institute of Electrodynamics of the UkSSR Academy of Sciences. Scientific and technical progress in this interbranch complex is due to the successes of basic research, first of all in chemistry, physics, and mechanics, and directly depends on the level of development of machine building and metallurgy. The optimum directions of nuclear power engineering, the efficient location of its facilities with allowance made for the ecological and economic conditions of the republic, the optimization of the structure of generating capacities, sound levels of electrification, and the use of nontraditional and renewable energy resources have to be ensured. New series of nuclear plants of various types should be developed with allowance made for the increase of the reliability and safety for atomic electric power stations.

V.F. Besedin, deputy director of the Scientific Research Institute of Economics of the UkSSR State Planning Committee, spoke on questions of the economic substantiation of a number of indicators of the Comprehensive Program. The speaker pointed out the necessity of a closer connection of theoretical forecasts with the specific needs of the economy, a more realistic evaluation of possible rates of economic development, and their comprehensive substantiation.

Corresponding Member of the USSR Academy of Sciences V.I. Shinkaruk, director of the Institute of Philosophy of the UkSSR Academy of Sciences, described in detail the problems of the influence of scientific and technical progress on the development of man. The increase of the role of the human factor is a two-sided process. On the one hand, scientific and technical progress influences the system of social qualities of man and, on the other, an individual, who has been developed in a versatile manner, participates more actively and productively in the acceleration of scientific and technical progress. This is reflected in concentrated form in the development of the structure of abilities and needs and in the philosophical aims and legal culture of the individual. In most general form the optimization of the influence of scientific and technical progress on the molding of the new man, the stimulation of his positive aspects, and the neutralization of his negative aspects will ensure during the period being forecast significant progress in the direction of the all-round development of the individual and his qualitative conformity to the requirements of the dynamically developing productive forces and to the social ideals of communism.

V.P. Shevchenko, chief of a department of the UkSSR State Planning Committee, spoke on questions of the improvement of the quality of the formulation of the Comprehensive Program of Scientific and Technical Progress. He noted, in particular, the need for the economic substantiation of the development and use of robotics and flexible machine systems, as well as the restructuring of the forms of participation of the republic in USSR foreign economic relations.

A number of problems of the development of power engineering in the Ukraine were touched upon in the statement of V.P. Pronin, chief of a department of the UkSSR State Planning Committee, who stressed the close connection of the problem of the reduction of water consumption with the development of power engineering. There is only one solution—to provide for the mass use of water-saving and energy-saving technologies in all sectors of the national economy.

President of the UkSSR Academy of Sciences Academician B.Ye. Paton addressed the meeting of the Interdepartmental Scientific Council. The concepts, goals, and directions of long-range development, which are reflected in the preliminary version, he pointed out, should become the basis of the program. Precisely for this reason it is now necessary to give a detailed evaluation of the prepared materials and to ascertain what should be used in the work on the final version of the program and how. Much factual material has been collected, the key problems have been singled out, and important forecasting research has been conducted. As compared with the program for the period to 2005, the work on substantiating the versions of development has been stepped up, the range of investigated questions has been enlarged, and many more results of specific technical and economic calculations have been incorporated in the forecasts. Answering the question of whether the preliminary version is aimed at the accomplishment of the most important task—the achievement during the period being forecast of the highest level of social production on the basis of scientific and technical progress, which conforms to the world level, the president of the UkSSR Academy of Sciences noted that on this level developers in many cases have been unable to avoid an extrapolative approach and no radical change of the formed ideas has occurred. For example, in the section "The Machine Building Complex" in practice there is no comparison of the products being produced by machine building enterprises with the best foreign analogs in productivity and quality on the world level. An obviously inadequate pace of the increase of the technical level is being forecast.

Unfortunately, in most cases the preliminary versions of the sectorial sections do not contain clear indications as to by what date and by means of what the attainment of the world level with respect to specific directions, technical and economic indicators, types of products, and their quality will be ensured. The next most important question is the increase of the efficiency of use of all types of resources. This problem is extremely urgent in the republic. In the preliminary version it was not possible to completely overcome the formed stereotypes, as a result of which the forecast continues in many respects to be oriented toward the extensive means of development. In particular, the questions of water consumption are not properly reflected in the sections on the most water-intensive sectors of the national economy. This needs to be eliminated. It is also necessary to ensure more fully a systems approach to the formulation of the sections of the problem, to take into consideration the real possibilities of the republic economy, as well as to analyze more thoroughly the different versions of forecasts and to engage in their optimization.

A decision, which specifies the basic directions of the work on the preparation of the final version of the program, was adopted in accordance with the results of the meeting.

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Komsomol Prizes in Science, Technology for 1987 Awarded

18140106 Moscow KOMSOMOLSKAYA PRAVDA in Russian 29 Oct 87 p 4

[Article: "On the Awarding of the 1987 Lenin Komsomol Prizes"]

[Excerpt] The Buro of the All-Union Komsomol Central Committee, having considered the representations of the commissions of the All-Union Komsomol Central Committee for Lenin Komsomol Prizes, resolves to award the 1987 Lenin Komsomol Prizes to:

In Science and Technology

1. Eduard Bulatovich Abubakirov, Candidate of Physical Mathematical Sciences Grigoriy Gennadyevich Denisov, scientific associates of the Institute of Applied Physics of the USSR Academy of Sciences, Candidates of Physical Mathematical Sciences Aleksey Ivanovich Klimov and Vladislav Vladimirovich Rostov, scientific associates, and graduate student Sergey Dekabrevich Polevin, staff members of the Institute of High Current Electronics of the Siberian Department of the USSR Academy of Sciences, Candidate of Physical Mathematical Sciences Mikhail Ivanovich Yalandin, senior scientific associate of the Institute of Electrophysics of the Ural Department of the USSR Academy of Sciences—for the work "The Study of Methods of Increasing the Frequency of the Induced Radiation of Relativistic Electron Flows and the Development of Powerful Microwave Generators of the Millimeter Wave Band on the Basis of High Current Recurrent Pulse Accelerators."

2. Candidate of Technical Sciences Vartan Eduardovich Avakov, senior scientific associate of the Moscow Institute of Petroleum and Gas imeni I.M. Gubkin, Candidate of Technical Sciences Kurbanmukhammet Nuryyevich Kuliyev, senior scientific associate of the Turkmen Scientific Research Geological Prospecting Institute—for the development and industrial introduction of new highly efficient drilling muds.

3. Candidate of Biological Sciences Leonid Vladimirovich Averyanov, junior scientific associate of the Botany Institute imeni V.L. Komarov of the USSR Academy of Sciences—for the work "The Classification and Karyoclassification of Several Species of Orchids."

4. Candidate of Physical Mathematical Sciences Valeriy Georgiyevich Andreyev, junior scientific associate of an enterprise of the USSR Ministry of the Communications Equipment Industry, Andrey Petrovich Brysev, junior scientific associate, and Candidate of Physical Mathematical Sciences Mikhail Yuryevich Romanovskiy, senior scientific associate, staff members of the Institute of General Physics of the USSR Academy of Sciences, Candidate of Physical Mathematical Sciences Vitaliy Eduardovich Gusev, assistant lecturer of Moscow State University imeni M.V. Lomonosov, Veniamin Yevgenyevich Nazarov and Aleksandr Mikhaylovich Reyman, junior scientific associates, and Candidate of Physical Mathematical Sciences Dmitriy Mikhaylovich Donskoy, scientific associate, staff members of the Institute of Applied Physics of the USSR Academy of Sciences, Candidate of Physical Mathematical Sciences Viktor Vasilyevich Zosimov, junior scientific associate of the Volzhskiy Scientific and Technical Department of the Acoustics Institute imeni N.N. Andreyev of the USSR Academy of Sciences, Aleksey Tovyevich Skvortsov, junior scientific associate of the Acoustics Institute imeni N.N. Andreyev of the USSR Academy of Sciences—for the series of works "Studies of the Nonlinear Scattering and Self-Excitation of Acoustic Waves and Their Application in the Diagnosis of Media."

5. Kyastutis Ignovich Andryunas, junior scientific associate, and Candidate of Physical Mathematical Sciences Viktor Petrovich Syrus, scientific associate, staff members of the Institute of Physics of the Lithuanian SSR Academy of Sciences, Candidate of Technical Sciences Yelena Gennadiyevna Dulneva, docent, and Candidate of Physical Mathematical Sciences Sergey Arkadyevich Kozlov, engineer, staff members of the Leningrad Institute of Precision Mechanics and Optics—for the work "Multicolor Lasers of High Brightness Based on Solid State and Solid State-Liquid Active Media."

6. Candidate of Philosophical Sciences Anatoliy Nikolayevich Antonov, senior scientific associate of the Philosophy and Law Department of the USSR Academy of Sciences, Candidate of Philosophical Sciences Aleksey Georgiyevich Barabashev, senior instructor of Moscow State University imeni M.V. Lomonosov—for the work "The Philosophical Analysis of the Laws and Trends of Development of Modern Science."

7. Viktor Leonidovich Bizyayev and Andrey Valentinovich Koptyug, junior scientific associates, Candidates of Physical Mathematical Sciences Nikita Nikolayevich Lukzen, Valeriy Ilich Melekhov, and Vladimir Oskarovich Sayk, scientific associates, Candidate of Physical Mathematical Sciences Sergey Nikolayevich Smirnov, junior scientific associate, staff members of the Institute of Chemical Kinetics and Combustion of the Siberian Department of the USSR Academy of Sciences—for the work "Primary Track Processes in Solutions With the Involvement of Spin-Correlated Ion Radicals."

8. Candidates of Medical Sciences Vladimir Nikolayevich Bogatyrev and Nikolay Yevgenyevich Kushlinskiy, Tatyana Vladimirovna Piskunova and Dmitriy Yuryevich Blokhin, scientific associates, Andrey Yuryevich Savinov and Candidate of Biological Sciences Sergey Viktorovich Litvinov, junior scientific associates, Boris Shalvovich Chikvashvili, graduate student, Mikhail Dmitriyevich Nefedov, physician, Tatyana Valerianovna Golovkina, senior laboratory assistant, staff members of the All-Union Cancer Research Center of the

USSR Academy of Medical Sciences—for the development of integrated pathogenetic methods of the diagnosis, treatment, and prevention of breast cancer.

9. Candidate of Physical Mathematical Sciences Yuriy Viktorovich Bogachev, assistant lecturer, Viktor Aleksandrovich Yanchurov, graduate student, staff members of the Leningrad Electrical Engineering Institute imeni V.I. Ulyanov-Lenin, Vladimir Aleksandrovich Yermokhin, chief of a sector, Vladimir Alekseyevich Potasyev, senior engineer, workers of the Nizhnekamskneftekhim Production Association—for the work "The Study, Development, and Introduction in the Synthetic Rubber Industry of Methods and Means of the Monitoring and Control of the Technological Process of the Production of Catalysts on the Basis of the Phenomenon of Electron Paramagnetic Resonance."

10. Igor Gennadyevich Blinov, senior scientific associate, Sergey Alekseyevich Veremeyenko, head of a laboratory, Viktor Aleksandrovich Ilin, assistant lecturer, Aleksey Anatolyevich Korshak and Oleg Khurmatovich Tarzimanov, docents, candidates of technical sciences, staff members of the Ufa Petroleum Institute, Natalya Germanovna Kocheva, engineer-programmer of the Administration of Ural-Siberian Main Petroleum Pipelines of the Main Administration of the Transport and Delivery of Crude Oil—for the work "Resource-Saving Methods of the Designing, Construction, and Operation of Pipeline Systems."

11. Konstantin Aleksandrovich Borovkov, scientific associate of the Mathematics Institute imeni V.A. Steklov of the USSR Academy of Sciences, Boris Andreyevich Zalesskiy, senior scientific associate of the Institute of Mathematics of the Belorussian SSR Academy of Sciences, Alfredas Yurgevich Rachkauskas, docent of Vilnius State University imeni V. Kapsukas, Vladimir Vasilyevich Ulyanov, assistant lecturer of Moscow State University imeni M.V. Lomonosov, candidates of physical mathematical sciences—for a series of works on boundary theorems of probability theory.

12. Gennadiy Alekseyevich Viktorov, junior scientific associate, Rustem Galeyevich Davletov, senior engineer, staff members of the Institute of Chemistry of the Bashkir Affiliate of the USSR Academy of Sciences, Aleksey Borisovich Dyatkin, junior scientific associate, Candidates of Chemical Sciences Marina Nikolayevna Protopopova and Mikhail Yuryevich Eysmont, scientific associates of the Institute of Organic Chemistry imeni N.D. Zelinskiy of the USSR Academy of Sciences, Candidate of Chemical Sciences Andrey Mikhaylovich Katunskiy, scientific associate of the All-Union Scientific Research Institute of Chemical Means of Plant Protection, Marat Galikhanovich Migranov, junior scientific associate of the Department of Biochemistry and Cytology of the Bashkir Affiliate of the USSR Academy of Sciences, Andrey Olegovich Nefedov, junior scientific associate of the Moscow Institute of Petroleum and Gas imeni I.M. Gubkin, Georgiy Anatolyevich Pluzhnik, engineer of the Kiev Plant of Custom-Made Chemical Reagents, Tracers, and Analytical Preparations (RIAP)—for the development and practical implementation of a general-purpose technology of the obtaining of pyrethroids—a new generation of ecologically safe broad spectrum insecticides.

13. Yelena Konstantinovna Davydova, Albert Samigullovich Sitikov, and Aleksey Nikolayevich Fedorov, junior scientific associates, Candidate of Biological Sciences Valdemar Bertgoldovich Minikh, scientific associate, Aleksey Georgiyevich Ryazanov, graduate student, staff members of the Institute of Protein of the USSR Academy of Sciences, Candidate of Biological Sciences Konstantin Villenovich Kandrov, scientific associate of the Institute of Biochemistry imeni A.N. Bakh of the USSR Academy of Sciences—for the work "The Compartmentalization of Proteins of the Apparatus of Translation on Eucaryotic Polyribosomes."

14. Candidates of Technical Sciences Abdurasul Narbutayevich Isakulov, Yevgeniy Georgiyevich Kim, and Bakhtiyar Gulyamovich Nazarov, junior scientific associates, Rapizhan Rakhmankulovich Islamov, graduate student, Umar Berustamovich Tylepov, engineer, Abduaziz Abduvaliyevich Khudayberdiyev, senior scientific associate, Ubaydullo Orinbayevich Khalimbetov, technician-engineer, staff members of the Central Asian Scientific Research Institute of the Mechanization and Electrification of Agriculture—for the development of a set of machines for the coating of cotton seeds, their sowing, the harvesting and transportation of raw cotton by the container method.

15. Candidate of Technical Sciences Sergey Vasilyevich Kazakov, assistant lecturer, Sergey Alekseyevich Ivlev, junior scientific associate, Candidate of Technical Sciences Leonid Vladimirovich Ronkov, junior scientific associate, staff members of the Moscow Institute of Steel and Alloys, Candidate of Technical Sciences Mikhail Aleksandrovich Pozhivanov, foreman of the Zhdanov Azovstal Metallurgical Combine, Viktor Petrovich Kirilenko, scientific associate, Igor Valerianovich Arsentyev, junior scientific associate, staff members of the Central Scientific Research Institute of Ferrous Metallurgy imeni I.P. Bardin, Sergey Serafimovich Kolpakov, chief of a shop, Petr Mikhaylovich Ovchinnikov, foreman of a works, Oleg Borisovich Orionov, foreman, workers of the Novolipetsk Metallurgical Combine imeni Yu.V. Andropov—for the development and introduction of an integrated technology of the production of high quality low-carbon steels with the use of cyclical blowing in an oxygen converter and the preparation of metal for continuous casting by the methods of extrafurnace metallurgy.

16. Candidate of Technical Sciences Gagik Tigranovich Kirakosyan, docent, Gagik Khorenovich Matevosyan, head of a sector of the Information and Computer Center, Oganes Yekhikovich Mkrtichyan, deputy head

of a department, staff members of Yerevan Polytechnical Institute imeni K. Karx, Dmitriy Robertovich Martirosyan, chief engineer of the Computer Center of the Yerevan Scientific Research and Design Institute of Automated Control Systems of the City, Vladimir Pavlovich Kremer, scientific associate, Candidate of Technical Sciences Boris Tsalevich Bebchuk, junior scientific associate, staff members of the Institute of Problems of the Complex Utilization of Mineral Resources of the USSR Academy of Sciences—for the work "The Solution of the Problems of Environmental Protection and the Efficient Use of Resources in a Mining Region With the Use of Interactive Information Processing Systems."

17. Candidates of Medical Sciences Nikolay Sergeyevich Prozorovskiy and Yelena Sergeyevna Fedenko, junior scientific associates, Vladimir Dmitriyevich Prokopenko, deputy chief physician, staff members of the Institute of Immunology of the USSR Ministry of Health—for the work "Extracorporeal Immunopharmacotherapy: The Therapeutic Use of Diutsifon-Induced Cells—the Regulators of the Immune System."

18. Candidate of Technical Sciences Ivan Vasilyevich Sitnikov, head of a laboratory, Candidate of Technical Sciences Aleksandr Antonovich Zyryanov, senior scientific associate, staff members of the Irkutsk Laboratory of the Scientific Research Institute of Concrete and Reinforced Concrete of the USSR State Committee for Construction Affairs, Candidates of Technical Sciences Sergey Dmitriyevich Vitko and Petr Yevgenyevich Ivanov, senior scientific associates of the Scientific Research Institute of Concrete and Reinforced Concrete of the USSR State Committee for Construction Affairs—for the work "Low Energy-Consuming Methods of the Erection of Cast-in-Place Extended Components Under Inclement Natural Climatic Conditions."

19. Nikolay Vasilyevich Stepanov, chief of a design bureau, Fedor Semenovich Sudnitsin, chief of a group, staff members of the Zaporozhye Motorstroitel Production Association, Candidate of Technical Sciences Valeriy Nikolayevich Shlyannikov, senior scientific associate of the Kazan Physical Technical Institute of the Kazan Affiliate of the USSR Academy of Sciences, Candidate of Technical Sciences Aleksandr Afanasyevich Zakhovayko, docent, Sergey Nikolayevich Shukayev, assistant lecturer, staff members of Kiev Polytechnical Institute—for the development of methods of the forecasting and study of the durability of the elements of gas turbine engines with allowance made for the design and technological factors of production and operation.

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Candidates for Prizes of Academy of Medical Sciences

18140060 Moscow MEDITSINSKAYA GAZETA in Russian 23 Sep 87 p 4

[Article under the rubric "Announcements": "From the USSR Academy of Medical Sciences"; first paragraph is MEDITSINSKAYA GAZETA introduction]

[Text] The Presidium of the USSR Academy of Medical Sciences reports that the following works were received for the nominal prizes of the USSR Academy of Medical Sciences for 1987:

The A.I. Abrikosov Prize—for pathological anatomy:

1. V.I. Yeliseyenko—a series of works devoted to the pathogenesis and pathological anatomy of laser wounds (1982-1986).

2. V.S. Paukov—the monograph "Elementy teorii patologii serdtsa" [Elements of the Theory of Pathology of the Heart]. Moscow, "Meditsina", 1982.

3. V.V. Serov, V.A. Varshavskiy, and L.A. Kurpiyanova—the monograph "Immunopatologiya pochek" [Immunopathology of the Kidneys]. Moscow, "Meditsina", 1983.

The P.K. Anokhin Prize—for normal physiology:

1. F.P. Vedyayev—the series of scientific works "The Study of the Physiology of the Limbic System of the Brain and the Development of Realistic Models of Emotional Stresses" (1982-1986).

2. A.M. Ivanitskiy, V.V. Strelin, and I.A. Korsakov—the monograph "Informatsionnyye protsessy mozga i psikhicheskaya deyatelnost" [Informational Processes of the Brain and Mental Activity]. Moscow, "Nauka", 1984.

3. I.A. Aleshin, P.K. Klimov, and A.D. Nozdrachev—the monograph "Ocherki chastnoy elektrofiziologii zheludka" [Essays on the Special Electrophysiology of the Stomach]. Leningrad, "Nauka", 1983.

The V.M. Bekhterev Prize—for neurology and psychiatry:

1. G.V. Morozov and N.I. Bogolepov—the monograph "Morfinizm" [Morphinism]. Moscow, "Meditsina", 1984.

2. Sh.Sh. Shamansurov—the book "Tikoznyye giperkinezy y detei i podrostkov" [Tic Hyperekinesis in Children and Adolescents]. Tashkent, "Meditsina" Uzbek SSR, 1985.

3. I.K. Sosin, G.N. Mysko, Ya.L. Gurevich, O.S. Slabunov, and S.G. Lomakin—the series of works "Nonmedicinal Methods of Treating Alcoholism," which is included in the monograph "Nemedikamentoznyye metody lecheniya alkogolizma" [Nonmedical Methods of Treating Alcoholism]. Kiev, "Zdorovye", 1986; eight procedural recommendations, inventions, and efficiency proposals.

4. Ye.M. Burtsev and A.S. Bobrov—the monograph "Otdalennyy period voyennoy cherepnomozgovoy travmy" [Remote Period of War Craniocerebral Trauma]. Moscow, "Meditsina", 1986.

The A.A. Bogomolets Prize—for pathological physiology:

1. A.N. Mayanskiy and D.N. Mayanskiy—the monograph "Ocherki o neytrofile i makrofage" [Essays on the Neutrophil and the Macrophage]. Siberian Department, "Nauka", 1983.

2. V.A. Frolov and G.A. Drozdova—the monograph "Gipertonicheskoye serdtse" [The Hypertensive Heart]. Baku, Azerb. gos. izd., 1984.

3. Ye.D. Goldberg, V.V. Novitskiy, and S.Ye. Fursov—the series of works "Reactivity of the Blood System in Early and Remote Periods Following the Action of Antitumorous Antibiotics of the Anthracycline Series". 1984-1987.

The M.M. Burdenko Prize—for neurosurgery or military field surgery.

No works were received.

The V.S. Gulevich Prize—for biological and medical chemistry:

1. A.M. Gerasimova and L.N. Furtseva—the monograph "Biokhimicheskaya diagnostika v travmatologii i ortopedii" [Biochemical Diagnosis in Traumatology and Orthopedics]. Moscow, "Meditsina", 1986.

2. Yu.S. Tatarinov—the series of works "Throphoblastospecific Beta Glycoprotein: Biochemical and Clinical Studies" (1982-1986).

3. T.T. Beresov, Ya.V. Dobrynina, V.A. Zanina, Z.I. Lebedeva, and I.P. Smirnova—the series of works on the theme "The Search for, Isolation and Investigation of Catalytic, Physico-Chemical and Biological Properties of Antitumorous Enzymes of Microbial Origin" (1982-1986).

4. L.Ye. Panin—the monograph "Biokhimicheskiye mekhanizmy stressa" [Biochemical Stress Mechanisms]. Siberian Department, "Nauka", 1983.

The M.P. Konchalovskiy Prize—for internal diseases:

1. V.N. Petrov—the monograph "Fiziologiya i patologiya obmena zheleza" [Physiology and Pathology of Iron Metabolism]. Leningrad, "Nauka", 1982.

2. L.I. Olbinskaya and P.F. Litvitskiy—the monograph "Koronarnaya i miokardialnaya nedostatochnost" [Coronary and Myocardial Insufficiency]. Moscow, "Meditsina", 1986.

The N.P. Kravkov Prize—for physiology and toxicology:

1. S.N. Golikov, V.I. Sanotskiy, and L.A. Tiumov—the monograph "Obshchiye mekhanizmy toksicheskogo deystviya" [General Mechanisms of Toxic Action]. Moscow, "Meditsina", 1986.

2. I.V. Komissarov—the monograph "Mekhanizmy khimicheskoy chuvstitelnosti sinapticheskikh membran" [Mechanisms of Chemical Sensitivity of Synaptic Membranes]. Kiev, Izd. "Naukova dumka", 1986.

3. A.A. Lebedev—the monograph "Diuretiki i krovoobrashcheniye" [Diuretics and Blood Circulation]. Moscow, "Meditsina, 1984.

4. M.D. Mashkovskiy, N.I. Andreyeva, A.I. Polezhayeva, and S.M. Golovina—the series of works on the pharmacology of antidepressants and the monograph "Farmakologiya antidepressantov" [Pharmacology of Antidepressants]. Moscow, "Meditsina", 1983.

5. S.A. Mirzoyan, V.P. Akopyan, and A.V. Topchan—a series of works dealing with neurochemical mechanisms regulating cerebral blood circulation.

6. V.A. Filov, B.A. Levin, and B.O. Krayz—the series of studies "Quantitative Connections of the Structure to the Biological Action of Antitumorous and Cancerogenic Substances" (1983-1986).

The F.G. Krotkov Prize—for general and radiation hygiene:

1. V.Ya. Golikov, L.A. Bakulina, N.N. Kotov, L.V. Novikova, and V.A. Pertsov—the series of works "The Substantiation and Development of Measures for Improvement of the System of Radiation Safety and State Sanitary Surveillance of the Use of Sources of Ionizing Radiations in the National Economy and Medicine."

2. R.K. Chekurishvili—the efficiency proposal "Apparatus for X-Ray Study of the Large Intestine by Remote Control."

The B.I. Lavrentyev Prize—in the field of histology:

1. O.S. Sotnikov—the monograph "Dinamika struktury zhivogo neyrona" [Dynamics of the Structure of a Live Neuron]. Leningrad, "Nauka", 1985.

2. S.G. Khomeriki, I.A. Morozov, T.M. Solomatin, and M.N. Volgarev—the series of works "The Functional Morphology of the Stomach's and Small Intestine's Endocrine Cells" (1983-1986)].

3. N.G. Feldman—the book "V.I. Lavrentyev". Moscow, "Nauka", 1983.

The V.V. Parin Prize—in the field of physiology and pathology of blood circulation:

1. B.A. Konstantinov, V.F. Yakovlev, and V.A. Sandrikov—the monograph "Otsenka proizvoditelnosti i analiz potsiklovoy raboty serdza v klinicheskoy praktike" [Evaluation of the Productivity and Analysis of the Cyclical Operation of the Heart in Clinical Practice]. Leningrad, "Nauka", 1986.

2. V.I. Orlov and V.G. Ovsyannikov—the series of works "The Study of the Microcirculation of the Womb at the Time of Pregnancy and Its Use for the Prevention and Treatment of Not Carrying to Term" (1983-1986).

3. R.S. Orlov with coauthors—the monograph "Limfaticheskiye sosudy" [The Lymphatic Vessels]. Leningrad, AN SSSR, 1983.

4. I.A. Potapov, "On the Formation of Lymph in the Skeletal Muscles During Movements," in the collection "Fiziologiya i patologiya venoznoy i limfaticheskoy sistem" [Physiology and Pathology of the Venous and Lymphatic Systems]. Tallinn, 1986.

5. S.A. Selezneva, G.I. Nazarenko, and V.S. Zaytsev—the monograph "Klinicheskiye aspekty mikrogemotsirkulyatsii" [Clinical Aspects of Microhemocirculation]. Leningrad, "Meditsina", 1985.

6. S.A. Simbirtsev and N.A. Belyakov—the monograph "Mikroemboliya legkikh" [Microembolism of the Lungs]. Leningrad, "Meditsina", 1986.

7. L.F. Sherdukalova, V.D. Arutyunyan, and R.A. Ovanesyan—the invention "A Method of Diagnosing Occult Cardiac Insufficiency.

The N.D. Strazhesko Prize—for internal medicine and rheumatology:

1. A.B. Zborovskiy with coauthors—the monograph "Revmatizm, revmatoidnyy artrit i problemy gomeorezisa" [Rheumatism, Rheumatoid Arthritis and Problems of Homeorhesis]. Izd. Saratovskogo universiteta, 1983; the monograph "Revmatism i problemy vegetativnoy reaktivnosti i gipotalamicheskoy regulatsii gomeostaza" [Rheumatism i Problems of Vegetative Reactivity and Hypothalamic Regulation of Homeostasis]. Izd. Saratovskogo universiteta, 1988; the books "Terapiya v Tablitsakh i skhemakh" [Therapy in Tables and Diagrams], Vols I, IV. Izd. Saratovskogo universiteta, 1986.

2. A.I. Gritsyuk, V.I. Shchigelskiy, and V.T. Chuvikina—the book "Vospalitelnyye zabolevaniya serdtsa" [Inflammatory Diseases of the Heart]. Kiev, "Zdorovye", 1986.

The V.D. Timakov Prize—in the field of microbiology, immunology, and virology:

1. Yu.Z. Gendon, G.I. Aleksandrova, A.I. Klimov, T.Ye. Medvedeva, and K.V. Lisovskaya—the series of works "Genetic Bases of Attenuation of the Influenza Virus (on a Model of Cold-Adapted Strains for Live Influenza Vaccines)."

2. V.M. Korshunov and B.V. Pinegin—the series of works "Disbacterioses of the Intestinal Tract and Methods of Their Correction in Experimentation and the Clinic."

3. P.N. Kosyakov and N.P. Kosyakova—the monograph "Antigeny opukholey cheloveka" [Antigens of Human Tumors]. Moscow, "Meditsina", 1986.

4. Ye.A. Kuznetsov and I.I. Oleynik—materials of the study "The Nonselective Mechanism of Resistant Antigenic Variability of Microorganisms Induced by Antibodies." Reports 1, 2, and 3.

5. A.Ya. Kulberg—the series of works "Natural Antibodies—Structure, Origin and Significance in Immunodiagnosis."

6. S.V. Prozorovskiy, V.I. Pokrovskiy, and I.S. Tartakovskiy—a series of works on the study of the causative agent of Legionnaires disease (legionellesis).

The V.P. Filatov Prize—for eye surgery and plastic surgery:

1. S.N. Fedorov and E.V. Yegorov—the monograph "Khirurgicheskoye lecheniye travmaticheskikh katarakt s intraokulyarnoy korrektsiyey" [Surgical Treatment of Traumatic Cataracts with Intraocular Correction]. Moscow, "Meditsina", 1985.

2. N.A. Puchkovskaya and S.A. Yakimenko—the monograph "Opticheskoye keratoprotezirovaniye" [Optic Keratoprosthetics]. Kiev, "Zdorovye', 1986.

3. V.S. Bondar—the monograph "Kozhnaya plastika ploskimi steblyami" [Epidermatoplasty With Flat Rods]. Alma-Ata, "Nauka", 1982; articles.

The N.F. Filatov Prize—in the field of pediatrics:

1. M.K. Oskolkova and O.O. Kupriyanova—the monograph "Elektrokardiografiya u detey" [Electrocardiography in Children]. Moscow, "Meditsina", 1986.

2. M.V. Volkov—the monograph "Bolezni kostey u detey" [Bone Diseases in Children]. Moscow, "Meditsina", 1985.

3. Yu.Ye. Veltishchev, A.A. Ananenko, M.V. Yermolayev, and Yu.A. Knyazev—the monograph "Obmen veshchestv u detey" [Metabolism in Children]. Moscow, "Meditsina", 1983.

4. V.F. Bazarnyy—the series of works "Age Peculiarities of the Organ of Vision in Children when Normal and in Pathology" (1982-1986).

The V.N. Shevkunenko Prize—in the field of topographic anatomy and operative surgery:

1. I.A. Movshovich—the monograph "Operativnaya ortodediya" [Operative Orthopedics]. Moscow, "Meditsina", 1983.

2. G.Ye. Ostroverkhov and V.D. Zatolokin—the monograph "Printsipy anatomicheskikh dolevykh resektsiy pecheni" [Principles of Anatomic Lobal Resections of the Liver]. Moscow, "Meditsina", 1984.

3. I.D. Kirpatovskiy—the monograph "Khirurgicheskaya korrektsiya endokrinnoy impotentsii" [Surgical Correction of Endocrine Impotence]. Moscow, Izd. universiteta Druzhby narodov, 1986; two chapters of the collection "Microsurgery in Urology." New York, 1985.

4. B.S. Gudimov and Yu.V. Moskalenko—the series of works "Topographic Validation of Surgical Accesses to the Caval Portae of the Liver."

5. G.A. Bairov, Yu.L. Doroshevskiy, and T.K. Nimilova—"Atlas operatsiy u novorozhdennykh" [Atlas of Operations in the Newborn]. Leningrad, Meditsina, 1984.

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Decree On Institution Of RSFSR State Prizes In Science, Technology

18140181 Moscow SOBRANIYE POSTANOVLENIY PRAVITELSTVA RSFSR in Russian No 25, 1986 pp 507-512

[Decree No 467 of the RSFSR Council of Ministers of 14 November 1986: "On the Institutions of RSFSR State Prizes in Science and Technology"]

[Text] The RSFSR Council of Ministers decrees:

1. To institute 32 annual RSFSR State Prizes in Science and Technology in the amount of 2,500 rubles each.

To establish that RSFSR State Prizes in Science and Technology are awarded for scientific works, which make a significant contribution to Soviet science and solve problems of the development of regions and sectors of the RSFSR national economy, as well as for works on the development of fundamentally new technologies and equipment, advanced materials, machines, and mechanisms and for outstanding production results in sectors of the RSFSR national economy, which were obtained on the basis of the extensive introduction of achievements of science and technology and advanced know-how, which are of great national economic importance.

2. To confer on the people awarded the RSFSR State Prize in Science and Technology the title "Winner of the RSFSR State Prize in Science and Technology."

A Diploma, the Honorary Badge, and a certificate are presented to the winners of the RSFSR State Prize in Science and Technology.

3. To form the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers.

To assign to the indicated Committee the preliminary examination of the works, which have been submitted for RSFSR State Prizes in Science and Technology, and the submission to the RSFSR Council of Ministers of proposals on the awarding of RSFSR State Prizes in Science and Technology.

4. To ratify the appended Statute on RSFSR State Prizes in Science and Technology and the Statute on the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers.

[Signed] Chairman of the RSFSR Council of Ministers V. Vorotnikov

Administrator of Affairs of the RSFSR Council of Ministers I. Zarubin

Moscow, 14 November 1986. No 467.

Ratified by Decree No 467 of the RSFSR Council of Ministers of 14 November 1986

The Statute on RSFSR State Prizes in Science and Technology

1. RSFSR State Prizes in Science and Technology are awarded annually in the number of up to 32, including: 21 prizes for scientific works, which make a significant contribution to Soviet science and solve problems of the development of regions and sectors of the RSFSR national economy, as well as for works on the development of fundamentally new technologies and equipment, advanced materials, machines, and mechanisms; 11 prizes for outstanding production results in sectors of the RSFSR national economy, which were obtained on the basis of the extensive introduction of achievements of science and technology and advanced know-how, which are of great national economic importance.

The amount of the RSFSR State Prize in Science and Technology is 2,500 rubles each.

2. A collective, which has been submitted for an RSFSR State Prize in Science and Technology, should not exceed eight people and should include only the chief authors, whose creative contribution was most significant. Inclusion in it of people solely on the basis of administrative and organizational work is not permitted.

If a winner of the RSFSR State Prize in Science and Technology has new important achievements, this prize can be awarded to him again, but no sooner than 5 years after the preceding award.

Works, for which their authors have already been awarded state awards, the Lenin Prize, the USSR State Prize, a prize of the USSR Council of Ministers, or prizes of other union republics, are not nominated for the RSFSR State Prize in Science and Technology.

The simultaneous nomination of the same work or the same candidate for the RSFSR State Prize in Science and Technology, as well as for a one-time prize of the RSFSR Council of Ministers for the development and assimilation in production of highly efficient equipment, advanced technology and new materials is not permitted. Moreover, the same candidate cannot be submitted at the same time for the RSFSR State Prize in Science and Technology for two and more works.

3. The nomination of works for the RSFSR State Prize in Science and Technology is made by USSR and RSFSR ministries and departments, the USSR Academy of Sciences, the USSR Academy of Medical Sciences, the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, the USSR Academy of Pedagogical Sciences, the Siberian Department of the USSR Academy of Sciences, the Siberian Department of the USSR Academy of Medical Sciences, the All-Russian Department of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, the Siberian Department of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, the Department for the RSFSR Nonchernozem Zone of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, the Council of Ministers of autonomous republics, kray and oblast soviet executive committees, and the Moscow and Leningrad city soviet executive committees in consultation with the corresponding trade union organs.

The works nominated for the RSFSR State Prize in Science and Technology should be discussed thoroughly and in principle in advance in the press, at conventions and conferences of scientific and scientific and technical societies, meetings of scientists, scientific and technical councils, and councils of higher educational institutions, and at meetings of labor collectives of enterprises, organizations, and institutions with allowance made for the creative contribution of each competitor.

The nomination for the RSFSR State Prize in Science and Technology of works, which are connected with the development of engineering and technical structures, designs of machines and mechanisms, technological processes, and new materials and and with the improvement of production methods, should be preceded by their successful introduction in the RSFSR national economy.

4. The works submitted for the RSFSR State Prize in Science and Technology are accepted by the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers annually prior to 1 September.

The list of the works, which have been selected for further discussion as a result of their examination by sections of the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers for individual fields of science and technology, is published with an indication of the authors of these works in the newspaper SOVETSKAYA ROSSIYA no later than 2 months prior to awarding of the prizes.

5. The decree of the RSFSR Council of Ministers on the awarding of the RSFSR State Prizes in Science and Technology is published in the newspaper SOVETSKAYA ROSSIYA on the occasion of the Day of Soviet Science.

6. The title "Winner of the RSFSR State Prize in Science and Technology" is conferred on the people, who have received the RSFSR State Prizes in Science and Technology and a Diploma, the Honorary Badge, and a certificate are presented to them.

The presentation of the Honorary Badge "Winner of the RSFSR State Prize in Science and Technology" is made by the Chairman of the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers or his deputy in a ceremonial setting at the same time as the presentation of the Diploma and certificate.

The Honorary Badge "Winner of the RSFSR State Prize in Science and Technology" is worn on the right side of the chest above USSR orders and medals and after the Honorary Badges of winners of the Lenin Prize and the USSR State Prize.

7. In awarding the RSFSR State Prize in Science and Technology to a collective of authors to be guided, as a rule, by the following: given two authors, the prize is divided equally; given a collective of three authors, half of the prize is presented to the director, while the other half is divided equally between the other two; given a collective of four or more people, one-third of the prize is presented to the director, while two-thirds are divided equally among the other members of the collective; if the collective of authors has not nominated a director, the prize is divided equally among all of the members of the collective.

8. The Diploma and the Honorary Badge of a deceased winner of the RSFSR State Prize in Science or Technology or of a person, who has been awarded them posthumously, are left with or turned over to his family as a keepsake. The monetary part of the prize is inherited in accordance with the procedure established by prevailing legislation.

9. The procedure of submitting works and drawing up materials for the RSFSR State Prize in Science and Technology is specified by the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers.

Ratified by Decree No 467 of the RSFSR Council of Ministers of 14 November 1986

The Statute on the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers

1. The Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers was formed for the preliminary examination of works, which have been submitted for RSFSR State Prizes in Science and Technology, and the submission of proposals on the awarding of these prizes to the RSFSR Council of Ministers.

2. The membership of the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers is approved by the RSFSR Council of Ministers for a term of 4 years.

3. A meeting of the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers is considered competent if not less than two-thirds of the membership of the Committee are present.

The decision of the Committee on a work, which has been nominated for the RSFSR State Prize in Science and Technology, is adopted by secret ballot by a majority of not less than three-quarters of the number present.

4. The members of the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers familiarize themselves with the works received by the Committee, which have been submitted for the prizes, and if necessary travel to the sites for for their more complete and comprehensive study.

The Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers is granted the right:

a) to form sections and expert commissions in individual fields of science and technology for the preliminary examination and comprehensive evaluation of works which have been submitted for prizes;

b) to entrust the examination of submitted works to scientific research institutions, higher educational institutions, enterprises, and other organizations;

c) to send expert commissions for on-site familiarization with construction and technical structures, inventions, components, materials, production processes, and the state of their introduction;

d) to enlist individual scientists and specialists of the national economy in reviewing works which are received for the RSFSR State Prize in Science and Technology;

e) within the limits of the established estimate to pay members and experts of the Committee for expenditures relating to official trips.

5. The Presidium headed by the Chairman of the Committee supervises the work of the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers.

6. Under the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers there is a working staff for the preliminary study of the works, which are submitted for prizes, the preparation of all the materials for their examination by the Committee, the study and generalization of the materials of public discussion, reviews, and critical scientific literature on the works being nominated, and the conducting of business correspondence, as well as for the organization of statements in the press, on radio, and on television of leading figures of science and technology on the works, which are being awarded the RSFSR State Prize in Science and Technology.

7. The Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers has a seal and a budgetary account in an institution of the USSR State Bank.

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Igor Vasilyevich Petryanov-Sokolov

18140123b Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 10, Oct 87 pp 128-129

[Article under the rubric "News Items and Information": "Academician I.V. Petryanov-Sokolov Is 80 Years Old"]

[Text] For services in the development of physical chemical science, the training of scientists, and active public work and in connection with his 80th birthday the Presidium of the USSR Supreme Soviet by the Ukase of 18 June 1987 awarded Academician Igor Vasilyevich Petryanov-Sokolov the Order of Friendship of Peoples.

In the salutatory address, which was sent to the celebrator, the Presidium of the USSR Academy of Sciences commended the scientific services of Hero of Socialist Labor and winner of the Lenin Prize and USSR State Prizes I.V. Petryanov-Sokolov—a prominent scientist in the field of physical chemistry. About half a century ago

he was the initiator of research on the physical chemistry of aerodispersed systems, and the entire development of this field of science and its successes are inseparably connected with his name.

I.V. Petryanov-Sokolov discovered a new physical chemical phenomenon, which made it possible to develop the technology of producing fibrous polymer materials, which found the most extensive use in means of the protection of respiratory organs and the trapping of highly toxic aerosols of any dispersity and in the technological processes of absolutely pure materials. Owing to the "Petryanov filter" the protection of the health of millions of people has been ensured. The developments of the scientist for the prevention of the radioactive contamination of the environment with the waste products of atomic works are especially important.

In recent year a new scientific direction—the study of artificial aerosol clouds—which is of great importance both for the development of space technology and for the formation of notions about the ecological condition of near-earth space, emerged under the supervision of I.V. Petryanov-Sokolov.

The principle of waste-free technology, which was proposed by the scientist, as a common principle of the organization of modern industrial product has received extensive recognition of the world community.

Along with the scientific work of I.V. Petryanov-Sokolov the Presidium commended his scientific organizational activity as chairman of the Scientific Council of the USSR Academy of Sciences for Colloid Chemistry and Physical Chemical Mechanics, as well as his constant efforts in the area of the popularization of science. "Sovetskaya detskaya entsiklopediya" [The Soviet Children's Encyclopedia] and books of the series "Scientists to the School Child," which were published under his editorship, have been translated into many languages. The journal *Khimiya i Zhizn*, which he founded and has headed continuously, enjoys enormous popularity. He is in charge of the editorial board of the series "Popular Science Literature," which is published by the Nauka Publishing House.

I.V. Petryanov-Sokolov is making a large contribution to the cause of the preservation of the cultural and historical traditions of our people as deputy chairman of the All-Russian Society of the Preservation of Monuments of History and Culture, editor in chief of the almanac "Pamyatniki otechestva" [Monuments of the Fatherland], and chairman of the All-Union Society of Book Lovers.

The services of the scientist have been worthily commended by the highest medals of the country. For cultural and educational activity he was also awarded the K.D. Ushinskiy and S.I. Vavilov medals; UNESCO awarded him the Kalinga Prize.

The Presidium of the USSR Academy of Sciences wished the celebrator good health and further successes for the good of the homeland.

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Valeriy Leonidovich Makarov

18140123c Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 10, Oct 87 p 129

[Article under the rubric "News Items and Information": "Corresponding Member of the USSR Academy of Sciences V.L. Makarov Is 50 Years Old"]

[Text] For services in the development of economic science and the training of scientists and in connection with his 50th birthday Corresponding Member of the USSR Academy of Sciences Valeriy Leonidovich Makarov by the Ukase of the Presidium of the USSR Supreme Soviet of 25 May 1987 was awarded the Order of Labor Red Banner.

V.L. Makarov is a prominent economist and mathematician, Soviet scientists know him as a serious researcher in the field of the mathematical economic analysis and simulation of the processes of socioeconomic development. His great contribution to the improvement of mathematical economic methods and the introduction of advanced computer technology in the practice of the planning and management of the national economy is well known. V.L. Makarov is the author of more than 100 scientific works, among which are such basic works as "Matematicheskaya teoriya ekonomicheskoy dinamiki i ravnovesiya" [The Mathematical Theory of Economic Dynamics and Equilibrium], "Modeli optimalnogo funktsionirovaniya otraslevykh sistem" [Models of the Optimum Functioning of Sectorial Systems], and "Matematicheskoye obespecheniye otraslevogo perspektivnogo planirovaniya" [Software of Sectorial Long-Range Planning]. Many of them have been translated into foreign languages and are contributing to the increase of the international prestige of Soviet science.

The scientist is performing fruitful scientific organizational work. He is the director of the Central Institute of Economics and Mathematics of the USSR Academy of Sciences. Many talented researchers—doctors and candidates of sciences—have grown up under his scientific supervision.

In the salutatory address the Presidium of the USSR Academy of Sciences wished the celebrator good health, long years of life, and new creative achievements for the glory of Soviet science.

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Mechnikov Gold Medal Awarded to R.V. Petrov

18140124b Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 10, Oct 87 p 131

[Article under the rubric "News Items and Information": "The I.I. Mechnikov Gold Medal to R.V. Petrov"]

[Text] The Presidium of the USSR Academy of Sciences has awarded the 1987 I.I. Mechnikov Gold Medal to Academician Rem Viktorovich Petrov for the series of works "The Monitoring and Regulation of the Immune Response."

The series of works of R.V. Petrov includes monographs and theoretical articles on urgent problems of the biology of the immune system. The author and his students made a substantial contribution to the problem of the monitoring and regulation of immune reactions: the monitoring role of the genotype in the strength of the immune response of mammals to microbe antigens was shown, the dominant nature of the strong type of reaction was established. The research of R.V. Petrov on the mechanisms of intercellular interactions in the system of hemogenic and lymphoid cells has acquired world fame. The three-component system of the interaction of bone marrow, typical, and macrophage cells during the development of an immune reaction, which was proposed by him in 1969 simultaneously with foreign authors, has become classic and has been included in all educational handbooks. The priority of the discovery of the regulating role of lymphocytes in the differentiation and reproduction of rod hemogenic cells belongs to R.V. Petrov. As a result of the discovery of a new class of immunoregulatory molecules of a bone marrow nature—myelopeptides—a medicinal preparation, which stimulates immune reactions, has successfully undergone clinical tests, and has been turned over to production, was developed. R.V. Petrov and associates showed the promise of the use of the peptides of the human immune deficiency virus, which were obtained by the method of chemical synthesis, for the development of a new generation of the means of diagnosing acquired immune deficiency syndrome (AIDS). The proposed preparation—peptaskrin—has been recommended to practice.

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Bakh Prize Awarded to A.V. Kotelnikova, R.A. Zvyagilskaya

18140124d Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 10, Oct 87 p 132

[Article under the rubric "News Items and Information": "The A.N. Bakh Prize to A.V. Kotelnikova, R.A. Zvyagilskaya"]

[Text] The Presidium of the USSR Academy of Sciences has awarded the 1987 A.N. Bakh Prize to Doctor of Biological Sciences Alla Vladimirovna Kotelnikova and Doctor of Biological Sciences Renata Aleksandrovna Zvyagilskaya (the Institute of Biochemistry imeni A.N. Bakh of the USSR Academy of Sciences) for the series of works "The Biochemistry of Yeast Mitochondria."

The authors obtained priority data on the peculiarities of the energy conjugation and metabolic activity of yeast mitochondria and established a new direction in the study of the peculiarities of the energy transfer of yeast. They developed an effective system of the selection of strains of yeast and yeast-like organisms, which are promising for use in the microbiological industry.

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Lebedev Gold Medal Awarded to V.S. Vavilov

18140124c Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 10, Oct 87 pp 131-132

[Article under the rubric "News Items and Information": "The P.N. Lebedev Prize to V.S. Vavilov"]

[Text] The Presidium of the USSR Academy of Sciences has awarded the 1987 P.N. Lebedev Gold Medal to Doctor of Physical Mathematical Sciences Viktor Sergeyevich Vavilov (the Physics Institute imeni P.N. Lebedev of the USSR Academy of Sciences) for the series of works "Experimental Studies of Radiation Effects in Semiconductors."

The series of works, which was awarded the prize, includes articles, which were published by the author during 1958-1965 and contain data, which were obtained by him for the first time, on the Keldysh-Frants electrooptical effect, on the spectral dependence of the quantum yield of photoionization and its increase due to secondary ionization by hot carriers, as well as on the quantitative parameters which characterize the generation of nonequilibrium electrons and holes in case of the deceleration of fast electrons and the passage of gamma radiation through semiconductors. Data on the effects of the interaction of point radiation effects in silicon with each other and with impurity atoms were obtained and analyzed on the basis of the experiments conducted by the author.

The works of V.S. Vavilov have received recognition in the USSR and abroad; their results have found important practical applications.

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Readings in Memory of L.A. Melentyev

18140124f Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 10, Oct 87 p 134

[Article under the rubric "News Items and Information": "The Melentyev Theoretical Readings"]

[Text] The Physical Technical Problems of Power Engineering Department of the USSR Academy of Sciences has adopted a decree on the holding of the Melentyev theoretical readings in memory of Academician L.A. Melentyev (1908-1986), a prominent power engineering scholar, the founder of the Siberian Power Engineering Institute of the Siberian Department of the USSR Academy of Sciences and the Institute of Power Engineering Research of the USSR Academy of Sciences and the State Committee for Science and Technology, and Hero of Socialist Labor.

The school of Lev Aleksandrovich Melentyev developed the concept of long-range forecasting of the development of the power engineering complex of the country, formed a new scientific direction—systems research in power engineering, and developed modern research apparatus, which is based on the use of mathematical methods for the solution of the problems of the development and functioning of power engineering of the country.

The scientific legacy of the academician includes 19 monographs and more than 130 scientific articles, his students—from candidates of sciences to corresponding members of the USSR Academy of Sciences—are well known not only in our country, but also beyond it.

The holding of the Melentyev readings will contribute to the extension of the theoretical bases of long-range forecasting of the development of power engineering of the country and to the elaboration of scientific recommendations on the priority directions of systems research in power engineering.

The Melentyev readings are held once every 2-3 years by the Scientific Council of the USSR Academy of Sciences for Complex Problems of Power Engineering and are timed to coincide with the birthday of Academician L.A. Melentyev on 9 December. The first Melentyev readings are being held in December 1988. An organizing committee, which is the jury, has been set up under the chairmanship of Corresponding Member of the USSR Academy of Sciences A.A. Makarov for their holding.

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S.I. Vavilov Monument Unveiled

18140124e Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 10, Oct 87 p 133

[Article under the rubric "News Items and Information": "In Memory of Sergey Ivanovich Vavilov"]

[Text] On 14 April 1987 a monument to Sergey Ivanovich Vavilov—an outstanding scientist and public figure—was unveiled in Moscow on Leninskiy Prospekt at the entrance to the Physics Institute of the USSR Academy of Sciences. The authors of the project are Honored Artist of the RSFSR V.A. Fedorov and architect V.M. Repin. President of the USSR Academy of Sciences Academician G.I. Marchuk, other executives of the academy, and scientists, who had worked with S.I. Vavilov, spoke at the meeting which was devoted to this event.

"A man of great talent and inexhaustible energy, Sergey Ivanovich Vavilov simultaneously performed a large number of most difficult duties," Academician N.G. Basov said in his speech. During the postwar years he was president of the USSR Academy of Sciences, director of the Physics Institute imeni P.N. Lebedev—his main creation, and scientific supervisor of the State Optics Institute (GOI), which now bears his name. He was in charge of the Editing and Publishing Council of the academy and was editor in chief of "Bolshaya Sovetskaya Entsiklopediya" [The Great Soviet Encyclopedia], *Zhurnal Teoreticheskoy i Eksperimentalnoy Fiziki*, and *Priroda*. He was the initiator and first chairman of the Society for Knowledge.

He was the author of books and articles on A.N. Krylov, I. Newton, M. Faraday, P.N. Lebedev, F. Joliot-Curie, and S.V. Kovalevskaya. In studying the history of science, Vavilov sought the laws of its development. He needed this for the management of the academy and for the development of physics and all science in the country. His ideas on the planning of the development of basic science and the forecasting and long-range estimation of its contribution to the national economy are thoroughly modern.

The entire life of Sergey Ivanovich Vavilov is a vivid example of dedicated service to science and our people.

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Scientists' Anniversaries and Awards

Moscow VESTNIK AKADEMII NAUK SSSR in Russian No4, Apr 87 pp 152-158

[Sketches and awards of seven scientists; each sketch includes a photograph of the scientist in question]

Anniversaries of Scientists

[Text] Academician A.A. Logunov, Vice President of the USSR Academy of Sciences, Is 60 Years Old

For worthy contributions to the development of Soviet science, training of scientific personal and in connection with his 60th birthday, Academician Anatoliy Alekseyevich LOGUNOV has been awarded the Order of Lenin by a Ukase of the Presidium of the USSR Supreme Soviet of 29 December 1986.

Winner of the Lenin and State prizes A.A. Logunov is an outstanding representative of the Soviet school of theoretical and mathematical physics. He made a basic contribution to the development of the quantum field theory, the validation and use of dispersion relations and the creation of the renormgroup [renormgruppa] method, which is used in the solution of a broad range of problems. He established strict asymptotic theorems for the behavior of the characteristics of strong interaction in the presence of high energies. He proposed a new approach to the study of numerous processes which has been found to be most adequate for the composite structure of particles and has made it possible to discover at the accelerator of the Institute of High-Energy Physics a new very important law of the microcosm—scale invariance.

In recent years, he has worked fruitfully on problems of gravitation. Developing the ideas of Poincare, Minkowski, Einstein and Gilbert, he created a consistent relativistic theory of gravitation, which, fully agreeing with all the experimental facts, eliminates the fundamental difficulties of the general theory of relativity.

A.A. Logunov made an outstanding contribution to the organization and development of research on high-energy physics. Under his supervision, there went into operation the biggest at the time proton accelerator with an energy of 76 GeV and created one of the largest scientific centers in the world, enriching science with outstanding discoveries. On the site of the Institute of High-Energy Physics, wide-scale cooperation was attained for the first time of all Soviet and the most important foreign centers in the field of high-energy physics.

Under A.A. Logunov's supervision, a plan was developed for an acceleratory-accumulator complex at the Institute of High-Energy Physics. At the present time, this is being realized, which will make it possible to put our country among the most advanced positions of research in the field of physics of the microcosm.

Vice president of the USSR Academy of Sciences since 1974, A.A. Logunov has invested much energy into the development of the academy as the country's highest scientific organ, strengthening its scientific and technical potential and publishing acivity.

A.A, Logunov in the position of rector of Moscow University is conducting work on raising the quality of training of young specialists and the level of scientific research, fuller utilization of the potential of VUZ science and its strengthening in connection with academic science.

In the congratulatory address to A.A. Logunov, the Presidium of the USSR Academy of Sciences wished him good health, happiness and new creative achievements for the benefit of the Motherland.

Academician G.A. Avsyuk Is 80 Years Old

An outstanding scientist in the field of glaciology and physical geography, Academician Grigoriy Aleksandrovich AVSYUK has devoted his life to the study of the ice cover of the Earth and to the laws of its prevalence, formation, dynamics and prediction. He is the organizer and scientific head of the first stationary glaciological research studies. He has to his credit the development and wide-scale introduction of original methods of research: photogrammetric, electrometric, geophysical and other research, making it possible to provide quantitative evaluation and to obtain outstanding results in different fields of glaciology.

The research performed by G.A. Avsyuk on modern glaciation of the Tien Shan and other mountainous regions and the classification created by him of glaciers by type of temperature conditions as well as the results of studying the evolution of the glacier system of the Arctic and the Antarctic and elucidation of the laws of movement of ice and glacial cupolas are of important theoretical and practical value.

Paying constant attention to the selection and training of scientific personnel, G.A. Avsyuk founded a school of Soviet glaciologists—a solid collective of pupils and followers, many of whom have become well-known scientists. The creation of such a school serves as evidence of the talent, energy and high human qualities and principles of G.A. Avsyuk. He is by right an example of a scientist deeply dedicated to science and a model of an attentive and benevolent attitude toward people.

G.A. Avsyuk always combines his scientific work with active scientific organizational work. As chairman of the glaciology section of the Interdepartmental Geophysical Committee attached to the Presidium of the USSR Academy of Sciences, he contributes to the embodiment of the most advanced ideas and methods of research and of an integrated approach to the study of natural ice. Under his leadership and with his direct participation, a number of important glaciological plans have been implemented. This subsequently led to the creation of a permanent international service of observations of the fluctuation of glaciers and the compilation of a World Catalog of Glaciers. At the present time, G.A. Avsyuk is the responsible editor for the publication of a very large generalizing work on glaciology—the Atlas of Snow and Ice Resources of the World, now being prepared.

In the congratulatory address to the anniversary celebrant, the Presidium of the USSR Academy of Sciences wished him good health and many years of creative work for the benefit of our Soviet science.

Academician Yu.M. Pushcharovskiy Is 70 Years Old

For contributions to the development of geological sciences, training of scientific personnal and in connection with his 70th birthday, Academician Yuriy Mikhaylovich PUSHCHAROVSKIY was awarded the Order of the Labor Red Bannor by a Ukase of the Presidium of the USSR Supreme Soviet of 14 January 1987.

Winner of the USSR State Prize and winner of the Prize imeni A.P. Karpinskiy of the USSR Academy of Sciences, Yu.M. Pulshcharovskiy is a prominent Soviet scientist in the field of geotectonics and regional geology. His scientific and productive work has been connected for almost half a century with the study of tectonic structures of the earth's core. He developed the theory of edge sags and resonant tectonic structures, the practical result of which was the discovery of the Lena-Vilyuyskaya Gas Bearing Province.

A major place in Yu.M. Pushcharovskiy's investigations is occupied by tectonic regionalization of the earth's core and the compilation of tectonic charts serving as the basis for elucidation of the laws of disposition of mineral deposits. Under his supervision and with his direct participation, such charts were compiled for the Pacific Ocean segment of the Earth, the Arctic, Cuba, Eastern USSR and other regions. He did considerable work on the study of the tectonics and petroleum and gas bearing capability of ocean-side zones. The results of this research are being widely used in the practice of geological surveying and prospecting work. Yu.M. Pushcharovskiy developed rational principles of tectonic regionalization of oceans and proposed a new direction in the study of their geology based on a comprehensive analysis of petrogeological, geochemical and tectonic data on rocks on the bottom of these water bodies.

In addition to scientific research, Yu.M. Pushcharovskiy is engaged in major scientific organizational work, serving as the chairman of the Interdepartmental Tectonic Committee, the chairman of the section of geology, geophysics and geochemistry of the Commission on Problems of the World Ocean of the USSR Academy of Sciences and the chief editor of the journal GEOTEKTONIKA.

The Presidium of the USSR Academy of Sciences in its congratulatory address to the celebrant highly rated his contributions and wished him good health and further creative achievements.

Corresponding Member of the USSR Academy of Sciences V.P. Solonenko Is 70 Years Old

For contributions to the development of geology and geophysics, training of scientific personnel and in connection with his 70th birthday, Corresponding member of the USSR Academy of Sciences Viktor Prokopyevich SOLONENKO has been awarded the Order of the Labor Red Banner by a Ukase of the Presidium of the USSR Supreme Soviet of 14 November 1986.

An outstanding specialist in the field of geological and geological-geophysical research, V.P. Solonenko made a valuable contribution to the study of mineral deposits and to the solution of problems of engineering geology, tectonics, seismogeology and seismology. His scientific and productive work is closely tied to Siberia and the regions adjacent to it. He discovered and studied a number of graphite, molybdenum, iron-ore, phosphorite and other deposits in Siberia, the Far East, the Mongolian People's Republic and in the area of the Baykal-Amur Main Line—regions of young volcanoes and mineral springs.

V.P. Solonenko studied catastrophic earthquakes in the Baykal seismic region and on the territory of the Mongolian People's Republic. Under his guidance and with his direct participation, a series of charts was created of engineering geological and seismic regionalization of Eastern Siberia, the areas of the Baykal-Amur Main Line and other regions of our country. V.P. Solonenko developed and introduced into practice a paleoseismogeological method, making it possible to carry out reliable seismoregionalization of regions that do not have seismostatic data and to provide a long-range forecast of strong earthquakes. He studied in detail the tectonics of the Baykal folded country and in particular the structure of the Baykal reef zone, determined the laws of development of the tectonic depression of the Baykal type and disclosed the chief directions of migration of the process of reef genesis of the Baykal region.

In addition to scientific work, V.P. Solonenko is engaged in major scientific organizational work, serving as a member of the Presidium of the Eastern Siberian Affiliate of the Siberian Department of the USSR Academy of Sciences. He has given much of his energy and attention to pedagogic activity at Irkutsk University.

The Presidium of the USSR Academy of Sciences in its congratulatory address to the celebrant wished him good health and further creative achievements.

Corresponding Member of the USSR Academy of Sciences A.A. Pistolkors Is90 Years Old

For his big contribution to the development of Soviet science and technology and in connection with 60-years of scientific activity, Corresponding Member of the USSR Academy of Sciences Aleksandr Aleksandrovich PISTOLKORS was awarded the Order of Lenin by a Ukase of the Presidium of the USSR Supreme Soviet of 2 December 1986.

Winner of the Lenin Prize A.A. Pistolkors is a scientist with a world known name. He is one of those who has created the foundation of modern electrodynamics and

antenna technology. His civil position was shown in 1919 when he participated in establishing illegal radio communication for Baku communists with Moscow. His scientific alma mater became the Nizhgorodskaya Radio Engineering Laboratory created on the instructions of Lenin. The numerous scientific works and inventions of A,A. Pistolkors have always been in the channel of the country's technical progress and have been widely acknowledged by the world's scientific community. The gamut of embodiment of his ideas ranges from Pistolkors's classical folded dipole antenna to the modern solar radiotelescope.

A.A. Pistolkors is the head of the Soviet school of antenna technology. Among his pupils are many well-known scientists, members of the USSR Academy of Sciences and academies of sciences of union republics. He devoted a significant portion of his life to coordination of the work of academic institutions and industrial enterprises, asserting and defending the positions of scientific and technical progress with the consistency and adherence to principle characteristic of him.

A.A. Pistolkors is an RSFSR Honored Inventor, winner of the Gold Medal imeni A.S. Popov and member of the International Scientific and Technical Society. In the congratulatory address to the celebrant, the Presidium of the USSR Academy of Sciences wished him health and active creative activity.

Corresponding Member of the USSR Academy of Sciences Yu.B. Vipper is 70 Years Old

For contributions to the development of Soviet study of literature and in connection with his 70th birthday, the Presidium of the USSR Supreme Soviet by a Ukase of 4 December 1986 awarded corresponding member of the USSR Academy of Sciences Yuriy Borisovich VIPPER the Order of the Badge of Honor.

Yu.B. Vipper is a prominent Soviet specialist in the study of literature. His books "Formirovaniye klassitizma vo frantsuzskoy poezii nachala XVII veka" [Forming of Classicism in French Poetry of the Beginning of the 17th Century] and "Poeziya Pleyady. Stanovleniye literaturnoy shkoly" [Poetry of the Pleiad. Establishment of a Literary School] in which such important theoretical problems as laws of genesis of a literary school, the transition from one art epoch to another, form of interaction and change of different ideo-stylistic trends received an innovative solution.

In studies of recent years, he has worked on a complex of complicated theoretical problems arising with the creation of a history of individual national literature, a comparative historical study of the development of world literature, a comparative analysis of literary interrelations and typological correlations. He has made a significant contribution to the development of a conception and principles of formation of a multitome "Istoriya vsemirnoy literatury" [History of World Literature]. He is the deputy chief editor of the entire publication, the responsible editor of Volume IV and the author of a whole series of basic chapters of this work.

Yu.B. Vipper successfully combines scholarly work with pedagogic and organizational activity. His many years of scholarly and pedagogical work at the Department of History of Foreign Literature of Moscow University have been powerfully imprinted in courses of lectures and scholarly works and have been continued in the work of several generations of his pupils—undergraduate and graduate students. He is the deputy chairman of the Scientific Council on the Comprehensive Problem "Laws of Development of World Literature in the Contemporary Epoch" of the USSR Academy of Sciences and the chairman of many scientific councils and editorial boards. Yu.B. Vipper is a member of the USSR Writers Union.

The scholar's work on expansion and strengthening of international ties of the USSR Academy of Sciences has been fruitful. He is a member of the Central Board of the USSR-France Society. The International Association of Comparative Study has twice chosen him as its vice president. He was elected vice president of the International Federation of Contemporary Languages and Literatures.

In the congratulatory address to the celebrant, the Presidium of the USSR Academy of Sciences wished him good health and new creative achievements.

Awarding of Gold Medals and Prizes of the USSR Academy of Sciences

Gold Medal imeni M.A. Lavrentyev Awarded to S.S. Grigoryan

The Presidium of the USSR Academy of Sciences has awarded the 1986 Gold Medal imeni M.A. Lavrentyev to Doctor of Physico-Mathematical Sciences Samvel Samvelovich GRIGORYAN (Moscow State University imeni M.V. Lomonosov) for the series of works "Issledovaniya po mekhanike prirodnykh protsessov" [Investigations on the Mechanics of Natural Processes].

The series of works for which the award was conferred deals with the elucidation of the basic mechanisms of a number of natural phenomena that were previously unexplained and lack an adequate mathematical description and building of simple mathematical models, making it possible to predict with the required adequacy the course of these processes and their quantitative characteristics. The natural processes studied in these works include movements of glaciers, snow avalanches, large-scale mountainous landslides and landslips and phenomena in directed explosions. The employment of methods of mathematical modeling with the use of new laws established by the author has made it possible to quantitatively describe important aspects of natural processes arising in mountainous locations, which is of great

importance to the national economy, especially rational planning of different kinds of structures: canals, dams of hydroelectric stations and so forth. The applied results of these works of S.S. Grigoryan have already found broad use in practice.

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UDC 001.4:651.926:06.053

Zonal Seminar on Scientific, Technical Translation

18140043b Moscow NAUCHNO-TEKHNICHESKAYA TERMINOLOGIYA in Russian No 6, 1987 pp 16-17

[Article by Candidate of Philological Sciences Yu.L. Patrik: "Questions of Terminology at the Zonal Conference 'Terminological Aspects of Scientific and Technical Translation'"]

[Text] The annual zonal seminar for translators of enterprises, scientific research institutes, and design bureaus, specialists in scientific and technical translation, and instructors of higher educational institutions, which was organized and run by the section of scientific and technical translation attached to the Volga River Region House of Scientific and Technical Propaganda, was held in Penza in February 1987.

Representatives of 226 organizations of RSFSR, the Ukraine, Belorussia, Moldavia, Estonia, and Latvia took part in the work of the seminar. About 20 reports were heard and practical studies for translators from English, German, and French were held.

In the report of K.Ya. Averbukh (Moscow) "The Terminological Concept of E.K. Drezen" the scientific achievements of the scientist and his contribution to the matter of placing the study of terminology on a scientific level were covered.

M.V. Antonova (Leningrad) in the report "Interlinguistic Correspondences of Scientific and Technical Terms" proposed to introduce in the prevailing classification of types of interlinguistic correspondences at the level of special vocabulary the additional parameter "concept" and to distinguish the equivalent, nonequivalent, correlative, and claquing types of correspondences.

In the report of S.S. Ivanov (Gorkiy) "The Results of the Structural Probability Analysis of Lexical-Semantic Variants of Narrowly Specialized Vocabulary," in particular, the conclusion of the advisability of changing the structure of the vocabulary article when compiling the minimum necessary vocabulary in one specialty or another in connection with the fact that lexical-semantic variants form their own hierarchy of meanings, which is different from the vocabulary hierarchy, was drawn.

K.S. Kakurina and E.P. Komarova (Voronezh) in the report "Several Structural Semantic Peculiarities of the Terms of a Scientific Text" addressed the problem of polysemy and homonymy in terminology. According to the data of the authors, more than 50 percent of the terminological units (texts on radioelectronics and communications were studied) are polysemantic, while the terminologization of commonly used words is regarded as one of the courses of polysemy in such texts.

R.I. Komarova in the report "Structural Peculiarities of the English Terminology of Heuristics" traced the fact that the affixal method of the formation of terms is the leading one in this sublanguage; substantivization, abbreviation, and the semantic and syntactical methods of the formation of terms are also widespread.

The report of S.A. Koreneva (Angarsk) was devoted to the methods of recognizing patent and technical terms, while N.M. Radovilskaya and V.Yu. Falkova (Odessa) dwelt on the problems of the functioning of terminological vocabulary in U.S. patents.

The role of adjectives in advertising texts and the problems of equivalent translation and the specific nature of oral translation in scientific and technical texts were examined in the reports and communications of the other seminar participants.

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UDC 001.86:001.4:061.12

Coordination of Terminology Work at Republic Academies

18140043a Moscow NAUCHNO-TEKHNICHESKAYA TERMINOLOGIYA in Russian No 6, 1987 pp 1-4

[Article by Candidate of Technical Sciences A.Z. Chapovskiy under the rubric "The Methods and Practice of the Standardization of Terminology. Domestic Information": "On the Coordination of Terminology Activity at the Academies of Sciences of the Union Republics"]

[Text] As applied to the languages of the peoples of the USSR it is possible to speak about three aspects of the scientific theoretical development of terminology, which were described by Yu.D. Desheriyev at the All-Union Seminar on Problems of Terminology in March 1981 (in the collection "Problemy razrabotki i uporyadocheniya terminologii v akademiyakh nauk soyuznykh respublik" [Problems of the Development and Regulation of Terminology at the Academies of Sciences of the Union Republics], Moscow, Nauka, 1983, pp 30-37). It is a question of the cognitive (epistemological), social, and national linguistic aspects. The author stressed that the optimum combination of the requirements, which follow from these aspects, is of fundamental importance for the proper solution of the general terminological problems of the development of the linguistic life of the peoples of the USSR at present under the conditions of the universal dissemination of national-Russian bilingualism.

The coordination of the terminology work of the academies of sciences of the union republics is a multifaceted, complex, and urgent problem. As was already mentioned, it was raised in general form at the All-Union Seminar on Problems of Terminology 5 years ago, but in this time little has been done for its solution.

The Committee of Scientific and Technical Terminology (KNNT) of the USSR Academy of Sciences as the main organization in this area in the system of the USSR Academy of Sciences has implemented specific organizational methods measures in this indicated direction, in particular, it familiarized itself with the state of terminology work at the academies of sciences of the majority of union republics, analyzed the long-range plans of scientific research, and gave organizational and procedural assistance in the solution of a number of problems locally. Thus, with the direct assistance of the Committee of Scientific and Technical Terminology during 1985-1986 terminology commissions were formed at the Uzbek SSR and Moldavian SSR academies of sciences and the 1st Republic Conference on Terminology was held at the Uzbek SSR Academy of Sciences. However, this is clearly insufficient for the solution of the problem of coordinating terminology work.

For the purpose of eliminating the shortcomings in the solution of the problems of coordinating terminology work the terminology committee of the Azerbaijan SSR Academy of Sciences and the Committee of Scientific and Technical Terminology of the USSR Academy of Sciences advanced the idea of establishing a working commission for the coordination of the activity of the terminology organs of the academies of sciences of the union republics, having included in it one authorized representative each from every republic. The work of the commission should be carried out under the supervision of the Committee of Scientific and Technical Terminology of the USSR Academy of Sciences and the Institute of Linguistics of the USSR Academy of Sciences.[1] The suggestion on the holding of annual conferences for the discussion of the plans of scientific research for the coming year was made.

There should be included in the group of the examination of questions of the planned working commission:

—the coordination of the plans of scientific research in the area of terminology at the academies of sciences of the union republics for the year, the five-year plan, and the more distant future, which envisage, in particular, the formulation of generalized classifications of developed terminology systems for the purposes of identifying the gaps and coordinating subsequent terminology work in the union republics;

—the coordination of the publishing activity of terminology organs;

—the standardization of terminology by linguistic groups (Slavic, Turkic, Ugro-Finic, and others);

—the development of the scientific principles of borrowing in national terminologies;

—the development of unified procedural principles of the formation of bilingual and multilingual terminology dictionaries;

—the mutual exchange of the bibliography in the area of terminology;

—the coordination of dissertation projects;

—the preparation of all-union and regional conferences and meetings on specific problems of scientific terminology.

The urgency of the question of broadening the publishing possibilities in the area of terminology is obvious. However, difficulties with the publication of works on terminology exist in nearly all the republics.

The All-Union Conference "The Preparation and Use of Scientific and Technical Dictionaries in the System of Information Supply," which was held in Moscow in October 1986, testifies to the stepping up of dictionary activity in the USSR and to the urgency of its problems.[1] The conference was organized by the Russkiy yazyk Publishing House jointly with the All-Union Center of Translations (VTsP) attached to the State Committee for Science and Technology and the USSR Academy of Sciences and the Committee of Scientific and Technical Terminology of the USSR Academy of Sciences. A decision on the holding of a conference on the development of forms and methods of the prompt reflection of new scientific and technical terminology (terminology collections, notebooks of new terms, rapid information bulletins, and others) was adopted at the conference. The Russkiy yazyk Publishing House was commissioned jointly with interested organizations to perform work on the coordination in the country of the publication of scientific and technical dictionaries with a common Russian basis (with allowance made for the experience of the drawing up and use of standard Russian word lists).

In the matter of standardizing terminology the well-known principle of the minimum discrepancies in terminology, which presumes the consideration of historically formed traditions, the specific national nature, the achievements of Russian culture, science, and technology, as well as the trends of development of the international and all-union terminology funds, can serve as a general guide. The idea of the standardization of terminology by linguistic groups or linguistic regions, which was advanced by the author of this article jointly with M.Sh. Gasymov, as a whole received support in a number of terminology organs of the academies of sciences of the union republics.

Obviously, the questions of standardization by regions should be settled at regional conferences, while the general methodological questions of standardization should be settled at the all-union level.

At present a significant scientific contribution has been made to the development of the scientific principles of borrowing in national terminologies: a number of studies on this question have been published, among which it is possible to mention the article of Candidate of Philological Sciences V.P. Skuinya, "The Principles of the Borrowing of Foreign Terms in Latvian Scientific Terminology,"[3] and the article of Candidate of Philological Sciences S.V. Grinev, "The Consideration of the Peculiarities of the Development of Terminology in the Formation and Borrowing of New Terms."[4] At the Institute of Linguistics of the Ukrainian SSR Academy of Sciences work is being performed on the theme "The Ratio of National and International Components in Modern Terminology Systems." The working commission should take this experience into account and continue the work on the development of general scientific principles of borrowing in national terminologies.

In every union republic work is being performed on the formation first of all of bilingual terminology dictionaries and specific procedural principles of their writing are being established. However, it is also advisable to identify the common principles which unite the different approaches.

The work of the terminology committee of the Azerbaijan SSR Academy of Sciences in this direction is significant.[5] The experience of Azerbaijan, just as of the other republics, is a specific basis, which should be used for the solution of the posed problem, including as applied to dictionaries of the systems type.

The development of a long-range plan of the holding of all-union and regional meetings, conferences, and seminars on questions of terminology should become one of the practical tasks of the working commission.

Footnotes

1. See "The All-Union Conference 'Urgent Problems of Terminology in the Languages of the Peoples of the USSR'," *Nauchno-tekhnicheskaya Terminologiya*, No 5, 1987.

2. See in greater detail on this *Nauchno-tekhnicheskaya terminologiya*, No 2, 1987, pp 1-5.

3. See the collection "Problemy razrabotki i uporyadocheniya terminologii v akademiyakh nauk soyuznykh respublik" [Problems of the Development and Regulation of Terminology at the Academies of Sciences of the Union Republics], Moscow, Nauka, 1983, pp 241-259.

4. Ibid., pp 133-142.

5. M.Sh. Gasymov and S.M. Kuliyev, "The Principles of Compiling Terminology Dictionaries," in the collection "Vsesoyuznaya konferentsiya "Podgotovka i ispolzovaniye nauchno-tekhnicheskikh slovarey v sisteme informatsionnogo obespecheniya"" [The All-Union Conference "The Preparation and Use of Scientific and Technical Dictionaries in the System of Information Supply], Moscow, Russkiy yazyk, 1986, pp 7-10.

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Role, Importance of Museums of Science, Technology

18140145e Moscow NTR: PROBLEMY I RESHENIYA in Russian No 23, 8-21 Dec 87 p 5

[Interview with Professor Gurgen Grigoryevich Grigoryan, director of the Polytechnical Museum, by O. Lebedeva under the rubric "The Problem Up Close": "The Museum and Scientific and Technical Progress. Professor G. Grigoryan, Director of the Polytechnical Museum Relates"; date, place, and occasion not given]

[Text] [Answer] "After the Chernobyl catastrophe," Gurgen Grigoryevich says, "the model of a nuclear reactor, which was exhibited at our museum, began to evoke increased interest. Once a rather old man stood near it for a long time. I asked what he was thinking about. 'I want to understand,' he say, 'what this is, who invented this, and where to flee from this.' Museums of science and technology should also answer the first two questions posed by him. To answer so that the aspiration to flee from the progress of science and technology would not arise.

"The inclination to flee or the barbaric handling of equipment occurs from the lack of knowledge and culture. If we do not familiarize ourselves with the experience of using equipment of the past, we will also repeat its mistakes in the work with the latest equipment. Moreover, now, given more powerful equipment, misconceptions and lessons will have a more painful effect."

[Question] "Do you believe that owing to technical museums it is possible to get rid of the thoughtlessness and negligent attitude of personnel toward their duties?"

[Answer] "Of course not. We will not stop a person who is capable of violating the law. However, morals do not enable people to get to the point where the law comes into force. But this is a trainable category. Training work, on the basis of expositions and lectures, is among the group of concerns of the museum."

[Question] We have grown accustomed to the idea that the Polytechnical Museum is a multiple-discipline center of scientific and technical education. But you are placing the emphasis on its training role...."

[Answer] "I actually do consider training a buttress of education. And a scientific and technical museum, while training, is capable of educating. A person should leave here with an increase of knowledge. Moreover, not random, but systematized knowledge. For knowledge can be chaotic and ordered, suitable for practical use.

"In case of the competent work of a museum a specialist of some sector can quickly understand a field that is new for him. For example, computer technology.

"Every person needs acquaintance with a museum, regardless of whether or not he will be a technical specialist. It helps him to live in the world of technology as in the natural environment.

"Incidentally, this has been taken into account at the most different foreign museums. For example, the technical museum of Chicago reflects mainly the leading positions of the United States. But at it there are also interiors of the past. There you can 'pass' within the human heart (moreover, it is visible how it reacts to strains) and 'find yourself' in a mine and a submarine. While at the Bavarian Museum there are exhibits which illustrate splendidly the unity of natural genius and engineering thought. For example, a bird which is depicted as an ideally solved flying object. Such museum 'immersions' and 'discoveries' take part in the formation of the present scientific and technical culture of man."

[Question] "You have named several examples of museum work abroad. Is it planned to use this experience in the work, for example, of our Polytechnical Museum?"

[Answer] "Its activity will change radically. For this the associates of the Polytechnical Museum have already developed a long-range scientific conception. It does not have analogs either in structure or in ideology. The Polytechnical Museum should become the main museum of domestic science and technology, which also performs the functions of a scientific research institute. The latter signifies that it will also conduct scientific research in the area of the history of science and technology, will formulate the ideology of museum work of the future, and will help its affiliates in other cities.

"In the exposition we intend to use all modern types of museum work—exhibitions, video and movie films, attractions, games, even plays, and much more. For example, visitors will be able to check with their own hands the basic laws of science and the principles of the operation of equipment by means of special stands and working exhibits.

"But the primary innovation consists in the fact that we have decided to reject altogether the purely sectorial principle of exhibiting, which was always used at the Polytechnical Museum. Instead of this we will show how man in the process of developing his own habitat by technical means has solved global problems."

[Question] "Does this mean that not equipment and even not science, but man will be at the center of attention?"

[Answer] "Yes! And this is natural: for man, his interests, and his concerns are invariably at the center of the processes of the comprehension of nature and the creation of a 'second nature'—handmade nature. Equipment and the scientific result are merely the embodiment of human efforts on the solution of global problems.

"Given such a principle of the organization of the exposition the knowledge of mankind about nature and itself will be presented most intelligibly and logically. For example, it will become clear that we, who have taken everything necessary from mother earth, have now become grown up, powerful, and capable of influencing the processes in nature. Hence, now we should worry particularly about our habitat.

"The Polytechnical Museum will contain information about the expositions of other technical museums. For example, a visitor is interested in transportation. We will show him slides, stands, and a movie. But if this proves to be insufficient, we will suggest where to find the necessary information."

[Question] "Hence, the concept of the scientific and technical museum of the future is clear. When will the Polytechnical Museum acquire the new quality?"

[Answer] "The Polytechnical Museum is already today capable of performing the functions of the main museum of science and technology, but for the present there is nowhere to house it. Now it occupies less than half of the building that is called the Polytechnical Museum. If, as they report, the construction of the House of Knowledge is completed by 1992, here they will free the remainder for us. It is not clear when the construction of storehouses for the exhibits will begin.

"The building of the Polytechnical Museum needs overhauling. But, despite the recommendation of the USSR Council of Ministers to the Moscow City Soviet Executive Committee to include us in the plan of renovation for next year, this was not done. So that for the present we cannot bring up from the basement and show several massive exhibits (a motor vehicle, for example): the floors will not hold up."

[Question] "What is hindering for the country as a whole the development of museums of science and technology?"

[Answer] "I believe that the reason lies in the lack of a 'manager.' For example, art museums have a 'manager'—it is the USSR Ministry of Culture. While scientific and technical museums are disconnected. They belong to various departments, ministries, enterprises, and territorial organs. That is why each of them sees its own tasks in its own way."

[Question] "Who should become the 'manager' of museums of science and technology?"

[Answer] "I believe that it should be sought among the USSR State Committee for Science and Technology, the USSR Academy of Sciences, and the All-Union Society for Knowledge, since precisely they are most interested in the promotion of knowledge."

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Development of Scientific, Technical Cooperatives

18140145d Moscow NTR: PROBLEMY I RESHENIYA in Russian No 23, 8-21 Dec 87 p 6

[Article by Candidate of Economic Sciences A. Kolesnikov under the rubric "Opinions, Evaluations, Trends": "A Workers' Cooperative in the Service of the Scientific and Technical Revolution?"]

[Text] It is well known how great the reserves of the acceleration of scientific and technical progress are, how great the amount of embodied labor, which remains idle, is, and how great the reserves of living labor are.

It is a vital necessity to unite them in any effective organizational form—however unusual it seems at first glance. Cooperative scientific and technical activity is one of them.

Precisely for this reason there is envisaged in the decree of the CPSU Central Committee on the experience of the establishment and operation of cooperatives a set of measures on the substantial increase of their efficiency, in particular, to transfer more extensively to them the premises, equipment, and vehicles, which are freed in case of the changeover of enterprises to multiple-shift operation.

Nevertheless such a form of the acceleration of the process of scientific and technical progress as cooperations also has opponents.

The first argument: it is impossible by the efforts of "small forces" to develop anything worthwhile. For now large collectives are also not coping with the assignments on the development of equipment of new generations.

This doubt, in my opinion, is a kind of inversion of the correct thesis that among the main merits of socialist society is a high concentration of production. But this thesis is correct for the times, when the directions of technical development were clear in the main thing and had as their goal the development of mass production. The inversion is also a consequence of the fact that in case of economic methods of management only an economically justified trajectory of development is acceptable. It is hardly accidental that such a giant as General Electric annually invests more than $100 million in 30 small firms. The "little ones" develop fundamentally new technological processes for the investing firm. Another thing that is well known to specialists is that 75 percent of the output of machine building in the United States is produced in batches of not more than 50 units.

The second argument against scientific and technical cooperatives is as follows: the cooperators will take, they say, the most skilled specialists away from state enterprises and will lure them with high wages and other attributes of "the easy life."

As a counter argument it is possible to say that a creative person is least of all similar to "economic man" of bourgeois political economy. The trends of development of technology are now such that only collectives of like-minded creators achieve the greatest heights. J. Galbraith, the classic of the liberal wing of American economists, acknowledged that important technical innovations are developed not by individuals, but by organizations. In our country an entire army of innovators for many years has been demonstrating by deed devotion precisely to the ideas of scientific and technical progress—for the rewards to inventors cannot be compared with the labor intensity of the pains on the introduction of innovations.

And, finally, the third argument against cooperatives is that their successful work, which is not fettered by bureaucratic chains of consultations and is paid for at contract prices, creates for our financial and monetary system a source of anxiety—the increase of the unmet effective demand on the part of the technically most competent part of the population.

Indeed, the research and development, which are performed by scientific and engineering and technical cooperatives, are paid for in practice from a single source—the fund for the development of production, science, and technology (FRPNT). This source is significant in size. Therefore, the possibilities of attracting highly skilled engineers for work during extracurricular time increase at least by about 1.5-fold. Moreover, the return from the contribution of these engineers will come in 2-3 years, while the payment for their labor is made immediately after the completion of the work. And whereas previously the production development fund was embodied in metal and could not "run over" to the wage fund, now—through the payment for the services of the cooperative—the assets of the fund for the development of production, science, and technology will find themselves quickly and on an appreciable scale on the consumer goods market.

True, standard documents stipulate: the fund for the remuneration of labor should increase in proportion to the output of consumer goods. However, first, it is well known that only a few examples of them are now causing the animation of trade. Second, the assets of the fund for the development of production, science, and technology, which are transformed by cooperatives into the fund for the remuneration of labor, in principle do not lend themselves to balancing with the goods that are intended for meeting the demand (precisely owing to the mechanism of cooperative management). Of course, under the conditions of a shortage of pilot experimental capacities and a reserve for promising design and technological developments the changeover of scientific research institutes and design bureaus to two-shift operation and their supply with advanced designing aids will create a new enormous sphere of the application of living labor.

But such labor should be highly paid. But the additional amount of money will intensify inflationary processes and will aggravate the present lack of conformity between planning and cost accounting levers of the management of the national economy. The phenomenon will be all the more distressing as it will occur regardless of the will of innovators.

Let us note that of the nearly 10,000 cooperatives now operating in the country only about 700 are engaged in the procurement and processing of secondary raw materials. All the other cooperatives have concentrated on public dining, consumer goods production, and the rendering of personal services—on the spheres of labor, which promise (and yield) quick commercial success. Scientific and technical cooperations—their number for the present is negligible—require, in our opinion, a different approach.

First of all it is necessary to give the collectives of cooperatives the opportunity to merge with state enterprises, but with the retention of their own system of the remuneration of labor and its organization. It is natural that here a progressive tax should be imposed on the cost accounting revenue of such enterprises, which are fundamentally new for us. From the above-mentioned decree of the CPSU Central Committee it is evident that a similar assignment has already been given to the USSR Ministry of Finance. It would also make sense to lease to cooperatives already built small enterprises on the same terms.

The channeling of the assets earned by scientific and technical cooperatives into the sphere of the noncash circulation of money, for example, the creation by means of them under local authorities or the councils of the All-Union Society of Inventors and Efficiency Experts and scientific and technical societies of insurance funds, which cover fully the losses from unsuccessful developments, should be the main task here.

It would also be advisable to allow cooperatives the mutual extension of commercial credit for the development of the material and technical base of both cooperative and state organizations—up to the granting of credits in foreign currency.

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Development of Material, Technical Base of Research, Development

18140145c Moscow NTR: PROBLEMY I RESHENIYA in Russian No 23, 8-21 Dec 87 p 6

[Article by Doctor of Economic Sciences M.S. Mintairov, chief of a sector of the Institute of Socioeconomic Problems of the USSR Academy of Sciences and the USSR State Committee for Labor and Social Problems, under the rubric "We Are Studying the Economics of Restructuring": "The Experiment on a Cost Accounting Basis. To the Aid of Propagandists and Organizers of Economic Training"; first three paragraphs are *NTR: Problemy i Resheniya* introduction]

[Text] The course: "The Acceleration of Scientific and Technical Progress Is the Basis of the Intensive Development of the Economy" (for personnel of scientific research institutes, design bureaus, and planning organizations).

The theme: "The Development of the Material and Technical Base of Scientific Research and Planning and Design Work." The lectures are 2 hours, the seminar and practical lessons are 4 hours.

Doctor of Economic Sciences M.S. Mintairov, chief of a sector of the Institute of Socioeconomic Problems of the USSR Academy of Sciences and the USSR State Committee for Labor and Social Problems, leads the discussion.

Let us note that this theme appeared in the syllabuses of economic education of specialists of scientific research institutes and design bureaus not at all by chance. The need to strengthen in every possible way the material and technical base of science as one of the main directions of the intensification of the scientific production process was emphasized at the 27th CPSU Congress and subsequent plenums of the party Central Committee.

However, the question often arises: With what is one to compare the increase of the growth rate of the technical equipment of scientific labor? It is clear that it should be greater than the growth rate of the total expenditures on scientific research. But by how much? According to current data, this lead comes to 20-30 percent. Is this enough? I believe that it is not. In the future it is desirable to increase it to 50 percent. It is also necessary to view from such a standpoint the strengthening of the material and technical base of scientific organizations in the future.

But the increase of technical power involves expenditures. The science of management was always difficult. With the changeover on 1 January 1988 of scientific research institutes and design bureaus to full cost accounting and self-financing it will become even more complicated. The spending on equipment will be covered from the profit earned by the collective. Moreover, the fee for fixed production capital and natural resources is becoming firmly established. That is, now scientists and engineers will have to know how to use capital like regular economists.

The analysis of the use of equipment would be incomplete, if we did not reveal such indicators of its evaluation as the capital-labor and equipment-labor ratio of personnel. It is worth turning to figures. For example, for Leningrad scientific organizations the capital-labor ratio comes on the average to about 4,000 rubles per person. At the same time at large leading scientific research institutes and design bureaus, which are achieving significant results, it comes to 8,000-9,000 rubles. According to the forecasts of scientists, this is precisely the level that Leningrad science as a whole should achieve in the immediate future.

Such an increase of the capital-labor ratio is also dictated by the fact that the number of people employed in science will not grow, while their output should increase significantly. How is this to be achieved? To reveal this question, I believe, will also be the basis task of the propagandist and a topic of conversation at the seminar lessons.

The means are well known. First, this is the increase of the production of equipment. During the 12th Five-Year Plan the Ministry of Instrument Making, Automation Equipment, and Control Systems envisages a 1.7-fold increase of the production volume, while for computer hardware a 2.2-fold increase. It is necessary to direct attention not only to the quantitative aspect of the problem, but also to the qualitative aspect. Given the present thorough knowledge of the microcosm and macrocosm one cannot do without fundamentally new and complex equipment. But how is it to be developed? It is clear that large associations are capable of producing single-design units and complexes. The Leningrad Nauchnoye priborostroyeniye Interbranch Scientific Technical Complex, which established a research complex for the growing of thin film structures of future microcircuits in 1 year 2 months, can serve as an example of such an association. This is instead of the usual 6-7 years. The development interested specialists abroad, the instrument for liquid chromatography has been ordered by 25 firms from the United States, the FRG, Japan, and other countries.

It is also necessary to assign to the qualitative aspect the cultivation in scientists and engineers of a creative approach to the selection of research apparatus. For if one thinks out carefully the course of an experiment, it is often possible to design inexpensive, but effective devices. Let us recall the amazingly simple physics experiments of P.N. Lebedev on the measurement of the light pressure on solids and liquids.

Interinstitute cooperatives for the performance of work on single-design devices and collective-use centers will also decrease the shortage of equipment. But neither cooperatives nor centers are organized without local initiative. Thus, the Institute of Thermal Physics of the Siberian Department of the USSR Academy of Sciences, in having thermal gas dynamic, hydrodynamic, plasma chemical, and other stands, is proposing to organize on their basis collective-use centers, where associates of a large number of sectorial scientific research institutes and design bureaus could conduct their own research for the development of specific engineering designs (see *Vestnik Akademii Nauk SSSR*, No 10, 1987).

It must not be forgotten that the technical equipment of laboratories and departments also influences the choice of the theme of research and development and the pace and quality of their conducting. That is why much attention is now being devoted to means of the mechanization and automation of the labor scientists and engineers.

Whereas mechanical machines increase the strength of man, electronic machines increase the amount of his information. But the issue of the day is the quality of the knowledge of specialists. From this angle the propagandist also needs to reveal the role and the directions of development of the State Scientific and Technical Information System.

While the head of the lesson needs to advance through the entire theme the idea that instruments and computers should not be acquired, if the engineer and scientist attach to the order only a technical substantiation without checking the algebra of the financial settlements.

Besides the list of literature from the standard syllabus let us additionally recommend familiarization with the following publications: G.A. Nesvetaylov, "Intensifikatsiya akademicheskoy nauki" [The Intensification of Academic Science], Minsk, "Nauka i tekhnika", 1986; "Sistema kollektivnogo ispolzovaniya nauchnym oborudovaniyem" [The System of the Collective Use of Scientific Equipment], Kishinev, "Shtiintsa", 1986, the Moldavian SSR Academy of Sciences, the Center of the Automation of Scientific Research and Metrology; "Sovershenstvovaniye planovykh i organizatsionnykh form sblizheniya nauki s proizvodstvom" [The Improvement of the Planning and Organizational Forms of the Convergence of Science With Production], Moscow, the Central Institute of Economics and Mathematics of the USSR Academy of Sciences, edited by N.I. Komkov and B.G. Soltykov; L. Voronin, "The Restructuring of Supply," *Pravda*, 23 September 1987; K. Frolov and V.

Kutenev, "The Maneuvering of Resources," *NTR: Problemy i Resheniya*, No 21, 1987; V. Avduyevskiy, "Technology as a Science," *NTR: Problemy i Resheniya*, No 9, 1987; "Information and Stimuli," *NTR: Problemy i Resheniya*, No 3, 1987.

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Problems of Managing Technological Risk

18140145b Moscow NTR: PROBLEMY I RESHENIYA in Russian No 23, 8-21 Dec 87 pp 4-5

[Article by Candidate of Economic Sciences R.A. Perelet, member of the working group for risk assessment and problems of the safety of technologies attached to the Presidium of the USSR Academy of Sciences, and Candidate of Historical Sciences G.S. Sergeyev under the rubric "The Problem Up Close": "Risk Management"; first three paragraphs are *NTR: Problemy i Resheniya* introduction]

[Text] In recent times production accidents, whose scale, as well as their attendant human casualties, enormous material damage, and adverse environmental consequences make it incumbent to revise the formed stereotypes of the assurance of technological safety, have begun to occur with increasing frequency in various sectors of the economy of developed states, including in the USSR.

In our country this became the task of the working group for risk assessment and problems of the safety of technologies, which was recently established under the Presidium of the USSR Academy of Sciences and of which Academician V.A. Legasov took charge.

The interpretation of foreign experience is one of the tasks of this group. The article of Candidate of Economic Sciences R.A. Perelet, a member of the working group of a commission of the presidium, and Candidate of Historical Sciences G.S. Sergeyev is devoted to its analysis.

Studies conducted in various countries have shown that the use of even the most effective safety steps and modern methods of monitoring technological processes does not ensure—and in principle cannot ensure—the absolute reliability of production or large engineering structures.

Today with the decrease of the likelihood of each individually taken accident (an air, sea, or rail catastrophe, the collapse of a dam, an explosion at a chemical works, the leak of radioactive substances at a nuclear facility, and so on) the scale of the consequences of each of them, as a rule, increases appreciably.

Researchers of the United States, the FRG, Japan, the Netherlands, England, France, and other countries are now engaged in the study of various aspects of the problem of technological risk. Corresponding work is also being performed under the aegis of such international organizations as the World Health Organization, the International Atomic Energy Agency, the United Nations Environmental Program, and the International Labor Organization.

In the United States several state organs (including the Federal Emergency Management Agency), which deal with questions of the assurance of technological safety, environmental protection, and emergency management, have been established at the level of the federal government.

And whereas previously researchers spoke about the assurance of human safety, which was understood as absolute protection against harmful effects, in the early 1980's it had already become a matter of the problem of "risk." It was divided into two independent elements, namely: "risk assessment," by which its nature and scale are understood, and "risk management," that is, activity aimed at its reduction.

A series of major accidents in a number of West European countries forced management organs of the Common Market to bring the national legislation in the EEC states in line with the requirements of the times. A special directive on questions of the assurance of technological safety of the countries belonging to the Common Market was promulgated.

The recognition of the impossibility of achieving "absolute" safety at any works is facing researchers with the task of introducing and defining the level of safety or risk, which is "acceptable" for society. By it they now understand the likelihood of the occurrence of an event, the negative consequences of which are so negligible or the obtainable benefit is so great, that a person, a group of people, or society as a whole is willing to agree to this risk.

Now as a whole the general framework of this problem and the social groups and organizations, which are interested in its solution, have already been determined. These are first of all industry, central and local authorities, various commercial firms, several international organizations and scientific centers, and the community at large.

The methods of settling such questions have also been determined. Of their large number—the analysis and assessment of the risk, the study and consideration of the socioeconomic aspects, the elaboration of questions of management under the conditions of emergency situations, the development of a mechanism of regulation, and so forth—let us dwell on one which seems extremely urgent to us.

The decrease of the level of technological risk and the reduction of the material losses and other negative consequences from accidents are the essence of the combined direction of work, which has received the

name "risk management." The extensive use of the methods of the systems approach and the consideration of the most diverse factors, which contribute to the appearance of critical situations in the sphere of production (technical, organizational management, socioeconomic, medical, biological, and so forth), is required here.

A technological accident, as a rule, is an entire chain of separate events that occur as a result of the effect of a large number of interconnected factors. Their coincidence in time once again is usually grouped with statistically unlikely events, to which, of course, planners do not direct attention. But this likelihood can increase sharply—in an entirely unpredictable manner—due to random coincidences of many factors. Among them the incorrect decisions or actions of people, as well as shortcomings in maintenance are in one of the first places. This means that the human factor in the process of production can have a substantial influence on the increase of the degree of technological risk and accordingly decrease production safety. In other words, it is a question of the stabilization of such an unreliable and at the same time fundamental component of modern technological processes as man and his actions in the "man-machine" system.

The analysis of the causes of the occurrence of the major accidents that have happened in recent years testifies: the impossibility of making the necessary and timely organizational management decisions, the broadening of the scale of accidents, the increase of the number of human casualties, and the serious harm to the environment have the same origin—the lack of the required accurate information. And for this reason a well thought out and reliable system of communications, that is, the receipt and transmission of information over various communications channels at large industrial complexes, particularly at nuclear electric power plants, is becoming one of the decisive factors of accident prevention.

Indeed, first, accidents occur and develop here, as a rule, not only suddenly, but also very rapidly, spreading, moreover, to other technological sections as well.

Moreover, they lend themselves with difficulty to quick diagnosis, and management personnel, without having the necessary information for taking emergency steps and monitoring the development of the situation, prove to be helpless in face of the impending catastrophe. Under the conditions of a shortage of information not only operators, but also highly skilled experts often are incapable of understanding what is going on and of providing timely recommendations. Delays with the making of decisions at various levels of management, including the highest levels, which are not offset by anything, are the consequence.

Second, most often representatives of various organizations participate in the work on eliminating the accident and its consequences. At times they hold different views on the causes and nature of the events. While this once again means that they begin practical actions only after numerous and lengthy consultations and coordinations.

Third, the majority of major technological accidents, especially at the first stages, can be detected only by means of special instruments (for example, discharges of radioactive or toxic substances). Therefore, decisions can be made when managers of the corresponding levels are firmly convinced of the correctness of the information coming from the instruments. Hence the demands on information equipment, which should also operate reliably under emergency conditions.

The system of communications must be regarded as an entire set of measures. These are the organization of communication with the appropriate management levels, the assurance of the possibilities of the receipt by the operator of the substantive and correct information that he actually needs, and the assurance of its transmission to other users. One of the most important units of this communication system is the notification of the public by means of established contacts with qualified representatives of the press, radio, and television. Under the conditions of technological accidents the proper interpretation of the information being conveyed also acquires extremely great importance. It has occurred more than once that even correct information, which has been conveyed in haste, has been incorrectly understood by personnel who knew poorly the corresponding instructions. It is even worse when several communications channels, over which contradictory, or else mutually exclusive information arrived, began to operate. This is a tested means to management paralysis. Incidentally, one of the reasons that the highest management finds out about accidents with a significant delay is that every subsequent instance delays information until the complete explanation by it of everything happening. And such an approach, of course, complicates the development of the optimum strategy of actions in an emergency situation.

It must be said with complete frankness that the research on the problem of risk and production safety in our country is suffering today due to departmental barriers and the lack of a common methodology. As a result the scientific work in this area has turned out to be uncoordinated, while it is possible to use the results of the conducted research, at best, for the solution of separate, special problems in the interests of specific departments or individual enterprises.

The quickest establishment in our country of a scientific research center, which would coordinate all the work being performed on the problem of risk, would disseminate the most interesting results, which have been obtained by Soviet and foreign specialists, and would ensure our participation in long-range research along the lines of international scientific organizations and the corresponding programs, is an obvious necessity. We believe that the first results of the work of such a center

will be of great national economic importance, since they will make it possible to reduce sharply the losses that are potentially characteristic of any modern works.

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Role, Nature of Scientific, Technical Periodicals

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[Article by R. Vcherashniy, scientific secretary of the All-Union Scientific Research Institute of Information and Technical and Economic Research in Electrical Engineering, and S. Kovbun, scientific associate, under the rubric "The Problem Up Close": "An Urgent Union"; first two paragraphs are *NTR: Problemy i Resheniya* introduction]

[Text] Physicists decide what a particle accelerator is to be like, electrical engineers—what an electric motor is to be like, and literary people—what a literary journal is to be like. But what a scientific and technical journal is to be like is decided today by...publishing personnel. Is this logical?

Information has become an economic resource. How skillfully we have learned to use this key resource and how it is to work under the conditions of cost account—it is worth pondering this before making administrative decisions. This is important now, when new enforceable enactments, which are called upon to put in order and intensify information activity in the country, are being prepared. One of the aspects of this work is the improvement of scientific and technical periodicals of the journal type.

Primary and Secondary Information

The specialist needs "his own" journal. It is for him a source of news, which rouses creative thinking, a forum for polemics with colleagues, and a showcase of innovations of science and technology.

For the manager a journal is a powerful means of implementing a formulated policy, "a collective organizer and propagandist," and an important channel of the transmission of rapid information.

Today this arsenal, which is capable of stimulating creativity, consists of more than 400 scientific journals and on the order of 350 applied science and production journals; 80 of them are published jointly with scientific and technical societies. Approximately 300 more periodicals reflect the problems of technology. A fifth are connected in one way or another with machine building. Together with newspapers and books they form the system of primary publications.

All-union and sectorial scientific and technical information centers emerged in the 1950's. In a little more than 30 years their development led to the formation of the State Scientific and Technical Information System. Now it already unites tens of organizations, to which there has fallen the seeing to it that the specialist would promptly get access to the information he needs. For this the State Scientific and Technical Information System publishes abstract journals on domestic and foreign publications, makes copies of articles, descriptions of inventions, and catalogs available, and publishes surveys and machine-readable databases. It is customary to call all this information proper and, more precisely, secondary information.

Let us analyze the "journal situation" in the most urgent area—machine building. It has acquired the status of a national economic complex and has set up its own organ of management, but, let us risk noting, has not yet formed its own information publishing medium.

The thematic diversity and the randomness in the choice of the nature of the journal and its reader address formed in machine building periodicals not by chance. The majority of journals have been published for 30-50 years. They are obliged for their origination to various departments and pretexts. Their present structure and thematic specialization are often a tribute to obsolete publishing traditions and the notions, which have receded into the past, about machine building as a conglomerate of autonomous sectors, which were united only by the terminological word combination "machine building production." Now new directions and new technologies are appearing in it. But the journal medium is following the revolutionary changes very slowly. But the organizing and propaganda role of periodicals is also needed precisely in such turns of the history of technology.

We are not undertaking to give an exhaustive evaluation of the entire diversified and very mixed palette of periodicals which in one way or another pertain to machine building. We have analyzed 24 basic journals. It turned out that all of them do not cover the themes of machine building, both narrow specialized and intersectorial themes. But there are intersections. They are far from always justified.

It is sufficient it to mention titles—*Elektricheskaya i Teplovoznaya Tyaga* and *Promyshlennyy Transport*, the same *Promyshlennyy Transport* and *Avtomobilnaya Promyshlennost*. And there are many such examples. The choice of the specialization of one journal or another is determined by the department that is the publisher, and not by the logic and structure of machine building as a scientific discipline and a field of production activity.

A significant portion of the scientific and technical, scientific production, and other periodicals, which pertain to machine building, are oriented as if toward a specific field of technology (*Kholodilnaya Tekhnika, Kuznechno-Pressovoye Proizvodstvo, Svetotekhnika, Elektrotekhnika*, and so forth). True, the attentive reader will note that illumination engineering as one of the directions of electrical engineering as if does not have the

right to an independent publication. However, life refutes formal logic—the perennial fate of *Svetotekhnika* justifies its coexistence with its fellow tribesman. But then a question reasonably arises—Why do the journals *Kabelnaya Tekhnika*, *Bytovaya Elektrotekhnika*, and so on not exist? For these are entire sectors within a sector!

Among general machine building problems only a few have "their own" journals (*Zashchita Metallov*, *Treniye i Iznos*, *Mekhanizatsiya i Avtomatizatsiya Proizvodstva*, *Elektronnaya Obrabotka Metallov*, *Svarochnoye Proizvodstvo*). But such a most important general machine building problem as the reliability of equipment has not acquired its own forum and is reflected more or less consistently only in the collection "Problemy mashinostroyeniya i avtomatizatsii" [Problems of Machine Building and Automation].

Themes, which have become urgent in recent times, are presented irregularly and incompletely. Thus, *Khimicheskoye i Neftyanoye Mashinostroyeniye*, *Steklo i Keramika*, and several other journals reflect more or less systematically the development of functional cost analysis in sectors and environmental problems.

Abstracts and annotations to the materials being published appear in only half of the examined journals, although their obligatory nature is regulated by government decree. Only a few journals, for example, *Stanki i Instrument*, *Energomashinostroyeniye*, and *Pribory i Sistemy Upravleniya*, publish abstracts of the articles, which have been turned over by the editorial boards for depositing at information centers. It was not possible to find in the journals a single thematic index that makes it possible to find quickly the needed material.

The majority of journals cover far from completely the "life" cycle of items. Very few articles on the serviceability of equipment and on the problems of its salvaging are being published. You will rarely encounter publications on the peculiarities of the export of certain equipment and on the demands that are made on it on foreign markets.

How Much Is Knowledge Worth?

It is gratifying that in recent years in the country the number of mass and popular publications has been growing rapidly and their reading audience has been expanding. However, the growing tendency for scientific and technical publications to turn into popular publications is alarming. In pursuit of operation without losses the most important channel, which links the sections of scientific and technical progress, is losing its character and is ceasing to be an effective catalyst of the processes of restructuring.

Today popularization of a particular type: the interoccupational "translation" of the achievements of related sciences and engineering disciplines, at the meeting point of which fundamentally new solutions are originating more and more often, is important for occupational surroundings. But popularity for the inflation of circulation has nothing in common with the substantive, informational value of a publication. In the examined journals, incidentally, the circulation ranges from 4,000 to 115,000. From the standpoint of the goals of these publications, it is not yet known what is best.

The state of affairs with translated scientific and technical publications arouses particular alarm. Academician V.L. Ginzburg once aptly noted that "foreign scientific literature is the exclusive 'commodity,' which it is impossible to produce here." And here we are hearing suggestions on halting the issuing of such publications in Russian, particularly a number of most important American journals. (*NTR* wrote about this in No 6, 1987.) It seems that a scientific analysis of the information situation did not precede this.

It is often possible also to hear a similar thing addressed to domestic journals. The State Committee for Publishing Houses, Printing Plants, and the Book Trade is guided by only economic considerations: the circulations, they say, are small, it is unprofitable. The simple fact that the economic efficiency, first of all, of a scientific and technical publication is not measurable by just the nominal value of circulation is not taken into account. And the possibilities of expanding circulations often are artificially restricted: advertising is checked, departmental subscription is reduced. But many of our journals are translated and published abroad. True, the lion's share of the revenues pass through other departments.

It is strange that the decision on whether or not one journal or another is to exist is made not by the interested ministry, but by the State Committee for Publishing Houses, Printing Plants, and the Book Trade, which takes into account only the economic indicators of publishing. What would happen if we evaluated in the same way the advisability, for example, of education?

The Paths of Restructuring

How are scientific and technical journals to be blended with the present system of information communications? Who should be the manager and patron of the press, which bears the basic potential of progress—knowledge? What should the journal itself be like?

Last year the issuing of 15 publications, which had been put out by the Ministry of the Electrical Equipment Industry for about 20 years, was halted.

The reason? Instead of scientific and technical abstract collections something very similar to ordinary journals was being published. Leading scientists, designers, process engineering, and, in addition to that, representatives of clients belonged to the editorial board of each one. The structure of the publications is precisely aimed: for

the scientist there are short reports on the results of the latest research, on defended dissertations, and on scientific congresses; for the designer and planner there are information on new equipment catalogs, descriptions of inventions, and news from recent exhibitions; for the process engineer there are production information, procedural news, and the experience of people from related industries. And there is more: for the researcher there is information on how to use a microcomputer more efficiently, for the developer there is information about new computer-aided design systems, for the operator there is information on the brigade contract....

One of the periodical collections that ceased to exist at that time—"Elektrotermiya" [Electrothermics]—looked like that. The All-Union Scientific Research Institute of Information and Technical and Economic Research in Electrical Engineering jointly with the All-Union Scientific Research Institute of Electrothermal Equipment published it as an experiment.

This "event" deprived a large detachment of specialists of what was needed. Both those, who make irons that are well known to everyone, and the developers of enormous electric furnaces.

The search for new forms of the journal publication did not find support in the State Committee for Science and Technology, which by right should develop periodical journals jointly with the All-Union Council of Scientific and Technical Societies, with the material support of interested ministries and departments. Incidentally, in recent years the greater and greater isolation of periodical journals of the USSR Academy of Sciences and the USSR Ministry of Higher and Secondary Specialized Education from scientific, technical, and production publications has been occurring. This is leading to the increase of the time of use of basic achievements in applied science and engineering practice. In machine building it often comes to 7-8 years and more.

The information system, which has been deprived of a natural leader, which the journal should also become, is meeting worse and worse the professional interests of specialists, being isolating into a system that works "for itself." Meanwhile interesting experience in the integration of information and journal publications, which should be carefully studied, has been gained in a number of sectors. An example of this is the publications that are put out by the Ministry of the Electronics Industry and other ministries.

The time has also come to comprehend the technological unity of the two information flows—journals and information publications.

The present possibilities of photocomposition fully permit this. The magnetic tape is used both for the preparation of printed forms and for the feeding of the same text into a computer, by means of which its automatic indexing and its entry in the information retrieval system take place. Here the text also becomes accessible to users through "computer networks." In case of the autonomous "life" of the two information flows the access of a specialist to new information from related fields, which he receives through information systems, is delayed by 1-1.5 years. While this depreciates both the information and the entire system.

A common technology of the primary and secondary flows of information would make it possible to reduce drastically the losses of "scarce raw materials"—time and paper. A more favorable atmosphere for an objective survey and evaluation of the state of domestic science and technology would be created. The technology of the work of a specialist, when he gets the most information from the fewest publications, is also simplified. Here it is a question, of course, not of the decrease, but of the streamlining and even the increase of the number of journals being published.

The time has come also to settle the question of the form of the published report. First, a journal article should be suitable for its quick feeding into modern channels of scientific and technical communications. The author should not simply present the obtained result, but should attempt to reveal its still untapped potential, including in related fields of technology. This will induce specialists to seek new, not yet revealed possibilities which make it possible to take a step forward. It should also not be forgotten that a detailed statement often leads to the loss of the possibility of the commercial implementation of scientific and technical results.

This is what, in our opinion, the model of the efficient information of a specialist should be like.

In every field of knowledge there should be a thematic journal (at times in the form of several thematic issues), which generalizes the results of basic science. The journal *Elektrichestvo* has already become such, for example, in the field of electrical engineering.

Every sector of production and every independent direction needs its own journal. Authors could send to it both the full texts of articles (they are deposited at the information center of the sector) and a detailed categorized abstract. It should contain data in accordance with the mandatory rubrics for the information system. Its optimum size is 3-5 standard typed pages. Here it is not out of place to recall the aphorism of Academician P.L. Kapitsa: "The greater the achievements of a scientist are, the more briefly and precisely it is possible to describe them." Authors' abstracts are published in the journal together with other specially selected information. At the same time as the composing of the journal the texts are fed into automated information retrieval systems.

The reader has the right to subscribe both to the journal and to the supplement to it in the form of microfiche with the full text of the article. Individual works, which

are deposited by the center, can be made available at contract prices. Various indexes—author, subject and thematic, data, and others—are prepared for the journal with the aid of a computer. It is possible to publish such indexes in the journal and to issue them as diskettes for personal computers. Related information is drawn by the specialist from abstract journals and databases.

It is obvious that such an advanced technology is possible only in case of the introduction of journal periodicals within the All-Union Council of Scientific and Technical Societies.

People may allude to difficulties: not all information centers have developed printing possibilities, instruments for reading microfiche are not yet available in sufficient quantity, not everyone has become accustomed to the new form of the publication. But these difficulties are temporary and surmountable, while the process of the proposed reorganization is expensive and complicated. It should be started in machine building.

The Administration of Scientific and Technical Information and Propaganda operates in the system of the USSR State Committee for Science and Technology. Its superdepartmental status is the best position for the organization of the earnest scientific formulation of our own, domestic unified "journal policy," which is in keeping with the requirements of the times. The new typology of scientific and technical journals, the new information technology of their publication and dissemination, and the new structure of publications should be developed precisely here, and not in the Administration of Journal Periodicals of the State Committee for Publishing Houses, Printing Plants, and the Book Trade. In machine building this task should be accomplished with the participation of the information center of the machine building complex.

More than 700 scientific, scientific and technical, and scientific production journals are published in the country. Is this many or few? Only the serious study of the real needs, which are formed by the very logic of scientific and technical progress, with allowance made for the new structure of existing publications can give an answer. The All-Union Council of Scientific and Technical Societies and sectorial ministries can also take an interested part in this work.

The future of periodicals lies in a scientifically sound policy of the development of information publishing activity. We want to believe that it will be that way.

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