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USSR Report

SCIENCE AND TECHNOLOGY POLICY

No. 18

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THE SOCIALIST AND DEVELOPING COUNTRIES: TECHNOLOGY TRANSFER

Moscow FOREIGN TRADE in English No 3, Mar 83 pp 28-35

[Article by Stanislav Simanovsky, Cand. Sc. (Econ.)]

[Text]

The transfer of technology as a basic means accelerating industrialization in the developing countries has extended beyond the framework of the specific problems; it now reflects the essence and character of relations between the industrialized countries and the newly independent nations. Elaboration of an agreed new organizational basis for the technology transfer to the developing countries and for improving its economic mechanism with due regard for the interests of all its participants is one of the urgent tasks for restructuring international economic relations and establishing a new international economic order.

Particularly acute are the problems facing the developing nations. Today over 75 per cent of the Earth population lives in these countries; they account, however, for under five per cent of the world's scientific and technical potential. Their burden of combating illiteracy is also the greatest in the world: in Asia 40 per cent and in Africa over 60 per cent of the population is still illiterate.

According to available forecasts, the volume of world trade in technology by 1985 will have increased up to 40,000 million dollars (without equipment and machinery exports) and the share of the developing states (basically as receivers of technology) will have increased in this trade up to 15 per cent, and that under the most favourable conditions.

Of course, it is not a question of the outward comparability of the quantitative indicators of scientific and technical development or the ambitious desire

of the developing countries to be adequately represented in the world intellectual potential. Scientific knowledge, progressive technologies, modern machinery, advanced production experience are badly needed by the developing nations for solving their pressing social and economic problems, accelerating their rates of industrial development, raising the population's living standard.

The main causes of the continuing backwardness of the developing nations, low growth rates of their industrial production and national income and the hard living conditions of their population lie in neo-colonialism, the continuing exploitation of their resources by the imperialist monopolies, the arms race, and the growth of prices for industrial and agricultural goods. These negative phenomena are being aggravated by the transnational corporations as they try to maintain their dominant position in these states by artificially supporting the existing pattern of trade and undermining their efforts to build up their own scientific, technical and industrial potential, thereby deepening their unequal and dependent position in the system of the international division of labour.

Last decade the transnational corporations in their neo-colonialist activity showed a clear tendency, which began way back in the early 1960s, for drawing the developing countries into the scientific-and-technical or technological dependence orbit, which is a new type of dependence.

The absence of a developed system of general, specialized secondary and higher education and of a research base hinders the adequate scientific and technical satisfaction even of limited traditional production activities in the developing countries, let alone the industries underlying scientific and technical progress. These problems, which are aggravated by the insufficiency of requisite investment means, compel the developing countries to look for external sources of acquiring technology to solve their economic development problems.

The "brain drain", inherited from the colonial past and deliberately encouraged in the interest of the neo-colonialist policy of the monopolies, continues to be a serious obstacle in the way of the developing nations building up their national scientific and technical potentials. Between 1961 and 1975, for instance, around

300,000 skilled specialists from the developing countries emigrated to the USA, Canada and Great Britain alone, this figure includes more than 200,000 scientists, engineers, teachers and technicians, whose training cost these countries over 46,000 million dollars.

The "brain drain" is a major component of the so-called "reverse transfer of technology", which in fact means nothing else but the shameless robbery by the monopolies of the already meagre scientific and technical resources of the developing nations.

A serious consequence of the outflow of a considerable portion of scientific and technical personnel from the developing countries to the West is the low level of inventive activities in these countries, which substantially hinders the achievement and application by them of their own scientific and technical results.

Statistics shows that the share of the developing countries in the world patent pool remains at an extremely low level. For instance, of the 3.5 million patents registered in the world in the mid-1970s only 200,000 or about 6 per cent were formally granted by the developing countries; but even of this number approximately five-sixths belong to foreign patent owners of the industrial capitalist countries. More than that, 90 to 95 per cent of the patents granted by the developing countries to foreign patentees are not used in their national economies, for most patents are taken out by transnational corporations with a view to protecting their commercial interests and preventing the development of national science and technology in the developing countries in directions which may adversely affect the interests of the foreign monopolies.

The exacerbation of inter-imperialist contradictions, the loss by the United States of its technological leadership in the modern capitalist world to the forward positions in world science, technology and production, the advancement of Japan and several West European countries, and the saturation and acute competition of capitalist markets more and more compel the monopolies to turn to the developing countries as consumers of machinery and technologies, so as to find new sales markets and sources of cheap manpower. It is these circumstances rather than philanthropic charity that are responsible for the growing flow of Western technology to the developing world, which was observable in the 1970s.

Among the basic forms of the transfer of capitalist technology to the developing countries are: the export of equipment and machinery, the sale of licences, the design and construction of industrial projects on the "turn-key" basis, the training of local technical personnel. Between 1970 and 1980 the highest rates of growth were observed in equipment and machinery exports to the developing countries from the leading capitalist OECD members; this growth averaged some 10 per cent a year. On the whole, the export of machines and equipment from the OECD member-states to the developing countries over this period amounted to 40 per cent of their total export of this group of merchandise. By the end of the period under review the volume of construction on the "turn-key" basis had decreased, and its geography shifted from the Arab world to Asia and Latin America. Proceeds from licence sales grew at an average of four per cent a year.

The import of Western technology by the developing nations was accompanied by the growth of the latter's financial dependence on the capitalist countries: the total sum of loans and credits to pay for technology grew at an average of 10 per cent annually, thus increasing the already high foreign debt of the developing states, which by the beginning of the 1980s had reached 540,000 million dollars.

The USA, Japan, the FRG, Great Britain and France are the main exporters of technology to the developing countries; they account for approximately 70 per cent of the technology imported by these countries from the OECD member-states; what is more, the fact that shipments from Japan and the FRG grow most quickly, points to the growing competition between the capitalist countries on the technology market of the developing states.

The so-called restrictive business practice of the monopolies, manifested in the fettering legal and economic conditions imposed on the developing nations, limiting the export of products manufactured, is intensified by protectionism, and an export cartel policy, which on the whole sharply reduces the effect expected from the acquisition and use of Western technology by the developing states.

In their drive for high profits the monopolies in several cases resort to more refined methods of technological expansion. When developing a new, more paying technology they curtail the output of the old one,

which is still in demand at their home market, and ship the unwanted technology to the developing countries and in this way release production capacities for a new market manoeuvre. By using such provisions in the restrictive business practice as the obligatory submission of all technical improvements to the supplier of the technology and the shipment of products turned out in accordance with this practice to the market indicated by him, the monopolies are enabled not only to set up a new line of production but also to continue satisfying the demand for the old products at home, setting up the requisite line of production or even a whole industry in other countries. The scope of this type of the monopolies' activity can be judged by the fact that between 1970 and 1979 the proportion of the import of manufactures from the developing countries in the total import of articles of this commodity group by the OECD member-states rose from 5.3 per cent in 1970 to 10.1 per cent in 1979, a 1.6-fold increase. Moreover, the proportion of non-electrical machines went up from 0.8 per cent to 2.9 per cent, a 3.6-fold increase, that of electrical machines and instruments rose from 5.3 per cent to 17.2 per cent, or 3.2 times as much, and the proportion of transportation means increased from two per cent to 5.5 per cent, or 2.75 times as much.

The above figures have a dual meaning. On the one hand, they characterize the relatively increased scientific, technical and industrial potential of the developing countries, the improved competitive position of their products on the Western markets, an improvement of their export pattern thanks to the technology obtained from their industrial capitalist partners. On the other hand, this growth costs the developing nations dearly and it is more to the advantage of the monopolies than the developing states. The penetration of the markets of the industrial capitalist countries is effected through the channels half opened by the monopolies; the structure of the production complex is often distorted and lopsided as a consequence of the foreign monopoly capital's influence. Therefore, instead of achieving the expected economic independence the developing countries find themselves firmly tied to the technological "wagon" of the world capitalist economy.

The system of imperialist exploitation of the developing countries and their growing economic, scientific and technical dependence on the capitalist world is opposed by the socialist states' policy of consistent and

all-round assistance to the developing nations to help them overcome their economic and technological backwardness, carry out progressive internal socio-economic transformations, eliminate the dominance of foreign monopolies and these countries' dependence on them and achieve genuine economic independence and sovereignty in economic development and full equality in international economic relations.

These principles are clearly traced in the position of the socialist states on the question of the elaboration and application of an international Code of Conduct as concerns the transfer of technology, which for several years now has been attracting the attention of the world community as one of the major aspects of a new international economic order. They do all possible to remove the existing political, legal and economic barriers raised by the transnational corporations in the way of the developing nations' social and economic progress and to turn this important document into an effective instrument easing these nations' access to up-to-date technology and increasing the contribution made by the world science and engineering to the development of their national economies.

The principles underlying the cooperation of the socialist countries with the developing states reflect a complex approach to the problems of social and economic advancement in these states. This approach is based on the consistently predominant development of these countries' internal resources coupled maximally with the external economic, scientific and technical assistance and the setting up of a basic complex of industries (extractive, power-generating, manufacturing) in the national economy with the simultaneous solution of problems concerning the supply of foodstuffs for the population and the establishment and development of national educational and medical care systems and housing construction.

It is quite evident that no balanced development of the various spheres of the economy, science, production, infrastructure, social services, can be effective without a clear-cut strategy of national social and economic progress, a strategy based on nation-wide planning with the public sector playing the leading role in economic development.

The socialist countries are giving the developing nations every possible assistance in working out such a strategy and its implementation in the form of socio-

economic, scientific and technical development programmes, as well as certain practical measures.

The complex nature of cooperation between the socialist countries and the developing world predetermines the appropriate structure, volume, as well as forms and methods of the transfer of technology for the industrialization of the newly free countries.

When transferring scientific knowledge, technical developments and industrial experience to the developing nations the socialist countries proceed from the premise that without an efficient national system of education it is impossible to organize and successfully develop their own research, engineering and technical potentials capable of not only adapting the technology received from abroad but also of creating their own scientific, technical and industrial resources adequate for the requirements of their national economies.

Cooperation in the field of education and in training scientific personnel proceeds in the most varied forms ranging from assistance in preparing curricula to the construction of educational premises and their fitting out with the requisite equipment and aids and providing them with the teaching staff. The Soviet Union has helped Algeria to build and equip three establishments of higher learning: an Institute of Oil, Gas and Chemistry and an Institute of Light Industry in Boumerdes; an Institute of Mining and Metallurgy (as a part of the Annaba University); the construction of the Hydroamelioration Institute in Blida is nearing completion. The mere enumeration of Soviet-assisted projects in the sphere of education characterizes the structure of personnel training for Algeria, which is aimed at eliminating the shortage of specialists in the major sectors of the country's economy. By the beginning of 1980 with the assistance of the CMEA member-states built or under construction were over 50 primary, secondary and higher educational establishments for 20,000 students.

By agreement between the Hungarian foreign trade organizations Metrimpex and Gepexport and the Ministry of Education of Nigeria, these organizations delivered to that country and assembled on "turn-key" terms the equipment for a factory to turn out educational aids. The contract also provides for the training of local specialists and teachers for using these aids.

Among the active participants in the transfer of know-how to developing countries in the field of education and personnel training are those socialist

countries which themselves are in the formative stage as concerns their scientific, technical and industrial potential. In the Republic of Cuba, for instance, 16,000 persons from 81 countries are receiving training, of these over 2,500 persons are studying at the higher learning establishments, such as the polytechnical, agricultural, medical and other institutes.

Over the past ten years the CMEA countries' higher and specialized secondary educational establishments have trained over 47,000 specialists from the developing countries. In 1973 the CMEA countries set up a special Scholarship Fund to help the developing countries train their local personnel. At present some 3,000 students from 48 developing states are studying in the CMEA countries thanks to this Fund.

In 26 young states alone there are 143 Soviet-aided educational establishments which have trained over 37,000 engineers, technicians and other specialists. Another 88 educational establishments are being set up in these countries.

A characteristic feature of the transfer of socialist technology to developing countries, as distinct from the capitalist practice, is the desire to give maximal assistance in developing fundamental research, setting up an appropriate scientific and experimental base and training higher qualified scientific workers; in this, the socialist countries proceed from the premise that the results of fundamental research assist the development of the applied sciences and design activities. Moreover, priority is given to those fundamental researches which in the future should help solve important macroeconomic problems, such as those in power engineering, the expansion of the agricultural and food base, and so on. For instance, in accordance with the 1972 Soviet-Indian Agreement on scientific and technical cooperation Indian scientists, with the assistance of Soviet specialists from the Institute of High Temperatures of the USSR Academy of Sciences, are working in the research centre in the town of Tiruchirapalli (Tamil Nadu state) on the development of MHD-generators. In 1977 a 5,000 kW installation was built; at present the centre has an experimental 15,000 kW installation and the results of its operation will serve as a basis for the first industrial MHD power station in India. As an outcome of these researches, India finds herself among the pioneers in mastering magnetohydrodynamic technology.

The GDR has helped India to build and equip Asia's first research centre (Gujarat state) with up-to-date equipment for studying the upper layers of the atmosphere; the results of its work are of great importance for forecasting atmospheric and weather conditions in the country's major agricultural areas.

Access to Soviet space technology has enabled India to score appreciable successes in developing and launching artificial Earth satellites and using them for geological, geophysical and meteorological investigations of great importance for the Indian economy, in particular, for setting up modern satellite-based communication systems. The experience gained by Indian scientists and specialists in launching the Indian satellites Ariabhata and Bhaskara in cooperation with the USSR made it possible for India to independently launch her new Rohini satellite in 1980.

These examples are clear evidence that the socialist countries give the developing nations unrestricted access to the latest achievements in fundamental and applied sciences which are in the vanguard of world scientific and technical progress.

The socialist countries provide the developing states with an appreciable volume of technology to help them settle the food problems, facing them. A whole complex of measures is being carried out for the purpose: construction of irrigation networks, breeding and cultivating highly productive varieties of plants and stocks of domestic animals, farm machinery manufacture, setting up of experimental and model farms. All this is directly needed for the establishment of a food industry, processing plants and canneries, bakeries and meatpacking plants, refrigerating complexes, etc. Here, too, technology is transferred in the most varied ways ranging from mere exchange to complex cooperation which includes a wide range of technical assistance. The USSR, for instance, gave Peru comprehensive technical assistance in building a large fishing industry complex. Soviet organizations designed, shipped and assembled complete sets of equipment for two ice-making plants able to produce over 200 tons of ice a day, a fish freezing plant (20 tons a day), a fish-processing plant, a diesel power station, repair workshops, auxiliary services. This contract is an excellent example of a complex transfer of technology to the developing nations, and it reflects the programme-objective approach to their pressing economic development problems.

Bulgaria is technically assisting Laos to develop her agriculture according to a broad programme covering such forms of aid as the construction of irrigation systems, the setting up of experimental horticultural and gardening farms, the building of granaries as well as roads in rural areas.

Socialist countries' technology plays an important part in solving the housing problem facing the developing countries. This technology is transferred in the form of surveying work, pre-investment technical and economic analysis, design and financial documentation, consulting services, construction machinery and equipment, plants to turn out building materials, and group-complexes to build houses on "turn-key" terms, technical assistance in building such houses and civil installations. The GDR, for instance, is carrying out a broad programme in Algeria on the construction of projects for the building industry: a cement plant in Batna, a house-building complex and a works to manufacture construction and erection equipment. Czechoslovakia is constructing an integrated house-building factory in the town of Hama (Syria). In Nigeria factories are being built by Bulgaria on "turn-key" terms to manufacture sanitary equipment as well as door and window fittings used in housing construction. Cuba is building 1,500 houses in Al Bakr (Iraq).

The Soviet Union has designed a large hydroengineering complex and a water supply system to meet the needs of Tunisia's capital and inhabited localities in the central areas of the country for drinking and communal purposes. Construction work on the basis of Soviet documentation is being carried out by the Tunisian Bredro and the Yugoslavian Gidrotekhnika Association; the Soviet side is supervising the construction activities. A distinctive feature of the project is the cooperation of two socialist countries and their local (Tunisian) partner in implementing this project through the three countries' division of labour.

Of the biggest scale and diversity is the transfer of technology necessary for the establishment and con-

solidation of the industrial complex in the economies of the developing countries, i.e., the key sectors of their national industries: extraction of minerals, the fuel and raw material industry, ferrous and non-ferrous metallurgy, oil refining, the chemical and petrochemical industries, power engineering, mechanical engineering, transport, communications, the industrial infrastructure, the light industry. It is in these sectors that the major economic projects are under construction; they account for the bulk of the technology received from the socialist countries.

At the pre-investment stage of large-scale industrial projects an important role belongs to socialist countries' assistance in organizing and conducting activities connected with the technical and economic assessment of the natural resources in the developing countries, exploration, geological prospecting, geodetic survey, the compilation of economic and geographic atlases, when technology is being transferred by means of the consulting and engineering services, the sending of specialists, shipping requisite equipment (including that on lease terms), and training local specialists.

Large-scale iron and steel works are being constructed in the developing world with the assistance of socialist community countries: at the beginning of the 1980s iron and steel works with a total capacity of over 30 million tons of steel a year had been commissioned or were under construction. The Soviet Union plays a leading role in supplying the developing nations with machinery and technologies for developing their metallurgical industry. The Soviet-aided enterprises in these countries account for nearly 84 per cent of the increase in the output of steel and other metals (9.7 million tons for 1960—1980); at present another series of iron and steel projects is being built with a total capacity of 16.4 million tons of steel annually. In this case technology is transferred chiefly through the export of equipment and machinery, deliveries of complete installations and plants, sale of licences and know-how, provision of services in preparing technical documentation and training local technical personnel.

An energy base of their own is a decisive factor in the economic development of the developing states, especially in conditions of the energy crisis which has so adversely affected the economies of many countries. In view of this, the socialist countries attach great importance to assisting the newly liberated states to organize their energy economy. Towards the end of the 1970s the installed capacity of the socialist countries' assisted power stations in the developing countries had exceeded 16 million kW.

Over 40 Soviet-aided power stations with an installed capacity of 7.4 million kW have been built in Afro-Asian countries, and another 10 power stations with a total capacity of 8.4 million kW are under construction. In the Latin American countries the Soviet Union is participating in building power stations with a total power rating of 3.6 million kW.

The CMEA member-states transfer appreciable volumes of technology to help develop other basic industries in the developing countries. More than 200 enterprises in the engineering and metal-working industries, over 200 projects in the oil-refining, petrochemical and chemical industries and over 1,100 enterprises in the light and food industries have been built or are under construction with socialist countries' assistance.

On the whole, the number of various enterprises and other projects that have been built, are under construction, or are to be built in developing countries with the technical assistance of the CMEA members, totals 4,600; more than 3,100 of them are in operation.

The setting up of assembly enterprises in manufacturing industries, especially in mechanical engineering, the electrical and electronics industries, is a new tendency in the transfer of technology to developing nations by the CMEA member-states. In Mozambique, for instance, the GDR is helping build a workshop to assemble IFA-50 lorries, and in Ethiopia- another to assemble tractors. Hungary will build in Mozambique a factory on "turn-key" terms to assemble Ikarus buses; when commissioned in 1985, it will turn out 250 buses annually.

The construction of industrial enterprises and other economic projects in the developing countries is proceeding with CMEA members' financial assistance in the form of easy credits. Over 75 per cent of the total credits to the new states is for the development of the latter's industrial base.

Machines and equipment loom large in the total flow of socialist technology to the developing world; more than half of their imports consists of complete installations and entire industrial projects to be handed over to the client on "turn-key" terms. This assistance finds expression in a form of provision of various services for designing, constructing, commissioning and adjusting operations, as well as of technical documentation and know-how transfer on a licence basis, predominantly as accompanying licences. Previously the sale of licences held an insignificant place among the various forms of the technology transfer, but over the past ten years its proportions have considerably increased and it has now turned into an important independent sphere of economic relations between the socialist and developing countries. Between 1971 and 1980, for instance, the volume of sales of Soviet licences increased more than tenfold.

Of substantial importance is the training of local cadres of workers at construction sites and at similar enterprises in the socialist countries. Over the past ten years more than 400,000 workers from the developing countries have obtained professional skills, of them 260,000 were trained with Soviet help. A wide network of highly specialized and diversified centres has been set up in the developing countries with the CMEA members' assistance for training skilled workers for the national industries.

The past decade has brought several new forms of technology transfer to the developing states. These include, in particular, the construction of industrial enterprises on a compensation basis. Moreover, the technology supplied is paid for with both traditional export goods and products of the enterprises so built. For instance, part of the nickel obtained in Burundi by the stock company Somiburom (Romania—Burundi) with the use of Romanian technologies and equipmer will be shipped to Romania.

The ever wider scope of this assistance needs the joint transfer of technology by two and more interested CMEA members to their partners in the developing countries. As an example we can mention an agreement the GDR and Czechoslovakia have signed with Ethiopia on the joint construction of a textile complex to turn out 20 million square metres of cotton fabric a year. Participation in this project is as follows: Ethiopia — 59 per cent, the GDR — 31 per cent, and Czechoslovakia — 10 per cent. The complex which will employ 3,500 persons is to be commissioned in 1985. Czechoslovakia and the GDR wil supply the requisite equipment and technologies and will help to build the complex and train local personnel.

Another new form of the technology transfer to the developing nations is the cooperation between CMEA member-states and industrial capitalist countries in building industrial enterprises in the developing nations. Italimpianti, for instance, is building, on a Soviet licence, a coke dry quenching installation at the iron and steel works in the town of Tubãrao (Brazil), while the design documents for the requisite equipment are being prepared by Tecnicon (Italy) with the participation of Licensintorg (Soviet Union).

Characteristically, an appreciable portion of the developing countries' orders for technology from the CMEA member-states has of late been determined by the results of international tenders and bids. This is evidence of the high technical standard of engineering and design solutions proposed by socialist countries, of the excellent quality and high competitiveness of their equipment, of its reliability and high economic characteristics.

When deciding on the most effective forms and methods for the technology transfer, the socialist countries proceed on the principle of correspondence of the organizational forms of cooperation in this field to the local conditions in the recipient countries, the level of development of their productive forces and the degree of their participation in the international division of labour. What is more, account is taken of the difference in the level of economic, scientific and technical development of the developing nations, their uneven growth rates.

All this presupposes the need for a differentiated, strictly individual approach to the choice of technology itself and the organizational forms and structural trends of its transfer to the developing countries. In this sense, we believe, it is wrong to speak of some kind of average technology, "adequate", "acceptable" or "corresponding" to the requirements of the developing states. Technology "acceptable" to one country may prove "inadequate" to another country. The concept "adequate" technology perhaps allows the monopolies to view the developing nations as a sales market for obsolete technology economically inefficient for the markets of the industrial capitalist countries.

In recent years the socialist countries have been following a line aimed at intensifying cooperation in the transfer of technology to the developing states with due regard for international specialization and cooperation in science, technology and production, requirements and possibilities of the developing nations.

The technology transfer to developing countries by socialist states is an important component of the latter's foreign policy intended to give all-round support to the just demands of developing nations, to normalize international economic relations, to eliminate all manifestations of discrimination, *diktat* and inequality, to establish a new international economic order on the basis of democracy and justice.

CSO: 1812/315

SCIENTIFIC, TECHNICAL COOPERATION AMONG CEMA MEMBER-COUNTRIES URGED

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV in Russian No 4, Apr 83 pp 17-20

/Article by Yuriy Shiryayev, corresponding member of the USSR Academy of Sciences, and Aleksandr Anchishkin, corresponding member of the USSR Academy of Sciences: "A Decisive Thrust for Increasing the Effectiveness of Socialist Production"/

/Text/ The most important thrust of the economic strategy of the CPSU, as well as of the Communist and labor parties of the other CEMA member-countries at the present time, is to ensure the growth of end-result production output with the least possible expenditures of material, financial, and labor resources, along with the most efficient utilization of the existing production and scientific-technical potential.

As the general secretary of the CPSU CC, Comrade Yu. V. Andropov, has noted, in order to intensify the economy and increase its effectiveness, we must attain a speed-up of scientific-technical progress, together with a broad-based and rapid introduction into production of the achievements of science, technology, and advanced experience.

An important role herein is played by deepening the comradely cooperation and socialist mutual aid among the fraternal countries, their joint solution of scientific-technical, production, transportation, power-engineering, and other problems. Further steps are now being planned on this level within the CEMA member-countries and organs.

A special place among them is occupied by the development of a unified scientific-technical policy as a component part of a coordinated economic policy as a whole.

The objective necessity for strengthening the mutual action of the fraternal countries for speeding up scientific-technical progress was also emphasized in the decisions of the CEMA Session at its 35th and 36th meetings.

Emergence of Forms of Exchange of Scientific-Technical Achievements

In analyzing the future prospects for the distribution and cooperation of labor within the CEMA framework in the field of science, technology, and production, we must take into account the specifically historical circumstances which brought about their present-day status. It is characterized not only by very great achievements but also by definite moments of inertia, the overcoming of which is dictated by the necessity of further developing and improving the socialist economy.

As is known, during the first few postwar years the countries of socialism had extremely unfavorable internal and external conditions for the formation of their scientific-technical potentials. This was determined both by the extreme weakness of the appropriate base for most of them as well as by the harsh technical blockade on the part of the developed capitalist states. Under the given conditions there was only one solution: concentration of the efforts of the fraternal countries for a speeded-up formation and development of their scientific-technical potentials on that base which was at the disposal of the USSR and certain other socialist countries (above all, the GDR and the CSSR).

The most suitable form for a broad-based utilization of the technical solutions available at that time was that established upon the initiative of the USSR--the charge-free exchange of experience and achievements, along with assistance in training national personnel staffs for scientific-research and planning-design organizations.

This not only allowed the savings of considerable monetary funds (approximately 30 billion dollars) but also facilitated very important structural changes in the national economies of the CEMA member-countries, and even the formation of industrial and scientific-technical potentials in those of them which in the past did not have at their disposal an appropriate material-technical base.

Nevertheless, by virtue of several factors, the results proved to be uneven. In particular, there arose a definite isolation between cooperation in the field of science and technology and in the production sphere. As a rule, each of them developed without the necessary coordination with the other. This necessitated certain specific adjustments in the economic foundations of interaction, utilizing, along with the charge-free forms, payment forms enabling it to be set up on the foundations of cost accounting, thereby providing a commensurate means for establishing the genuine contribution of individual countries with the results obtained by them.

Therefore, beginning in the mid-1960's, new trends and forms came to predominate in scientific-technical cooperation. The center of gravity began to shift more and more from the sphere of exchanging finished results to the sphere of combining the efforts of scholars and specialists of the various countries, the rational division of labor among them, the concentration of efforts and funds for the solution of the most important scientific-technical problems in the development of the national economy.

A New Phase--New Problems

Today scientific-technical cooperation among the CEMA member-countries is being improved along the following lines:

--coordination of the five-year plans for applied research and development, coordination of long-term programs on the most important problems, inclusion of scientific-technical measures in the long-term targeted programs for cooperation and long-term, bilateral programs of specialization and cooperation in production;

--the gradual overcoming of the economic isolation of scientific-technical ties, the introduction in them of cost-accounting elements, and the joint financing of large-scale projects;

--a closer linking of scientific-technical cooperation with production, its orientation toward a deepening of international socialist division of labor both in its inter-sectorial and in its intra-sectorial aspects.

The choice of these directions has been conditioned by the increased role played by science and technology in the development of production, by the necessity to overcome the resource, ecological, and other limitations on economic growth. Of course, for many of the CEMA member-countries there is an essentially tight balance of mineral raw materials and fuel, labor resources, etc; there are also general shortages and an insufficiently high level of certain types of up-to-date equipment and technology. As a result of this, there has been an increase in the proportional expenditures of labor and materials.*

The entrance of the Soviet Union and the other socialist countries upon the path of production intensification requires further strengthening of planning for scientific-technical progress, coordination of the development of science and technology with other spheres of the economy, as well as society as a whole. Manifested herein is the decisive role of scientific-technical progress in uplifting the national economy and solving social problems.

Socio-economic tasks are determined by the thrusts of scientific-technical progress, to be more exact, by their priorities. Let us cite the principal sources for the formation of such priorities. The first is the limited nature of production resources and the rise on this basis of an imbalance in the national economy. The more limited any one type of resource is, the more attention must be paid to its direct savings and replacement by others.

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* According to the calculations of Czechoslovakian economists, the consumption of steel per 1,000 dollars of gross social production in the CSSR amounted to 170 kg, whereas in Denmark, the Netherlands, Sweden, and Belgium this figure ranges from 45 to 55 kg; primary energy sources were 1700 and 800 kg respectively; cement--150 and ranging between 50 and 100 kg. (See: EKONOMICHESKAYA GAZETA, No 16, 1982, p 20).

The second source is comprised of processes and phenomena reflecting the emergence of new social needs and the possibilities for satisfying them. The basis for the formation of priorities here can be new technology (for example, space communications), giving rise to new needs (the reception of pictures over any distance).

A Course Aimed at Comprehensiveness

Along with the interaction among CEMA member-countries in the high-priorty lines of scientific-technical progress today, one of the important tasks of cooperation is ensuring the rapid introduction of the results of scientific research and design developments into production. A special role is played here by the rational distribution of production programs among the partners.

Quite a few examples are known of the comprehensive approach of the fraternal countries to solving the problems of technical progress and production growth. One of them is specialization and cooperation in the field of computer technology. During the time which has passed since the signing of the 1969 intergovernmental agreement and on the basis of a long-term program, there has been a combination of efforts on the part of scientific-research and planning-designing organizations, as well as industrial enterprises specializing in the manufacture of computer equipment. And here is the result: today the joint efforts of the countries participating in this agreement have created and put into serial production the ES models of the Ryad /Series/-1 Computer, as well as the Ryad-2, and work is proceeding on the ES models of the Ryad-3 Computer. At the same time, the first complexes have appeared, constructed on a mini-computer base. A great deal has also been done to implement the general agreements signed during the course of the 35th and 36th meetings of the CEMA Session regarding the creation of a micro-electronic element base for computer equipment.

Standing at the center of attention of the fraternal countries today is the comprehensive solution of scientific-technical and production-economic problems in a whole range of other areas as well, such as micro-processor technology and robotics. It is anticipated that in 1990 the pool of robots, for example, in the CEMA member-countries will amount to 200,000 units. This will be achieved thanks to the implementation of a joint program. It presupposes not only the development of an integrated technical policy but also the most efficient division of labor in creating and producing robots.

An important part of the joint efforts of the fraternal countries at the present-day stage is solving the energy problem. Particular attention is being paid here to the development of nuclear-power engineering. Now being implemented is the large-scale agreement signed in 1979 providing for specialization and cooperation in the production of equipment for AES's. It is directed at carrying out extensive plans for building nuclear-power centers in the CEMA European member-countries and the Republic of Cuba. In order to solve this problem, a profound interaction has been established for scientific-research projects, the creation of special materials, and the construction of the necessary production capacities.

The countries which are participants in this agreement have expressed the intention to master during the current five-year plan the production of equipment with reactors having a capacity of 1 million kW. Of great importance for the future will be the adoption of powerful, fast reactors.

The Goal: Speeded-Up Introduction of the Achievements of Science and Technology in Production

The development of comprehensive agreements is particularly urgent today, when the CEMA member-countries are jointly defining the top-priority projects for cooperation, achieving a situation whereby the 1980's may become a period of intensive production and scientific-technical cooperation. The task consists in facilitating the development of high-priority kinds of production, those which determine the technical progress and effectiveness of many sectors and of the national economy as a whole.

As is known, the implementation of any scientific idea requires the efficient interaction of all the elements of the integrated cycle: science--technology--production. Therefore, even individual attempts to introduce in "raw form" the achievements of science into the national economy will lead to significant additional expenditures, hinder the broad-based utilization of new technology, and discredit the scientific idea itself. And so every step along the path of scientific-technical progress, having as its goal the mass introduction of its results into the national economy, must provide for the role and place of scientific-research and planning-design organizations, engineering institutes, and experimental production lines, as well as enterprises and associations at which serial production will be set up. It is also high time that we created specialized, introductory organizations (engineering firms), which would engage directly in servicing the customers for new equipment. This would ensure the promulgation of the lines of demarcation between experimental and serial production on a basis more precise than has been the case heretofore. In other words, a barrier would be placed to organizing mass output at experimental plants, thus transferring the cares and outlays of experimental production to serial production.

This is one aspect of the problem. But there is also another one, no less important. It consists in the fact that the priorities in developing science require the maximum possible concentration of resources in the decisive lines. Under conditions whereby the extensive growth of these resources is being slowed down, task number one becomes their systematic redistribution among the various lines of science.

The given task has as its goal the curtailment of the length of time required by the cycle: science--technology--production. For this purpose the following factors are also necessary:

--a speeded-up development of scientific instrument making;

--modeling and automating scientific experiments, based on the use of computers;

--significant speed-up in the planning and designing operations, based on automated search and selection of already existing standard solutions, utilization of the latest equipment and appropriate peripheral apparatus.

Strengthening the planning of scientific-technical progress has been called upon to ensure the increasing scope, speed, and effectiveness of introducing and disseminating the achievements of science and technology in the national economy. Under these conditions the last element in the cycle of science--technology--production will become the first in the process of disseminating the new trends. This means that the ordinarily used concept of "introduction," as equivalent to the conversion from experimental production to mass production, must be supplemented by the concept of "dissemination," reflecting the increase in scale, and at a certain definite stage also the proportion of use in the national economy of the latest equipment, new materials, sources of energy, etc.

On the Macro- and Microeconomic Levels

Today the synthesis of scientific-technical and production cooperation is climbing to a qualitatively new level. This process has not yet been completed. As noted in CEMA documents, it needs to be further expedited and to have its orientation toward end-type production results strengthened.

As practical experience has shown, in order to achieve this, together with large-scale, comprehensive measures, we must pay more attention to joint actions with respect to a broad-based introduction into production of "partial" innovations. Their growing volume ought to facilitate the constant increase in the technical quotient of equipment of the production lines and engineering processes which have taken shape, as well as an improvement in the quality of output and a lowering of its prices.

What we are talking about is that, at the same time that there is an implementation of the large-scale, high-priority programs of cooperation, developed at the macroeconomic level, more active use should be made of the direct (non-mediated) ties between enterprises, associations, combines, and other economic organizations for renovating and modernizing existing facilities and retooling them.

Thus, the solution to the problem presupposes the carrying out of comprehensive measures on both the macroeconomic and the microeconomic levels.

A great deal here depends on the mechanism of cooperation. The task also consists in further developing production and scientific-technical cooperation, creating the conditions for expanding the direct (non-mediated) ties, forming joint firms, combining the resources of the CEMA member-countries, and other forms. These conditions include not only the material but also the organizational-legal prerequisites, including the unification of the norms of national economic law.

Integration of science with production requires a more precise orientation of scientific-research and experimental-design projects toward the needs of

the national economy, and the coincidence of the cost-accounting interests of all the participants. The creation and development in the CEMA member-countries of scientific-production associations and other forms of cooperation have raised the level of administration of scientific-technical progress; they have facilitated the more rapid introduction and dissemination of the achievements of science and technology.

The concluding and, in a specific sense, the decisive link in the overall system of a well-planned administration of scientific-technical progress is the formation of such an economic "climate" as would open up the road to all effective new trends. Such economic levers as price, payment for resources, profits, wages, credits, and contractual relationships are called upon to ensure the concerned interest in introducing new equipment both on the part of its creators and its consumers. The most complex factor here is coordinating the current cost-accounting interests with prospective socio-economic problems.

At the present time the fraternal countries are seeking out such paths as would provide incentives for the solution of the problems confronting them, paths which would facilitate the integration of science and production.

2384
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STRONGER UNION OF SCIENCE AND INDUSTRY DEMANDED

Moscow PARTINAYA ZHIZN' in Russian No 11, Jun 83

[Article by Academician B. Paton, president of the Ukrainian SSR Academy of Sciences, twice Hero of Socialist Labor: "Strengthen the Union of Science and Production"]

[Text] The 26th CPSU Congress called science the basic foundation of scientific and technical progress. Under present conditions, its role in conversion of the country's economy to the path of intensive development and improvement of the economic mechanism is very great. Nevertheless science as a direct productive force can and must bear a greater role in the solution of key national-economic questions. A demanding need exists for the further growth of effectiveness of scientific research and the soonest possible embodiment of it into a practical result. All of us were reminded of this with full completeness and judiciousness by the November (1982) Plenum of the CPSU Central Committee, which emphasized that reserves in the national economy "should be sought in faster scientific-technical progress and wide-scale, rapid introduction into production of the schievcements of science, technology and advanced methods."

Our republic's scientists are fully determined to make a worthy contribution to the accomplishment of important tasks set by the party. Good opportunities have been created for this. The resolute headquarters of Ukrainian science and academy, the oldest of the country's republic academic centers--is operating actively. Scientists of the republic have enriched both the country and world science with significant achievements in the most diverse spheres of knowledge. They are concentrating their efforts on the most important directions of scientific-technical and social progress; they develop research that opens up essentially news means and opportunities for the transformation of the country's productive efforts and creation of equipment and technology of the future and are strengthening and developing in every possible way cooperation with production collectives.

The search for reserves for boosting the effectiveness of scientific activity is one of the most important concerns of our academy. We know that the most revolutionary changes in equipment, technology and the economy are occurring on the basis of basic research, that is research aimed at cognition of the most profound laws of nature and society. But the present stage of scientific

development is characterized by constantly growing interpenetration and fusion of basic and applied research. This process leads to the genesis of research of an essentially new type--research which is basic in its character but is at the same time directly aimed at the solution of concrete national-economic problems. The large-scale researches of Ukrainian scientists on thermonuclear synthesis, welding, study of materials, computer technology, biotechnology are typical examples of such research work.

The advantages of the new organization of scientific activity are obvious. They make it possible to concentrate significant manpower on key problems of present-day production and to organically combine theoretical, experimental and applied problems within the framework of the research cycle and create the possibility of unified planning, financing, cadre and material-technical provision. Such a research process is aimed in all its stages at the acquisition of high end results. At the same time, if it can be so expressed, the distance between theoretical researches and the utilization of their results is significantly reduced.

The growth of the role of purposeful basic research is not a short-term phenomenon but a natural tendency exerting a strong transforming action both on the structure and organization of science itself and on the character of its interrelation with production. Special consideration should be given to questions of application of the results of basic research in major technological solutions. The creation of essentially new technologies first and foremost in key sectors of the national economy--metallurgy, machine building, fuel power engineering--makes it possible to significantly boost labor productivity and to ensure growth of quality and reduction of production cost.

The Ukrainian Academy of Sciences has examples of such successful search. I shall cite only a few. Thus, basic research conducted in the field of study of materials has helped to create alloys on the basis of chromium, molybdenum, tungsten and niobium which are distinguished by heightened durability at high temperatures and elasticity at low temperatures. These alloys have found broad application at enterprises of a number of sectors of industry. Deep study of physico-chemical processes in metals and in fluid-metal and slag melts have culminated in the development of an electroslag technology which has become the base for the creation of new metallurgical processes and marked the beginning of an entire sector of industry--so-called special electrometallurgy. Let me point out that electroslag casting is one of the best examples of waste-free technologies and is patented practically in all the industrially developed countries of the world.

As shown by the experience of our academy, it is possible to clearly distinguish two stages in the process of creation and application in practice of essentially new technologies. In the first stage, the entire complex of necessary research and planning and design development is carried out. It is completed by the fabrication of experimental models of the new equipment and technology. During this stage, the work is most frequently performed entirely within the organization of the Academy of Sciences. For this, the academy must possess an adequately equipped experimental and industrial base. Only in such a case is it possible to create good preconditions for wide-scale development of new products and technologies.

Such a base exists at the present time at the UkSSR Academy of Sciences. And this has been responsible for significant changes in the organization of scientific research and strengthening of its purposefulness. Moreover, the presence of a developed experimental and production base has also made it possible to initiate the transformation of the traditional structure of academic institutions. Large scientific-technical complexes, based on a number of leading institutes of our academy, have been created. They include in their composition in addition to research institutions sufficiently strong design and technology bureaus, experimental production facilities and experimental plants.

This structure makes it possible to solve at once very important problems: on the one hand, to intensify basic and applied research and, on the other, to sharply speed up the creation of new technologies, to increase the number of developments for many sectors of the national economy and to achieve significant reduction of the time of practical realization of scientific ideas. Specifically, the Institute of Electrowelding needed only a year and a half to create and introduce into production with the cooperation of organizations of the Ministry of Construction of Petroleum and Gas Industry Enterprises essentially new technology and complexes of unique equipment for contact butt welding of gas pipelines with a diameter of 1,420 millimeters.

The creation of complexes in the sphere of science has in our view an objective character. The timely modification of the organizational structure of scientific institutions and the direction of research is indicated in "Basic Directions of Economic and Social Development of the USSR for 1981-1985 and for the Period to 1990." We are increasingly convinced that scientific complexes in full measure represent the solution of tasks of the first stage of creation of new equipment and technology.

The second stage encompasses the period of adoption of new technologies, machines, equipment and materials in sectors of the national economy when it is necessary to speed up and expand in every possible way the scale of practical utilization of the new. The chief role here is bound to be played by ministries and departments, production associations and enterprises.

But the requisite effect can be achieved only in the case where the most efficient and modern organizational forms and methods of united science and industry are employed. The UkSSR Academy of Sciences has been the initiator of a number of new forms of cooperation of scientists and production workers who have successfully withstood the test of time. They include organization of joint work with ministries on complex plans of research and adoption, complex scientific-technical programs with sectorial scientific-research institutes and production associations (enterprises), creation of sectorial laboratories and contracts on socialist cooperation at various levels.

In a number of new forms and methods, we attach major importance to the holding of joint sessions of the Presidium of the UkSSR Academy of Sciences and the collegiums of union and republic ministries. They are an effective way of influencing technical policy in sectors of the national economy. In the current year alone, meetings have been held with colleagues of the Ministry of

Communications Equipment Industry and with the Presidium of the USSR Academy of Medical Sciences and the collegium of the UkSSR Ministry of Health. At these meetings, complex plans of work on research and application are approved. They are of major mobilizing importance and build a real foundation for expanding scientific-technical cooperation with sectorial enterprises and organizations. At the present time, the academy has joint plans with more than 20 ministries and departments.

The most effective form of organization action of workers of science and production is the creation of large sectorial collectives which take into maximum consideration the interests of the two sides. They are linked by common scientific-technical and material interests and equal responsibility for work results.

Major importance is attached to this question at the Ukrainian SSR Academy of Sciences. The Presidium of the UkSSR Academy of Sciences, the management of scientific institutions and their party organizations support comprehensively the forming of such collectives. For example, the Institute of Cybernetics imeni V.M. Glushkov and Production Association imeni S.P. Korolev work on the basis of a single plan. They created and turned over for series production in the shortest possible time the first section of computerization of this sector of the national economy. The attained economic effect has already exceeded 100 million rubles. The motto of this collective of scientists and production workers is "today basic research, tomorrow a technical policy for the sector" and it directs all of us to efficiency and a large-scale approach to the solution of a group of questions of development and adoption of innovations.

An important merit of the prospective form of cooperation of scientists and production workers is the fact that it creates a real possibility for the successful overcoming of regionalism and a narrow departmental approach, which, as we know, are a serious hindrance to the introduction of achievements of science and technology. We are convinced that large creative collectives with the active support of party organizations can and must play a decisive role in speeding up of scientific-technical progress.

The close union of workers of science and production serves as an important factor in the successful fulfillment of a task of major state importance--the realization of the food program. Through the joint efforts of scientists and agricultural specialists of the republic there has been created a semiclub variety of wheat called "Kiryanka," a quick ripening hybrid corn called "Kollektivnyy-210" and a highly productive variety of sugar beet called "Industrial'naya." The high yield and good qulities of the new varieties of agricultural crops and the possibility of complete mechanization of all stages of the production cycle constitute those basic aims which our breeding people are aspiring to achieve.

In recent years, Ukrainian scientists have been devoting increasingly more attention to the study of problems of storage and utilization of products. Their solution contains a major reserve for the increase of production of food products. And even now good results have been obtained.

Our scientists together with colleagues of the All-Union Institute of the Sugar Industry have developed a method of storing sugar beet with the use of carbon ammoniate [ugleammiakat]. Its employment reduces losses of sugar by an average of 20 percent. At present, this progressive method has been adopted at five large sugar plants in the Ukraine. By the end of the five-year plan, it will have been introduced at another 10 enterprises. But this is manifestly inadequate.

Among other joint work of a comparable nature, mention should be made of a highly efficient method of storing vegetables and fruits in a gas medium with a regulated composition. Special gas generators have already been created for this purpose. But for this method of storing vegetables and fruits to be "put out" on the required scale, immediate and single-minded efforts of ministries and departments will be required.

Major practical interest is presented by proposals of scientists of the academy for a technology of preserving forage grain of heightened humidity on threshing floors with ammonium carbonates whose use is significantly more advantageous compared to traditional organic acids. Scientists and production people are presently faced with an important roblem--to complete all the work in the shortest possible time and to achieve the most widespread use of this highly efficient technology.

A promising method of storing easily spoiled products also involves their refrigeration and freezing with the aid of cryogenic fluids, first and foremost nitrogen. Truck refrigerators of varying load capacity equipped with nitrogen cooling systems have been successfully used in intercity hauls of vegetables and fruits as well as in intercity deliveries of meat. But unfortunately, this has not gone beyond the experimental stage, although the positive results are tremendous.

I would like especially to dwell on the work of our scientists concerned with the production of valuable powders made from fruit processing wastes. It is well known that in the production of juices up to half of the original raw material is not used. On the scale of our country, this means a yearly loss of 3.0-3.5 million tons of apple and other fruit residues. Scientists of the UkSSR Academy of Sciences and specialists from the republic's Ministry of Food Industry have developed and introduced a technology of waste-free processing of fruit residues into special powders. Their production has already been organized both in the Ukraine and in a number of other union republics. At the present time, it is important to have this technology introduced on a wide scale.

The subjects of developments are also connected with the use of wastes of agricultural production and of the food and dairy industry. In particular, there is the problem of complex use of skim milk. On being enriched, it can be successfully utilized in animal husbandry for the feeding of young stock. Along this line, our academy and organizations of Dnepropetrovsk Oblast have done major and interesting work, but at the present time its results should become available to other farms.

In general, so-called wastes of agricultural production constitute a most valuable raw material, which after the proper processing becomes an additional source of protein mass. Today, a method has been proposed by scientists for producing fodder protein with the help of microorganisms from wastes of flax and hemp, sunflower stalks, cuttings of grapevine; work is proceeding on the use of wastes from processing of fish. Here methods of modern biotechnology serve as our chief "helper."

Despite the growing effectiveness of our researches and increasingly bigger return on the creative labor of Ukrainian scientists, we believe that there are still many problems on the way to both creation of new examples of equipment and technology and their introduction into production. These problems are not new, but they are becoming increasingly acute.

Major importance is to be attached to raising the social prestige of the profesion of scientific worker. The effectiveness of his work depends both on purposeful preparation and on creative capabilities. The work of a real scientist is continuous and constant search, requiring the utmost exertion of energy and occasionally even self-sacrifice. It is necessary to raise to a higher level work on casting light on the total importance of the labor of the scientist. This is necessary both for the development of science itself and for the solution of most complex national-economic problems.

A major hindrance to the introduction of the achievements of science and technology is to be found in departmental barriers. One can speak about them, fight them, but they still make themself felt, especially in the solution of such questions as mechanization of manual labor, use of a complex of new technologies, rational use of mineral and raw-material resources and protection of the environment. Demolition of these barriers and elimination of their negative influence on scientific-technical progress largely depend on strengthening of the creative cooperation of scientists and production workers and on the maximal development of the initative of all the partners in creative cooperation and mobilization of their efforts for the purposeful utilization of the potential of science and technology for the solution of all-union, intersectorial and regional problems.

In this connection, regional scientific centers possess favorable possibilities for strengthening the union of science and production and eliminating barriers on the road of scientific-technical progress. They, in addition to the development of basic problemls, direct a significant portion of their research to the solution of practical problems.

The Academy of Sciences has concluded contracts with all the republic's oblasts on scientific-technical cooperation based on regional scientific-technical and social-economic programs for the 11th Five-Year Plan. These contracts mark an important stage in the work of the academy on strengthening the tie of science with production. Realization of the contracts makes it possible to make fuller use of the scientific potential of the UkSSR Academy of Sciences for the solution of scientific-technical and social-economic problems of all oblasts of the republic where no developed scientific base exists.

Experience has shown that the regional system of control of scientific and technical progress supplements effectively and harmoniously the sectorial system and contributes to the overcoming and elimination of departmental barriers.

A significant impediment to the realization of the achievements of the creative thought of scientists is the lack of reserve production capacities and necessary capital investment. We can also understand something else--without the solution of these questions it is impossible to speak seriously of a large-scale introduction of new revolutionary technologies and new equipment in the interest of the further development of the country's national economy. The elimination of the indicated defects is beyond the capability of a single scientist and requires coordinated solutions of party, planning and economic organs. And the need for such solutions is obvious.

While speaking of the growing influence of science on acceleration of technical progress, it is necessary to emphasize the special role of the social sciences in this process. Their stimulating value is difficult to overestimate. Researches on questions of raising production efficiency, improving management of the national economy and various aspects of social-economic problems provide the possibility of concentrating efforts in the field of the natural and technical sciences and in joint work on acceleration of scientific-technical progress along the main directions. Many reserves still exist in this work.

We are convinced: the knowledge, experience, skill and talent of our scientists, constant striving of the personnel of the academy for materialization of the results of scientific search in regard to equipment and technologies, all-round support of the initiatives of Ukrainian scientists by party and economic organs and guidance by the USSR Academy of Sciences constitute those factors which lend confidence to the scientists of Soviet Ukraine that the tasks facing them will be honorably fulfilled and that they will make their ponderable contribution to the further development of scientific-technical progress.

7697
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IMPROVEMENTS NOTED IN PATENT INFORMATION SYSTEM FOR CEMA MEMBER-COUNTRIES

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN CHLENOV in Russian No 4, Apr 83 pp 23-26

/Article by Lotar Nikht, CEMA Secretariat: "The Role of the International System of Patent Information in Scientific-Technical Cooperation"; passages enclosed in slantlines printed in boldface/

/Text/ Under the present-day conditions whereby the countries of the socialist community are making the transition to a predominantly intensive path of development for their national economies, the acceleration of scientific and technical progress has become increasingly important. Therefore, in carrying out socialist economic integration there is an enhanced role to be played by scientific-technical cooperation among the CEMA member-countries. One of its important links is cooperation in the field of inventions and patents, since only equipment created on the basis of inventions is capable of revolutionizing production and yielding maximum economic effects.

In the CEMA member-countries there is a constant growth in the number of scientific-technical results obtained on the level of inventions. Every year 200--300 new or improved designs for machines, instruments, and equipment appear, 100--150 engineering processes are developed or perfected, and 100--200 new types of materials and preparations are created. There has been a steady increase in the number of authorship certificates and patents issued to applicants from the CEMA member-countries. Thus, in 1981 their number amounted to approximately 116,000. More than half of the investions, protected by secure documents, are being used in the national economies of these countries and yield a large economic effect.

By means of a long-term program of cooperation among the CEMA member-countries on the questions of inventions until 1990 and basic measures to implement them, the main tasks of developing, improving, and increasing the effectiveness of cooperation have been determined, including those in the field of patent information and documentation.

An important means of becoming acquainted with the level achieved with respect to scientific, technical, engineering, and design solutions in the world from the viewpoint of their originality, progressiveness, and legal status, is information about inventions.

The conference of directors of the departments of inventions of the CEMA member-countries created the /International System of Patent Information/ (MSPI) as a specialized system of the International System of Scientific and Technical Information (MSNTI). In accordance with the Comprehensive Program, yet another 6 specialized and 22 sectorial international information sub-systems were formed within the framework of the MSNTI.

The MSPI constitutes an aggregate of technologies and methods for collecting, completing sets, processing, storing, and transmitting patent information to clients on the basis of multilateral and bilateral cooperation among the national systems of patent information. Taking part in the activities of the system are the appointed national organs (VNO) of all the CEMA member-countries, and they function as partners with equal rights. The functions of a pilot organ are performed by the Poisk /Search/ Scientific-Production Association of the USSR State Committee for inventions and discoveries.

The basic purpose of MSPI's operation is to provide patent information in a more efficient, complete, and targetted manner to various categories of clients in order to increase the effectiveness of operations with regard to creating new equipment in the CEMA member-countries. This is achieved by the following means:

--maximum satisfaction of the needs of the participating countries for patent information, including organizing the informational provision of DTsPS and other high-priority lines of scientific and technical cooperation;

--drawing closer together and evening out the levels of development of the national systems of patent information for the purpose of steadily upgrading their general level;

--combining the efforts of the VNO and providing a division of labor in the field of acquiring sources of patent information, their processing, storage, and search;

--working out general methodological, organizational, and technical principles for the functioning of the elements of the national systems within the framework of the MSPI;

--standardization and unification of individual information processes and services.

The MSPI includes patent information from all fields of science and technology, containing an aggregate of technical, legal, and economic data, received as a result of scientific-technical activity and which are contained in documents applied for or recognized as objects of commercial ownership by industries, as well as data about their utilization. In accordance with its basic purposes and tasks, the MSPI for all 118 classes of the International Classification of Inventions (MKI) annually processes the following patent information:

--description of inventions covering 38 of the world's countries (approximately 500,000 documents);

--abstract information covering the CEMA member-countries, as well as Great Britain, the United States, the FRG, France, Japan, and Switzerland (approximately 350,000 documents);

--bibliographical information on machine-readable carriers covering 49 of the world's countries and two international organizations (more than 840,000 documents, over 95 percent of the applications for inventions in the world).

The clients of the MSPI in the CEMA member-countries are the departments of inventions, the international specialized and sectorial systems of scientific and technical information, the CEMA organs, as well as other international organizations. Furthermore, included among the clients are the national organs of scientific-technical information, state institutions, enterprises, scientific-research, planning-design, and other organizations, as well as individual citizens of the countries participating in the system, serviced by means of the VNO's of their respective countries.

The MSPI includes the following three sub-systems: holdings of patent documentation; processing and search of patent documentation; information service.

A qualitatively new phase of cooperation in the field of patent information was entered by the adoption at the 21st session of the Conference of the directors of the departments for inventions of the CEMA member-countries (December 1981) of the /MSPI Phase one/ for industrial use. It constitutes nine services, embodied within the framework of the enumerated sub-systems, for example, in the following manner.

Within the framework of the holdings sub-system the following have been put into operation: /the Central Service for Collecting and Processing Data on the Composition and Changes in the Holdings of Patent Documentation of the MSPI /TsSSOD/ and the Service for Exchange, Completing Sets, and Copying Patent Documentation /SOKK/./ Strictly speaking, the holdings of the patent documentation of the MSPI comprise the so-called distributed base holdings (RBF), consisting of the aggregate of the systematized holdings of patent documentation located in the participating countries, as allocated by the departments of invention of the CEMA member-countries for functioning within the framework of the system.

The work of filling out complete sets and utilizing the RBF has been distributed among the VNO's, which have been entrusted with the functions of a base service of the SOKK. Each such organ presents to the part of the RBF attached to it copies or duplicates of individual patent documents for acceptance at the MSPI on carriers of information. The RBF includes both the primary documents (the published descriptions of the inventions to go with the applications prior to or after expert opinions have been rendered,

as well as to the secured documents), as well as secondary documents (official bulletins of the patent departments, numerical and systematic indexes). The maximum thoroughness for filling out sets by the RBF for Great Britain, the USSR, United States, Germany, France, Japan, and Switzerland, which are included in the minimum of patent documentation in accordance with the Treaty on Patent Cooperation (RST), since 1920, and for the remaining countries--in accordance with the period of validity of the secured documents. In its aggregate the RBF encompasses the patent documentation of 53 countries, as well as the publications of the European Patent Department and the World Organization of Intellectual Property (VOIS) with regard to international applications. Every year the RBF fills out 500,000 documents, while the initial number of the holdings consists of 18 million documents.

Such data as the following also testify to the great possibilities of the sub-system of the holdings of patent documentation of the MSPI for clients. For example, if a client needs a description of an invention from the GDR, Germany (prior to 1945), the FRG, Denmark, Norway, Finland, Sweden, or publications of the European Patent Department and the published applications in accordance with the RST agreement, then his request for a copy is carried out by the VNO of the GDR in the course of two weeks. If he requires a description of an invention from the USSR, Japan, India, Sri Lanka, Iraq, Kuwait, Tunisia, Brazil, Israel, Iceland, or Pakistan, then the order is carried out by the VNO of the USSR also within two weeks, etc.

The practical contribution of the TsSSOD to the functioning of the RBF is the publication of the reference work entitled "Holdings of the Patent Documentation of the MSPI Participating Countries." It contains data on the descriptions of inventions, on patent publications, gaps in the holdings, information carriers, systems of classification, and a list of countries for which each VNO carries out information service for the clients of MSPI.

The sub-system of processing and search includes the following:

The Service for Exchange of Bibliographical Information on Machine-Readable Carriers;

The Service for Automated Preparation of Indexes (for the CEMA and RCT member-countries);

The Service for Topical Information-Search Systems;

The Service for Management and Exchange of Reference-Search Apparatus;

The Service for Analytical-Synthetic Processing of Patent Information.

The principal information unit of this sub-system is the /Service for Exchange of Bibliographical Information on Machine-Readable Carriers/. It provides for the collection, control, and preliminary processing of bibliographical data about inventions registered in the CEMA member-countries;

the formation of a composite magnetic tape (ML), exchanges with the International Center for Patent Documentation (INPADOK) and the distribution of the combined INPADOK ML among the participating countries. Prepared by the Poisk Scientific-Production Association, the annual set of compiled ML's contains bibliographical data (13 elements) concerning approximately 120,000 inventions which have been registered in the CEMA member-countries. In exchange, the participating countries receive from INPADOK bibliographical data on more than 840,000 inventions which have been registered in 49 of the world's countries and two international organizations.

/The Service for Automated Preparation of Indexes/ has been functioning in an industrial regime since 1973. Within its framework, on the basis of the ML INPADOK, the pilot organ of the MSPI publishes numerical, systematic, and name indexes on ML's and offers them to clients through the VNO. Together with this, the VNO MSPI of the GDR offers clients indexes of analogous patents on ML's or on micro-fiches in the A6 format.

As a vivid example of the rational and effective utilization of the MSPI service on a national scale, we could cite the activity of the magnetic-tape service for patent information of the Poisk NPO. At the present time it has extended its base of patent-information data in the form of 13-element bibliographical descriptions of patent documents from 49 of the world's countries and two international organizations among 44 organs of information (30 sectorial ones and 14 regional ones). Service to these collective subscribers is carried out in two systems. The first of these provides twice a month a complete copy of the current entries in the bibliographical data bases, while the second provides a selected distribution once a month of current entries in the bibliographical data bases of patent information in accordance with the requests of the subscribers, as expressed in MKI categories.

Within the framework of the /Service for Topical Information-Search Systems/ the pilot organ of the MSPI offers upon requests from clients search groups such as the following: alloys, steroids, lasers and masers, analog-to-digital converters, lubricating and laminated materials, on machine-readable carriers, as well as a standardized packet of applied programs, facilitating the use of these groups. The VNO MSPI of the GDR conducts a topical search upon one-time and continuously active requests, using computers in sectorial search groups of electrical engineering and electronics. The search group contains data on approximately 85,000 documents. The results of the search are sent to the client in German in the form of computer readouts with citations of the bibliographical data and descriptors of all the relevant descriptions of the inventions.

/The Service for Analytical-Synthetic Processing of Patent Information/ at the level of the MKI classes for the countries of the RST minimum encompasses the preparation by the pilot organ of the MSPI at the requests of the VNO of detailed, subject-statistical surveys. These contain information about the inventing activity for countries of the RST minimum and for the MKI groups, and they may be used to evaluate the level of equipment and technology, scientific-technical analysis, forecasting, etc.

The sub-system of the information service renders information services directly to the clients. It includes the complex of /decentralized national services of the information service and the Reference-Information Service /SIS/ under the pilot organ of the MSPI./

The functions of the decentralized services in bringing various types of information to the clients of the MSPI are performed by the VNO, taking into account the characteristics of the national systems of information in the countries participating in the MSPI. The information services of the MSPI, delivered by means of the VNO to the clients, include the following:

--publishing patent information prepared by the traditional method (printed publications, including materials of the reference-search apparatus) or using computers (bibliographical indexes, detailed subject-statistical surveys);

--bibliographical information on ML's (copies of the ML's with information from the CEMA member-countries, as well as 39 other countries of the world and two international organizations, selective dissemination of bibliographical information);

--copies of patent documents on various carriers;

--narrowly topical searches using computers.

Proceeding from the great importance of providing patent information on the inventors' activity and patent work in solving the problems of DTsPS, as well as other high-priority lines of economic and scientific-technical cooperation among the CEMA member-countries, the departments for inventions render practical aid to the ministries and economic organizations of the CEMA member-countries.

The /PRB/ makes sure that priority is given to filling orders for copies of descriptions of inventions. It has begun disseminating bibliographical information from the ML INPADOK to organizations and enterprises which are connected with the implementation of DTsPS. Research studies are being conducted on the patent purity with regard to orders from interested organizations for determining the level of equipment, as well as other types of patent searches.

In the /HPR/ patent searches are conducted outside the normal sequence upon requests from enterprises or organizations which are carrying out targeted programs.

In the /GDR/ a great deal of attention is paid to the targeted information service provided for combines and organizations which are taking part in implementing the DTsPS. It is conducted in accordance with the existing national system of the GDR's patent information, as well as on the basis of services obtained within the framework of the MSPI. The patent-information services of the combines have at their disposal the necessary holdings of patent documentation in accordance with their topical lines. Within the

system of selective dissemination they receive from the departments of the GDR descriptions of inventions from the GDR and the FRG according to the current entries. Upon request, they offer copies of the descriptions of inventions from other countries as well. Moreover, the department of the GDR renders aid to combines and organizations by means of working out evaluations of the trends of technical development according to individual topics containing the most important tasks of the DTsPS.

In the /SRR/ information service is provided to all interested organizations participating in the implementation of the DTsPS by means of offering patent documents as well as topical, retrospective research. In particular, good results have been achieved in the field of information service to the joint laboratories of the CEMA member-countries on drilling and grouting solutions, as well as to those carrying out scientific-research work within the framework of the DTsPS in the field of the petroleum and gas industry.

In the /USSR/ requests and orders for copying patent documents and reference-information service are performed out of sequence for organizations participating in solving the problems of the DTsPS.

In the /CSSR/ assistance is offered in completing the sets of patent holdings in accordance with the topics to be solved, and aid is provided to the individual ministries and the CSSR Academy of Sciences in the field of information delivery to those performing the tasks of the DTsPS.

The conference of the directors of the departments of invention of the CEMA member-countries at the 22nd session (July 1982) approved the procedure for the organization and conduct of invention and patent work in carrying out the economic and scientific-technical cooperation among the CEMA member-countries; it also considered it feasible to utilize the above-indicated procedure in implementing the bilateral and multilateral economic and scientific-technical cooperation among the CEMA member-countries. In this document, along with the questions of organizing and planning invention and patent activity, providing legal protection and patent purity, as well as the planned utilization of inventions, industrial models, and trademarks, the question was moved to the forefront of the need to conduct patent research studies at all stages for the following purposes:

--to reveal the world level of science, equipment, and technology, as well as trends of their development with regard to specific tasks;

--evaluation of the patent situation in CEMA member-countries and in Third World countries, which represent for our countries a technical and economic interest;

--determining the ways to solve the given problem, including the creation of fully protective and/or patent-pure technical solutions.

Particular attention must be paid to the results of patent-research studies in preparing draft plans and determining the necessary level of joint

scientific-technical developments. The activities of the MSPI fully correspond to this.

At the present time the CEMA member-countries are confronted with the task of significantly raising the scientific-technical level of the jointly developed equipment and technology in implementing the DTsPS and the high-priority lines which were adopted at the 97th session of the Executive Committee. In connection with this, it is necessary within the framework of the program of cooperation to deepen the analysis of the world level of patent research. The cooperating organizations must ensure the patent purity of the joint developments and patent capabilities, as well as the legal safeguards for the inventions, industrial models, and trade-marks received so as to create favorable conditions for the effective use of the results of scientific-technical interaction by means of exporting products and selling licenses.

Taking into account these requirements for patent information and in accordance with the basic measures on implementing the Long-Term Program for cooperation among the CEMA member-countries in the field of invention up to 1990, provisions have been made to put /MSPI Phase Two/ into operation before the end of 1985. The goal consists in expanding the opportunities for providing the clients in the CEMA member-countries with patent information with the aid of such new automated services as, for example:

--processing the bibliographical data in machine-readable form and expanding the composition of the data within the framework of international exchange;

--automated preparation of bibliographical indexes based on the use of the SOM-chamber apparatus;

--collecting and processing data on the changes in the legal status of patent documents of the CEMA member-countries and the countries of the minimum RST patent documentation in machine-readable form;

--collecting and processing abstract information on patent documents of the CEMA member-countries;

--offering data on analogous patents in a question-and-answer system.

Moreover, we must increase the proportion of automated information processes as well as prepare the prerequisites for including the MSPI within the MSNTI network of automated centers.

Furthermore, in accordance with the indicated basic measures, it is intended to develop a forecast for the development of the MSPI to the year 2000 as a guide to the activity of MSPI in implementing scientific-technical cooperation among the CEMA member-countries, as well as a program for the development of the MSPI to the year 1995 for the purpose of satisfying the needs for patent information of the industry, science, and technology of the CEMA member-countries.

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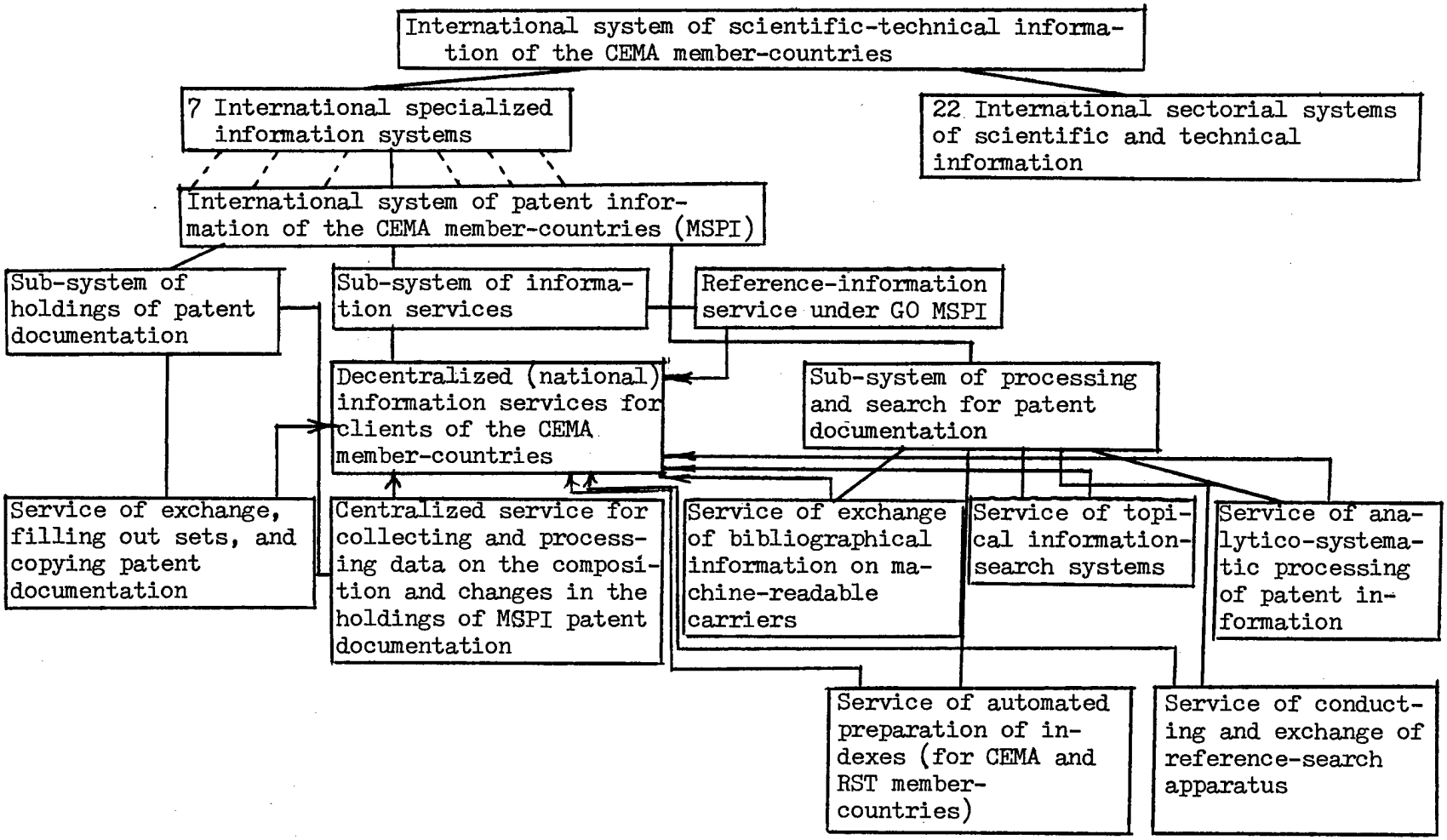
THE PLACE OF THE MSPI WITHIN THE FRAMEWORK OF THE MSNTI



ORGANIZATIONAL IMPROVEMENTS IN CEMA SCIENTIFIC, TECHNICAL COOPERATION SOUGHT

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN CHLENOV in Russian No 4, Apr 83 pp 20-22

/Article by Vladimir Leont'ev, doctor of technical sciences, chief of the administration of the composite scientific-technical plan of the USSR State Committee for Science and Technology: "Certain Problems in Improving Scientific and Technical Cooperation"/

/Text/ Scientific-technical cooperation among the CEMA member-countries has the following goals:

--unifying the efforts of engineers and scientists and concentrating the resources of the fraternal countries for achieving the maximum results with regard to the problems of mutual interest, in particular, with regard to working out and introducing into production competitive models of machinery and equipment, along with technology new in principle;

--creating for this purpose a mutually coordinated scientific-technical potential;

--developing on the basis of the achievements of science and technology in the countries involved an international specialization and cooperation in production.

These tasks are resolved at each stage with the use of appropriate forms. Their improvement ensures a more complete and effective utilization of the country's material-technical and scientific base in the interests of mutual development.

Prior to 1969 scientific-technical cooperation among the CEMA member-countries was based on the coordination of scientific and technical research studies.

Having played a large role in the development of the scientific-technical potentials of the fraternal countries, it, nevertheless, had a number of substantial shortcomings. Thus, due to the failure of the individual countries to follow certain fixed and specific lines, each one of them was engaged in solving many or even all problems. This inevitably led to a duplication of work projects as well as a dissipation of scientific efforts and resources.

Mutual activity was not directed at end results--the creation of the most up-to-date equipment and its introduction into production, and this led to a disruption in the unified cycle: science--technology--production--sales, as well as to complications in the planning of cooperation as a whole.

A new phase of mutual activity in the field of science and technology was connected with the 23rd (special) meeting of the CEMA Session in 1969. Thereat, the results of the preceding phase were summed up, and more complex tasks were set forth, having as their goal speeding up the pace of the intensification of the national economy.

The new trends in cooperation were reflected in the Comprehensive Program, adopted in 1971 at the 25th meeting of the CEMA Session. It outlined the strategic lines for the mutual action of the fraternal countries for a period of 15--20 years, including those in the sphere of science and technology; it pointed out that this should be comprehensive in its nature. In order to solve these problems, a CEMA Committee was created for scientific-technical cooperation, a resolution was adopted concerning the organization of coordination centers, international scientific-research institutes, joint laboratories, temporary international groups, cost-accounting scientific-production associations, etc. Of particular importance was the fact that the plans for cooperation envisioned the end results, linked with the development and mastery in production of new types of equipment and technology.

An important role in improving mutual action in the sphere of science and technology has been played by the adoption by the CEMA Session of long-term targeted programs for cooperation. They have allowed us to coordinate the cardinal problems of science and technology with production problems, to prepare detailed plans for cooperation, encompassing scientific research, technical developments, introduction, and marketing.

However, despite these positive shifts, the specific proportion of joint scientific-research studies is obviously insufficient. Mutual activity has developed with regard to many topics at different levels. Most of them have not been coordinated with the high-priority thrusts of science and technology. The existing organizational, legal, financial, and planning forms do not ensure the most rapid possible completion of the obligations which have been adopted. The multi-stage structure of interrelations among the countries does not fully correspond to the present-day phase of their scientific-technical development. And this presents the CEMA member-countries and organs with a number of qualitatively new problems.

As is known, at the present time upon the proposal of the 26th CPSU Congress, preparations are underway for an economic conference of the CEMA member-countries at the highest party and state level. It is supposed to lay the foundation for a higher stage of socialist economic integration. In the sphere of scientific-technical cooperation what we are talking about here is, by utilizing the organizational forms which have already been worked out, to make a further step forward and to make the transition to an agreement by the countries concerned with regard to coordinating scientific-technical policy as a whole.

Within the heightened effectiveness of the mutual activity of the fraternal countries, an increasing role is played by forecasting. At its 27th meeting the CEMA Committee for scientific-technical cooperation (November 1982) approved a new program of operations in the given field. It provides for the following:

--the selection of long-term, high-priority lines, representing mutual interests;

--concentration of resources on solving comprehensive problems connected with the processing of raw materials, the utilization of non-waste-product and resource-conserving technology, automation and mechanization of production processes, raising the technical level and competitiveness of products being turned out;

--providing more compact time periods for developing highly productive equipment by means of creating an improved scientific-technical base, to be developed jointly by the participants in the cooperation;

--the creation of an appropriate production base, necessary for turning out new equipment, based on the development of specialization and cooperation.

As practical experience has shown, increasing the effectiveness of cooperation requires new forms of joint operation in order to optimize each link in the cycle: scientific research--technical development--introduction--production--marketing.

The discussion of the immediate and longer-range prospects for development within the CEMA Committee with regard to scientific-technical cooperation and the working group on forecasting has made it possible to picture with sufficient fullness the structure of this complex as a whole and in its component elements.

A large role has been played here by studying the experience of the Soviet Union in working out its long-term Comprehensive Program of scientific-technical progress for the next 20 years. It has the goal of ensuring the mutually coordinated solution of the problems of economic and scientific-technical development.

Relying on this experience, the Committee set forth the idea of preparing an analogous program within the framework of CEMA. National programs are basic to it. In accordance with them, each country defines its own "section," keying on the needs of the entire community. In its first phase the role of such a document could be fulfilled by the Basic Directions for the development of science and technology, as worked out by the Committee.

Of particular importance at the present time are the solutions of scientific-technical problems in the fields of machine building, fuel-energy and raw-material sectors, construction, agro-industrial complexes, the production infrastructure, etc.

Each problem must be solved within the national framework or on the basis of cooperation, taking into account the level of the technical development of the countries and the material, financial, and labor resources which they possess. Moreover, use should be made of the experience in implementing DTsPS (long-range comprehensive programs of cooperation), which are comprehensive in nature.

Subsequently, we must determine the tasks which represent bilateral or multilateral interests, outline the most important and high-priority trends of cooperation, the possible performers and co-performers for these tasks, including the chief performer--a scientific organization, headed up by a director under one of the countries. Herein it is necessary to create an international scientific-technical council which will include representatives from all the countries involved.

In the future within the CEMA framework it will obviously be feasible to develop large-scale, national-economic programs as well; their implementation should take place on the basis of carrying out scientific-technical programs. Their selection will be determined by the Comprehensive Program for scientific-technical progress.

In order to make the transition to the new system of cooperation, a number of measures need to be carried out both in each country and on the community-wide scale, and even in the CEMA apparatus.

In our opinion, we must do the following within the countries:

--introduce unified structure and time periods for preparing plan, program, and forecasting documents, which will allow us to coordinate them with the general CEMA documents with regard to cooperation;

--create national committees, to be headed by the academies of sciences and the departments of science and technology, in order to work out comprehensive programs of scientific-technical progress in each country. The structure of these programs and their forms must be unified;

--form national sections of the working group on forecasting of the CEMA Committee for scientific-technical cooperation, having entrusted them with the task of organizing all forecast activity within the country.

Within the community as a whole we must obviously do the following:

--introduce an integrated, coordinated system of plans and programs, directed at solving the most important problems;

--prepare proposals with regard to organizational, financial, and administrative forms, ensuring the high-quality execution of the coordinated solutions;

--determine the methodology for selecting the high-priority lines of science and technology, constituting the greatest possible mutual interest;

--organize within the framework of the CEMA Committee the development of joint forecasting of global problems (with a time horizon of 40--50 years);

--on the basis of the most careful study of the historically formed scientific-technical potentials of the CEMA member-countries, prepare a plan for the creation of a mutually coordinated potential for cooperation, along with proposals for its effective functioning and development, eliminating the dissipation of scientific efforts and technical possibilities of the countries involved.

Within the CEMA apparatus it would be feasible to do the following:

--make more precise the role and tasks of the working group on forecasting of the CEMA Committee for scientific-technical cooperation, having charged it with the duty of preparing proposals with regard to working out and harmonizing within the framework of the Comprehensive Program for the scientific-technical progress of CEMA an integrated scientific-technical policy;

--carry out the forecasting activity of all the CEMA organs in the sphere of science and technology solely through this working group.

The above-mentioned measures, which obviously do not exhaust everything required for increasing the effectiveness of scientific-technical cooperation, are called upon to render assistance in providing better grounds for defining the goals of cooperation, the concentration of efforts and resources of the CEMA member-countries to solve the high-priority problems. They are of great importance for creating within the optimum time periods competitive equipment, as well as organizing its speeded-up joint production.

At the same time, taking into consideration the real time periods for planning the development of the national economies of the CEMA member-countries, it is obviously feasible to provide for a definite stage-by-stage progress in carrying out the system of measures for increasing the effectiveness of scientific-technical cooperation.

As regards cooperation in the field of fundamental research, it is obviously feasible to carry it out within the framework of the coordinated plans for the development of science and technology.

All this will make it possible to subordinate the plans for scientific research to the long-term goals of developing the national economies; it will facilitate the intensification of socialist production and the increase of its effectiveness.

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'PRAVDA' ARTICLE ON INVENTIONS ELICITS RESPONSE

Moscow PRAVDA in Russian 27 Apr 83 p 3

/Article by V. Reut: "Around an Application"/

/Text/ The article by A. Glovatskiy "Application Was Submitted..." (PRAVDA 17 November 1982) evoked a big response. Five months passed and the editorial board is still receiving comments. The authors of most of them approve the article either unreservedly, or in principle, disputing some points and advancing counterpoints.

"I entirely agree with the opinions expressed in the article 'Application Was Submitted...,'" D. Sukhin, candidate of technical sciences, winner of the USSR State Prize, RSFSR honored inventor (Vladimir Oblast), writes. "I refer to the fact that after the complication of the procedure of formulation of applications I decided that it was necessary to work, not to lose time on their preparation. How many assets we lost, are losing and will lose owing to the deficiencies in the organization of inventive work...," Prof V. Aver'yanov, doctor of technical sciences (Minsk), complains. I. Dobrokhotov (Ivanovo Oblast), S. Kovalev (Moscow) and many others express similar thoughts.

"The article notes the causes producing insignificant inventions, which not only litter the all-Union stock, but also lead to an excessive expenditure of state funds on the payment of bonuses to authors and assisting person," A. Sakharov, head of a division of the Minsk Special Design Office of Automatic Lines, believes. "Apparently, it is time to more clearly define the concept of 'invention' and to affirm it legislatively," K. Chubarov, director of the patent and license group of the Znamya Oktyabrya Production Association (Leningrad), assumes. A. Liberman, winner of the USSR State Prize (Kiev) expresses a similar opinion: "The lofty term 'invention' should characterize proposals of quite a high rank."

There are many letters, in which A. Glovatskiy's article is considered incorrect and even offensive for inventors. "I categorically do not agree with the term 'triviality' used in the article. For example, a hole in the needle transferred to the point produced the sewing machine," M. Valdayev (Leningrad) is angry. "One must not offend people, stating that some of them invent for the sake of easy money. I consider the proposal to abolish the incentive bonus not serious," patent expert L. Komarov (Saratov) insists. "The author of the article sees the cause of all flaws in the vague and contradictory requirements of the State Committee for Inventions and Discoveries and in the diffuse criteria of standard documents. We emphatically disagree with this," this is the opinion of B. Gol'dshteyn and A. Libman (Khimki, Moscow Oblast).

The USSR Committee for Inventions and Discoveries agrees with these evaluations. In his answer I. Nayashkov, chairman of the committee, states that A. Glovatskiy's debatable article, "although it represents an attempt to raise the important problem of improving the level of technical solutions claimed as inventions, on the whole, it does not contribute not only to its correct solution, but even to its formulation--mainly owing to the incorrect and highly simplified idea of its author on the essence of the problems touched upon and the possible ways of solving them." Next the answer rejects the basic points of the article--both the criticism contained in it and the proposed measures.

Yes, the practical recommendations made by A. Glovatskiy were received by readers by no means unanimously. All the colors of the "rainbow"--from enthusiastic support to a radical denial--are here. A detailed examination of their merits and demerits is more appropriate on pages of publications specializing in problems of inventions. It is surprising, however, that the State Committee for Inventions and Discoveries confined itself to nonagreement with these proposals. Reading the 11-page reply, one reaches the conclusion that the State Committee is firmly convinced that there are no grounds for a discussion of shortcomings. The chairman of the State Committee, admitting that "among a large number of technical solutions applied for in the committee there is a certain number that have no significant effect on an acceleration of scientific and technical progress," after this writes the following: "However, one cannot agree with the opinion that such a situation is brought about by flaws in the organization of work with inventors..."

As can be seen from the letters, many readers are no longer inclined to think that everything is satisfactory in the management of inventions and in the organization of mass technical creative work. Most are perturbed by the shortcomings in this matter. Apparently, we must not brush off those that point to these impediments, but weigh how to best eliminate them.

Many are disturbed by the fact that the number of types of developed and mastered machines has not been growing for a number of years, while, at the same time, the indicators characterizing the achievements of inventors have been improving steadily.

In fact, let us consider the following figures. Whereas during the 8th Five-Year Plan, according to the data of the Central Statistical Administration, the number of developed models of new types of machines, equipment, apparatus and instruments, on the average, totaled 4,254 annually, during the 10th Five-Year Plan, 3,704. And what about the beginning of the 11th Five-Year Plan? In 1981 the number of these innovations totaled 3,600 and in 1982, 3,500. Perhaps the national economy now needs the renovation of technical facilities to a lesser extent? By no means. As noted at the November (1982) Plenum of the CPSU Central Committee, the acceleration of scientific and technical progress, as before, remains the first reserve.

Not only is the quantitative aspect important here. Qualitative indicators are of no lesser and perhaps even of greater significance. New equipment must differ from old equipment not in the date of output, but in increased technical and economic characteristics, productivity, reliability and competitiveness on the world market, which is possible only with the utilization of highly

efficient inventions in it. Of course, there are also such machines, apparatus and other articles among the newly developed ones. However, models inferior to those developed in our country and abroad before this are often elevated to the rank of new equipment. Inventions that do not play a decisive role in the rise in the technical level of an article as a whole are used in some. In fact, a signal whistle of a new type will not improve the basic properties of a locomotive. Meanwhile, L. Shashmurin, associate at the Perm Scientific Research and Planning Institute of Petroleum Industry, notes that "very many authors' certificates for technical solutions, which, in fact, hardly resemble rationalization proposals, are issued."

A number of readers express dissatisfaction with the average economic efficiency per invention. In the country in 1981 it amounts to tens of thousands of rubles. In individual ministries and departments this indicator does not exceed 12,000 and even 2,000 rubles. These figures are "averaged out" and it turns out that in some sectors major highly efficient inventions literally drown in a sea of absolutely useful, but minor inventions, whose implementation is not particularly difficult. As the saying goes, higher in number, lower in price. This is a reproach to the organizations managing inventions, primarily ministries, departments and, moreover, developers of new equipment themselves.

It is well known that the efficiency of inventions is affected by their "circulation." Unfortunately, even an invention, which is used only in prototypes, beyond which the matter does not go further, if an enterprise reports for it, is considered introduced. Readers assume that the planning principle is needed here. Innovations, especially major ones, should be incorporated in projects and planned and their widespread realization should be ensured. In practice, however, a significant number of advanced technical solutions remain "ownerless." Any enterprise or no one at all can utilize them. The committee calls the attention of ministries to some innovations, but not always with success, because recommendations are of an nonobligatory nature. This work requires a decisive improvement. "There is an urgent need for the development of a harmonious and efficient system of introduction of valuable inventions," G. Fridman, candidate of technical sciences (Moscow), believes.

Readers also pay attention to the need to improve the organization of patent and license work. M. Frenkin (Moscow) believes that ministries and departments should approve the indicator of currency proceeds from the sale of licenses. Then there will be more concern for their competitiveness on the world market.

The contribution of inventors to the acceleration of scientific and technical progress, intensification of production and increase in its economic efficiency is significant. However, this does not give reason to rest on one's laurels and to close one's eyes to oversights. We must not take up talents in the field of science and technology. The whole point is to direct these talents primarily toward the solution of the most important scientific and technical problems and toward achievements capable of introducing truly revolutionary changes into production and not to delay the realization of results, especially large-scale ones.

This requires management talent and organizational abilities on the part of those responsible for the further improvement in mass technical creative work--the USSR State Committee for Inventions and Discoveries, ministries and departments. "Scientific and technical progress is inconceivable without competent policy in the field of inventions. Its constant improvement must become the rule," candidate of chemical sciences V. Kokozey (Kiev) is convinced. The generalization and dissemination of advanced experience in the field of inventions, organization of competitions and holding of contests for the solution of problems most important for the national economy and of reviews of technical achievements--it is time to make these and other means of increasing the creative activity of the masses the daily norm in work with innovators and to orient it more firmly not only toward quantitative indicators. We must not forget that a hundred of insignificant inventions, no matter how obvious their benefit, quite often will not replace one weighty invention revolutionizing a certain field of technology. Soviet science and industry are legitimately proud of many such achievements. But it is a matter of seeing to it that there are more of them.

Inventors also complain about the All-Union Society of Inventors and Efficiency Experts, which does not always actively promote the concentration of efforts, especially of inventors working alone, and their unification into creative collectives (N. Gusenko from Yalta). By no means all inventors have the opportunity to execute even prototypes of devised units, although this requires mostly the simplest machine tools and materials. With regard to the practical realization of individual inventions there are even more difficulties here.

The State Committee for Inventions and Discoveries, the All-Union Society of Inventors and Efficiency Experts, ministries and departments have something to think about--think and decide what measures should be taken to further improve the organization of inventive work in the country, to steadily increase its efficiency and to accelerate the realization of innovations. As readers' letters indicate, people of an inquisitive technical mind are waiting for this and are ready to actively assist in increasing their contribution to scientific and technical progress, intensification of production and rise in its efficiency.

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IMPROVED MANAGEMENT OF SCIENTIFIC PROGRESS IN ARMENIA URGED

Yerevan KOMMUNIST in Russian 2 Apr 83 p 2

/Article by A. Agababov, chief of the Division of Science and Technology of the Armenian SSR State Planning Committee: "To Improve Science of Management"/

/Text/ The beginning of the third year of the 11th Five-Year Plan was marked by events of tremendous importance. The decisions of the November (1982) Plenum of the CPSU Central Committee produced a nationwide movement for the maximum possible strengthening of labor and state discipline and for an increase in the responsibility for a full implementation of national economic plans--performance and state discipline.

Significant advances in national economic development have been made in the republic in the last 2 years. The gross national product increased by more than 11 percent, the national income, by 12.1 percent and the volume of industrial production, by 12 percent. New goals were also achieved in the field of agriculture, construction and transport.

What has been achieved is the result of the planned introduction of the achievements of science and technology into national economic sectors. More than 1,400 key measures for new technology, including 115, for the mastering of new types of industrial products, 428, for advanced techniques and mechanization and automation of production, 225, for a rise in the technical and economic level of production, 320, for scientific labor organization and others have been introduced in the last 2 years.

This made it possible to master the output of new types of equipment meeting modern requirements and to raise the level of production and industrial output, including consumer goods.

The achievements in the acceleration of scientific and technical progress in Armenia are obvious. However, there is no basis for calmness. Comrade Yu. V. Andropov, general secretary of the CPSU Central Committee, said the following at the November (1982) Plenum of the CPSU Central Committee: "We have great potentials in the national economy. These potentials must be sought in an acceleration of scientific and technical progress and in a widespread and rapid introduction of the achievements of science, technology and advanced experience into production."

Meanwhile, a number of shortcomings exist in matters concerning the introduction of completed scientific developments into production. An increase in exacting requirements on collectives of scientific institutions and their managers and a high sense of responsibility of every associate are important conditions for their elimination.

In order to attain an acceleration of scientific and technical progress in the republic, it is necessary to intensify work on improving its management and planning.

An organic unity of management of scientific and technical progress and of the national economy as a whole is attained through national economic plans, whose important link is the planning of science and technology.

The Armenian SSR Academy of Sciences and the State Planning Committee are now developing a long-term overall program for scientific and technical progress throughout 5-year periods. It will become the basis for the drafts of main directions in economic and social development for the 12th and subsequent five-year plans.

Overall management of progress is a broad program for a rise in the technical and economic level of production in all national economic sectors and for the planning of the development of science and technology as the base of this process. Management should encompass the entire system of indicators, including the formation of a scientific reserve and of a production potential, as well as material, financial and labor resources.

Economic incentives presupposing a cost accounting system of activity of scientific research institutions, other subdivisions and research organizations in connection with the cost accounting of all the links of the chain connecting science and production occupy an important place in the management of scientific and technical progress. An efficient system of economic incentives presupposes financial incentives for researchers connected with the effect attained from the introduction of scientific developments.

The strengthening of relations between sectorial scientific institutions and production is of great importance. Positive experience in a rapid passage of innovations from an idea to the production of a new product is especially important. This experience must be studied and introduced.

The process of management of scientific and technical progress is based on the program-goal method. As applied to economic planning, this method provides for the selection of the basic goals and tasks of social, economic and scientific and technical development and for the elaboration of interconnected measures for accomplishing them.

During this 5-year period the republic's scientists take part in the solution of nine urgent republic overall programs and in the development of 14 goal-oriented programs and of 31 programs of all-Union importance approved by the USSR State Committee for Science and Technology, the Presidium of the country's Academy of Sciences and the USSR State Planning Committee.

At present coordinating councils have examined and approved overall programs for the mechanization of manual labor, further industrialization of construction and installation work, protection of the environment and a rational utilization of natural resources, including in the Sevan Basin.

However, not all managers of ministries, departments and scientific institutions pay proper attention to the development and approval of overall programs for the solution of major problems. For example, to this day the Administration of Nonferrous Metallurgy and Armniprotsvetmet have not completed the development of the program for an increase in the extraction of nonferrous metals and for an overall utilization of ores; the Ministry of Construction Materials Industry and the Scientific Research Institute of Stone and Silicates, for an overall utilization of deposits of local nonore materials; the Ministry of Agriculture, for the reclamation of saline soil in the Ararat Valley and so forth.

The task is to see to it that the republic's Academy of Sciences, ministries and departments more rapidly complete the development and approval of major goal-oriented and overall scientific and technical programs. These measures will be a concrete realization of the principles of performance and state discipline. It is necessary to overcome the force of inertia, which here and there impedes an effective solution of problems, especially in the matter of utilization of potentials. As Comrade K. S. Demirchyan noted at the December (1982) Plenum of the Central Committee of the Communist Party of Armenia: "The link of science with production is still unsatisfactory... Many scientific institutions, primarily some institutes of the republic's Academy of Sciences, work out of touch with the tasks of national economic development and have not established close relations with other sectors of industry, agriculture and economy."

Suffice it to say that this year in the total volume of expenditures planned by the State Planning Committee the proportion of expenditures on scientific and technical programs and problems makes up only about 31 percent; in the Academy of Sciences, 30 percent and in the republic's higher educational institutions, 28 percent respectively and so forth. Some scientific institutions of the republic's Academy of Sciences, ministries and departments do not take any part at all in the solution of major scientific and technical problems according to goal-oriented and overall programs.

It is clear that it is necessary to review the subject plans of scientific institutions in order to eliminate serious oversights.

The provision of a prompt introduction of completed developments requires the creation of the closed cycle "fundamental research-applied research-planning and design operations-experimental production-series production."

The experimental design offices and experimental production facilities organized in the system of the republic's Academy of Sciences and other ministries and departments in the last few years play an important role in this.

However, the problem of acceleration of the process of introduction of scientific developments is far from solved, many developments remaining unintroduced. It is necessary to increase the responsibility of collectives of scientific institutions for the efficiency of their activity.

The republic automated system of management of the development of science and technology of the Armenian SSR should play an important role in the improvement in the management of scientific and technical progress.

The problem of its development and commissioning is handled by the Armenian affiliate of the All-Union Scientific Research Institute of Problems of Organization and Management of the USSR State Committee for Science and Technology, where the elaboration of the engineering plan of this system should be completed during the first 6 months of this year. Some experience in the planning of the republic automated system of management of the development of science and technology has already been accumulated in the country, in particular in the Ukraine, Latvia and other republics.

The task is to see to it that both the developers and users of the republic automated system of management of the development of science and technology introduce in the shortest possible time the system of management of scientific and technical progress as a subsystem in the republic automated system of management of the national economy.

Improvement in the management of scientific and technical progress is one of the main potentials for an accelerated development of the national economy.

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LACK OF SUPPORT FOR INTRODUCTION OF SOVIET INVENTIONS SCORED

Moscow IZVESTIYA in Russian 1 Jul 83 p 3

/Article by L. Levitskiy, IZVESTIYA correspondent, Tomsk: "Innovation From the Side"/

> /Text/ "For the production of microsuspension polyvinyl chloride we negotiated the purchase of a separator of a Belgian firm. However, tests did not give positive results. We ask that you examine the competitiveness of the centrifugal air classifier for the separation of polyvinyl chloride. The Scientific Research Institute of Chemistry and Technology of Polymers imeni Kargin. Dzerzhinsk."
>
> "Owing to the complexity and unreliability in operation of the averagers of granules of the Prikumsk Plastic Plant (U.S. development), we ask that you examine the problem of the possibility of reconstruction of these units. The Okhtinsk Plastpolimer Scientific Production Association."

I picked only two letters from those addressed to the Scientific Research Institute of Applied Mathematics and Mechanics of Tomsk State University. The thick file contains dozens of them. The essence of the appeals is one--give us your apparatus. Only the sectors and names of enterprises differ. Involuntarily, the following thought comes to mind: Indeed, it is difficult to be a prophet in one's native land. They searched and searched in Europe and across the ocean and gave currency for equipment that by no means was better. Only after being sobered up by failure did they turn to native experience, finding out with surprise about the apparatus existing in Tomsk from the article "Costs Instead of Support" published in IZVESTIYA (No 173, 1981).

It discussed the difficult fate of single-design pneumopulse equipment for the grinding and grading of particles according to size and for the mixing of powders, which did not have analogs in world machinery. Miniature automatic lines prepare and grade granules of any--from 1 to 500 microns--size. Such "jewelers" do not yet exist in other countries.

There are enough people who want to acquire this apparatus. However, as indicated in IZVESTIYA, sectors did not manifest a desire to set up its output. Of course, nor is the scientific research institute at the higher educational

institution capable of meeting the demand of industry. It must take care of itself. However, "someone else's" innovation is unable to break through sectorial prejudice. The 2 years following the publication of the article "Costs Instead of Support" fully confirmed its conclusions.

To be sure, the Prikumsk Plastic Plant could do without American mixers, which need an urgent modification. It was also pointless to search for separators of polyvinyl chloride particles abroad. As long ago as 1978 the Tomsk classifier faultlessly picked small--up to 30 microns--fractions for the All-Union Soyuzkhlor Association. If the Ministry of Chemical Industry had the desire and persistence, its enterprises would have possessed inexpensive and reliable units. They had no equals at the International Khimiya-82 Exhibition.

A reservation must be made here. It is naive to expect that any equipment will be suitable for all cases in life. In order to adapt it to the needs of specific production, sectorial science must join in. Its duty is to translate the universality of prototypes into the language of sectorial technology, to embody them in optimal designs and to determine the circulation for its enterprises. Scientists are ready to participate in such a modification, of course, with financial support.

"We did not get any help," A. Kolmakov, director of the institute, says. "Not a single sector included research on our apparatus in its plans. This means that rates for specific purposes and funds for the development of the base were not added. After the IZVESTIYA article a squall of universal attention swept over us. Everyone demanded certificates, reports and proposals! In time passions calmed down, being of no real use. The proprietor of the new equipment did not appear after all."

The reply to the article by Yu. Kuznetsov, chief of the technical administration of the Ministry of Ferrous Metallurgy, is an example of the lack of interest on the part of the sector. The politely instructive reply is dictated by the desire to relieve the ministry of any responsibility for the protracted inspections of pneumatic equipment. I will cite the last paragraph of the reply, which discloses the attitude of the technical administration to the bothersome Siberians: "With the positive results of the preliminary tests of the equipment for the grinding and classification of iron powder developed by the Scientific Research Institute of Applied Mathematics and Mechanics the USSR Ministry of Ferrous Metallurgy... will take all the necessary measures for the most rapid introduction of this equipment into fields where it will prove to be the most effective." It is not clear from the reply who will conduct these tests and when and what the role of the Ministry of Ferrous Metallurgy will be in them. The sector deliberately did not burden itself with obligations.

Of course, an exacting selection of innovations is necessary. Their competition is always beneficial both for science and production. However, it must be an honest competition determined by the significance of the discovery, not by the departmental affiliation of a scientist and an institute. Often, however, departmental considerations prevail. The fate of another valuable invention by the people of Tomsk, which was also discussed in the article, is an

example. I will recall what was discussed. It is well known how scarce special--stainless, tool and cold resistant--steel is. Rare and expensive additives--wolfram, molybdenum and nickel--are needed for its smelting. Ordinary nitrogen, which is all around us, can replace them. It possesses the remarkable property of transforming commercial steel into high-quality metal. It is introduced into metal in the form of nitrogen containing alloys. Nitrided ferrovanadium is the most widespread of them.

A plant in Zaporozhye manufactures it according to a recently mastered, but obviously unsuccessful and complex, technique. The lightness and porosity of the alloy and the small content of nitrogen in it do not suit steelmakers. The people of Tomsk in cooperation with the scientists of the Institute of Chemical Physics of the USSR Academy of Sciences proposed a fundamentally new method of nitriding ferrovanadium. The technique is simple, reliable, efficient and safe for the environment. A dense alloy, the kind that metallurgists need, containing twice as much nitrogen as Zaporozhye alloy, is obtained. Its cost is one-half lower.

As long ago as 1976 the decree of the USSR State Committee for Science and Technology noted the following: "Important practical results were achieved in the Scientific Research Institute of Applied Mathematics and Mechanics in the production of nitrided ferroalloys in the regime of technological combustion." And furthermore: "It should be taken into consideration that the Ministry of Ferrous Metallurgy will establish an experimental unit at the Chelyabinsk Electrometallurgical Combine." To this day there is no unit here. Only experimental smelting with an alloy brought by the people of Tomsk has been carried out. It was fully successful. The experiment was repeated at the Orsko-Khalilovo Combine.

But there is a problem: Metallurgists do not intend to produce it even for themselves. The All-Union Soyuzferrosplav Association openly does not note the advantageous and cheap technique.

"A new technique of nitriding ferrovanadium has been mastered for the first time in world practice at the Izhstal' Production Association according to the development and with the active participation of your institute. The use of the new alloy makes it possible to reduce the consumption of ferrovanadium for steel alloying to two-thirds or one-half and gives a big economic effect. N. Ponomarev, general director of the association."

A remarkable letter. The line for nitriding was installed directly in a corner of the foundry. It will now produce about 100 tons of alloy. The people of Izhevsk intend to increase its capacity to 300 or 400 tons. Next year the experimental line should also appear in Chelyabinsk. However, the sector needs dozens of times more alloy than what will be manufactured at the first production facilities.

The slow introduction of many innovations developed by higher educational institution science is due mainly to the lack of interest on the part of sectors and their head institutes, which dictate technical policy, in the use of "someone else's" inventions. This means that the proposals by higher educational

institution scientists require special attention on the part of the State Planning Committee and the USSR State Committee for Science and Technology, which are called upon to solve interdepartmental problems. However, even arbitrators forget their role.

In September 1981 the consolidated division of machine building of the State Planning Committee discussed a problem raised by IZVESTIYA--organization of the production of pneumatic units for the grinding and grading of particles according to size and for the mixing of powder-like materials. A protocol of joint actions was agreed upon. Alas, of the seven points of the protocol not a single one was fulfilled.

There is a paradoxical situation: Ministries brush off the stubborn "mechanics," while dozens of plants see saviors in them. On the initiative of the oblast party committee, when it turned out that the protocol "did not work," 20 sets of units were made at Tomsk enterprises. Most of them were transmitted to the plants of the Ministry of Chemical Industry and the Ministry of Ferrous Metallurgy. An air classifier has been tested at the Tulachermet Association recently. It successfully grades nickel and iron powders at the boundary of 50 microns. The capabilities of the new equipment are much higher than the requirements of the All-Union State Standard.

"We are convinced that without pneumatic apparatus we cannot work any longer."

The representative of the Tulachermet Association uttered these words at a repeated conference in the consolidated division of machine building of the country's State Planning Committee. In the middle of April of this year the department representatives met again in order to come to an agreement about the fate of the equipment developed in Tomsk. A joint protocol repeating the first one was again approved. Only the time of output of apparatus was postponed from 1983 to 1985. Two years were lost on talks.

A much more complex barrier--to set up the output of equipment--is next in line. The institute is also waiting for tangible support.

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SIXTH ALL-UNION CONGRESS OF INVENTORS HELD

Moscow TRUD in Russian 26 May 83 pp 1-2

[Unsigned report: "Technical Creativity of the Country's Innovators: 6th Congress of the All-Union Society of Inventors and Rationalizers"]

[Text] Vast opportunities for scientific and technical creativity are afforded to the working people of our country. The army of millions of innovators is making its own weighty contribution to the fulfillment of the decisions of the 26th CPSU Congress. The broad expansion of scientific and technical progress and the mass mobilization of direct participants in production for creative exploration are actively promoted by the All-Union Society of Inventors and Rationalizers [VOIR]. Currently it has a membership of nearly 13 million production pace-setters, experts and scientists.

About 1,400 delegates gathered on 25 May at the Great Kremlin Palace for the 6th Congress of the All-Union Society of Inventors and Rationalizers. This congress will assess the past accomplishments and outline the program for the coming years.

The congress presidium consists of the comrades V. V. Grishin, V. I. Dolgikh and N. I. Ryzhkov; the deputy chairmen of the USSR Council of Ministers N. K. Baybakov and G. I. Marchuk; S. A. Shalayev, a representative of the All-Union Central Council of Trade Unions; responsible functionaries of the CPSU Central Committee, heads of ministries and departments, scientists and production pace-setters.

Guests from foreign countries are taking part in the deliberations of the congress. Ye. I. Tyurin, chairman of the VOIR's Central Council, officially inaugurated the congress.

The congress participants unanimously elected an honorary presidium consisting of the Politburo of the CPSU Central Committee.

Members of the presidium and working commissions of the congress are being elected.

Those present responded with prolonged applause to the greetings from the Central Committee to the 6th VOIR Congress, presented by V. I. Dolgikh, candidate member of the Politburo of the CPSU Central Committee and secretary of the CPSU Central Committee.

Thereupon, the floor was given to Ye. I. Tyurin, chairman of the VOIR's Central Council, for presentation of the report. In behalf of the multi-million army of enthusiasts for technological progress, he expressed heartfelt gratitude to the Communist party of the Soviet Union for its unremitting concern for fostering mass technical creativity and the high esteem in which it holds the activities of inventors and rationalizers, as well as for the good wishes expressed in the greetings from the CPSU Central Committee to the 6th VOIR Congress. He declared that the nation's inventors and rationalizers shall make a worthy contribution to fulfilling the historic decisions of the 26th CPSU Congress.

Thereupon Comrade Tyurin presented the body of the report of the VOIR's Central Council to the congress. He stated that barely 5 years have passed since the 5th congress of the All-Union Society of Inventors and Rationalizers had been held here in the Kremlin. Those 5 years abounded in great events for inventors and rationalizers as well as all working people of this country. The new horizons opened to the party and nation by the 26th CPSU Congress are oriented toward a better life for the Soviet people, year after year, so that their labor would produce higher and higher results, so that our socialist system of society would increasingly reveal its humane nature and unlock boundless creative prospects.

The direct consequences of the decisions of the 26th CPSU Congress were the May and November plenums of the CPSU Central Committee, which focused attention on the social and economic problems of decisive importance to the accelerated development of the entire national economic complex. A major event to the working people of our country and the international worker movement was the 18th Congress of Trade Unions of the USSR, whch put foward a broad program of action for trade unions to implement the decisions of the 26th CPSU Congress. An upsurge of political and labor enthusiasm accompanied that notable date in the history of our multinational socialist state--the 60th anniversary of establishment of the Union of Soviet Socialist Republics.

Further, the speaker discussed the results of activities of the VOIR organizations and the future tasks and prospects. Inventors and rationalizers have fulfilled ahead of schedule, in 4 years, the socialist pledges they had adopted to produce 22 billion rubles in savings to the national economy during the 10th Five-Year Plan period. During that period, more than 378,000 inventions and approximately 23 million labor-saving ["rationalizing] proposals had been developed. The application of 20 million labor-saving proposals and 156,000 inventions served to save the national economy more than 29 billion rubles, or 1.5 times as much as had been thus saved during the 9th Five-Year Plan period.

Describing the VOIR's activities intended to reduce manual labor, the speaker dwelled on the operating experience of VOIR councils in the Zaporozhye region. Major contributions to solving the problem of manual labor have also been made by innovators at forestry management enterprises in Altay Kray, the Magnitogorsk Metallurgical Combine and the USSR Ministry of the Maritime Fleet. It is noteworthy that the increase in output at these collectives was achieved without hiring additional manpower, owing to the application of leading inventions and labor-saving proposals.

The introduction, within the framework of competition among subsectors of industry, of the indicator of reduction in manpower due to the utilization of inventions and labor-saving suggestions, has greatly improved the effectiveness of competition among innovators. Last year alone the application of technological

innovations at enterprises of the Ministry of Chemical and Petroleum Machine Building relieved about 2,000 workers; at the Ministry of the Automotive Industry, 7,000; at the Ministry of Instrument Making, Automation Equipment, and Control Systems, 24,000; and altogether nearly 47,000 workers had been relieved at enterprises of the machine-building subsectors.

The speaker stressed that primary attention should be devoted to inventions that radically alter production processes, such as a machine for the continuous upkeep of railroad tracks, designed by milling-machine operator D. D. Matveyenko, Hero of the Soviet Union and Honored Inventor of the Moldavian SSR. This machine supplants the labor of 100 workers. An adequate provision of machines of this kind to the railroad network could relieve mor than 40,000 workers of manual labor.

But while expressing appreciation of the accomplishments of VOIR councils in reducing manual labor, comrade Tyurin pointed to a number of shortcomings. Tentative analyses indicate that no technical solutions have as yet been devised for mechanizing at least two-thirds of the current manual operations. In industry alone the proportion of manual unmechanized labor is 40 percent. So far finishing operations and the installation of plumbing and electrical fixtures in construction have not yet been mechanized. Many workers are engaged in manual labor at utility enterprises and those of the ministries of nonferrous metallurgy, forest industry and consumer services.

It is a task for VOIR councils to--jointly with trade-union committees--promote most actively the implementation of the "Targeted Comprehensive Program for the Participation of Trade Unions in the Work to Reduce the Use of Manual Labor in the National Economy During 1982-1985 and Through 1990," and to expand the organization of thematic contests for new solutions fostering the mechanization of manual and arduous physical labor, as well as to exploit more effectively the possibilities of the creative combined skills brigades and the advanced knowhow of innovators.

Next, the speaker dwelled on the problem of reducing unproductive expenditures of metals, fuels, energy and raw and other materials and promoting their conservation. VOIR councils have launched broad organizational work to mobilize inventors and rationalizers for a mass drive in behalf of conservation and thrift. Thus for example, the VOIR council and BRIZ [Office for Rationalization and Invention] at the Zhdanovsk "Azovstal'" Metallurgical Plant did much to mobilize the plant's innovators for developing waste-free technological processes. Thematic plans were drafted, and creative combined skills brigades as well as individual inventors were assigned to the principal problems at shops and sectors. The plant management had, jointly with the trade-union committee and the VOIR council, announced contests for the best solutions of specific technical problems relating to the conservation of material and fuel-energy resources.

At the same time, comrade Tyurin pointed out, many VOIR councils and subsector sections still are not adequately exploiting the creative technical potential of working people in the struggle for conservation and exploitation of production potential. There is inadequate monitoring of the application of the inventions that markedly reduce the consumption of materials. At certain enterprises the activities of innovators are not oriented to specific conservation and thrift problems and there is no rigorous accounting of the resources conserved owing to

the application of inventions and labor-saving suggestions, and advanced knowhow is inadequately propagated and utilized as well.

The next part of the report dealt with the participation of inventors and rationalizers in implementing the Food Program and developing technical creativity in the countryside. During the last Five-Year Plan period the savings produced by applying inventions and labor-saving suggestions in the countryside increased by a factor of 2.5, and today they account for more than 1 billion rubles out of the 7 billion rubles saved annually to the entire national economy. But the possibilities for making agricultural production more effective are exceptionally great. VOIR councils should intensify social control over the application of major inventions, the achievements of selection and rationalizing proposals capable of producing considerable economic effects in agricultural production, as well as over their broad utilization. The patronage assistance provided by industrial enterprises to the development of technical creativity in the countryside should be broadened in all ways. Currently such assistance is provided to only 13 percent of kolkhozes and sovkhozes. Contests for the solution of major problems of agricultural production should be organized and conducted more widely.

The report paid considerable attention to aspects of competition among inventors and rationalizers. The drive of Moscow innovators for a broad application to production of the achievements of science and technology, inventions and rationalizing proposals, serving to maximize the conservation of manpower, material and energy resources during the current Five-Year Plan period, is being widely emulated nationwide, as is the drive of Ukrainian innovators, who compete under the slogan "Union of creative thought and labor in behalf of an accelerated development of new equipment and technology." The same can be said of the drive of Belorussian innovators, held under the slogan "Devote to the 11th Five-Year Plan the creative searches of innovators for enhancing the effectiveness of production, improving the quality of performance and reducing manual labor," as well as of the drive of the innovators of Novosibirsk Oblast, held under the slogan "The creative explorations of every inventor should be oriented toward intensifying production and enhancing its effectiveness."

Next, the speaker dwelled on aspects of the invention process in research, design and higher educational institutions.

Comrade Tyurin analyzed the causes of the slow application of many valuable inventions. One cause is the insufficient number of experimental facilities, shops and application sectors. This is a major reason why only about one-third of the new inventions is as yet being utilized in the national economy. Quite a few examples can be cited showing that the delays in applying valuable innovations are causing direct damage to the national economy. At present, for example, the economy loses about 5 million tons of coal (equal to the extraction of several mines) during its transportation alone, owing to the wind-caused loss of the smaller fractions. As far back as 10 years ago, an effective method of depositing a special emulsion on the surface of transported coal had been devised. That invention serves to completely preclude losses of coal due to wind during transportation. The method has passed operating trials. But the Ministry of the Coal Industry maintains only seven emulsion-depositing installations, whereas 70 are needed.

The subsequent part of the report dealt with the activities of public creative associations. The number of their participants has exceeded 1.5 million. In 1982 the public design offices and creative combined skills brigades accounted for nearly one-third of all the inventions and rationalizing suggestions developed and applied in the national economy. It is worth noting that these innovations have been several times as effective as proposals made by individual authors.

Comrade Tyurin commented that the primary task of VOIR councils in the competition is to provide every assistance to innovators in drafting and implementing ambitious pledges and personal and collective creative plans for inventions and rationalizations, as well as in applying them highly effectively in production.

Next, the speaker examined the tasks of VOIR organizations concerning a broad mobilization of youth for technical creativity. Inventiveness and technical creativity among young workers, experts, students and pupils are promoted by the All-Union Contest of the Scientific and Technical Creativity of Youth, organized by the Komsomol Central Committee, the State Committee for Science and Technology, the VOIR Central Council and the VSNTO [All-Union Council of Scientific and Technical Societies]. The number of its participants has grown by 5 million during the period covered by the report and at present it exceeds 20 million. Thirty five thousand schools of the young rationalizer operate in this country and train more than 800,000 people a year.

The speaker considered problems of popularizing technical creativity among students at vocational and technical colleges as well as among university and school students.

Further, the speaker described the international activities of the All-Union Society of Inventors and Rationalizers.

In conclusion, he stated that the VOIR congress is occurring during an important period of nationwide struggle to implement the 1983 Plan for the Economic and Social Development of the USSR. The decisions of the November (1982) CPSU Central Committee Plenum and the important tasks enunciated by Yu. V. Andropov, General Secretary of the CPSU Central Committee, in his speech at the conference of first secretaries of Union republic CP central committees and kray and oblast party committees regarding the problems of developing agriculture and implementing the Food Program require total devotion of the creative efforts and energies of the Soviet people and redoubling of effort to utilize reserves and possibilities more fully. Together with the entire Soviet people, the country's inventors and rationalizers are resolutely determined to make the 11th Five-Year Plan Period one of new creative accomplishments, new successes in the struggle to fulfill the decisions of the 26th CPSU Congress. On behalf of the congress delegates and all of the country's inventors and rationalizers, comrade Tyurin assured the CPSU Central Committee and the All-Union Central Council of Trade Unions that the members of the All-Union Society of Inventors and Rationalizers shall devote all their efforts, knowledge and experience to translating into reality the party's historic directives.

Following the presentation of the report, the floor was given to B. R. Kuznetsov, chairman of the Audit Commission of the VOIR Central Council. He presented the commission's report.

This was followed by discussion of both reports. The delegates expressed ardent gratitude to the CPSU Central Committee for its great appreciation of the activities of inventors and rationalizers and unremitting attention to and concern for promoting technical creativity in the country. Speaking from the tribune of the congress, workers, engineers, agricultural toilers and scientists averred that they shall take an active part in accomplishing the tasks posed by the party as regards accelerating scientific and technical progress.

The floor was taken by Yu. A. Perfilov, chairman of the Moscow City Council of the VOIR. He described the contributions of Moscow innovators and the great work they are doing to apply new equipment at enterprises. VOIR councils at industrial enterprises in the nation's capital continually foster creative bonds with inventors and rationalizers at research institutes. This creative collaboration has produced tangible results at the Automotive Plant imeni I. A. Likhachev, the "Kompressor" Plant, and many other enterprises.

The speaker also dwelled in detail on the provision of favorable conditions for the application of innovations. Application shops and sectors proved to be highly effective. At the same time, in comrade Perfilov's opinion, not everything depends on VOIR councils. There exist effective innovative projects that are of inter-subsector importance. As a rule, these projects are the slowest to be applied. Apparently it is time to introduce a centralized procedure for handling these innovations.

The floor was given to V. F. Zakharov, chairman of the Leningrad Oblast Council of Innovators, Hero of Socialist Labor.

He noted: "A major role in the innovator movement is played by creative laboratories. Analysis of their operations shows that each year the average such laboratory develops and promptly introduces several dozen specimens of new instruments and devices serving to produce considerable savings. Unfortunately, such creative laboratories are still few. Their establishment and operation encounter certain difficulties. Apparently it is time to assess the experience of all subdivisions of this kind and draft a standard charter that would officially determine their status, rights, duties and system of relations with the administration."

The next speaker was V. I. Ryazantsev, chairman of the Ukrainian Republic VOIR Council. He described the work being done in his republic to apply inventions and rationalizing suggestions. Once a year VOIR councils, jointly with economic administrators, analyze all the adopted proposals that have not yet been utilized. A schedule for their application is composed. Such regular public stocktaking has made it possible within just 2 years to apply 129,000 "rusting" proposals producing an economic effect equal to 157 million rubles, without spending any additional funds, and to augment the proportion of utilized innovations to 88 percent of the total of accepted innovations.

Z. V. Bondarenko, equipment operator at the Mogilev Artificial Fiber Plant and Heroine of Socialist Labor, described how the plant's inventors and rationalizers struggle to reduce manual labor. Each year all labor-intensive operations are vetted. Special thematic plans enumerating production bottlenecks are drafted. The innovators work to fulfill these plans. This approach resulted in elevating the level of the mechanization and automation of production. But there also exist

unsolved problems at that enterprise. For example, no success has been achieved in mechanizing the packaging of products.

The floor was taken by D. M. Parmakli, chairman of the Kagul'skiy Rayon Council of Moldavian SSR Kolkhozes, Honored Rationalizer of the Republic. He noted that the principal crop of the republic is viticulture. Industry manufactures nearly 43 different types of equipment for vineyard operations. But in practice most of that equipment cannot be used, because it is not adapted to the cultivation of the vine. Rural inventors have developed quite a few innovations which in a number of cases are superior to series-produced machines. For example, rationalizers at the Kolkhoz imeni V. I. Lenin constructed a machine for the planting of vineyards--a most laborious operation whose labor-intensiveness has thus been reduced by a factor of more than 5! But even so only a single specimen of this machine exists. The experience of rural inventors and rationalizers should be disseminated and they should be provided with concrete assistance in introducing new equipment.

K. T. Turysov, chairman of the Kazakh republic trade-union council, declared: "Kazakhstan's inventors and rationalizers actively participate in the socialist competition for a successful fulfillment of the tasks of the 11th Five-Year Plan. The introduction of many valuable innovations enabled the principal branches of the republic's economy to advance to new frontiers."

The speaker also analyzed many negative aspects that hamper the application of valuable proposals by innovators. In comrade Turysov's opinion, it is expedient to assure a close linkage between the state plan for the application of inventions and major rationalizing proposals and material-technical supply.

In his speech, K. D. Kyazimov, chairman of the Azerbaijan Republic VOIR Council, declared: "In our republic much is being done to solve the problem of applying technical innovations. The "Novator" [Innovator] Design and Technology Organization was established with the object of applying inventions and rationalizing proposals to the national economy. In the years since its establishment "Novator" has prepared for utilization more than 2,000 innovations producing an economic effect of about 100 million rubles. Similar organizations operate successfully in Latvia and Estonia. It would be advisable for the State Committee on Inventions and the State Committee for Science and Technology to consider establishing an all-Union application center with branches in all Union republics and major industrial regions."

The next speaker was Ye. V. Chadin, assistant foreman at the Obukhovo Rug Production Association in Moscow Oblast. This Honored Rationalizer of the RSFSR described how equipment productivity at his enterprise is being augmented through the application of inventions and rationalizing proposals. Innovators have proposed many refinements in modernizing weaving equipment, some of which deserve widespread application. Thousands of assistant foremen would be grateful for a chance to familiarize themselves thoroughly with a special anthology describing the latest innovations intended to augment the productivity of weaving equipment.

L. A.Meliksetyan, head of the central laboratory at the Armkhrustal' [Armenian Crystalware] Plant and VOIR Prize Winner, declared: "Much work is being done in Armenia to utilize inventions. But instances of red tape in utilizing them and delays of payments of the specified rewards are still frequent. Consider one

example: At our association a technology for producing low-lead crystalware has been in use since 1980. Its economic effects exceed 1 million rubles a year. But the USSR Ministry of the Construction Materials Industry uses various pretexts to avoid paying a reward to the technology's inventors. The organizations of our society should institute a most thorough monitoring of the prompt payment of rewards to inventors."

S. N. Fedorov, Corresponding Member of the USSR Academy of Medical Science, declared:

"Many products developed at our institute surpass the world level. We export our products to the United States, England, India and other countries. Our plan provides for acquiring the equipment needed at the clinics under our patronage with part of our share of profits from the exports. Currently the institute's specialists can correct myopia in nearly any individual in whom it does not exceed 9-10 diopters. About 8,000 operations of this kind have already been carried out, with 90 percent of the patients recovering normal vision. But there is no doubt that our method could become still more widespread if it were supported by organizational measures."

Professor Fedorov presented two proposals: one, for resolving the questions of establishing production-technical facilities to operate on cost-effective principles under medical centers, and the other to accelerate sharply the application of the new technology, to be accompanied by a mandatory proscription of the old methods of diagnosis and treatment.

V. B. Yuzhina, chairman of the Mandate Commission and secretary of the VOIR Central Council, presented the report of the Mandate Commission.

The floor was given to V. A. Romanov, foreman at the Magnitogorsk Metallurgical Combine and Hero of Socialist Labor. The speaker noted that the exploration of new ways of conserving materials and fuel-energy resources is a major direction of the creative activity of innovators at the combine. On an annual basis, at the combine every second ton of metal, one-fifth of electricity and one-third of fuel are saved owing to the application of technical projects developed by inventors and rationalizers. The utilization of the ideas of innovators accounts for as much as 30 percent of the overall growth in labor productivity.

Other speakers at the congress were: Academician I. A. Glebov, chairman of the Commission for Science and Technology under the USSR Supreme Soviet, Hero of Socialist Labor, State Prize Winner; I. M. Cherepanov, secrtary of the Moscow Oblast CPSU Committee; N. D. Gubenko, fitter at the rolling stock depot of the Yasinovataya Station of the Donetsk Railroad, Hero of Socialist Labor, Honored Rationalizer of the Ukrainian SSR; A. T. Skaldin, chairman of the Maritime Kray VOIR Council; I. N. Ordzhonikidze, secretary of the Komsomol Central Committee; L. A. Yakovlev, chairman of the Central Committee of the Trade Union of Automotive Transport and Highway Workers; and Ya. A. Podin'sh, deputy minister of Agriculture Latvian SSR, chairman of the republic section for inventions and rationalization in agriculture.

Greetings to the congress delegates were presented by the foreign guests: L. Dmitrova, secretary of the Central Council of Bulgarian Trade Unions; L. Bukta, head of the economic department of the All-Hungarian Council of Trade Unions; Le

Chung Quyen, deputy head of the production department at the Federation of Vietnam's Trade Unions; G. Mueller, chairman of the board of the Association of Free German Trade Unions in Gere District; and L. Delmonte, chairman of the Cuban National Association of Innovators and Rationalizers.

Today the congress is continuing its deliberations.

Congress Delegates Comment

/DURING THE PAUSES BETWEEN SESSIONS OUR CORRESPONDENTS MET WITH DELEGATES TO THE 6TH VOIR CONGRESS AND ASKED THEM THE QUESTION: "IN YOUR OPINION, WHAT SHOULD BE DONE TO ACCELERATE THE APPLICATION OF INVENTIONS AND RATIONALIZING PROPOSALS?"| [printed in boldface]

Yu. Strigachev, chairman, Moscow Oblast VOIR Council:

"One considerable obstacle hampering the application of major and principal technical solutions is our national practice of evaluating the status of invention and ratinalization work at an enterprise basically according to quantitative indicators such as the volume and number of new innovations. This approach sometimes promotes the application of minor and relatively ineffective rationalizing proposals. How then should the technical creativity of work collectives be evaluated? In my belief, according to the end-result of their economic performance. But this requires different criteria.

"At the outset of the 11th Five-Year Plan period the Moscow Oblast VOIR Council had, jointly with the Coordination Council under the Moscow City CPSU Committee and the Moscow Oblast Trade Unions Council, based the competition among work collectives also on indicators of the concrete contribution of innovators to the solution of such most important national-economic tasks as the reduction of manual labor and the conservation of all kinds of resources. We were thus enabled not only to evaluate objectively the results of local technical creativity but also to take steps to improve it and expedite the application of important technical solutions capable of markedly influencing the production processes and producing considerable economic effects.

"This work resulted in making the activities of Moscow Oblast innovators more purposive and effective. In 1982 they accounted for 57 percent of the savings of ferrous and nonferrous metals, 29.7 percent of the savings of electricity and 34.3 percent of the reduction in manual labor."

N. Gryazev, fitter-toolmaker at the "Elektronika" Voronezh Electronics Production Association, Hero of Socialist Labor, Honored Rationalizer of the RSFSR:

"Our enterprise manufactures regular and video tape recorders. Such products require continuing refinement and updating.

"The plant's innovators pioneer in improving the quality of production and refining the technological processes. Our method for applying innovations is simple and effective. For example, previously workers used to notch soldering rings. I designed an automatic machine for mechanizing that operation and notified the BRIZ [Office for Rationalization and Inventions]. It is mandatory for every rationalizing proposal and invention to be considered within 2 weeks.

If its author needs help, a special application team is set up. The team's task is to construct the innovation and apply it to production. Within a month the automatic machine I had proposed already relieved 10 persons of manual labor.

"Of course, it is good that we have no problems with application at our plant. But this automatic machine should also start operating at dozens of other subsector enterprises. I am convinced that they also would be pleased to build and use it. The trouble is that we simply are ignorant about any innovations developed at our fellow plants--and they are ignorant about ours. I think that the technical administrations at ministries, which are responsible for the application of new equipment, should organize a regular exchange of ideas among innovators at plants of the same subsectors. There is a need for more frequent encounters, official trips, seminars, and the publication of bulletins."

G. Ilizarov, Director, Kurgan Scientific Research Institute of Experimental and Clinical Orthopedics and Traumatology, Hero of Socialist Labor, Honored Inventor of the RSFSR:

"In medicine, as nowhere else, the path of the invention from idea to practice has to be the shortest possible. It is no sin to conceal that so far this goal is still distant. For example, it took us 20 years to assure a broad application of an apparatus promoting a rapid healing of bones. And yet, medical technology, like any other technology, becomes obsolete very rapidly. I think that it would be rational to establish within the system of the Ministry of Medical Industry a special subdivision for building prototype models of the ideas of medical innovators, testing them and organizing their series production.

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APPLICATIONS OF ACADEMIC RESEARCH NEGLECTED BY INDUSTRY

Moscow SOVETSKAYA ROSSIYA in Russian 20 Apr 83 p 2

[Article by V. Fedyakin, Kuybyshev Oblast: "To Whom Should Innovations Be Entrusted: What Are the Reasons for the Aging of the Research Projects of Higher-School Scientists Ordered by Enterprises"]

[Text] Yuriy Ivanovich Bayborodov lives at the Volzhsk Hydroelectric Power Station [GES], in a dormitory. For months. Yet he has a Kuybyshev residence permit and is an employee of the Kuybyshev Aviation Institute, located dozens of kilometers from the GES. What is a candidate of technical sciences doing here? He is developing fundamentally new "flexible metal-plastic segments for hydro-generators" or, as the professionals call them, bearings along which slides the rotating giant body of a turbine.

Without going into technical details, let me explain: unlike the traditional babbit bearings, the new bearings do not fracture every time the generator is stopped. What is more, the segments of the new design can withstand loads to an extent making it possible to develop superhigh-capacity turbines and hence also advance our entire hydroelectric power industry. But all that is a matter of the future, while for now Yuriy Ivanovich, together with several skilled workers from the GES's machine shops, is largely engaged in the routine production of bearings for the country's other GES'es. He is afraid that, if he leaves, a cause worth laying down one's life for may become neglected.

You will agree that it is not normal when a promising scientist has thus to promote his invention, by rolling up his sleeves. It is not normal when recognition arrives after years and years of jury-rigging work without support from advanced industry. But what is much more abnormal still, such a situation is the norm rather than an exception for the higher schools as a whole with their huge present-day research potential.

It is a fact that even at the Kuybyshev Aviation Institute--one of the principal higher-school research centers in the Volga Region--research projects often remain on paper only. Why?

Let us consider how does the application of a research project benefit an institute. Little, at most. It does not receive a percentage of the profits of enterprises for the output sold. Is the application advantageous to a scientist? If it is a major success, yes. But first, one has to live so long. Secondly, consultantcy contracts do not, as a rule, provide for the inventor's direct participation in the application process. The subsector becomes the sole owner of the project developed by a higher school! And under the law it is not at all accountable to the state for applying a project.

Now let us view the problem through the eyes of a typical plant director, the "enemy No 1" whose defenses--the need to catch up with plan fulfillment, shortages of manpower and other problems--have to be breached by our "innovator." Consider this scene: the innovator enters the director's office and declares:

"I've an idea! I can double labor productivity and assure incalculable savings of energy and metal!"

I repeat: You are a good director, an honorable man, and this prospect attracts you. So, of course, you ask:

"What's your idea? Show me."

This is where confusion grips the academic inventor: "You see, our higher school lacks design personnel. But here are the blueprints. May I lose my head if they fail. Just follow them and the thing will work."

The plant does not need a decapitated head. What it needs is a tried and tested prototype, new equipment and tools and, ultimately, not just one or two but at least a series of finished products in order to ascertain that the game is indeed worth the candle. Who will attend to this? The average higher school lacks the proper design facilities and the more so experimental production facilities. For this reason, most of its projects either remain on paper only or culminate in the construction of a mockup or experimental model that does not allow for the technological and other realities of a given enterprise. How can the average plant further develop the project considering that its facilities and personnel are fully occupied and it has a minimum of reserves? Moreover, if the project concerns a fundamentally new type of production, there is hardly any indicator of economic preformance that is conducive to altering the variety of the currently manufactured products.

So then you, the director, say: "Well, leave the blueprints with me."

And you pigeonhole them. You, the head of the enterprise, sometimes even find it advantageous to spend the funds allocated by your subsector for conducting scientific research work on also utilizing for this purpose the wage fund and personnel of an "outsider" agency--the Minvuz [Ministry of Higher and Secondary Specialized Education]. You profit without having to make any sacrifices. In itself, a consultantcy contract is not a plan document and hence, even if it specifies the schedule and scale of the application of a research project, the customer bears no responsibility for implementing them.

Such is logic: everyone has his own logic.

As a result, the reported applications of research projects and the millions of rubles in effects that they produce not infrequently exist only on paper. At one ministry I heard someone say: "Higher-school research resembles a mighty tractor that hauls a little dolly." This concerns a sphere of activity or, more exactly, a branch of production--experts and ideas--employing one-half of all doctors and candidates of sciences. Their researches are of little real use to the national economy and their intellectual efforts are largely wasted.

It might seem that the academic institution and the subsector enterprise are natural allies. The former trains qualified personnel for the latter and,

moreover, it is ready to fulfill concrete intellectual orders. The enterprise, on its part, disposes of funds which could be at least partially spent on promoting research work at the academic institution, and moreover it is a source of potential students and auditors at advanced training courses. Natural allies....But there is no free dialogue between them.

One administrator explained to me: "Our 'parents' are different." And as known, intra-subsector relations are stronger and firmer than external relations. A variety of institutes maintains design bureaus and machine shops that resemble small or even medium-sized plants. They are supposed to facilitate things greatly. Such "homegrown" enterprises not only translate research projects into reality but build equipment and tools for production and develop technologies: well, you stubborn director, come and make use of it all.

But the plant directors do not come, or rather come rarely. On viewing condescendingly the new little plant, which they receive practically gratis (well, for some building materials, equipment, etc.), industry people provide it with the assistance needed for its growth, but in return...assign an output plan to it. So now the academic institution begins to die-forge components for series-produced engines or some electronic units, and within 5 minutes doctor of sciences Bayborodov, who figured at the outset of our tale, with his own hands provides bearings for the country's GES'es.

But would not it be better for each to do what he specializes in: for the higher school to teach and for the builders to build? Of course, academic research needs a kind of "selection centers" at which the audacious ideas of scientists could be tested and future operating personnel, including students, would learn and advance their qualifications. Such centers should be developed--and this is being attended to at present by the RSFSR Minvuz. But there are reasonable limits!

Why cannot the State Committee for Science and Technology, the USSR Academy of Sciences and the Minvuz, jointly with other interested agencies, develop a master plan for the geographical distribution and development of a network of experimental-production facilities for science as well as OKTB's [design and technology offices based on public participation] with pilot production facilities based on specialization and inter-agency cooperation? That would be a cardinal solution of the problem.

In practice the solutions may differ. Let us dwell on a solution having the indisputable advantage of being engendered by and tested in practice. The locale: Togliatti. The "characters": the Togliatti Polytechnical Institute and the Volzhsk Automobile Plant [AvtoVAZ]. More than 5 years ago a small creative brigade had been formed there. It was conceived out of need when intricate equipment broke down and experts were unavailable. The polytechnical institute operated in the same city and had long been offering its services and projects. Of course, these projects had still to be refined, but why not give it a try? And so, on the initiative of A. I. Grechukhin, chief of the machine assembly shop at the Volzhsk Automobile Plant, scientific-production division of electronic control devices was established on co-partnership principles, with part of its personnel being subordinated to the plant and another part to the Togliatti Polytechnical Institute [TPI].

The institute assigned its staff members and the AvtoVAZ its personnel and moreover it allocated premises and an experimental sector to the division. The division's operations, which are closely linked to those of the other plant services, are geared to the solution of the most urgent problems of a constantly changing production. During the first year of its existence the new collective built and installed in existing equipment 20 sets of measuring devices that proved to be extremely expedient.

At first the cooperation was forced, but later it turned out to be mutually advantageous. After all, the plant's economists know how to count. Now there are four divisions of this kind at the plant. As stated in the general agreement between the institute and the association, concluded for the five-year period: "The TPI and the AvtoVAZ will conduct joint scientific research work to develop new technological processes and equipment as well as to design automotive components and elements with the object of reducing metal-intensiveness, mechanizing and automating labor-consuming manual operations, improving the quality, reliability and competitiveness of the automobiles produced, and automating engineering calculations and the design of components and elements." Proposals for the pratical utilization of research findings will be considered by a joint scientific and technical council.

The example of Togliatti is not the only one in this country. As was pointed out at the 1980 All-Union Conference of Higher Schools, so far as applied research is concerned, it has become a widespread practice for higher schools to conduct scientific research on the basis of joint plans together with ministries and departments which obligate themselves to handle prototype and experimental work and apply the findings to production. This makes it all the more important to understand why such close cooperation has become possible. After all, despite the explorations of new organizational forms, the relations between the Togliatti Polytechnical Institute and the Volzhsk Automobile Plant still are based on traditional contractual principles and hence should have been complicated by all the aforementioned minuses.

Yet these complications did not arise. The plant itself cooperates satisfactorily with the institute, as if oblivious to the "loopholes" afforded to it by the sluggish mechanism of interdepartmental relations. Of course, the plant became convinced of the seriousness of the intentions and the real practical benefits of the reearches of its academic neighbors. Cooperation means mutual trust, but it also means more than that: cooperation means mutual trust multiplied by common interests.

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SCIENCE AND TECHNOLOGY PROGRAMS DISCUSSED

Moscow MOSKOVSKAYA PRAVDA in Russian 9 Jun 83 p 2

[Article by V. Polunin, head of the Department of Science and Higher Schools, Moscow City CPSU Committee: "On the Basis of Comprehensive Programs"]

[Text] Scientific and technical progress is, as stressed in CPSU documents, a most important premise for the intensification of the socialist economy.

An effective means of uniting science with production and pursuing a unified scientific policy is afforded by the state scientific-technical programs developed on the decision of the 26th CPSU Congress by the USSR State Committee for Science and Technology [GNTK], the USSR Gosplan, the USSR Academy of Sciences and ministries and departments. These programs are fully adequate to the party-imposed task of combining the achievements of the scientific and technical revolution with the advantages of socialism. These programs serve to exploit latent scientific and technical potential on a planned basis and on the scale of the entire country.

For the 11th and 12th five-year plan periods, 170 major state scientific-technical programs incorporating 7,500 tasks and 36,000 of their component parts-stages have been drafted. These programs encompass a vast range of research and development work and provide for its speediest possible application primarily in the fuel-energy and agrarian-industrial complexes, machine building, metalllurgy, instrumentmaking, chemical industry, transport, public health and consumer goods production.

Economists have calculated that the implementation of the state scientific-technical programs will serve to save 4 million tons of ferrous metal, 50 million tons of standard fuel and 14 billion kwh of electrical energy. The economic effects of the introduction of new equipment and technologies in 1985 have been estimated at the level of about 16 billion rubles.

Moscow is, as known, the country's largest research and economic center. Experts in the nation's capital have greatly contributed to implementing state scientific-technical programs: Moscow scientists participate in fulfilling nearly one-third of these programs. In addition to the considerable effects produced by these programs to the state as a whole, their implementation will serve to markedly raise the level and quality of performance of Moscow's industry and increase

labor productivity and improve working conditions. The application of new equipment and activation of production capacities will assure organizing the series production of new products, the expansion of the scale of the production of progressive products and the application of new technologies. For example, the State Bearing Plant No 1 [GPZ-1], the "Stankoagregat," "Stankokonstruktsiya," S. Ordzhonikidze and "Krasnyy Proletariy" machine tool plants, the "Kompressor" Plant, the Automatic Line Plant imeni 50th Anniversary of the USSR and others, jointly with a number of research and design organizations, participate in the development and introduction of high-capacity metal-cutting equipment, including equipment provided with computerized controls, as well as of combinations of metal-cutting machine tools and automatic lines. The use of automatic manipulators with programmed control as well as of means of computer and electronic technology for controlling the operation of equipment will serve to increase labor productivity during the machining of machine elements by a factor of 1.5-5. More than 20 Moscow academic and subsector-of-industry institutes and higher schools are taking part in the work to develop and refine automatic manipulators. Instances of this kind could also be cited for many other branches Moscow's economy.

The restructuring of the organization of the research process has also entailed some restructuring of the party's guidance over scientific establishments in order to implement it more concretely. For many years, party organs have consistently been posing the task of concentration on major research topics and focusing of efforts and resources on the principal directions of science and technology, eliminating trivial research topics. Now that state scientific-technical programs exist, the priority of some or other research topic can be clearly determined, as can be the importance and primacy of some topics over others and the directions in which research efforts and material-technical resources should be concentrated. Thus, more favorable conditions have arisen for concrete management of science by the party.

Under these conditions the most important party tasks are, first, the mobilization of scientists, engineers and designers for active participation in implementing the programs and, second, the assurance of party control over that implementation and the prompt application of R&D findings to production.

The Moscow City CPSU Committee has drafted measures to assure effective monitoring of the implementation of the scientific-technical programs. In 1982, pursuant to the resolution of 30 June 1982 of the Committee's plenum, which outlined the tasks of the city party organization relating to the fulfillment of the decisions of the 26th CPSU Congress to further develop science and improve the performance of research institutes and design bureaus, and strengthen the bonds between science and production, lists of stages and targets relating to the 58 most important scientific-technical programs being implemented by Moscow's organizations and enterprises were compiled and distributed to rayon party committees, along with lists of the affected research institutes, design bureaus and science-production associations located within particular rayons, as well as along with fulfillment schedules. This information enables the rayon party committees to assure party control over the fulfillment of scientific-technical programs at the rayon level and to organize the active participation of every scientific collective, every department, sector and laboratory in that fulfillment.

Many CPSU rayon committees are making good progress in this work. Monitoring the effectiveness and purposiveness of the efforts of research and design collectives and their party cells has at present become a focus of attention when considering the related problems at plenary and other sessions of the rayon party committee bureaus as well as at meetings of the party-administrative aktiv. And the results of such monitoring are decisive to the results of socialist competition among research establishments.

At the same time, state scientific-technical programs are not only of inter-subsector but also of inter-regional and inter-territorial nature. As known, they are being implemented with the participation of personnel with differing administrative jurisdiction, located in different rayons of the Nation's Capital. Hence the growing role of the branch factor, of branch departments of the Moscow City CPSU Committee, in the work to assure party control of the fulfillment of these programs.

The assurance of control by the departments of the city party committee is also important because the end-results of the implementation of these programs have a direct bearing on production. This refers to the construction of prototype and series-built specimens of machinery and mechanisms, the organization of new progressive technological processes and, lastly, the mass production of new equipment and goods. Thus this concerns party control and party influence over every element of the unified chain of scientific and technical progress, "science-technology-production."

At present party organizations at Moscow's research institutes, design bureaus and higher schools are working extensively to mobilize the collectives of scientists for the fulfillment of these programs. It is time to demolish the opinion, still persisting in some places, that these programs are supposedly something special lying outside the specific plan of activities of a scientific collective. Party control precisely begins with explaining to managers, experts and scientists that these programs are the most important component part of the state plan, however limited the participation of a given research institute, design bureau or higher school in implementing them may be. The directive-based nature of the programs also should be emphasized again and again.

It should be considered that the programs will be effective once the importance of their tasks is understood by every organization and every scientist, engineer and technician. Considering the long-range nature of these programs, constant and systematic efforts by party organizations are needed to mobilize scientific collectives for their fulfillment. Educational and explanatory work is among the main aspects of the related activities of the party organizations.

The system for assuring party control over the implementation of the programs also includes persistent and daily monitoring of the manner in which the programs (their targets and stages) reach all their executors and their implementation is assured with financial, material, manpower and technical resources.

Unremitting attention by party committees and organizations is required by problems of assuring interaction between the main organizations and implementors. All these aspects have to be considered at joint sessions of party committees and bureaus at the scientific establishments and organizations participating in the implementation of scientific-technical programs. The practice of establishing

councils of the secretaries of party organizations at the scientific and production establishments participating in the implementation of these programs is becoming widespread.

The party committees and bureaus within scientific collectives are called upon to consider regularly at their sessions problems of the participation of scientists, party members, in the implementation of the programs and their strict accountability for the on-schedule fulfillment of targets. Commissions for control over the activities of the administration as well as for promoting the application of achievements of science and technology to production should also be mobilized for this work.

The rayon party committees should energize the activities of the rayon councils for science as well as of technical-economic councils.

The work to implement the scientific-technical programs and the fulfillment of their targets and stages should occupy a worthy place in the socialist pledges and personal creative plans of scientists, designers and engineers.

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BRIEFS

LICENSING AGREEMENTS WITH ROMANIA--In Tallinn a licensing agreement was signed between the USSR foreign trade organization "Litsenznauka" and the foreign trade industrial association "Tekhnoimporteksport" of the Socialist Republic of Romania and in accordance with which the special design bureau of the Estonian SSR Academy of Sciences is sending documents to the license purchaser for manufacturing an electron capture detector. The detector will be set up on a chromatograph manufactured by the Romanian enterprise "IYaUK" [expansion unknown]. This is the first licensing agreement both in the Estonian SSR Academy of Sciences and in the experience of a working group on scientific instrument making of the CEMA committee for scientific-technical cooperation. As is generally known, the special design bureau of the Estonian SSR Academy of Sciences is actively participating in the work of this group. Very soon it is planned to conclude a long-term agreement with the Romanian enterprise "IYaUK" concerning scientific-technical cooperation, and during which the Romanian side plans to purchase several more licenses for production of chromatographic equipment. [By A. Paal'] [Text] [Tallinn SOVETSKAYA ESTONIYA in Russian 8 Apr 83 p 2] 9889

AMERICAN TECHNOLOGY TRANSFER--The "Nauka" publishing house has published the book "American Neocolonialism and Technology Transfer" in which the USA's neocolonial technological policy with regard to developing countries is examined. The author is R. I. Zimenkov and it is 223 pages. It is shown in the book that a policy of this kind has the objective of creating the most favorable conditions for economic expansion of American monopolies, developing capitalism in new states and their ties to the USA, and providing an ideological influence in these countries. The role of American transnational corporations (TNK) in the area of international technology transfer is revealed in the monograph. It is shown that TNK activities have negative consequences for the economic development of states which were liberated from colonial oppression. The conditions and nature of corporate technology transfer reduce its significance for economic development of new states and often exert an unfavorable influence on the growth of national technical potential, and they engender a new form of dependence--technological. The study sheds light on the struggle of new states for normalization of conditions in their acquisition of technology from countries of the West. [By B. Vasil'yev] [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 25, June 83 p 20] 9889

SOVIET-CUBAN SOIL RESEARCH--"Contacts of scientists from Soviet Armenia and Cuba are developing further and they are embodied in various spheres of our country's national economy," declared Cuban Communist Party Central Committee member and Cuban Academy of Sciences President Vil'fredo Torres who was in Yerevan and headed a delegation of Cuban agricultural scientific workers. "This cooperation," he noted, "finds reflection in the area of land reclamation and development of salt marshes, mechanization and electrification of agricultural production, and the use of solar energy." Armenian and Cuban soil scientists have conducted joint research for more than 30 years. Soviet specialists depart for the island of freedom to exchange experience and render assistance, where along with their Cuban colleagues they implement measures in the struggle with soil erosion and development of saline lands in particular. This research is conducted in accordance with an agreement on scientific cooperation between the Armenian Soil Science and Agrochemistry Institute and the Soil Science Institute of the Cuban Academy of Sciences. The results of their joint labor appeared in a collection published in Yerevan which is devoted to research of Cuba's soil resources and questions regarding their conservation and efficient use. Vil'fredo Torres reported that gold medals from the Cuban Academy of Sciences were presented to the Armenian Soil Science and Agrochemistry Institute for actively assisting in the development of Cuban science and training agricultural scientific specialists. At the end of the discussion, V. Torres expressed concern for the fate of peace on our planet. "The problems of peace and war have always troubled humanity," he emphasized. "Today, this question stands before people with particular sharpness because never before has the power of weapons been so destructive and threatening. Particular responsibility for the fate of the planet now lies with scientists who take a clear view of the catastrophic consequences of thermonuclear war. The all-union conference of scientists for saving humanity from the threat of nuclear war and for peace and disarmament, which was held in Moscow, expressed a sincere desire to objectively understand the complicated and dangerous situation in which humanity has found itself and the unwavering purpose to find a way out of it." [By A. Akhumyan] [Text] [Minsk SEL'SKAYA ZHIZN' in Russian 16 Jun 83 p 4] 9889

CEMA CONFERENCE ON MICROPROCESSING--The problems for widely introducing microprocessing equipment in the national economy was discussed at an all-union conference which opened in Moscow on 21 June at the USSR VDNKh [Exhibition of Achievements of the National Economy]. Deputy Chairman of the USSR Council of Ministers and Chairman of the GKNT [State Committee for Science and Technology] G. I. Marchuk, CPSU Central Committee Department Chief I. F. Dmitriyev, ministers, scientists, and leaders from enterprises and design bureaus are participating in its work. Leaders of the state committees for science and technology; leading specialists on computer technology from Bulgaria, Hungary, German Democratic Republic, Cuba, Mongolia, Poland, Romania, and Czechoslovakia; and executives from the CEMA Secretariat arrived for the conference. In accordance with the state program developed for the automation of production, before 1990 it is planned to establish 22 automated enterprises and 64 automated complexes, including those on the basis of lines being flexibly readapted for the use of robots. More than 40 ministries and departments are participating in the implementation of this program. The execution of a common program for the development of microprocessing technology by CEMA member countries also has begun successfully. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 22 Jun 83 p 2] 9889

SOVIET-CANADIAN TRADE MEETING--The third session of the Soviet-Canadian Joint Commission on Economic, Industrial and Scientific-Technical Cooperation took place in Moscow. Participants at the session noted with satisfaction the progress achieved during recent years in economic-trade, industrial and scientific-technical ties of Canada and the USSR, and the favorable possibilities for their further development. Henceforth, the commission will also be guided by the understandings reached earlier, including the long-term program for economic, industrial and scientific-technical cooperation signed in 1978. The delegations stated that it is important to continue active joint efforts in the indicated areas. This will promote general development of Soviet-Canadian relations, mutually beneficial cooperation, and thereby assist in realizing the principles of the concluding statement at the Helsinki conference concerning cooperation in economics, science and technology. A protocol was signed in accordance with results of the session. Deputy Minister of Foreign Trade V. N. Sushkov headed the Soviet delegation at the session and Minister of International Trade D. Rigan headed the Canadian delegation. The next session is planned to be held in Canada next year. In a conversation with journalists after signing the protocol, D. Rigan called the session meetings exceptionally useful and productive. He gave that evaluation on behalf of the government and business circles of Canada. "I express satisfaction with signing a document which laid the basis for further growth of our countries' cooperation," noted the minister. "There are good possibilities for expanding the range of economic-trade exchange and, in particular, for expanding Soviet exports to Canada. We are leaving Moscow filled with optimism." [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 24, Jun 83 p 2] 9889

ECONOMIC SYSTEMS MANAGEMENT CONFERENCE--The eighth all-union seminar-conference on managing large systems was conducted in Alma-Ata. Scientists and specialists from Moscow, Leningrad, and many of the union republics heard and discussed 70 reports on the most important problems in managing labor collectives and various production systems. Academician A. A. Voronov, who spoke and under whose leadership the conference was held, Corresponding Member of the USSR Academy of Sciences V. M. Matrosov, Rector of the Kazakh Polytechnical Institute imeni V. I. Lenin Professor A. A. Ashimov, Professor V. N. Burkov (Moscow) and others noted definite successes in the development and practical application of methods for managing complex systems, their importance for the growth of production and the quality of goods being delivered, and improvements of the economic mechanism. The seminar-conference aimed specialists engaged in pertinent research towards further improvement of methods for analysing the activities of enterprises, industrial associations, and branches. It is necessary to expand training of specialists in the area of modern theory on managing organizational systems and to devote more attention to the methodology of this operation and the problems of its evaluation and stimulation. Specific ways for increasing scientists' contributions to an improvement of the economic mechanism were examined through the experience of the Ust'-Kamenogorsk lead-zinc industrial group, the "Aktyubrentgen" industrial association, and other enterprises. [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 8 May 83 p 2] 9889

TURKMEN RAW MATERIAL RESEARCH--The branch laboratory is perhaps the youngest in the Turkmen SSR Academy of Sciences Chemistry Institute. Organized five years ago, it is always among the leading ones according to results of socialist

competition. Fifteen of its staff members headed by the laboratory director, Ata Orazmuradovich Orazmuradov, are successfully researching the development and use of mineral raw materials in the national economy. AT the present time here, studies are speeding up on two economic contract topics: using local bentonite clays as a component of drilling mud in oil fields (jointly with the Turkmen branch of VNIIgaz [Natural Gas Scientific Research Institute] with an anticipated economic effect of over 1 million rubles per year and using local mineral materials--chalk, tuff, and bentonite--as a filler in plastics (jointly with the scientific-industrial enterprise "Norplast"). The republic has significant mineral raw material reserves at its disposal, and particularly bentonite clays. Meanwhile, up to 40,000 tons of this raw material is delivered annually to Turkmenistan from remote regions of the country, but it is significantly inferior to the local material from Oglanly, Dargan-Atinskiy, and Kalinin. By means of laboratory research and experimental-industrial testing, Turkmen chemists proved the enormous economic expediency of using local raw materials. Within limits of the special-purpose, comprehensive scientific-technical program for developing large production of polymer-filled materials in the country, branch laboratory scientists conducted studies of the physico-chemical properties of fillers from local natural raw materials for polymeric materials used in the mass production of multicirculating packaging, drainage pipes, and materials for waterproofing irrigation canals. In the language of figures, this means a reduction of one-half as much materials and various raw materials when producing plastics for fillers. Thus, if one takes into account that 10 tons of crude oil is required to produce 1 ton of polymer, then 5 tons [of crude oil] are required for 1 ton of filled polymer. In addition, inorganic additives give them new and valuable qualities--strength and flexibility. This is particularly important under the conditions of Turkmenistan where polyethylene ages rapidly under the effect of heat and solar radiation. The laboratory staff will be faced with several other no less important tasks in the near future. In perspective, they are: development of methods for treatment of industrial sewage with the aid of natural and modified processing forms by means of various chemical agents, research on using local bentonite clays as antifiltration material for reducing water losses in irrigation systems, and studies on using modified forms of bentonite clays and zeolite as a catalyst during petrochemical processes. On the part of their colleagues from the Ukrainian SSR Academy of Sciences Colloidal Chemistry and Hydrochemistry Institute--there is a fruitful collaboration between them--the young Turkmen chemists feel the great practical assistance in their creative search.
[Text] [Ashkhabad TURKMENSKAYA ISKRA in Russian 12 Mar 83 p 4] 9889

MOLDAVIAN SSR SEMICONDUCTOR CONFERENCE--The Fourth All-Union Conference on "Triple Semiconductors and Their Application" begins tomorrow in Kishinev. Moldavian SSR Academy of Sciences Organizational Committee Chairman and Academician S. Radautsan tells about the purpose and tasks of this forum for scientists and production workers in a conversation with a correspondent of SOVETSKAYA MOLDAVIYA: "The development of chemical-technological processes for obtaining new matter with prescribed properties is one of the most important tasks posed before our science by the 26th CPSU Congress. Its solution provides intensive production of ultrapure, semiconductive, superconductive magnetic materials and the products from them necessary for further progress of electronics and computer technology. The fact that the all-union conference

on complex semiconductor materials is being held in Kishinev for the fourth time is recognition of the achievements of the Moldavian semiconductor school, and in the formation of which scientists from the RSFSR--first and foremost from Leningrad--played a large role. Recent years are notable for the discovery of many new classes of semiconductors and the necessity arose for exchanging scientific results, making sense of that achieved, and outlining ways for executing scientific ideas in production. The conference promises to be highly impressive. Many distinguished scientists from Moscow, Leningrad, Kiev, Sverdlovsk, Odessa, Vilnius, Baku, Tomsk and other cities of our country are participating in it. The Moldavian delegation will be represented by scientists from the Moldavian SSR Academy of Sciences, Kishinev State University, a polytechnical institute, and pedagogical VUZ's of the republic. Speaking in passing, Moldavian physicists and engineers presented more than 100 scientific reports. A noteworthy feature of the present conference is that its participants focused their attention not only on theoretical problems of the physics of complex semiconductors, but also along with representatives of industrial enterprises they gave consideration to the problem of their practical application in production. Within the limits of the conference, a symposium 'Materials for Electronic Technology' will be held for the first time, and the task of which is to elicit the most long-range developments for incorporation into production." [Text] [Kishinev SOVETSKAYA MOLDAVIYA in Russian 5 Jun 83 p 4] 9889

ESTONIAN SCIENTIFIC POTENTIAL SEMINAR--Intensification of every conceivable kind is such a distinguishing feature of the modern development of socialist economics. The results of scientific research and development directed towards further increasing production efficiency serve it to a considerable extent. At an all-union seminar concluded on 10 June in Tallinn, conversation was about the prospects for development and distribution of Estonian SSR scientific potential. In a conversation with an ETA [Estonian News Agency] correspondent, Estonian SSR Academy of Sciences Vice President A. Keyerna said that a new stage--the creation of comprehensive scientific-technical programs, the extensive automation of experiments, and the complication of laboratory and computer technology--is characteristic of scientific research in our country. The importance of applied branch science naturally increases in association with this; in fact, it is obvious that everything developed by scientists must be put into practice. However, A. Keyerna noted that in a situation of that kind there is a real danger that the importance of basic sciences will be depreciated somewhat. A rigorous economic substantiation of the development and distribution of scientific potential is necessary in order that a necessary proportion may remain for the development of all kinds of research work, the material base of scientific institutions may be substantiated systematically, and a team of highly skilled researchers may be replenished. Distinguished scientists from Moscow, Leningrad, Belorussia, Azerbaijan, Georgia, Latvia, and Lithuania participated in the seminar prepared by the Estonian SSR Academy of Sciences. [Text] [Tallinn SOVETSKAYA ESTONIYA in Russian 12 Jun 83 p 3] 9889

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