

JPRS 68469

12 January 1977

TRANSLATIONS ON EASTERN EUROPE
SCIENTIFIC AFFAIRS
No. 533

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited



U. S. JOINT PUBLICATIONS RESEARCH SERVICE

20000301 097

REPRODUCED BY
**NATIONAL TECHNICAL
INFORMATION SERVICE**
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

**Reproduced From
Best Available Copy**

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22151. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

BIBLIOGRAPHIC DATA SHEET	1. Report No. JPRS 68469	2.	3. Recipient's Accession No.																		
	4. Title and Subtitle TRANSLATIONS ON EASTERN EUROPE - SCIENTIFIC AFFAIRS, No. 533		5. Report Date 12 January 1977																		
7. Author(s)		6.																			
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201		8. Performing Organization Repr. No.																			
12. Sponsoring Organization Name and Address As above		10. Project/Task/Work Unit No.																			
		11. Contract/Grant No.																			
15. Supplementary Notes		13. Type of Report & Period Covered																			
		14.																			
16. Abstracts The serial report contains articles concerning the development of and progress in the various theoretical and applied scientific disciplines and technical fields; and the administration, structure, personnel, and research plans of leading East European scientific organizations and institutions, particularly the academies of sciences.																					
17. Key Words and Document Analysis. 17a. Descriptors <table border="0"> <tr> <td><input checked="" type="checkbox"/> International Affairs</td> <td>Scientific Societies</td> </tr> <tr> <td><input type="checkbox"/> Albania</td> <td>Research Management</td> </tr> <tr> <td><input type="checkbox"/> Bulgaria</td> <td>Organizations</td> </tr> <tr> <td><input type="checkbox"/> Czechoslovakia</td> <td>Research</td> </tr> <tr> <td><input checked="" type="checkbox"/> East Germany</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Hungary</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Poland</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Romania</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Yugoslavia</td> <td></td> </tr> </table>				<input checked="" type="checkbox"/> International Affairs	Scientific Societies	<input type="checkbox"/> Albania	Research Management	<input type="checkbox"/> Bulgaria	Organizations	<input type="checkbox"/> Czechoslovakia	Research	<input checked="" type="checkbox"/> East Germany		<input checked="" type="checkbox"/> Hungary		<input type="checkbox"/> Poland		<input type="checkbox"/> Romania		<input type="checkbox"/> Yugoslavia	
<input checked="" type="checkbox"/> International Affairs	Scientific Societies																				
<input type="checkbox"/> Albania	Research Management																				
<input type="checkbox"/> Bulgaria	Organizations																				
<input type="checkbox"/> Czechoslovakia	Research																				
<input checked="" type="checkbox"/> East Germany																					
<input checked="" type="checkbox"/> Hungary																					
<input type="checkbox"/> Poland																					
<input type="checkbox"/> Romania																					
<input type="checkbox"/> Yugoslavia																					
17b. Identifiers Open-Ended Terms																					
17c. COSATI Field/Group 5B																					
18. Availability Statement Unlimited Availability Sold by NTIS Springfield, Virginia 22151		19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 33																		
		20. Security Class (This Page) UNCLASSIFIED	22. Price																		

12 January 1977

TRANSLATIONS ON EASTERN EUROPE
SCIENTIFIC AFFAIRS

No. 533

CONTENTS

PAGE

INTERNATIONAL AFFAIRS

Czechoslovak X-Ray Photometer on Soviet Satellite
(Boris Valnicek; RUDE PRAVO, 3 Dec 76)..... 1

EAST GERMANY

Basic Research Key to Successful Science Strategy
(Robert Rompe; SPEKTRUM, Sep 76)..... 4

Officials, Members of Academy of Sciences Elected
(SPECTRUM, Aug, Sep 76)..... 14

President, General Secretary, and Vice Presidents
of the Academy of Sciences
New Members

HUNGARY

Deputy Prime Minister Aczel Comments on Science Policy
(Gyorgy Aczel; THE NEW HUNGARIAN QUARTERLY,
Winter, 1976)..... 17

INTERNATIONAL AFFAIRS

CZECHOSLOVAK X-RAY PHOTOMETER ON SOVIET SATELLITE

Prague RUDE PRAVO in Czech 3 Dec 76 p 2

[Article by Boris Valnicek: "For the First Time in the Depths of Space"]

[Text] On Thursday, 25 November, the satellite Prognoz 5 was launched from the territory of the Soviet Union. It was designed to explore space on an elongated trajectory reaching as far as 200,000 kilometers from the Earth. The first satellites of this type were launched in 1972. Their main task is to study the distribution of various particles of solar winds, particles of cosmic radiation, and X-ray radiation in space far away from the Earth, where measurements are no longer affected substantially by the magnetic field of the earth.

Since the particles and radiation, which fill the interplanetary space, are of various kinds within a broad range of energy, it is necessary that the instruments set up aboard the satellite be capable of registering this wide spectrum of particles and radiation. A substantial part of the instruments placed aboard the satellites Prognoz comes from the USSR.

On the basis of a bilateral agreement between the USSR and France, French instruments are also placed on these satellites (this equipment was also installed on the satellite Prognoz 2), which were designed for studies of very hard radiation, the so-called gamma radiation, which occurs in certain active processes on the sun and in the interplanetary space.

On the basis of an agreement within the framework of the Interkosmos program, it was possible to place also aboard the satellite Prognoz 5 Czechoslovak equipment designed for measurements of the sun's X-ray radiation within the broad

range of energy. Therefore, this was the first time that Czechoslovak equipment was launched on a satellite, the trajectory of which follows a path substantially further from the Earth, while for example the satellite Interkosmos 16, which was launched on 27 July of this year, followed a circular trajectory only 500 kilometers above the Earth's surface.

The Czechoslovak instrument aboard Prognoz 5 is a simplified variant of an X-ray photometer, which was used for example on the satellites Interkosmos 11 and Interkosmos 16. Just like the given X-ray photometers, this photometer was designed in cooperation with the Tesla National Enterprise -- A.S. Popov Research Institute for Communication Technology -- exclusively from parts made in Czechoslovakia. The small collective of workers of this institute, working under the direction of Engr Komarek, delivered in this case again an outstanding piece of work. Indeed, the operational conditions for satellites of this type are very harsh, during their flight on an elongated long trajectory it is necessary to expect substantially greater deviations of temperature, than it happens on a low trajectory, and the planned service life of the equipment is also substantially longer.

The X-ray photometer on the satellite Prognoz contains a scintillation sonde with a photomultiplier for measurements of higher energies of X-ray radiation, and a gas detector for measurements of soft radiation. An amplitude analyzer of the radiation spectrum is located in the electronic block, together with computing circuits and the source of power supply for the entire instrument. The dimensions had to be adjusted to the installation on the crowded board of the satellite, and it was necessary to maintain minimum weight. All the basic parameters were also effectively maintained, and no defects were found when the instrument was delivered and tested on the ground. The workers of the Soviet Institute for Cosmic Research praised very highly both the design as well as the functioning of the entire instrument.

The purpose of the Czechoslovak X-ray photometer aboard the satellite Prognoz 5 is to register the sun's X-ray radiation, whose level, at the time of the minimum activity of the sun, can demonstrate to what extent the amount of this radiation varies in the course of the entire cycle of the sun's activity.

The measurements will continue on the future satellites of the Prognoz type and on large sun satellites of a new generation. The Czechoslovak X-ray photometer was selected as one of the basic instruments for standard equipment in all these experiments.

5668

CSO: 2402

EAST GERMANY

BASIC RESEARCH KEY TO SUCCESSFUL SCIENCE STRATEGY

East Berlin SPEKTRUM in German Sep 76 pp 2 - 8

[Excerpts from a Lecture by Academy Member Robert Rompe]

[Text] The festive lecture of Prof Robert Rompe at this year's Leibniz Conference was awaited with intense interest and was received with undivided attention. A few weeks after the ninth party congress of the SED, he deepened and extended previous conceptions concerning the tasks of basic and applied research for scientific-technical progress as a main factor of intensification. We have selected a few passages from this lecture for our publication.

The development of an adequate science strategy raises profound problems:

1. The area included under basic research is limitless and inexhaustible. Its steadily increasing cogency of information is determined by the potency of its research methods, both theoretical and experimental, and especially by electronics and scientific device construction, which in turn are further developed during the research process.
2. For scientific results to become effective in society, especially in the sphere of material production, expenditures of personnel and material are required. In the sectors that are decisive for scientific-technical progress, these expenditures are comparable to those required for achieving the scientific results themselves. As a rule, they are still greater. With these expenditures, the contributions of basic research gain in extent and importance; over the long term, they accelerate the process of converting scientific results into practice.

Accordingly, basic research has a double function. Equipment suitable for basic research can be used with about the same prospects of success for corresponding equipment to obtain extensive new results, independent of their presently existing possibilities of application, or a proportion can be maintained between the gathering of new knowledge and helping to secure its transmission through technically oriented contributions, or

results can be taken from the global pool of knowledge and can be technologically adapted for utilization in production.

Which variant is suitable depends on a series of social, economic, and scientific criteria. A research organization, such as is represented by the academy, can integrally make contributions to all variants, and indeed implements this in practice. But one should guard against demanding from a single institution that it will fully exercise this double function at all times and in each of its projects.

During the first half of our century, the natural sciences, the technical sciences, and medicine have, so to speak, developed both in their elements and in their extent. Undoubtedly, technological utilization of their results promoted this development, especially under capitalistic conditions. The social effectiveness of science increased to an extraordinary extent, and its effects decisively influenced the material development opportunities of society. It is surely sufficient to point to broadcasting and television, telephones and teletypes, power plants and air traffic, products of the chemical and pharmaceutical industry. In particular, society's energy supply, especially electrical energy, is decisive for the future development of this society. Lenin's prophetic word: "Communism = Soviet power + electrification of the entire country," increasingly gains in actual significance.

In the advanced phase of the elemental-extensive development of science, a tremendous growth of the pool of knowledge and research methods occurred, primarily in breadth, but in some areas also in considerable depth. This development occurred only partially in connection with production and other social applications. Despite an apparent "oversupply" of basic scientific results, a genuine deficit of basic research achievements thus exists in several essential areas which also have useful significance. Primary among these are the contributions of basic research to technology.

Since results are not always available where and when they are needed, additional transmission problems arose. Naturally, as long as the pursuit of research and scientific curiosity are recognized as genuine scientific motives, this elemental scientific growth will exist, especially since the potency of research methods, which themselves have been developed through the basic research in the research process, will catalyze this development. But the point now is to remain within the framework of the realities of the national economy, and to reach a proportion with basic research in its double function as source of knowledge and of new technology.

The relationships of basic research and production, in the sense of what has been said above, are indeed somewhat clear for the component sectors of technology which have arisen from physics and chemistry. But the same

cannot be said from the start for the large older areas of technology, such as mining, metallurgy, production of glass and ceramics, and also for machine construction, which is so significant for us in the GDR. This is a serious problem, for these sectors, now as before, occupy the major portion in the national economy, and also play a decisive role in implementing the results of the most modern branches of science. In this connection there exist major developmental opportunities and obligations for increasing basic research as a significant intensification factor.

Modern basic research of physics and chemistry, collaborating with technological areas that have emerged from this research, has achieved a potency which makes it possible to set it the task of increasing the effectiveness of our traditional technology and thus of producing a mass effect of basic research which exceeds present achievements. Starting with this situation, the scientific orientation, as affirmed by the eighth party congress of the SED, and as urgently confirmed by the ninth party congress, must be: intensification, increase of effectiveness, improvement of the relationship of expenditure to performance.

The following thoughts on this point rest primarily on experience gained in physics. But since physics has undoubtedly become a very rich and multiply developed scientific discipline, with an extraordinarily far-reaching field of activity in social utilization and effectiveness, with a special responsibility for intensification through electronics and scientific device construction, with considerable significance for forming the dialectic-materialistic world image, considerations from this sector can to a greater or lesser extent also be of interest in other basic disciplines.

I may presuppose as familiar that the planning of scientific-technical progress and its economic assurance is a complex task, which addresses practically the entire spectrum of science, and which consequently must be engaged in by natural scientists (including mathematicians), medical scientists, technologists, and social scientists. Extensive cooperation of all disciplines is required for this purpose, and this cooperation will have to be developed. This will undoubtedly initiate a significant intensification effect, and on the other hand will point out new fundamental problems to basic research.

At this place, please permit me a word on the concept "fundamental". What I mean is definitions are by no means conventional, but should be determined in such a fashion that they promote the desired development. We must suitably understand the concept "fundamental" in the sense of our scientific development since the eighth party congress. The word "fundamental" should not be used as synonymous with "good" or "valuable". In the fundamental areas, there is undoubtedly work which is not good and valuable. Fundamental should also not be used as meaning "inapplicable".

Ten or fifty years ago, we used to say jokingly, "not everything that is inapplicable is fundamental". Fundamental surely is a problem whose solution furthers our path from socialism to communism. Typical examples for fundamental problems are furnished by energy (especially electrical energy) and by electronics (especially electronic components).

It may be said that the implementation of nuclear power plants on the basis of pressurized water reactors has occurred so relatively rapidly and smoothly because they could follow proven technologies of steam power plants. For an outsider, it may perhaps appear strange that the bulk of an atomic power plant falls within the sector of classical physics and technology, although with specific adaptation to the requirements of nuclear technology, especially with reference to reliability and safety. The information obtained here, especially concerning questions of reliability and safety, are pioneering for installations in other areas of technology. To express myself in a more generally understandable fashion: Plant construction in general is influenced by nuclear plants in about the same fashion as general automobile construction was influenced by experience with racing cars, until it reached a sufficiently high technical degree of maturity. The decision no longer to participate in races, once a sufficient technical maturity has been reached, is then surely also an intensification factor. But nuclear energy has not yet progressed to this point!

Through the example of nuclear energy, a valuable insight can be tested: Scientific results can quickly be made socially effective wherever elements of already fully established systems with corresponding technical maturity can be drawn upon. Our technical world of today is much richer and more developed than that of 75 years ago. At that time, the "electrical illumination" systems or the "auto" in general and independently had to conjure up from the ground whatever they needed for their implementation. But they then needed 40 to 50 years for their full implementation. Today there exist more opportunities for planned utilization by combining partial results of suitable systems for obtaining breakthroughs at planned, socially significant points.

It is necessary that no barriers any longer oppose this multivalent utilization of assured results and mastered technologies. Such barriers develop always anew in capitalism, through the competition of the monopolies. This mixture of old and new technology as a presupposition for a positive social effect and a steady and continuous "scientific-technical progress as uniform process of renewal" was already discussed in the Soviet literature before the 24th party congress. In the area of non-conventional large-scale production of electrical energy, I believe that development will actually occur in such a fashion that the next generation of systems will be able to be constructed on the basis of the assured technologies of a previous generation: After our pressurized water fission reactors, which are being used today, will come the fast

breeders with their technology, and then, using the technology of the latter, will come the fusion reactors.

Naturally, scientifically mastered components of technology are juxtaposed with components whose mastery is obviously empirical. This juxtaposition is a fact that must be counted upon - as is clear from what has just been said - even with the most modern components of technology, such as nuclear energy or semiconductor technology. If this were not the case, the word "know-how" would be superfluous. This entails some uncertainty, which is known to occur when, for example, a process is to be transplanted to another location.

I may call to mind that semiconductor components, at the beginning of their development, suffered considerable "childhood diseases". At a reliability conference organized in the mid-fifties, two experienced postal administrations of Western Europe, that of France and that of the FRG, spoke against using semiconductor components in the postal service, because of the inadequate stability and constancy of their parameters.

Subsequently, and primarily because of the pressure of military technology, new development began, pursued with enormous means. With an expenditure which can only be compared with that for nuclear weapons, this development produced today's generally usual silicon-epitaxial-planar technology.

This technology again led to the highly stable components of the present day. It made possible the next step, the transition to integrated circuits with their novel requirements on optical and electronic miniaturization technology. In this phase, the price for a component function fell by four to five orders of magnitude within 30 years. At the same time, reliability increased by orders of magnitude, and service and maintenance decreased. At the present time, it is possible to effect complex electronic functions with high reliability, for example in the form of microprocessors. It can be expected that, within the next 10 years, electronic device construction, and not merely this sector, will thereby experience major changes. Simultaneously, new requirements arise for training technical workers and developmental engineers.

The interface between basic research and its implementation in material production lies within the domain of responsibility of technology. Technology which is penetrated by science and which is mastered by science - for which insights from the natural and technical sciences as well as and primarily also the enormous sum of experience from daily production must form a unit - today characterizes the technical capacity of a country. The "obviously practical", or better intuitive-empirical methods of creating technologies in certain limits are certainly capable and are inexpensive. The "prescientific" history of technology, with its remarkable monuments, is not alone in bearing witness to this

fact. However, its disadvantage is not simply inferior performance capability, but its strong dependence on special capacities, severer human stress, poorer teachability, and poorer elasticity, the difficulty of cooperation between different "specialties", which makes the success of the work dependent on quite particular human talents, raw materials, and factors, without indicating a helpful way in case of altered conditions. With products that presuppose the cooperation of various crafts skills, strong fluctuations may occur. The exchange of information becomes more difficult. The scientifically fixed component of a technology can be transmitted more simply and more free of interpretative difficulties. A basis on known and certain natural laws guarantees stability for the process even when parameters fluctuate, or even when informed, knowledgeable persons are lacking. In the past, superlative technologies frequently "died out" when such persons disappeared. It cannot be doubted that, within the next years and decades, it must be a main concern for science to continue and implement this current conquest of classical technologies.

Of today's technologists we therefore require outstanding scientific training and the capability of creating something which hitherto did not exist in nature in such a form.

This requirement is still necessary even today, even though the history of technology shows that, during the last 75 years, technical progress in new areas has been initiated and established to a major extent by representatives from the basic research of mainline disciplines in the natural sciences.

It should be noted here that outstanding representatives of basic research also produced outstanding achievements as designers and technologists. Newton with his mirror telescope comes to mind here, or Helmholtz with his eye mirror. The following examples may be mentioned: In chemistry, the Haber-Bosch process of nitrogen fixation, which is still actually used today, and which has special interest for its collaboration between a physical chemist and a technologist; or the beginning of wireless telegraphy (Hertz, Popon, Marconi, Braun); or semiconductor electronics, nuclear energy, antibiotics, computer technology, to mention only a few. The technology of isotope separation with diffusion cascades was developed on a laboratory scale by Gustav Hertz, and it was industrially used for a long time. Likewise, the transistor technology for producing electronic components, which was developed by Bardeen, Brattain, and **Shockley**.

In my opinion, such close contact with the problems and cares of industrial production can be mastered only by scientists who are active in "in-house" branch-specific basic research. For physicists, this means that they must first of all master a plethora of questions which

lie outside the ambit of their studies. But this also signifies an interior disposition towards work. In this connection, the physicist G. Hertz, who died at the end of last year, gave the following answer to the question, "What is essential for a physicist active in industry?":

"First of all, he must be a great physicist. He should always be conscious of the fact that the objective of his work is the solution of technical tasks. This holds true for persons active in basic industrial research. With every newly won insight, he should ask 'Is there a technical problem to the solution of which this insight can contribute?'

He is in such a position only if he knows the problems of his industrial branch and is interested in them. A scientist whose interest 'must be kept awake', should rather do something else."

These simple words say so much that they could also have been chosen as the leitmotiv of a lecture on questions of intensification. We have here first the interior attitude towards work, beginning in school, at the university, and in professional life; being penetrated with the meaning of the task, the enthusiasm of all the participants. All great scientific successes, such as the construction of quantum physics or of large technological areas, such as energy technology, electronics, aviation, auto, have inspired enthusiasm in their co-workers. Without this attitude, these wonderful creations of the human spirit would not have come about. For this reason, the discovery and specification of promising and inspiring areas and problems is so significant. The great experience required for this purpose will generally be found only in the collective, especially since the point is further to explore also the social effects, to strengthen the progressive aspects, and to attenuate the negative ones. This judgment must not be limited to a single act. As long as the task is being worked on, it must be an on-going matter. The accents of social evaluation or the technologically defensible expenditures sometimes shift. It may be more advantageous to break off the work or to direct it in a new way. The demoralizing effect of long work without results must be borne in mind, and these negative effects must be considered just as the stimulating effect of a successful period.

In this connection, intensification also means mutually overcoming the residues of erroneous evaluation standards on the part of scientists, independently of whether they are active as researchers or technologists, that means the wrong view that the basic researcher is more valuable than the one who is occupied with technological questions. In the last analysis, this must be reflected in directing graduates according to their ability and gifts, since the intellectual capacity of a country is not arbitrarily large, and collective work likewise requires top performers.

Under the conditions of our national research strategy, the necessary requirement of understanding the problems of one's industrial branch contains profound problems.

The new tasks require that our industry should pursue its specific basic research.

At the present time, researchers active in industrial research and development generally address their questions directly to their colleagues in academies and collegies. But since these establishments are located "across the street", their colleagues do not always know the technical problems of industry with sufficient precision. Naturally, much has changed here since the eighth party congress of the SED, since the academy has oriented towards a new level of quality its responsibility with respect to basic research in the GDR, when this research is directed towards scientific-technical progress.

Professor Rompe then discussed in more detail the exchange of cadres between the academy and industry. In this connection he explained: The dialectic between research method and operating technology also includes the necessity of occasional industrial activity on the part of social scientists, who will find here a broad field of activity in the sense of creative practice. With the plant administrators and managing employees in our socialist industry, temporary assistance from the AdW (Academy of Science) should become an accepted rule. With this measure, we would also effect that social scientists acquire a higher education in natural sciences and technology. Creative collaboration in this sense is possible only, and our member Juergen Kuczynski has emphasized this in his lecture at the 1975 physics meeting, when the partners understand the problems of each side. And here too I would like to return to the words of Gustav Hertz. If this interest must be artificially "kept awake", then the interconnections are not at all as intimate as is necessary for solving the problems of intensification.

Technology provides the scientist with a direct view into the inexhaustability of the world and the processes occurring in it - just like contact with still unexplored areas of science. Only on the level of textbooks and manuals is everything clear and obvious. But a modern production technology can only to a certain extent be reduced to textbook- and even manual-knowledge. See what has been said above about "know-how"! This holds not only for physics. Examples from chemistry could just as well be adduced. The scientist who is occupied with technological questions must acquire, in addition to his technical qualification, also the creative-constructive facilities which have always distinguished the technologist.

Science has made great progress since Galileo. By means of new complexes - experimental and theoretical methods - it has developed the passive

process of observing and describing nature to an active struggle to extract natural laws "with levers and screws". Thought should be given to the fact that Galileo developed this new method by way of an engineering problem of determining the strength and reliability of construction components and supports. The research methodology of modern science is quite related to technology. Research and technology touch in this methodological sphere. Herein lies an opportunity of overcoming the old dilemma, "effectiveness of academic instruction - effectiveness of the graduate in practice".

Since intensification in all branches of technology, but also in the natural sciences and medicine, is connected with the introduction of electronic devices and systems, and since the effective utilization of the latter is assured only in the hand of experienced collectives, a quite broad field opens up for practice-oriented development of younger scientists. In any case, it would be good if the graduates would take a course in industry on the scientific-technical specifics and the technological opportunities of the industrial branch or of the combine or of the plant. This course would be given by older, experienced colleagues. I have already shown, through the example of nuclear energy and semiconductor components, that basic research as intensification factor is here sensible in really all other branches of science. In this fashion, basic research also influences the classical areas of technology. The development of physics in the past decades is thus characterized, among other things, by many physical effects - generally from the atomic or subatomic domain - being found and utilized, in order to develop advantageous measurement procedures, which are distinguished by higher precision, freedom from breakdown, or susceptibility to automation.

Of special significance for research and for the national economy, are modern procedures in chemical and biochemical analysis, in BMSR (industrial measuring, control, and regulating technology) and EDP technology, electronics, material diagnostics, process and system diagnostics, for process control to intensify research or production. I would also include the constant availability of highly complicated measurement-, diagnostic-, and test-methods. Within the framework of basic research, these methods are being developed, extended, improved, and, in the sense of the word, cultivated in many cases.

Such methods as, for instance, noise diagnosis for nuclear reactors or electronic components find application in technical equipment, which produces direct, significant economic effects. Today these are instruments that one can no longer think of doing without, for increasing reliability and consequently increasing availability of complex and simultaneously expensive objects, such as nuclear power plants, but also electronic consumer goods, with which each one of us has daily contact,

that is radios and televisions. In order to assure stable production of the latter, scanning electron microscopy is today necessary, as well as that collective which has long years of experience in this area - a circumstance that is little known.

As far as machine construction is concerned, which is an area of such significance for us, electronic equipment is an intensification factor of the first rank. It leads to a considerable saving of materials and energy. Furthermore, machine construction raises direct questions with basic research; I shall name only surface treatment with physical technology, such as ion nitriding.

The direct contributions deserve careful consideration and promotion: because generally, as indicated above, practicality wants to know and must know things which basic research precisely can no longer answer.

8348

CSO:2302

EAST GERMANY

OFFICIALS, MEMBERS OF ACADEMY OF SCIENCES ELECTED

President, General Secretary, and
Vice Presidents of the Academy of Sciences

East Berlin SPECTRUM in German Sep 76 p 4

Text On July 12, 1976, the Chairman of the Council of Ministers, Horst Sindermann, handed to the following scientists their notice of appointment. These scientists had been nominated for their high offices by the full session of the Academy.

Academy member Hermann Klare, President

Academy member Claus Grote, General Secretary

Academy member Ulrich Hofmann, Vice President for Research and Planning of Scientific Work

Academy member Heinrich Scheel, Vice President for Full Sessions and Classes

Academy member Kurt Schwabe, Vice President in his Capacity of President of the Academy of Sciences of Saxony

Academy member Werner Kalweit, Vice President for Social Sciences

In a subsequent discussion, Horst Sindermann thanked the management of the Academy for the work it had performed and expressed his wish for continued great success in solving the responsible tasks which the ninth party congress of the SED has placed upon science, so that its progress-promoting and humanistic character will become fully effective for the welfare of the people.

Consequent upon the achieved results, the issue should be, in close collaboration with the other social sectors, and in socialist communal

work by natural and social scientists, by researchers, technologists, and inventors of the Academy and of industry, to provide a large contribution for developing the performance and effectiveness of the national economy by way of intensification, as well as to direct the creative power of the scientists towards the decisive objectives of the present and of the future.

New Members

East Berlin SPECTRUM in German Aug 76 p 8

Text New Ordinary Members

Prof. Dr. rer. nat. habil.

Olaf Bunke

Director of the Statistics Area of the Mathematics Section of Humboldt University in Berlin

Prof. Dr. sc.

Rudolf Grosse

Ordinary Professor for German Philology at Karl Marx University in Leipzig

Prof. Dr. rer. nat. Dr. med. habil.

Werner Kohler

Deputy Director of the Central Institute for Microbiology and Experimental Therapy of the AdW (Academy of Sciences) of the GDR

Prof. Dr. rer. nat. habil.

Christian Weissmantel

Professor in the Physics Section of the Technical College at Karl-Marx Stadt

Prof. Dr. rear nat. habil.

Rudolf Winkler

Deputy Director of the Physics Research Area, Nuclear and Materials Sciences, of the AdW of the GDR

New Corresponding Members

Prof. Dr. rer. nat. habil.

Heinz Bielka

Division Director in the Central Institute for Molecular Biology of the AdW of the GDR

Prof. Dr. sc. techn.

Horst Blumenauer

Director of the Science Area and the Specialty of Materials Technology of the "Otto von Guericke" Technical College at Magdeburg

Prof. Dr. oec. habil.

Wolfgang Heinrichs

Director of the Central Institute for Economic Sciences of the AdW of the GDR

Prof. Dr. rer. nat. habil.

Helmut Koch

Director of the Area of Mathematics I at the Central Institute for Mathematics and Mechanics of the AdW of the GDR

Prof. Dr. sc. phil.

Guenter Kroeber

Director of the Institute for Theory, History, and Organization of Science at the AdW of the GDR

Prof. Dr. med. habil.

Hans Wolfgang Ocklitz

Director of the Institute for Infectious Diseases of Childhood, at the Municipal Clinic of Berlin-Buch

Prof. Dr. rer. nat. habil.

Margit Ratzsch

Director of the Process Chemistry Section of the "Carl Schorlemmer" Technical College at Leuna-Merseburg

New Foreign Members

Anatoliy Petrovich Aleksandrov

President of the AdW of the USSR

Yuriy Anatolevich Ovchinnikov

Vice President of the AdW of the USSR, Director of the Institute for Bioorganic Chemistry

Georgiy Konstantinovich Skryabin

Acting Scientific Chief Secretary of the AdW of the USSR, Director of the Institute for Biochemistry and Physiology of Microorganisms

Jorma Kalervo Miettinen

Director of the Department for Radio-chemistry of Helsinki University

8348

CSO:2302

DEPUTY PRIME MINISTER ACZEL COMMENTS ON SCIENCE POLICY

Budapest THE NEW HUNGARIAN QUARTERLY in English No 64 Winter 1976 pp 28-41

[Article by Gyorgy Aczel: "Science Policy and Management"*]

[Text] The general assembly of the Hungarian Academy of Sciences is an event of considerable importance in the scientific life of Hungary. The 1976 general meeting, the 136th, proved no exception. Important decisions were taken, new members elected and office-holders chosen. The president's opening address, the general secretary's report, the lectures delivered, and an address by the prime minister, all contributed to make this an outstanding survey of achievements and account-taking of the present position.

Having familiarised myself with the documents and the message of the general assembly, I should like to comment on certain facts and phenomena, achievements and shortcomings alike, chiefly on things which are related to science policy, and to public issues related to science. Politics are not secondary and extraneous to science, but are factors acting on the person of the scientist which he has to know his way about, else he cannot obtain lasting success in the study of his particular corner of reality, nor can he hope to change it.

Science must adjust itself to the requirements of the age, that is the consensus of this meeting as well. The Academy cannot be allowed to be an institution maintaining a rigid, conservative academicism out of touch with practice. Tradition and innovation must be integrated with the emphasis on the latter.

If the Academy accepts these dialectics of life, it will be able to retain what is good and reject what is obsolete and unnecessary; making room for the new. If such a way of looking at things asserts itself we can

* The Hungarian Academy of Sciences, the highest scientific institution of the country, maintains and directs a number of research establishments. This year's general assembly of the Academy was attended and addressed also by Deputy Prime Minister Gyorgy Aczel. We publish a slightly abridged version. (Ed.)

perhaps forget some of those "evergreen," but long overripe subjects, such as the coordination of research done in universities at institutes of the academy, and their concerted better adjustment to social needs. Speaking generally: research and science instead of being introspective should, true to their role in socialist society, become more and more open. What is needed is an Academy that is increasingly sensitive to the interests of society.

General Conditions in Science

Every science is aware that life "regrettably" is impatient, demanding action now. We must bow to reality and happily acknowledge its impatience. The commands of reality, of this fast changing world, must be obeyed with alacrity.

It was said earlier that what science achieves is always weighed and judged by posterity, let me add something new, that the present progressing at growing speed is increasingly able to judge the performance of science. Scientists have always dreamt of their knowledge being appreciated, applied and utilised by the present, but they did not always succeed in achieving this. Today, however, social circumstances being as they are, scientific progress and practical application appear in such quick succession that the objective possibility exists for the present to be able to appreciate and, what is more important, make use of some of the results. This is the only way to look ahead. The work needed is of the kind that prepares the future and, what is more, helps bring it closer.

What has to be clarified first is the degree to which genuine objectives form the backbone of science today. Everything depends on this. What is being commissioned and how, and who chooses what sort of subject, and what do they wish to reject? This should be the approach to ways of directing scientific research as well.

The scientific bodies created by the Hungarian Academy of Sciences, in the work of which scientists participate, are accorded an increasing role in the life of the country. Their working methods exert a decisive influence on the efficiency of research institutes and of science in Hungary as such. Their views are carefully considered by all who hold responsible positions in politics or economics.

This is why the responsibility of scientific bodies has increased enormously, particularly as regards creating the sort of atmosphere in which scientists do their work.

Research workers are not supermen, but since the conditions for high quality work are given, one may rightly raise ethical standards as well. There is no need to draft a code, what is more desirable is to influence public thinking so as to stop the morally inadmissible, for example, irresponsible manipulations connected with the nomination of members.

Greater social access to science would do much to help clean up the atmosphere in which scientists work. Inbreeding must come to an end, and greater attention should be given to practice and education when recruiting new staff. The gates of research should be opened to talented secondary-school teacher graduates. Social mobility must be made to apply to science as well. The scholarships system should be extended, with special emphasis on work at home, since in many cases it certainly does not warrant a trip abroad.

Training the young generation must surely figure high amongst the duties prescribed by a hypothetical moral code. Pride in being the only one in one's field is a distorted ambition. What should be a source of prestige is the number of young people one has trained to carry on the good work.

A man of outstanding talent should not be compelled to go through all the rungs of the ladder. No one is too young who possesses the necessary ability, perseverance and strength. Einstein was 26 when he formulated the special theory of relativity. In this country it is to be feared that a 26-year-old Einstein would be considered too young to present a thesis for the candidate's degree.*

One can often hear the argument that others should be given precedence owing to age, rank, or other considerations immaterial to science. And yet waiting one's turn, the principle of seniority, is difficult to put up with even in the bureaucracy, let alone in science. Janos Bolyai was 29 when he wrote his epoch-making work--as an appendix to his father's book. With an appendix of such modest size he would find it fairly difficult to get on today. Openness and purity in scientific life, publicity that implies control, is the best condition for talent to come through.

Research Workers and Administrative Heads

Most of those who head research institutes, of course, also do research work and--as the Academy's review *MAGYAR TUDOMANY* recently showed--strive first of all to gain further scientific distinction. The question is how far one can appreciate this, and when is it done at the expense of the collective; that is of administrative work?

How can the research performance of the head of an institute and collective research work be reconciled, and how can they be evaluated? Do not personal ambitions injure the interests of the institution and the community's interests, higher even than those of the institution?

If the subject studied by the head undeservedly receives greater support, who knows where and how this can be questioned? One is ashamed to say that this still calls for courage today. In some of the institutes a junior research worker brave enough to raise such an issue runs no small risk.

* Candidate--A post-graduate degree, awarded by the Academy of Sciences, which ranks above a doctorate awarded by universities but below the Academy's doctorate

A number of other questions also arise in this connection. Such as, for example, the expropriation of large and special equipment, shall I call it personal property of objects in social ownership. Some use and exploit as private capital certain appliances and installations bought and operated at public expense. There are heads of institutes, and senior research workers who are unwilling to allow others, even persons working in the same institute, to have access to expensive and fast deteriorating equipment. They use it only for their own research even if capacities remain unexploited as a result. In some fields it has become fashionable to take possession of apparatus or equipment of great value that is a source of status. In a provincial town, for example, the heads of two neighbouring research institutes asked for central assistance in procuring for each of them the same type of large instrument, at great expense, although one appliance would have been more than enough to satisfy the needs of all those doing research in that town. This cannot be tolerated, either from the economic or from the moral point of view, it shows irresponsibility towards the people, towards those who work hard to create--to produce--the material conditions of scientific research. It costs too much to employ scientists who want to attain authority through "status" equipment rather than performance.

The proliferation of subjects, the "my subject is my castle" attitude also causes much damage. The fact is that there is no "appropriable" subjects as "private property" which strangers are not supposed to trespass on. A dividing up of the scientific territory into strips is harmful not only because it is detrimental to the efficacy of research but also because it damages human relations.

Hungarian participation in international research depends on the domestic structure of science. One of the most important conditions is that integration and cooperation within Hungarian science should be closer, and there should be far more substantial knowledge of results attained by others. As long as cooperation among Hungarian scientists is unsatisfactory, as long as research results are not synthesised, in spite of relations abroad entertained by some, one cannot join as expected in international activities, first of all in the research work done in the socialist countries. Progress in this respect can be assured primarily by the sound public spirit of individual institutes if everybody is aware of the problems, and the head of the institute does not permit, or even demand, that his name be included among the authors, though everyone knows he has done none of the work. Since these wrongs affect the smaller part of science only it is still possible to cope successfully. It would therefore be timely to distinguish severely between normal, sound and natural personal ambitions and desires which exist in every man, and careerism. Careerism to my mind is when someone without doing any work manages to acquire title, rank and everything else that is due to man only for his labour.

Scientific schools are an important and recurrent question. Cliques are the greatest obstacle in the way of creating new schools. Either we have

a school or we have a clique. A school is based on debates among members, not cliquish intrigue. It was said earlier, a trifle humorously perhaps but I think in ill-chosen words, that there is peaceful coexistence in certain sciences in this country. This is a remark that cannot be peacefully ignored.

We use the term peaceful coexistence in connection with different social systems, and this really and clearly makes sense. In world politics--if we keep the future of mankind in view--there can be no other alternative. If, on the other hand, one thinks of those who share a Marxist view of life, research scientists who have differences of opinion, the use of the term peaceful coexistence is absurd and inadmissible. Differences of opinion must be discussed, they must not be hushed up. Peace at any price in one's daily work only leads to intellectual torpor. Indulgence of this kind only causes damage. If one cannot arouse a sound and ardent debating spirit, then scientific schools will not evolve, and science will make no progress. Where no schools have evolved because there was no discussion, direction was obviously of poor quality.

Criticism and Ethics

The closer to one another people are ideologically, in respect of spheres of interest and ambitions, the sharper differences of opinion concerning concrete questions of detail. That is how it should be. One should not be afraid of the ensuing conflicts, debates should be carried through to the end with scientific rigour--this is required by the interests of science and of the country.

On the other hand, the groups which have come into being based on particular interests, that is the cliques, bar the way of worthwhile scientific discussion, in which there is, and there can be, no other angle than the approach to truth.

The progress of science points to the integration of specific research, the Academy however often supports smaller groups. This is a dialectic process. There is specialisation and there is synthesis. In order to progress along the line of synthesis as well, specialists have to collaborate. Let them give, so they can take, using what they have achieved themselves to constructively criticize the work of others, thus helping each other.

This, however, can only be done if no one starts with the idea that someone might get cross because another criticizes his work. Let me repeat, scientists are not supermen, yet they have greater responsibilities which they cannot evade. In their corner of human activity commitment to truths that were fought for is not only a matter of honour but a working tool. It is up to criticism to fight against the resurrection of scientific dogmatism and not in the sense of the term used when speaking of the ideology of the fifties. The point is that there is danger of dogmatism if some try to apply mechanically, to today's reality, a truth that applied to yesterday's. It is still worse when they cling to truths that were merely imagined and described but not confirmed yesterday either.

Nor should one forget another danger: relativising the truth in a way which ultimately leads to scientific nihilism, and the self-denial of science.

Only Marxism-Leninism can really protect against all these dangers, if one's knowledge of it is sound, and it is properly applied. One often speaks, and with good reason, of the importance of interdisciplinary research, it should not be forgotten there that it is not enough for physicists to work with biologists or mathematicians, it should be clearly told as well that neither a chemist nor a historian can do successful work now without applying the scientific world outlook of the age, that is Marxism-Leninism.

A step forward must be taken in scientific criticism. Criticism is one of the most important tools of science policy, not only in the social sciences where it is indispensable owing to its ideological and epistemological function, in every science however it is its job to explore the truth and not accept any other approach. Of course, general conditions in scientific life depend on whether the tasks at the core of science are realistic and, what is inseparable from this, whether a realistic, businesslike, objective and correct criticism prevails.

Hungarian science is concerned with significant questions of nature, society, and technology, it has won an important place both in the shaping of the way of thinking of the nation and in economic growth. The moulders of consciousness, however, have to shape and develop more effectively the socialist character of public thinking in their own fields. Does Marxist criticism prevail, as it should, in the workshops of science, are scientific debates channelled in the way they should be? One cannot answer unambiguously that everything is in order.

Scientific criticism largely depends on the inner laws of particular sciences (natural science or social science; basic research or applied research). In the case of experiments in research evaluating performance is less troublesome than in other scientific pursuits. Nevertheless it has to be said that no science can do without criticism. Exact methods can tell whether an experiment was a success or failure, but deciding whether the experiment was necessary in the first place is up to science policy. In order to answer it is not enough to examine the process of experiments but comprehensive scientific criticism is also needed.

It is especially important to apply Marxist-Leninist criticism in the social sciences, where experiments have a very limited scope, and where the objective scientific truth filters through the prism of interest relations. (This does not mean that the natural sciences are outside the pale of interest relations.)

In this sphere it is up to criticism to enforce the public interest without prejudicing objective scientific truth. Since we know that criticism is not exempt either from the interest influences exerted on the social sciences, a criticism of criticism is also needed.

Science can be said to be really public-spirited when science policy considerations transmitting the social interest increasingly coincide with its own aspirations. The ethical aspects of scientific activity cannot be examined apart from the problems of public access. The controlling function of public access in order that public opinion might judge human attitudes in accordance with genuine knowledge and requirements has ever been basic to the assertion of ethical norms. Socialism has created better conditions for such an openness. Public access to science is not without its problems in Hungary; more precisely, everything that should be, is not properly publicized, and antisocial manifestations are also given some scope, and there are others who hypocritically create an appearance of satisfying ethical and political requirements. The lives of the majority of scientists are governed by the same norms as are valid throughout society and therefore it can be said that the great majority are interested in seeing things clearly and in the sort of publicity which action, and taking up a position, require.

I don't think that what I propose to refer to is a mere linguistic problem, it has profound implications, for politics and for a scientific outlook. I read something by Julien Benda once which Miklos Radnoti the poet chose to live by. "A badly constructed sentence is like a broken window pane." Ecclesiastical language necessarily kept people away from knowledge. Hungarian scientists are guided by different considerations, but even so it is inadmissible that good Hungarian expressions should have unreasonably been thrown overboard by some sciences, that progress be towards bookishness instead of towards knowledge, which is often given a pseudo-scientific dressing. If we peel off the pompousness and look behind the text, what we find there is often something extremely simple and simpleminded.

Looking over Hungarian scientific periodicals, I frequently experience grey tedium and professional esoterism. The inordinate use of scientific jargon makes many journals--and many articles judged to be important by their titles--unreadable and unusable. In other cases, especially in sociology which is progressing fast, it is the approach, and methodological fetishism, which provide alarming examples. There are literary studies which, analysing easily intelligible works, ultimately transform them into inexplicable puzzles. Instead of paving the way to such works, they often block it. Perhaps because they write not for the readers of the periodicals, but for the Scientific Qualifications Committee which awards scientific degrees.

No one can deny that the nature of communication varies from discipline to discipline, depending on the nature of the object. But it is unnatural that, for example, the social sciences, in the great part of which application is equal to communication, high-falutin' texts meant for initiates should be published. Science ought to become a force of production not only in the technical sense, it is also indispensable in the shaping of the principal force of production--man, with his consciousness and range of vision. For this, however, scientific publications are needed which show an awareness of this demand.

Something should be said about the desire for a research job. I know nothing about athletics, yet I read with interest that an American athlete had improved the world record for a 100-meters by a tenth of a second. I am convinced that he was not alone on the track, that he did not just race against the clock. Eight men started, all athletes of about the same standing as the world-record holder. In science, on the other hand, we try to get rid of competitors, although he who does that diminishes himself, his own strength, depriving himself of the chance of victory.

Lenin's dream that has since come true was socialist competition which would mobilise persons, individuals, hundreds of millions of them, as against the drabness of bourgeois society, replacing the dozens or hundreds of competitors in the latter. But this competition radically differs in spirit and practice from bourgeois competition or rivalry stimulated merely by the desire for personal success. In socialist society solidarity must be the law, the paramount law, of life and work. Only on such a new basis can the sort of competition blossom in which talent and knowledge, and perseverance triumph, competition is to do one's best for the social good, and not for barren laurels.

If the striving for monopolistic positions aspiration for absolute hegemony and the elimination of rivals is murderous in its effect, then it is certainly so in science. The age of kings is over in this field, as well. Where court jesters only can tell the truth, and only sometimes, there is no home for truth.

In the building of socialist society it was not all that long ago when genetics, cybernetics and certain other disciplines of knowledge were held back by the actions of scientists in other fields that brooked no competition. This was true of certain social sciences as well and impaired the scientific character of Marxism-Leninism, making it difficult to study things how they really were.

Having learned their lesson those responsible for science policy, and those who direct research, as well as scientists have to strive to guarantee the freedom of scientific research, discussing things in a manner democratic and in keeping with high principles, disseminating and applying scientific knowledge, thus enriching the science and ideology of Marxism.

Scientific Qualifications

The system of scientific, post-graduate qualifications is one of the most important selection mechanisms. If, however, this system equally grants degrees for mediocre, superficial, far from scholarly, only apparently but not really major scientific performances, then this is an insult to those who have seriously worked for science.

There is a danger of post-graduate degrees being devalued. A stop must be put to this process and standards have to be raised.

No scientific performance, no work of value for science, can be achieved if the only impulse behind it is the striving to obtain a post-graduate degree. It is equally inadmissible to judge the relevance of subjects by whether the applicant, using a trick or two, is able to give his work a title that allows it to be classified as high priority research. In many cases the chosen subjects are forcibly "connected up" with such high-priority fields. If someone in this country wishes to study elegies, there is no need to connect them up with the scientific and technological revolution just to lend the subject a more modern appearance, making it more marketable. A contributing factor of devaluation is also that qualifications are mostly decided without a confrontation with scientific opinions of real and common interest, that is a constructive exchange of views promoting the interests of the common cause is avoided.

A good few years ago the Academy of Sciences laid down that the work of scholars with qualifications should be re-examined from time to time, and the candidate's etc., degree might be withdrawn from those who for 5 to 7 years have done no research. The resolution had no teeth and very little was done as a result. It suffices for someone to write a thesis, pass the necessary examinations, and he has qualifications for life. Thus nobody requires systematic scientific work, or continued intellectual presence. A single thesis enables one to obtain a title and extra allowances until death.

In certain disciplines post-graduate degrees turned into a system of allowances. Examinations have to be passed if one wishes to continue doing research work. Such examinations have become formal conditions of promotion.

If degrees are conferred on undeserving persons, this is an insult to the whole of science. If a negative precedent occurs, if someone is granted a degree for a poor performance, what moral ground is there to object to the granting of a degree for other similar work? Poor performance in this way justifies the acceptance of 40, 50 or 100 other poor theses.

The practice of science policy is also to be blamed for this, since, for example, university appointments have been subjected to the holding of a post-graduate degree. But if we have made a mistake, let us not be ashamed of rectifying it. A person may be an excellent teacher, someone who gives a start to future scientists, without having obtained any qualification himself. A person may be an outstanding healer likewise without a higher degree. The current situation must therefore be ended. The Academy of Sciences should do its best to stop this process of devaluation, and to enforce a much higher standard.

It is also a task of the Academy of Sciences to establish at last an evaluative order of collective work. We all have a duty to promote the birth of such collective works.

Let us eliminate contingency, and let there be greater responsibility in selection on the basis of experience. Let us create the possibility of preventing abuses of knowledge in such a way that rejection should not mean disgrace, appeal should be possible, but that the feudal-minded hierarchy should stop strangling science.

In addition to exercising a selecting function, post-graduate degrees ought to mirror also the organic development of science, its relation to society, and to the economy.

One important task of the executives of the Hungarian Academy of Sciences might be to revise the system of post-graduate degrees it awards, enforcing more consistently the social interest against the monopolistic position which keeps particular interests to the fore.

Present and Future

Before the year 2000, having entered the last quarter of the century, we have to talk more, and in greater detail, about the future, doing something about it. In many respects all of us are working for the next century. We now lay the groundwork for the new era, and it is not irrelevant how we do it.

In this work, science has to play a conclusive and qualitatively new role which is now in the making. Science and research are organically linked with all aspects of social practice, without being distinct from them, and will in future simply become the duties of a job.

One has to make use of the opportunity of shaping the future scientifically. This is why the significance of investigating future tendencies of development, and the importance of long-range planning, has increased. We have to construe realistically the role played by the scientific and technological revolution. It has vast perspectives, but distilled, lifeless technocracy can make one blind and lead to the loss of human perspectives. This is why we have to concentrate on the scientific exploration of social, conscious, individual and community relationships, on the historical formation of the active cooperation of conscious communities. For this purpose science will require active, creative collectives, and men with real personalities. The two get on well together and even presuppose each other.

What Lenin had to say is most apposite in this connection:

"The hangers-on and spongers on the bourgeoisie described socialism as a uniform, routine, monotonous, and drab barrack system.... Only now is the opportunity created for the truly mass display of enterprise, competition and bold initiative.... One of the most important tasks today, if not the most important, is to develop this independent initiative of the workers, and of all the working and exploited people generally, develop it as widely as possible in creative organisational work."*

* V. I. Lenin: "Collected Works" Vol 26, Progress Publishers, Moscow, 1972, pp 404-409. "How To Organise Competition?" 1917.

In connection with the 1969 resolution on science policy there has been much discussion about democracy in science. Allow me to make a relevant point.

What can democracy be really like in science?

Someone remarked that the holder of a candidate's degree can receive more money to help him in his research than an academician or a university professor and head of department. I very much hope that in justified cases this is really so. I wish there were many such cases. Provision with funds should not be made dependent on status but on the subject and the result. I should again like to refer to Einstein, who was neither a candidate nor a university lecturer yet when he formulated his special theory of relativity, and fortunately he was not required to hold a post-graduate degree, or else he may not have obtained it to this day either; he might have failed in some of his special examinations. A judgment of scientific performances cannot depend on how old the person is or on his status. There is no progress if talent is not unconditionally supported. The great scientist is glad to see those more promising than he. He owes this to his moral standards. Appreciation should be based on the scale of values and knowledge, and not on official status. This is a primary democratic requirement.

It is known that the 11th Congress of the Hungarian Socialist Workers' Party has dealt in detail with questions of democracy, including democracy on the job.

Well, job democracy applies to research and science as well. Without looking for a forced analogy, we have to see clearly, in the improvement of the social efficacy of research and science, democracy on the job plays the same key role as in other sectors of life.

All that I have said about criticism, the true appreciation of research and scientific results, qualifications, and the researcher's ethics, is implied in democracy on the job. One may ask therefore whether research establishments of the Academy, and other research authorities have done enough in shaping a democratic, creative atmosphere of the place of employment. As I see it, they have not, certainly not yet. It is hard to imagine that in places of research with a sincere, creative atmosphere, where open debate, the mutual confrontation of differing views, constructive criticism are the rule, there should be research projects which are alienated from social demand, and mostly serve individual ambitions and interests, being carried out by appropriating the needed research equipment and personnel. To further develop democracy in science is one of the most important tasks of science policy. Energetic measures should be taken against monopolistic positions and ambitions. Only in this way is it possible to guarantee the expansion of talents. Whereas socialism cannot afford to waste even one man fit for creative work in vanity fair.

Further Development of Research Management

With the current revision of the implementation of the science policy directives, by improving the management of research, what has to be achieved first of all is that science and research development in Hungary should be more closely, more organically related to social practice, to the whole of society; that they be better integrated with the international--above all the socialist--division of labour. But this cooperation cannot be measured by the number of subjects of joint research; it is more essential to follow the same direction on the principles of this cooperation, and its Marxist-Leninist foundations. With a view to this broad integration internal integration has to be strengthened as well. Science should not be a separate, self-contained sector of social activity, it should be firmly linked to the economy, culture, education, state administration, politics, to the entire movement of society. That is, beside its reality-exploring function, its role in the shaping of reality should grow as well. All this does not, and cannot, jeopardise the autonomy of science and scientists and the scientific foundation of research.

It is still a weak point of science policy that it has been little able to draw into its scope the comprehensive guidance of international relations, and to ensure that domestic research development is more closely linked to social practice. There is still much to be done in these fields.

Open access in science, scientific ethics, democracy on the job are all tasks in which progress cannot be expected exclusively from a new system of management. The solution of these tasks in part belongs amongst the duties of the scientific institutes of the Academy. Progress can be expected only from the joint activity of the whole of Hungarian science, both research workers and those in charge of them.

Research must be directed based on the social and national economic interest. Here as well as everywhere this is what management has to serve. Good management is almost invisible, being of an ancillary character in the noblest sense of the word. At the Academy this means that the effectiveness of management has to manifest itself in the concentration of forces and in the results.

While stressing this, it also has to be said that here--just as in the arts and literature--creative discontent is equally needed. Science should feel the absence of commissions from the state, it should want more and expect more, and policy also should expect more because the sciences underwent rapid dynamic development precisely at the time when enterprise prospered and the demand for commissions was great. This kind of uninterrupted two-way process must enjoy support.

One cannot of course expect wonders from the improvement of management. There exists no automatism that settles things by itself, without cooperation, enterprise and risk-taking. We have to examine our common business

and do so in the spirit of Marxism-Leninism, understanding that it is necessary constantly to disturb minds and constantly to reconsider what was decided yesterday. This means that change is needed, and I am convinced that this need for change today comes from the depths of Hungarian science.

The freedom which the party and the socialist system guarantee science in the interest of the people involves immense responsibilities exercising which is difficult and complicated. The country is mature enough to make better use of opportunities and responsibilities. When there is so much talk about the management of science, this means that scientists should assist in working out the system of management, it is they who can really implement the system in the creation of which they have participated. Scientists should help to ask questions, and formulate them well, for if they succeed in this, it will naturally be easier to answer them.

Changes ripe to be made offer an opportunity which may lead to better cooperation and speedier development, and which may in future enable us to remove a few recurring subjects from the agenda and to start seeking solutions to some problems requiring further efforts.

CSO: 2020

- END -