

The XXVII Congress of the CPSU and the tasks for Soviet science

Usp. Fiz. Nauk 148, 217–220 (February 1986)

During February and March of this year the XXVII Congress of the Communist Party of the Soviet Union which guides and directs the forces of Soviet society is taking place. The October (1985) Plenum of the Central Committee of the CPSU approved the principal documents of the Congress: the proposals for a new edition of the Program of the CPSU, for changes in the Party Rules of the CPSU, and a draft of the “Basic Directions of the Economical and Social Development of the USSR for 1986–1990 and for the period up to 2000”. By the decision of the Plenum they were published in the press for discussion by the Party, by the labor collectives, and in the widest circles of the population of our country.

These documents summarized the results of the path traveled by Soviet society, and delineated tasks for its further development. The achievements are great, they are of lasting historical significance—“**the country has entered the stage of development socialism**”, but the further advance of our society towards communism sets us the task of accelerating the social-economic development of the country.

What gives rise to this task, what is its scale—this is clearly formulated in the draft of the new edition of the Program:

“The CPSU considers that under present internal and international conditions the comprehensive progress of Soviet society, its advance towards communism can and must be guaranteed along the paths of **accelerated social-economic development of the country**. This is the strategic course of the Party aimed at a qualitative transformation of all aspects of life of Soviet society: a radical renewal of its material-technical base on the basis of achievements of the scientific-technical revolution; the improvement of social relationships and first of all of economic relationships; profound changes in the content and nature of labor, of material and spiritual conditions of people’s lives; the activation of the whole system of political, social and ideological institutions”.

The qualitative transformations of all aspects of life of Soviet society necessarily includes man himself: “The successful achievement of the stated aims the Party associates with an **increase in the role played by the human factor**. A socialist society cannot function effectively without finding new ways of developing creative activity of the masses in all the spheres of social life. The grander are the historical aims, and more important is the active participation of millions personally interested in achieving these aims”.

The grand scale of this strategic course charted by the Party, supported by Soviet society, is presented in detail in the Party’s documents. Transformation of all aspects of life

of Soviet society under present internal and international conditions presents a unified overall task whether it refers to an intensification of production on the basis of the scientific-technical revolution, a further democratization of the life of society, the establishment of control over the amount of labor and payment for it in accordance with its quantity and quality, an increase in the well-being of the workers, or the strategy of the struggle against nuclear war and for a peaceful coexistence of two social systems.

The Party sees the historical mission of socialism in “bringing to the service of Communist construction the achievements of front-rank science, the most developed and powerful technology and, thus providing solid material base for the realization of the principal program aims of the CPSU—a rapid increase in popular well-being and a comprehensive development of man, a strengthening of the economic and defense power of our motherland”.

This task will be carried out under conditions of extending the scientific-technical revolution, which “exerts a powerful effect on all aspects of modern production, on the entire system of social relationships, on man himself and on his environment, opens up new prospects for a significant increase in the productivity of labor and for the progress of society as a whole”.

The Party associates the all-around acceleration in the scientific-technical progress with the cardinal increase in the technical level of production—the development of electronics, nuclear power, complex automation, “wide introduction into the national economy of fundamentally new technologies—electron-beam, plasma, pulsed, biological, radiation, membrane, chemical and other technologies which make possible an increase by a large factor in the productivity of labor, a raising of the efficiency of utilizing resources and a lowering of the consumption of materials by industry”. At the same time also in the domain of plant growing and animal breeding the task is set to go over to industrial, intensive technologies, “to utilize widely the methods of biotechnology and genetic engineering”. Plans are made for a widespread application in industry of information theory, of rapid electronic computers, of automatic lines, of robot technology.

Along with these directions for the development of techniques and of technology the task is set for increasing the value of the social labor by increasing the quality of the industrial output, by lowering of energy and material consumption, by ensuring uninterrupted production, and its complete automation and by organizational and technological flexibility in making the transition to the production of new items, etc. Realignment of production on a grand scale

must take place as a result of the acceleration of scientific-technical progress; this realignment must lead to a significant increase in the productivity of social labor.

A cardinal increase in the technical level of production sets large tasks for the natural sciences. In order to carry them out it is necessary to improve the organization and the system of introduction of scientific achievements into production and control over their realization. This is reflected in the draft of the "Basic Directions".

"The root problem,—as it is stated in this document—is to strengthen the contact between science and industry, to create such organizational forms of integration of science, technology and production, which would make it possible to guarantee the efficient and rapid passage of scientific ideas from their conception to widescale application and practice. It is necessary to increase the responsibility of scientific organizations for the level of research and development, for their more complete utilization".

Thus, responsibility for the utilization of scientific results in the national economy is placed also upon the scientific organizations. We are speaking of the acceleration of the process of realization of scientific results, of the search for more flexible forms and more rapid paths to attain this realization.

Such forms and paths are already becoming apparent, a positive experience has been accumulated in the practice of individual scientific-research institutes of the Academy of Sciences of the Ukrainian SSR, and the complex scientific centers of the Siberian Branch of the Academy of Sciences of the USSR.

Now, in accordance with the decisions of the Central Committee of the CPSU and of the Council of Ministers of the USSR, organizations of a fundamentally new type are being created—Interdepartmental Scientific-Technological Complexes (ISTC). They will have to provide for the accelerated development at frontline world level of the most important plans realizing the scientific-technical revolution in industry. The ISTC are being organized along 16 priority directions on the basis of major academic and industrial institutes; within their structure they shall have in addition to the scientific part a construction-technological office, and experimental production; they are permitted to organize engineering centers for the preparation for mass production of the technological samples under development. The ISTC report annually to the government. The Council of Ministers of the USSR approves the list of organizations from different Ministries and Departments that are required to participate in the work of the ISTC. On a presentation from the ISTC the Gosplan (State Plan) of the USSR includes for them the production output according to the documentation presented by the ISTC.

It is in this way that one of the most important program tasks of the Party will be realized—the program of accelerating scientific-technical progress.

In accordance with the increasing role of the leading scientific organizations in the development of the national economy the task of the Academy of Sciences of the USSR is defined within the "Basic Directions": "To increase the role

of the Academy of Sciences of the USSR as the coordinator of the scientific-research work in our country, to increase its responsibility for the creation of theoretical bases of fundamentally new forms of technics and technology. To assign priority to the development of fundamental science, which determines the raising of social production onto a quantitatively higher level. To reinforce the technical direction in the work of academic institutes".

The task of raising the technical level of production is based also on those divisions of the new technics and technology which are closely associated with the development of physical sciences. The potential of Soviet physics is highly and deservedly appreciated in the entire world. It was the Soviet scientists and Academician I. V. Kurchatov who already in 1956 in a lecture delivered in England first acquainted the scientific community with the early work of Soviet physicists on controlled thermonuclear reactions. The Soviet physicists developed one of the promising directions for solving this problem and constructed several generations of the "Tokamak" thermonuclear apparatus. Although the problem has not yet been solved technically, nevertheless the way of solving it is clear in principle. At present on the initiative of the Soviet Union and with the participation of scientists from several Western European countries, and also from the USA and Japan a design is being worked out of an international experimental thermonuclear reactor "Tokamak" (INTOR). There is reason to suppose that such a reactor will be built before the year 2000. Then the problem will be solved of obtaining a practically unlimited source of energy.

A real revolution in technology was brought about by quantum electronics, for the great contribution to the development of which Academicians N. G. Basov and A. M. Prokhorov were awarded both a Lenin and a Noble Prize. At present lasers are widely used in industry, medicine and other fields. Of importance is laser diagnostics of the state of matter subjected to extreme conditions, for example a plasma the temperature of which attains tens of millions of degrees. In recent years as a result of the efforts of practically all the leading physics scientific research centers of our country a complex of methods was created that are based on utilizing laser radiation, which are unique with respect to the number of measured plasma characteristics, with respect to the reliability of information about its structure, with respect to the breadth of range of the parameters being investigated. In this field our country occupies a leading position in world science.

A tremendous role is played by physics in conquering and investigating space, and also in investigating the properties of the earth's surface and of the atmosphere from space; this is of great significance in national economy.

Recalling these particular achievements of Soviet physics we only want to emphasize the depth and inexhaustible nature of its potential and possibilities, which it will doubtless utilize for solving problems posed by the Party to Soviet society.

Within the field of physico-mathematical sciences the "Basic Directions" point to the necessity of developing

promising areas: "To develop theoretical and applied mathematics, information science and cybernetics, elementary-particle, nuclear and solid-state physics, micro and quantum electronics and optics, radio physics, and also investigations in the field of atomic and thermonuclear power production, transformation and transmission of electrical energy, development of nontraditional sources of energy. To investigate on a broader scale problems of mechanics, and problems of automation of industry".

At the same time in developing the theoretical foundations of the natural sciences it is necessary to be guided by the proposition that "dialectical-materialistic methodology has been and remains the fundamental, tested basis for natural scientific and social knowledge. It must also in the future be creatively developed, and skilfully applied in research work" (draft of the new edition of the Program of the CPSU).

It is of great significance as to what international conditions will exist when the radical renewal of the material-technical base of Soviet society will be taking place. Will the threat of nuclear war be growing, particularly with its transfer into space, or will reason prevail which calls for the destruction of nuclear weapons—this worries all the peoples.

The Geneva meeting of the leaders of two countries—USA and the USSR gave rise to hopes that the period of detente will be reborn. In the "Joint Soviet-American Statement" both parties announced that "nuclear war must never be let loose, in it there can be no victors... . They also emphasized the importance of prevention of any kind of war between them, whether nuclear or ordinary. They will not attempt to attain military superiority". The two parties reached agreement that work on negotiations on nuclear and space armaments in Geneva will be accelerated, having in mind "to prevent a military race in space and to stop it on

earth, to restrict and reduce nuclear weapons and to increase strategic stability".

The peoples of the world await the realization of these statements in actuality, await with hope, but also with alarm, since they know that there still exist military-industrial corporations for which the race in nuclear armaments is profitable business.

Soviet scientists welcome the broad plan of mutual contacts between both parties along many lines indicated in the "Joint Statement". They are pleased by the intention "to make a contribution to solving global problems—conservation of the environment". The usefulness is acknowledged of expanding exchanges and contacts, including some of their new forms in a number of fields of science, education, medicine, and sport. For physicists the following is particularly noteworthy in the "Statement": Both leaders emphasized the potential significance of work directed towards the utilization of controlled thermonuclear fusion for peaceful purposes, and in this connection expressed their support for a comprehensive practical development of international collaboration in the field of obtaining this essentially inexhaustible source of energy for the benefit of the whole mankind".

The Soviet scientists approve the strategic line of the Communist Party to accelerate the social-economic development of Soviet society, for the realization of the politics of peaceful coexistence of countries with different social structure under the conditions of recognition of their sovereignty and right for equal security. The scientists will participate actively in carrying out the tasks set by the Party for Soviet science, and will fulfill their duty before the people from whose ranks they emerged and for whom they work.

Translated by G. M. Volkoff