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## THE BOUNDARIES OF SOVIET SCIENCE

General Meeting of the Academy of Sciences, USSR

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By Joseph L. Zygielbaum

Data Dynamics, Incorporated, Los Angeles, California

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The Annual General Meeting of the Academy of Sciences of the USSR began on February 6. The most significant representatives of Soviet sciences have gathered at the Moscow Hall of Scientists in order to discuss the results of investigations conducted on the eve of the Anniversary Year (fiftieth anniversary of the October Revolution--JLZ), and to outline the key problems of scientific-technological progress.

The opening speech was made by the President of the Soviet Academy of Sciences M. V. Keldysh. Scientific-technological progress, which is supported by the deepest investigations in natural sciences, he said, is one of the principal levers for raising the effectiveness of the public industry. Along with this, of great importance now is also the increase of the level of investigations in the area of social sciences; it is imperative that their results must be an effective weapon in the large ideological effort which is being carried out by our party (Communist Party--JLZ).

In the realization of the decisions of the XXIII Congress of the party, which have established the conditions for an objective approach to problems of the national economy, an enormous role is played by economic investigations based on the development of the political economy of Socialism and modern means for processing of information. The congress has emphasized the necessity for speeding up the utilization of results of science in industry. With the increase of the importance and broadening of the scope of scientific investigations with each year, the problems of raising the effectiveness of the efforts of scientists and accelerating the technological progress becomes more distinct. The duty of scientists, said the president, is to take an active part in the development of measures directed toward the solution of these problems.

M. V. Keldysh dwelled on some of the most important achievements of Soviet science and technology in 1966. He noted particularly the achievement of a soft landing on the surface of the Moon by the automatic stations "Luna-9"

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and "Luna-13." This is an important step not only in the investigation of the Moon, but also in the development of interplanetary communications. The launchings of the first satellites of the Moon have been realized. The results obtained by means of the stations which soft landed on the lunar surface and the three satellites of the Moon have broadened our knowledge considerably. We have continued successfully the work on the practical utilization of space technology in the area of communication and meteorology. Great interest was generated by the investigations of the composition of cosmic rays of ultrahigh energies and their interaction with matter, which were conducted by the "Proton" satellites.

The principal astronomical observatory, along with a number of other organizations, has carried out launchings into the stratosphere of automatic astronomical stations. We have lifted by means of balloons a telescope with a high resolving power, and complex spectral instrumentation and equipment for photographing the Sun. We have obtained unique photographs of formations on the surface of the Sun and other material which make it possible in particular to determine the amount of deuterium on the Sun.

In recent years work on the synthesis and study of properties of transuranium elements have been proceeding successfully. During the past year, the United Institute for Nuclear Investigations completed a cycle of investigations on five isotopes of the 102nd element. By means of chemical methods was confirmed the discovery of the 104th element--kurchatovium, which was synthesized for the first time at Dubna in 1964.

The Novosibirsk Institute of Nuclear Physics has obtained the first results in experiments on an installation with counterelectron, i.e. positron, beams at a relative energy of 580 billion electron volts.

During the past year we have put into operation a linear accelerator developing two billion electron volts at the Kharkov Physical-Technological Institute. We have completed in Yerevan (capital of Armenia--JLZ) the construction and have begun the adjustments of the largest cyclic electron accelerator. During the present year we will begin work on activating the Serpukhov proton accelerator with a power of 70 billion electron volts.

Scientists of the Physics Institute of the Academy of Sciences of the USSR have gained success in increasing the power of optical quantum generators, including continuous-action generators, and have disclosed new possibilities for increasing the stability of laser studies. The practical utilization of these instruments is growing. A number of new materials for quantum generators have been developed.

On the basis of scientific-research work, a number of academic and related institutes, coordinated by the Scientific Council for Solid-State Physics, have developed a technology for the production of steel with a tenacity up to 300 kilograms per square millimeter, a high level of pliability and toughness. In the course of a semi-industrial experiment, we have obtained tens of tons of such steel.

Investigations which have been conducted during recent years at the Institute of Semi-Conductors along with scientific institutions of a number of ministries, have led to the development of a new area--the technology of thermo-electric cooling. We have developed and our industry is producing a variety of instruments of thermo-electric cooling for radio-electron instruments and vacuum engineering for medical installations.

Substantial achievements were made by our mathematicians. Great results were derived in the area of algebraic topology, in the general theory of algebraic systems, in the development of methods for solving incorrect problems and numerical methods for solving multidimensional problems.

Then Academician M. V. Keldysh named a number of the greatest works conducted by Soviet scientists in various areas of chemistry, molecular biology and geology. He emphasized the importance of increasing the investigations of problems related to water balance, soil science and agricultural chemistry.

The President of the Academy of Sciences of the USSR has mentioned that our economic institutes participate more and more every year in solving concrete problems of our national economy. An important problem of the economic science is the development of investigations related to economic reforms which are conducted in accordance with the decisions of the September (1965) Plenary Session of the Central Committee of the Communist Party of the Soviet Union,

and particularly the development of scientific principles for rational wholesale prices. It is essential for economists at this time to pay more attention to works on the prognosis of the development of the national economy in order to develop a scientific basis for the construction of plans for the following five-year period.

The efforts on a series of works entitled "Socialism and Communism" have been completed. This publication contains the results of great investigations conducted by economists, philosophers, historians and lawyers. A series of works dedicated to contemporary problems of materialistic dialectics has been published.

In conclusion, M. V. Keldysh dwelled on problems of perfecting the organization of science. During recent years, he said, the Academy of Sciences has directed great attention to the effort of increasing the effectiveness of scientific investigations. We have improved the system for planning scientific work. Directors of institutes have received the right to establish staffing schedules within the limits of the apportioned salary fund.

The Presidium of the Academy of Sciences has given great consideration to the development of a scientific tool construction in the country. We have worked out a complex five-year plan for the development of a scientific tool construction. We must state with great regret, said M. V. Keldysh, that we have not organized well enough within the Academy of Sciences the work on the automation of scientific investigations with the use of modern computer technology, although these problems have been pointed out quite strongly.

The duty of all scientists, emphasized M. V. Keldysh, is to take an active part in the development of measures for a speedy utilization of the results of science.

Concluding his speech, the president said that the Anniversary Year should become a new horizon in the development of science, in the realization of the rapid scientific-technological progress of our country, and in the execution of the responsible assignments given to scientists by the XXIII Congress of the Communist Party of the Soviet Union.

After that, Academician Ya. V. Peyve named the workers of the Academy

of Sciences of the USSR, the academies of sciences of the union republics and higher institutions of learning who have been awarded in 1966 the highest award of our country--the Lenin Prize. He reported on efforts which have been rewarded by the Presidium of the Academy of Sciences of the USSR by gold medals and prizes named after outstanding scientists, after which he presented these prizes.

A speech entitled "The Most Important Achievements in the Area of Natural and Social Sciences in 1966" was made by the Principal Learned Secretary of the Presidium of the Academy of Sciences of the USSR, Academician Ya. V. Peyve.

After a recess, a discussion of the problems mentioned in the opening speech and in the report began.