JPRS 69492

26 July 1977

TRANSLATIONS ON EASTERN EUROPE

SCIENTIFIC AFFAIRS

No. 554

EAST EUROPE

U. S. JOINT PUBLICATIONS RESEARCH SERVICE

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 69492	2.	3. Recipient's Accession No.
4. Title and Subtitle TRANSLATIONS ON EASTERN EUROPE - SCIENTIFIC AFFAIRS, No.554			5. Report Date 26 July 1977 6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201			10. Project/Task/Work Unit No. 11. Contract/Grant No.
12. Sponsoring Organization Name and Address As above			13. Type of Report & Period Covered 14.

15. Supplementary Notes

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

___ International Affairs
___ Albania
_x_ Bulgaria
___ Czechoslovakia
___ East Germany
_x_ Hungary
___ Poland
_x_ Romania
___ Yugoslavia

Scientific Societies
Research Management
Organizations
Research

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 61
	20. Security Class (This Page) UNCLASSIFIED	22. Price PC-A04

JPRS 69492

26 July 1977

TRANSLATIONS ON EASTERN EUROPE

SCIENTIFIC AFFAIRS

No. 554

CONTENTS PAGE

BULGARIA

New Organizational Structure of Bulgarian Academy of Sciences
(Lyubomir Zhelyazkov, Aleksandur Vasilev; VECHERNI NOVINI, 1 Jul 77) 1

HUNGARY

President Evaluates Performance, Outlines, Tasks of Academy Organs
(Janos Szentagothai; MAGYAR TUDOMANY, Jun 77) 3

Activities of Academy Institutes Reviewed
(Ferenc Marta; MAGYAR TUDOMANY, Jun 77) 13

Proceedings of Academy General Assembly Published
(MAGYAR TUDOMANY, Jun 77) 28

Roster of Doctors and Candidates of Sciences Published
(MAGYAR TUDOMANY, Jun 77) 33

Academician Discusses CEMA Nuclear Cooperation
(MUSZAKI ELET, 1 Jul 77) 39

Communications Engineering Research Institute Advertises IC's
(HIRADASTECHNIKA, Jun 77) 41

Computer System Controls Nationwide Transport Network
(Janos Koncz; FIGEYLO, 6 Jul 77) 44

ROMANIA

Contributions of Romanian Physiologists Cited
(Razvan Barbulescu; FLACARA, 2 Jun 77) 49

Romanians Pioneers in Preserving Bone Marrow
(Dumitru Graur; FLACARA, 2 Jun 77) 52

NEW ORGANIZATIONAL STRUCTURE OF BULGARIAN ACADEMY OF SCIENCES

Sofia VECHERNI NOVINI in Bulgaria 1 Jul 77 p 4

[Statement by corresponding member Professor Lyubomir Zhelyazkov, BAN [Bulgarian Academy of Sciences] deputy chairman, to VECHERNI NOVINI, recorded by Aleksandur Vasilev: "Bulgarian Science in a New Stage of Development"]

[Text] Recently the Bulgarian Academy of Sciences held its General Assembly. New leading organs of the BAN were elected together with a new foreign member of our academy--Academician (Heintz Betge), member of the GDR Academy of Sciences. The delegates also voted on the list of additional members of the BAN General Assembly which includes noted Bulgarian scientists, ministers, deputy ministers, directors of scientific centers, and specialists.

The most important item on the agenda was the ratification of a general system for improving the management of the Bulgarian Academy of Sciences. This problem had already been considered in all its aspects by the State Council and the Council of Ministers. We asked Corresponding Member Lyubomir Zhelyazkov, BAN deputy chairman, to share with the readers of VECHERNI NOVINI the most interesting aspects of this new stage in the development of Bulgarian science. "Let us note with great pleasure and satisfaction that both the state commission to which the materials related to the general plan were submitted for preliminary basic discussion as well as the Council of Ministers paid particular attention to and had great understanding of the problems of the Bulgarian Academy of Sciences.

"By order of the Council of Ministers the new organizational structure of the Bulgarian Academy of Sciences was approved and will become effective immediately.

"Let us note that without changing the object of activities and the nature of the current united centers for science and cadre training, they will have different names such as United Center for Mathematics and Mechanics, United Center for Physics, United Center for Chemistry, United Center for Biology, United Center for Earth Sciences, and so on.

"A new scientific Association for Basic Problems of the Technical Sciences has been established. It includes the Institute of Technical Cybernetics, the Institute of Knowledge of Metals and Metal Technology, the Institute of Water Problems, and the Central Laboratory for Physical and Chemical Mechanics.

"At the same time certain changes have been made in the structure of the existing united centers. These changes will considerably improve the work of the centers themselves as well as of their branches. The work will become more purposeful and more effective. Let us indicate some of them: For example, the United Center for the Law will be replaced by the United Center for Sciences of the State and Law. The Institute of Biochemistry within the United Center for Biology, will become the Institute for Molecular Biology. The Base for the Development and Application of Computer Equipment and Automation (BRVITA) has become the Base for the Automation of Scientific Experimentation, with very promising and extensive rights. A Central Laboratory for Solar Energy and New Energy Sources has been established as well, along with the Institute for the Theory and History of Urban Construction and Architecture.

"It is important and it should be emphasized that the BAN is being granted extensive rights in the development of its management structures and in managing the system. Furthermore, the academy has been given the functions of national coordinator for basic research in the natural and social sciences. The bureau of the BAN presidium is being restored. Problem scientific councils are being created, age limitations in the election of academicians are being removed, and so on.

"As a result of all these changes we should expect of the BAN far greater effectiveness and quality in resolving problems related mainly to the practical application of our scientific accomplishments."

5003
CSO: 2202

PRESIDENT EVALUATES PERFORMANCE, OUTLINES, TASKS OF ACADEMY ORGANS

Budapest MAGYAR TUDOMANY in Hungarian No 6, Jun 77 pp 409-416

[Article by Janos Szentagothai: "The Tasks of Our Academy and of the Goals of Its Organs"]

[Text] The period that has elapsed since the 1976 general assembly was a period during which we ended a four-year cycle and carried out the first year of a five-year cycle synchronized with a new plan for the economy as a whole, and during which we examined ourselves, tried to answer the question "what next?", and during which we also carried out successfully some important tasks and mandates imposed on us by the resolutions of the last general assembly. Motivating and decisive factors from within and outside of the Academy also prevailed during this unusual period.

An especially important impetus for the Academy was the analysis of the evaluation of the implementation of the 1969 science policy guidelines, performed by the extensive network of the MSZMP committees. The results of this analysis indicate that the science policy guidelines promulgated eight years ago foresaw properly many of the major changes that took place in political, social, and economic life, as well as in the developments in science, and that they outlined properly that science policy which under these conditions ensured best the advancement of scientific research and technical development which had to keep pace with the practically explosive rate of growth in the demands of society as a whole.

The text of the evaluation, which reflects the present intermediate situation, was debated at the request of the secretariat of the central committee of the MSZMP at an expanded extraordinary session, which was held 25 March. At this session there was unanimous agreement that the science policy guidelines indeed affected domestic scientific life significantly during the past eight years, and that they also contributed to scientific creativity and the social role of science. It was also agreed that with suitable

modernization these guidelines will continue to assist in the proper orientation of our science policies and the definition of the tasks facing us.

The opinion of the expanded presidium about whether the level of domestic scientific research increased sufficiently during the last eight years — especially in view of the increased demands from society and of major international developments — was not that unanimous. As the evaluation concluded, there was major and high-quality progress in many areas. Although there has been a noticeable trend toward the orientation of the studies made in the direction of the needs of society, the attitude that research, technical development, production, and sales — which are all parts of a whole for more sophisticated and systematic planning and development — must be unified is not yet evident. However, this would be an opportunity for the joint interdisciplinary cooperation of the natural and social sciences, both at their fundamental and applied levels. The fact alone that the "products" of research activities do not everywhere in science yield outstanding results matching the international level in terms of practical and scientific terms — especially in certain fields of science — shows that there is something wrong in the operation of our scientific system. This is also indicated in the alarmingly low rate of patent generation. We know from scientific papers and reports, which we read every day, that there are important scientific achievements but we also know that their utilization proceeds with difficulties, for several reasons, one of them being the fact that material factors interfere. As a result, the scientists lose interest in attempting to travel the rocky road toward applications. Obviously, the viewing of the chain leading from research to the marketing of a product as a coordinated system is the sole hope for radical change, as has already been demonstrated by some cooperative efforts of scientific institutions and industrial enterprises in Hungary.

The falling behind in two disciplines, namely in medical and agricultural research, is disquieting: this is particularly so in view of the fact that the needs of society and the situation of our country would demand a good yield from the investments in these fields especially. In general, the esteem of practicality-oriented scientific research is not very high in our society. We are concerned about the falling behind, or at least by the fact that we do not advance, from the levels stipulated in the proper manner by the science policy concerning university research development.

There have been general concerns about the qualitative aspects of research, the more objective evaluation of the research activities, the quality of the debates, the level of the criticisms, and the mobility of scientists.

We must come back to these matters later, especially in view of the fact that they are of a general and fundamental character.

In such a critical review, we must be careful not to lose our realistic perspective in evaluating the achievements which did occur. There has been an explosive development in scientific research and the utilization of its results everywhere in the world at the threshold of the scientific and technical revolution. No tradition and talents can change the fact that, as Vorosmarty stated aptly "brains, force, and holy will," such as they exist in this medium-size, medium-developed country of 10.5 million inhabitants, can expect major achievements only in relatively few areas and only in cooperation with other countries. When the 11th Congress of the MSZMP outlined for us the task of assisting the domestic unfolding of the scientific and technical revolution and of speeding up the practical utilization of the results of scientific research, it also mandated us to be selective and to cooperate better in the international area.

Today, when the world-economic situation is more complicated and difficult than before, it is difficult to outline, even for the immediate future, the manner in which we should selectively develop our research activities on the basis of the science policy guidelines and slow down correspondingly the activities in some other areas. But if we face the realities, we have no other choice if we are to utilize optimally the resources available for research from the national product. We must therefore measure the priorities in the most objective manner possible, we must explore the reserves inherent in international cooperation, we must make use of these reserves, and we must even make and enforce some unpopular measures on the basis of the synthesis following from these considerations. If we are to be purposeful and systematic, we must continuously rethink our plans and we must be prepared to make drastic changes in our science policy approaches and decisions if this is warranted. Of course, we must always remember that science must become a "productive force" and it must also explore reality and shape consciousness, so that we establish the foundations for the role of science in today's society and the society of the years to come.

The science policy guidelines are manifested for the Hungarian Academy of Sciences in Law No 41 of 1969, and the organizational reform of the Academy of 1970. The seven years which have elapsed since permit us to view the positive and negative aspects of the reform from the proper perspective. The organs charged with this evaluation have assessed quite properly and in the spirit of the times the academic reform of 1970 and its results.

We can report major achievements even in those areas where the manifestation of the basic concepts of the reform has been most criticized and in the area of the functioning of the Academy as the supreme scientific organ in the country. The number and quality of comparative analyses of the domestic and foreign scientific activities in various fields has increased significantly in recent years, and the conclusions can be now compared and organized according to importance. Our academy was an important initiator and participant in the analysis of matters affecting our society as a whole and in formulating the future reforms in these matters. Some examples: public education, environmental protection, the complex problems of water management, the long-range development of the national economy, and the future educational complex. The Academy should take an increasing role in these matters in the future. The steps required by the times in the areas of the concerted organization of scientific efforts have been taken by the Academy in general, and its organs and committees in particular, in the formulation and implementation of the tasks, in cooperation with the OTTKT [National Long-Range Scientific Research Plan] and the OMFB [National Technical Development Committee].

Nonetheless, the general approval of the fundamental goals of the reform of 1970 is based on the fact that the responsible guidance of the academic institutions and research establishments is expected not from an even outstanding and unified social work but from an organ with state responsibility properly appointed for this purpose. Indeed, the development and operation of the academic research system and the institutions became more systematic after the reform, in the opinion of all non-biased observers and those directly affected. There has been a major improvement in handling everything, including day-to-day minor routine matters and major decisions, and the decisions are better founded and effective.

In spite of the undeniable achievements, important parts of the reform were only partially realized. The main weakness in the implementation of the reform is that the theoretical and methodological guidance function of the academic organs in terms of national science policy — the "supreme scientific character" as defined in the guidelines — manifested itself only within a narrow range. These deficiencies are related in part to the direct implementation of the reform , and in part to management methods, personnel changes, and the emergence of unexpected problems in connection with the introduction of the reform. There is agreement that what we need is not new reforms but the rectification of the deficiencies encountered. Remedy is to be expected primarily from the proper interpretation of the dual role of the Academy and from the proper performance of the two functions, meaning the leadership function for the theoretical and methodological

aspects of all phases of scientific research for all national institutions, and the scientific management function, and — last but not least — the joint effects of the two.

In defining the tasks of the institutional organs in more detail, it is advisable to start from the fact that the activities of the Academy continue to encompass all domestic scientific research functions, with special emphasis on fundamental research. In this field of activity, as it can be read in the draft "position paper" obtained, we should define more specifically the various tasks assigned to us. We can perform these tasks best in our own, quaint way, similarly to the way in which the social organs perform their tasks. We should devote detailed attention to the further strengthening of the relationships between research and practice, keeping in mind the related tasks of the Academy, including the need of making "the achievement of major scientific results which serve the development of science, and assist growth in society, the economy, and general development to a significant degree" as has been proposed by many.

It is also important that we strengthen and expand our relationships with the ministries supervising the non-academic research establishments, as well as with other bodies of national jurisdiction. In our opinion, we should use our good cooperation with the OM [Ministry of Education], EuM [Ministry of Health], the MEM [Ministry of Agriculture and Food], and the OMFB as the example for establishing good working relationships with other bodies and achieve that they ask our opinions about matters affecting their work and having to do with science. With all these activities, we should be able to supplement the "scientific society" role of the Academy.

Expansion of the role and authority, however, will not help much without an improvement in the style of the institutional work. It is absolutely essential to increase the democratic character of the institutional work, to improve the continuity and intensity of the committee-type regional supervision, and to become more selective and concentrated in the evaluation of higher-level (department-level) evaluations. It would be important to find a way for the advance recognition of activity "waves" which occur in various periods, for example when reporting and planning cycles come up.

The draft position paper obtained specifically defines the major aspects of those thoughts resulting from the extensive consultations which the appointed president and the general secretary of the Academy sumbitted in March of this year to the TPB [Technical Policy Committee] on the basis of authorization from the presidium. These items obtained their final form primarily on the basis of the more precise definition of the institutional organs and scientific leadership groups, and in our opinion they may form

the basis of the decisions concerning the debate of the general assembly and the further modifications of the reform. In order to provide properly the foundations for the unity of the Academy in its dual role, its present officers already established a consultative group, in which the appointed president, the general secretary, the deputy presidents, and the deputy general secretaries participate. It is our recommendation that this group of leaders be formalized and meet regularly. To implement better the need for interdisciplinary approach, we propose that — while the deputy presidents retain their jurisdictional authorities — the departments accord more authority to them in their otherwise intact fields. In order to achieve better organizational and administrative efficiency, we propose that the administrative apparatus be reorganized to become a unified Central Bureau. Some of these administrative changes require legal codification, and of course the present group is not best suited for establishing the details of this, since the general assembly is too unwieldy for such a project. Perhaps the working committee mentioned in the last item of the recommended resolution might prepare the legal modifications required, and might also prepare a draft organizational and administrative framework so that a decision could be rendered by a later general assembly.

This report has already referred to briefly to the weaknesses of the level of domestic scientific research, the objective evaluation of the results, and the scientific debates and criticisms. No matter how unpleasant this may be, we must face squarely one time or another these basic problems of ours. Let us be frank and admit that these often-reiterated deficiencies of our scientific life do exist. But we fear nonetheless that these homilies and timid resolutions for "the start of a new era" will not make much of a change, nor will any administrative proposals. For example, one of our esteemed colleagues called recently the concerns about the lack of debating spirit "self-pitying affectations" and concluded that not much useful will result from them. Indeed, it would be more helpful to analyze in detail the internal mechanism of our scientific life and to establish whether it is the cause of the "weakness" of the critique and of our other maladies. I am a biologist myself, thus I hope to be permitted to guess that what takes place in our science today — and doubtlessly in the science of others in the world also — is something like the event which took place in the biosphere which became filled with live organisms with amazing adaptation capabilities in its every nook. An analogy of this is what takes place in science: there is a peculiar retrenchment into the "ecological nooks of the scientific life" where an individual researcher or a team isolates itself behind a barricade of a narrow methodological wall to feel safe from the general competition. But same as in the live organisms, where this phenomenon is known under the name of "ecological cul-de-sac," this is a

retrogressive approach ultimately; it is good for survival but it is not good for moving forward. Major advancement in the history of science took always place if a scientific discipline supplements its own resources with knowledge and approaches from other areas. The most important breakthrough of the second half of the 20th century, the discovery of the double helix of the DNA molecule, resulted basically from the combination of our knowledge of analytical biochemistry and the factors concerning the macromolecules which were established basically by physical means and provided data about the spatial and dimensional aspects of the macromolecules. This started the triumphal advance of molecular biology. It is theoretically impossible to achieve such breakthroughs if science is retracted into such "quasi-ecological" nooks. As a matter of fact there is not even a hope for serious debate under such conditions. Thus, the absence of debate is not the disease itself; it is only a symptom of a basic malady afflicting the structure of our scientific life. The breathtaking growth of recent years, which is primarily methodological in character, understandably detracts the attention of the researchers from the major strategic aspects of the specialist sciences, since all our efforts are taken up by merely following this growth. Yet we cannot accept at all the methodological and attidudinal throttling down of our scientific institutions in general and our life-scientific institutions in particular, which characterizes our scientific life. Albert Szent-Gyorgyi held "Gombas Pal" quantum-mechanical courses in 1946-1957 for his broad team. There have been similar initiatives during the 1950's and the early 1960's by Jeno Ernst, but all these efforts remained a "cry in the wilderness." The rudimentary state of theoretical biology, including theoretical neurobiology, and the creative utilization of modern electronic instruments in the field of life phenomena — in spite of some promising beginnings — and the backward state of the application of non-equilibrium thermodynamics and system analysis to biological systems — to mention only a few typical instances — do not give the impression that some major breakthroughs will occur in our country in the future. We are not children and we know that the tactic of "small steps" appears to be safer today insofar as advancement in the sciences is concerned. We also know that the above-listed, more daring concepts with "stressed interdisciplinarity" are often not successful. But we must also be aware of the fact that without risks — of course, risks undertaken with scientific responsibility — there are no major breakthroughs and that such breakthroughs do not necessarily occur only in laboratories continuously lavished with the most modern special instruments. Accordingly, we must build into the scale of our evaluations some such risks also.

The basic problem of our scientific life is that we close up and lack a true interdisciplinary thinking and strategy. Anything else, such as the weakness

of the critical spirit and responsible criticism, as well as the lack of selectivity therefore obtains an additional objective base — in our opinion, further to the weaknesses of self assurance based on principle. It is very difficult to establish priorities among the individually closed and methodologically well founded studies. Each one may appear just as justified in its own field as another as long as we do not apply the measure of the need and possibility of breakthroughs.

The oft-mentioned lack of scientist mobility also looks different in the light of these considerations: "why should anyone move out from his own science-ecological niche if it provides him with relative security, promotions, and absence of strain?" The "inflation" of scientific qualification also turns up as a necessary consequence, to supplement the weaknesses of our public life in the areas of "active" and "passive" criticism (meaning criticising and being subjected to criticism). Let us say frankly: "who would not be able of writing an acceptable candidate's and later an acceptable doctor's dissertation within a few years after having found a place in a relatively small team, working in a hedgehog-like manner?" In our scientific qualification system, we must weigh not only the formalistic requirements but also the true and original creativity. We could continue to analyze the internal contradictions of our scientific life, but we would merely find that everything leads us back to the same starting point. We should mature so as to become able to face such uncomfortable facts and to become able to use methods for the objective assessment of scientific accomplishment, for example true "scientometry," the recognition and appreciation of true creativity, and the effective blockage of manipulations serving individual interests.

But it would be wrong to create the impression that the year that elapsed since the last general assembly was spent solely with such self-analysis. There have been major concrete tasks and events also.

We have issued a brief summarizing report as background material to supplement the report of evaluation prepared under a mandate from the last general assembly, dealing with the institutional activities concerning the 1976 report and the planning cycle change period. In this summarizing report, we discuss the work of the presidium since the last general assembly, some aspects of the work of the presidium committees, the major indicators of the restructuring of the scientific committees, and the institutional evaluation of the plans for the 1976-1980 period for the intermediate range of research, separately for each scientific committee.

In addition, we must also mention some major events in the field of international scientific relations:

The MTA developed, with the aid of the organs and supervisory bodies, and submitted to the TPB the concepts and guidelines for scientific and technical cooperation arising from the final document of the Security and Cooperation Conference of Europe. At its August 1976 meeting, the TPB debated the proposal, approved it, and in its resolution outlined the tasks of the specialist ministries and supervisory bodies in connection with the implementation of the provisions of the final document.

At its December 1976 meeting, the presidium of the MTA debated and approved the major guidelines for international scientific relations for the 1976-1980 period. In the course of formulating the "guidelines," we reviewed and critically evaluated the course, deficiencies, and accomplishments of international scientific relations. The guiding principle must be to steer all developments in international relations toward better implementation of specific cooperation.

We prepared ourselves and participated with many initiatives in the 2d Warsaw meeting of the social-sciences deputy presidents of the academies of sciences of the socialist countries held in October 1976. It will be a great honor for us that the 3rd such meeting will be held, at our invitation, during the first half of 1978, in Budapest.

A major event of last year was the Moscow meeting of the leaders of the academies of sciences of the socialist countries held in February 1977. As mentioned in a report published elsewhere, this is the beginning of a higher-level multilateral cooperation among the academies of sciences of the socialist countries. It is implemented initially in two specific areas: automation of scientific measurements requiring an industrial background and development of scientific instruments. The social importance of scientific research was also underscored by the fact that Leonid Ilich Brezhnev, general secretary of the Communist Party of the Soviet Union, received the presidents of the academies of sciences of the socialist countries. His thoughts and evaluations enunciated on this occasion are of high importance.

In line with our traditions, the "presidium report" is the material submitted by the president — the appointed president in the present instance. The presidium of the Academy approved what had been said so far mainly in terms of its general concepts and major factual statements. Since our present general assembly is a "working general assembly," the presidium agreed to this perhaps unusual personal tone which I have used, but hope not abused. Would the members of the general assembly therefore please direct their criticism against me and not against the presidium if they concern some of the individualistic statements. May I, in conclusion, add another such

personal note. Justification for this may be the fact that the presidium reports have always been submitted at the public sessions of the general assemblies, and were supplemented by the more personal remarks of the president in closed session. Thus, this report combines the two aspects of the earlier presidium reports.

I was able to allude only briefly and in keyword-like fashion to some still outstanding problems and endeavors of our scientific and academic life. The problems facing us immediately are quite clearly evident. Our basic problem is the "opening up outward" of our institutional and research work: the work of the institutions is the better accomplishment of the national tasks, and the work of the researchers is to establish satisfactory relations with other scientific disciplines and acquire new knowledge. But it is my strong conviction that the major task facing the Academy, our supreme scientific institution in the country, is to increase its prestige, which has necessarily been tarnished and devalued at this era when everything in life moves at so fast a pace. The prestige should not be based on the right to issue operative orders — a right that is of doubtful value to an institution in any event — but on conclusions based on a thorough analysis of all ramifications of the subject matter and on the activities carried out for the implementation of these conclusions. The true prestige of an institution, just as the true prestige of an individual, is composed from primarily internal factors such as consciousness of the vocation, responsibility, self assurance based on past achievements, favoring the common good over the self interest, and standards of proper conduct.

I am convinced that most of the scientific and administrative workers of the Academy possess these qualifications; all that is needed is to channel them toward combined efforts in a constructive fashion. To paraphrase Attila Jozsef, we may say: "...let us at last arrange our common affairs; this is our task and it is not a small task." This statement is still valid today.

2542
CSO: 2502

ACTIVITIES OF ACADEMY INSTITUTES REVIEWED

Budapest MAGYAR TUDOMANY in Hungarian No 6,Jun 77 pp 417-428

[Article by Ferenc Marta]

[Text] Last year — and part of the beginning of this year — our primary task was the evaluation of the medium-range reports and plans of the academy research institutes. The written report and the so-called "white book" already gave some indication about the status of this work at the last general assembly. In addition, I presented a report at the presidium meeting this year entitled "the use of the statements of the scientific departments in the course of the evaluation of the reports and medium-range plans of the research institutions." As promised earlier, I will now discuss the merits of the joint effort spent on the evaluation of the reports and plans; specifically I wish to discuss the major achievements which characterize and rate the scientific activities of the academy research institutes, the contents of the approved medium-range plans, and the science-policy conclusions which may be drawn from these plans for the future.

The 38 academy research institutes obligated to issue reports as well as the approximately 90 research institutions supported by the Academy carried out a total of 658 research projects, some within project groups. The projects were aimed at solving national and ministry-level OTTKT [National Lomg-Range Scientific Research Plan] problems and at solving problems of their own initiative or under contract. Since the centrally featured tasks played an important role in the work of our research institutions, primarily through the performance of work in the major themes and target programs instituted by the OTTKT, these tasks will be the subject of the first part of my article.

Among the major themes of the OTTKT, the activities in the solid-state research theme were aimed at the development of results which may be used directly or indirectly by industry. The properties of four categories of materials were investigated: metals and alloys, semiconductors, magnetic materials, and optical materials. Among the many important achievements, I mention some which are of special interest for direct utilization. Studies on tungsten and its alloys contributed to the more economical manufacture of incandescent lamps. The results of studies on memory materials served to improve computers and related equipment. Bubble memories, optical memories, and new types of wire memories permitted the development of novel memories. With the aid of the implantation devices developed from the results of implantation studies, we are now able to make solid-state components and circuits which could not have been made by means of other techniques. The special crystals prepared as a result of the crystal-physics projects are basic parts of many modern electronic devices.

Experts from many disciplines, primarily from biochemistry, genetics, neurobiology, microbiology, and medicine performed valuable work in the main theme covering the mechanism of the control of life processes (bioregulation).

Studies of specific DNA sections are of most interest worldwide among subjects dealing with molecular biology. Our accomplishments in this field are world-renowned, and domestically they are regarded as breakthroughs. The fact that our researchers could now set their eyes to directed gene transfer — as a result of their complex and modern studies and their development of new experimental techniques — is worthy of special mention. Their results provided the technical prerequisites for fusing cells from vertebrata as well as vegetable and bacterial protoplasms.

In the field of neurobiology, our researchers developed a new model for the cerebral cortex. The study of the sub-cortical special nuclei permitted the mathematical modeling of the newly discovered synapses in terms of their structure, and thus the elucidation of the role of these fundamental structures in the conversion of information taking place in the nuclei.

In the field of experimental medical research, new natural regulating substances were studied and their detailed effect mechanism elucidated. These effects include the pathological proliferation of white blood corpuscles and liver cells.

The following subjects were studied in the major theme dealing with biologically active substances: the Academy institutes investigated the

relationship between the chemical structure and the biological effects of pharmaceuticals and plant-protecting agents, peptide synthesis and structure, the molecular mechanism of the enzymes, the relationship between the structure and reactivity of heterocyclic compounds, isolation of natural organic substances, synthesis and structure of natural organic substances, structure of the antibiotics, semi-synthetic preparation of antibiotics, photochemical reactions, and new syntheses of substances of importance for the development of new pharmaceuticals and plant-protection agents. As a result, several new pharmaceuticals and plant-protection agents were discovered.

Accomplishment of the main goals of this theme was also facilitated by studies aimed at the elucidation of the factors contributing to the neural and humoral control of some of the hormones of the pituitary gland and various aspects of the influencing of the functioning of the central nervous system by pharmaceuticals. It is worth mentioning that a spasmolytic agent was obtained which is of very good quality. Our researchers were the first to recognize the fact that different groups of the enzyme molecule may take individual part in the regulation of the specific connecting sites and functional active centers. The so-called precursor synthesis method developed by them permitted the radioactive labeling of several peptide hormones, so that the biologically important hormone-receptor interaction could be better studied.

The following were the major fields of the academic studies in the field of the central development program for computer technology: computer-aided designing and manufacture in the electronics industry and machine-making industry, computerized process control for continuous operations and batch operations, metrological processes in industry and the laboratory, and fundamentals of the 4th-generation computer technology under contemplation.

Among the results, the following are worthy of special mention: Development of the shop-machine system encompassing the devices integrating the design and production operations for digital devices, as well as the software, and computation methods for high-voltage engineering. The development of the TPA small computer — the first device designed under an independent concept — was also accomplished during the period reported. This computer operates at high speed, has an effective instruction system, and is suitable primarily for test-data acquisition and control functions.

At the same time, important international-cooperation work was carried out in the field of the development of the CAMAC real-time periphery system, which is used to collect and process data from laboratories and plants.

Development, experimental manufacture, and trial of highly reliable industrial CAMAC units has started. This is considered by our foreign partners as a significant advancement. The practical result of the academic research in computer technology is the terminal network and the program system handling the network for use around the CDC3300 computer.

Studies carried out within the framework of the theme dealing with the establishment of the best micro and macro environment for humans indicated the importance of environmental protection. Considerable success was achieved in studies aimed at the elucidation of the properties of the alkaline soils and the salt transport processes leading to alkalification. Studies aimed at determining the effects of pesticide residues and the biological transformation of organic substances provided useful information for the forecasting of the long-range effects of intensive crop production methods. In studies aimed at the evaluation of agricultural ecosystems, we introduced mathematical methods, and in studies aimed at the evaluation of aqueous ecosystems we obtained information about the oxygen balance of the Danube river and the primary production of Lake Balaton.

Another national theme covered the scientific study of public administration development in a complex fashion. In this research theme, we prepared methodological foundations for the study involved, and examined the relationships between law and public administration on the basis of data from a number of socialist and capitalist countries. On the basis of empirical studies, we prepared a concept of the perspectivistic situation of the districts. Other projects within this theme include the preparation of background materials for decision-making, organizational sociology problems, settlement geography in general, and agglomeration in Pecs in particular.

Among the research projects of the academy research institutes dealing with the socialist enterprise, the following studies deserve special mention: enterprise-management law; legal projections of enterprise independence; analysis of the enterprise management and enterprise law data, and economic reforms from socialist countries; and factors affecting the organization of workplaces. In studies aimed at developing long-range enterprise planning techniques, we further improved the concepts of enterprise policy, enterprise strategy, development approaches, and the role of these in quantitative planning.

Another major part of the activities of our research institutions is the list of projects studied at ministry- and main department-level, as well as the solution of research problems proposed by the Committee on Agitation and Propaganda of the Central Committee of the MSZMP.

Within the major theme dealing with the development of the social structure and socialist consciousness in Hungary, mention may be made of the monograph on the exhaustive study of the historical development of legal consciousness and its structural characteristics.

Another major research theme dealt with the social conditions of the scientific and technological revolution and its expected consequences in the social development of Hungary. In this subject, our research institutions concentrated on the elucidation of theoretical problems.

We also studied, within the framework of a major research theme, the scientific foundations for the development of our economic policy. We analyzed the economic policies during the 1957-1960 period and obtained valuable data for further studies of this period. To prepare for the scientific formulation of the long-range standard-of-living policy, we prepared a concept for the consumption preferences to be promoted and the means for realizing the concept.

In the course of studies in the major theme "development trends in world economy with special emphasis on economic planning," we completed the first volume of the monograph entitled "World Economic Forecast for 1975 to 1980."

Another major research theme dealt with the study and exploration of the natural resources of Hungary. We achieved best results in the soil structure project, studies of the changes in the ionosphere, development of geonomic synthesis, investigation of the displacing phases in terms of their physico-chemical properties, thematic mapmaking, and examination of backward areas in Hungary.

Among the major achievements of petrochemical studies are the studies of the decomposition mechanisms of hydrocarbons, the homogeneous- and heterogeneous-phase catalytic reactions of hydrocarbons, and various types of catalysts.

Many noteworthy accomplishments may be reported from the studies of grain crop improvement and improvement of fiber crops. During the period being reported on, five types of wheat were given preliminary state approval;

they are more productive and superior in other agronomical properties than presently produced types. We had also much success in our maize-improving studies. Six maize hybrids received state recognition, and five hybrids received preliminary approval. We also succeeded in our barley improvement studies.

Veterinary-medical studies of the special problems involved in ensuring the animal-health conditions in large-scale animal husbandry establishments showed that the joint presence of various infections and maintenance deficiencies are the cause of the diseases of the respiratory tract of pigs. We obtained new information about the spreading of influenza viruses. We succeeded in isolating the disease-causing agent of goose influenza — a disease which causes serious damage — and we developed a method for fighting this disease and vaccinating against it. In the course of studies of the diseases of the digestive tract, we prepared a vaccine against coli diseases.

Among the studies proposed by the Committee of Agitation and Propaganda of the Central Committee of the MSZMP, there were several with great success. First to be mentioned is the fact that the summarization of the findings of the project on "direct and representative democracy forms and mechanisms in industrial and agricultural establishments" has been completed. Also, we successfully concluded the studies aimed at the elucidation of the layering processes of society and the studies of settlement sociology. We completed the analysis of the development of Hungarian literature during the last 15 years, and summed up the study of the present status of the Hungarian language and current wrongs in today's language use.

In addition to the major themes, the academic research institutions also carried out studies of the so-called disciplinary type. Many of these studies created the prerequisites for the research of the major themes, provided help to production, and resulted in the publication of social-sciences monographs.

In the field of mathematics, we can report achievements in group theory, mathematical logic, algebra, analysis, geometry and topology, probability theory and mathematical statistics, and operations research. It may be stated that Hungarian mathematical studies kept up with the high tradition and international recognition which it has enjoyed in the past. In addition, studies on new subjects were also initiated.

In the field of physics, successful studies were carried out primarily in the field of particle physics, using the high-energy physical facilities in Dubna and Serpukhov. The emphasis of the nuclear-physical studies was

on nucleus structure and nuclear reactions. The atomic energy studies created the basis of numerical and experimental research, with the aid of which effective cooperation may be established between Hungary and the socialist countries in the field of atomic energy.

Noteworthy studies were carried out in the field of astronomy on stellar statistics, applied celestial mechanics, solar activity, and so forth.

Among the chemical studies, the following areas are worthy of note: analytical chemistry in general, and electro-analytical chemistry, thermal analysis, and spectrochemical analysis in particular; methods of separation, and determination of trace elements by means of radio-analytical methods. These studies assisted the accomplishment of the goals of various major themes and also created the fundamentals of instrument development. Our ion-selective electrodes and thermo-analytical instruments are valued internationally for some time. The method developed for the purification of radioactive wastewaters will be used in the power plant in Paks under construction.

Among our achievements in the field of social sciences, first mention should be made of the studies of political economics of modern capitalism in general, and matters related to wages, profits, and taxation in particular. We completed two volumes of Hungarian literary science and critique. We also studied with success the socialist literature. Our studies of the renaissance and the baroque era were also successful. We completed Volume 8 of the comprehensive series on Hungarian literature (there will be a total of 10 volumes), and we completed the revisions of Volumes 6 and 7. We can also report success in the field of ideological history and economic history. We completed the Hungarian Folklore Encyclopedia, we analyzed the social and cultural conditions of a typical Hungarian village, we published Volume 3 of the Hungarian Folklore Bibliography and Volume 3 of the Historical-Etymological Dictionary of the Hungarian Language. We also completed two more volumes of the Archeological Topography and Volume 2 of the Archeological Handbook. Volume 1 of the Hungarian Musical History has been completed, and we published "Documents From the Musical Life of the Hungarian Council Republic." Among the results of art-historical studies, mention may be made of the projects dealing with comparative art history in Central and Eastern Europe, and critique history. Our psychology researchers had their best results in studies of phenomenological basic processes and social psychology. Noteworthy starts have been made in area-development subjects.

II.

I desire to add some general evaluative comments to the listing of the main achievements of the academy institutes.

The work performed in most academy institutes during the 1972-1975 period was primarily aimed at the realization of the goals outlined in the plans. Knowledge about the OTTKT has an orientating effect in the formulation of the goals of the research activities; however, the effect of the OTTKT was gradual and did not manifest itself in the same manner in all areas. These years were not only the years during which we learned how to adapt ourselves to the concepts outlined in the national plans, they were also the years during which we accomplished a change in the attitude of our researchers. We are glad to report that most our researchers strengthened their desire to serve the society as a whole and the national economy, and to solve those problems which contribute to this goal. One evidence in this is the fact that more and more contract research projects are handled in our research institutions dealing with the natural sciences. Most of our institutions , such as the KFKI [Central Research Institute of Physics], MUFI [Research Institute of Technical Physics], SZTAKI [Research Institute of Computer Technology and Automation], KKKI [Central Research Institute for Chemistry], the Isotope Institute, and so forth, cooperate with industrial research institutes and production enterprises such as — in the field of solid-state research, metrology, and computer technology — with Csepel Non-Ferrous Metallurgical Works, United Incandescent Lamp Factory, and — in the field of pharmaceutical and other fields — with Kobanya Pharmaceutical Works and Chinoin Pharmaceutical Works.

Between 1972 and 1975, the academy research institutions applied for a total of 162 patents; 139 patents were granted. We know of approximately 200 research results which were utilized during this period by enterprises or other research establishments. The utilization of our achievements in the field of agriculture is illustrated by the fact that approximately 20 percent of the wheat crop area uses types improved at the institute in Martonvasar. They obtain good yields. Our work in the field of maize and barley improvement was also useful.

We find a trend toward practical usefulness in the social sciences also. This is illustrated by studies carried out at the request of party and state organs in economics, political sciences, and law. In addition to projects carried out at the request of the Committee for Agitation and Propaganda, we should also mention the contribution — for example — which the Institute of Historical Sciences made to the study of socialist patriotism and proletarian internationalism of modern times.

Our institutes participating with success in the accomplishment of public education tasks also deserve mention. In this connection we must mention the experimental textbooks, some of which are completed and others are in the process of being completed. We must also mention other projects aimed at improving the quality of our mother tongue, and several useful small monograph series.

More than 60 percent of the academic research fund allottment was expended in projects within national- and ministry-level major research themes and target programs. In addition, several of our institutes have managed a number of major themes of different levels.

Planning of the research tasks affected favorably the thematic concentration. In our judgment, we managed to move forward during the last plan period in the clarification of the research profiles of some of our institutes.

The development of our international relations in the period reported on was characterized by greater participation in the international division of scientific work. Our bilateral and multilateral cooperation with the academies of sciences of socialist countries intensified and became better organized.

By and large, we may assess positively the work of the Academy's research base during the last plan period. This is also attested by the fact that we were awarded a number of honors of various degrees, such as eight State Prizes, 16 Academy Prizes, and 96 Academy Awards.

The undoubtedly positive pattern of development trends, however, cannot hide those deficiencies and problems which had to be, and were, cleared up or reduced in the course of planning our activities for the present period. Of course, not all were entirely eliminated.

The fact that, as already mentioned, much of the Academy's research base was expended on the solution of problems in major themes of various levels is a clear sign of improvement. However, if we probe deeper into this, we find that the pattern is not entirely rosy; the written attachments outline some of the causes. Some institutes, perhaps as a result of the very tight planning, "undertook too much" and expended less for the accomplishment of major research projects from their capacity, which sometimes was relatively small to start with, and expended more effort on initial initiatives.We have still too many themes, and of these quite a few are of peripheral interest or such that the conditions for them are not ideal within the conditions prevailing in a research institute.

An increase in the volume of contract studies indicates that we are more cognizant of cooperation with production than before; however, the fact that — especially in some large institutes, as we all know — the usually short-term contract work overtaxes our intellectual and material capacities to such a degree that we cannot support small industry as well as we should. This is a problem, indeed a danger.

The resolution of the TPB [expansion unknown] improved the situation to a considerable degree; however, the long-range and comprehensive settlement of this matter is an important necessity. One aspect of the matter is the utilization of the results of research. Some achievements from the academy institutes — sometimes resulting from a contract with an industrial enterprise — could have been used elsewhere and even been sold as an innovation on the international market had it been realized in time. But this was not always the case: there were delays or abandonment in some instances. The subject of profit-sharing is not settled satisfactorily between the research establishment and the production facility; as already mentioned in the daily press, this has an unfavorable effect on research since it does not stimulate toward the creation of useful achievements.

As we evaluate the achievements of the academy's research base we may conclude that part of them is up to the international standard — some are actually in the forefront . Real breakthroughs in the international sense are few, however. The fact that part achievements predominate and that there are relatively few outstanding research results is attributed by some to the fact that research became a "large-scale production operation." This is a subject worthy of the Academy's attention; it should be examined from a variety of points of view. For example, the fact that part achievements predominate may be due to the fact that mediocrity is already aimed for when the themes are chosen (so as to ensure success). To make sure that I am not misunderstood, I stress that I do not wish to disparage the part achievements. I merely try to evaluate the research approach. Considering the potentialities of our country, we can do nothing else in many cases than contribute to a major achievement in our speciality by a part achievement. Such part achievements are important for the solution of the overall problem, and we may operate at the international level when dealing with these. Good ideas and good thinking are needed for them too, just as they are needed for the solution of major overall problems. But the question "only" is whether we are justified in attempting to solve such major overall problems if the conditions of success appear promising. I propose to debate this matter. We should also consider the fact that we may participate in the international work so that we utilize the part achievements of our partners or that we utilize international scientific achievements to synthesize and

wind up the major subject ourselves. It appears that the mediocrity is not manifested by the tasks laid down for part achievements in the various research themes; it is manifested by the fact that we do not wish, or do not dare, contemplate major achievements. There is security in dealing with isolated and peripheral themes; however, they represent "ecological culs de sac" and to use the vernacular of sport, we tend to believe that mere participation in the competition is what counts. We may peacefully run in the middle of the field or at its end, while avoiding the stresses needed to be first, second, or even third in the competition.

In preparing and assessing the research plans for the new five-year plan period, we attempted to take the above factors into consideration, and we tried to stress the social role of scientific research, the relationship between research and production, and the selective development of the research base. As can be seen from the written attachment, studies related to the main OTTKT themes and target programs are stressed in the plans of the research institutions. They include solid-state research in general, and the development of instruments and methodologies for metals, semiconductors, magnetic materials and optical materials in particular. Insofar as research in the field of biologically active compounds is concerned, we stress public health and agriculture: we try to synthesize compounds meeting their needs. Our nuclear-energy studies are closely related to the fulfilment of the domestic atomic power plant program. Our ongoing studies of the "exploration and exploitation of our country's natural resources" are part of a major theme and will continue, to the benefit of the national economy. The earlier hydrocarbon studies are broadened and became petrochemical studies. In the field of computer-technology studies, we will continue to operate and develop the academic computer network.

In the major theme dealing with the mechanism of life-process control processes, we continue our studies and stress the mechanism of genetic control, metabolic processes, immunological and neurobiological processes, and liquid-circulation control mechanisms. We continue our studies of biologically active materials and of the biosphere. Among these studies, those dealing with ecosystems and hydrobiology are very important, as is the study of Lake Balaton. Complex studies of grain and fodder crops, as well as studies of large-scale animal breeding and soil productivity are fundamentally important and are so treated in our new medium-range plans.

Insofar as the social sciences are concerned, we stress more than in the last plan period the need for meeting better the needs of the economy.

We employ scientific methods for this purpose, and we allocated more funds in our plans for economic policy, world economy, socialist enterprise, public administration, and the domestic ramifications of the scientific and technological revolution. This trend is facilitated by the fact that the government approved a new national-level major research theme dealing with "scientific fundamentals of economic policy." Studies of our social structure and socialist consciousness contribute toward the meeting of other social needs. Nine research establishments in the field of social sciences — three of them in a project-management capacity — handle the research themes allocated by the Committee of Agitation and Propaganda.

In assessing the medium-range plans of the research institutions, we may conclude that they are adequate in view of our personnel and material resources. The fact that they are realistic is due to the fact that the leaders of the institutions are experienced and planned for the existing capacities, considering the more moderate growth expected in the years concerned. Properly, the medium-range plans include many such projects which can be handled only with an interdisciplinary or multidisciplinary approach, and there are more so-called borderline projects. In our opinion, this trend should be nurtured and strengthened, for example in the fields of biology and chemistry, but also in other fields, not excepting the social sciences.

Central featuring of the research themes generally leads to more compact thematics. There was a reduction in the number of themes in several research institutions. But we should go further in concentration. We must realize that combination of themes is found often not among the major themes but among the minor themes within the major ones. Unfortunately, the major research themes formulated at various levels received lip service only, and their orientating effect is not real. Nor should we be pleased by the fact that there are more and more projects in recent years which are incomplete and drag on from year to year.

We must confess that concentration and selective development is a voiced slogan more than a practice. Selection means the featuring of something and the deemphasizing of something else. We must accept the consequences of this. In the course of continuously monitoring the medium-range plans we must reduce the number of peripheral projects, we must concentrate more on the accomplishment of the major tasks, and we must make better use of the potentialities of international division of labor.

As I have already indicated, the work related to preparing the medium-range plan reports and planning for the research institutions consumed the time and efforts of many leaders and administrators of the scientific institutions and committees over a period of several months. The joint and complex work involved — for which I thank here also to those who participated — helped us to realize that we must find more efficient and simple methods for this work in the years to come. We also observed the need for finding means of further orienting the studies in terms of their content, and of utilizing our resources in a more effective and concentrated manner.

In spite of the fact that our research goals and tasks are proper for the present — since they are concentrated toward socio-economic needs and originate from the internal development laws of the sciences — we still have much left to do toward a more clear definition of the goals and a more detailed formulation of the tasks. When I say this I mean primarily that we must work further toward establishing a harmony between the social goals, economic plans, and research plans, and must implement their interactions. Indeed, we must modernize the entire plan system of the OTTKT. I think it is not too early to think about organizing the start of the preparation of the tasks for the Sixth Five-Year Plan, including the simplification of our medium-range planning system so that it is better adapted to the real character of research work. This is the wish of our presidium also. In order to accomplish this, we need more than ever a candid and sincere critical spirit both among the scientists and those whose responsibility is to administer, organize, and direct their work. Moving out from the comfortable mutual praising attitude, we must make better choices than before both in preparing our plans and analyzing our accomplishments.

There have been many justified comments about the accounting and planning system employed. Of these, we must accept all which help us make our work clearer and simpler, which replace formalism with content. The excessive formalistic, bureaucratic, and similar characteristics of research administration are mentioned by many these days. We think that the reason for this is that there are more and more people in high office who, at worst, already left scientific work far behind or, at best, never were engaged in it. It is also possible that measures are needed to strengthen the role of the creative people rather than that of the bureaucrats. One thing has not been stressed sufficiently, however: Somebody must perform the scientific evaluation of the research activities.

As we have already stated in our report to the presidium meeting dealing with the evaluation of the reports and plans for the research institutions, the opinions received from the institutions were inadequate, primarily

in terms of their critical content, since they mostly failed to address themselves to the matters that count most from the point of view of scientific evaluation. It is true that there were significant differences between the individual departments, but it is still interesting that the evaluative reports for the institute reports were of higher quality than the comments made about the research plans. This is so even if most proposals and comments dealt with other matters than the narrowing of the thematics.

Matters of content, rather than formalistic and bureaucratic activities, can come to the forefront only if those qualified to make an evaluation of the merits undertake this thankless task. But this task is vital for the development of science. True, there are no objective methods of measuring these matters, but who should develop them? In any event, it is difficult to get rid of a situation which — as mentioned by many — allows one to remain afloat by issuing verbous, but formalistically correct, reports. It is more risky to make a stand by questioning some research results than to try and disprove a specific statement made in a dissertation.

In my judgment, a debate of matters related to the evaluation of research results is essential for future progress. It is necessary to institute scientific debates and to create a critical atmosphere in which an expression of opinions is not regarded as an affront. This is the base on which we may build up our preferences and may establish priorities with all relevant factors being taken into consideration. Only in this way can we stop the harmful effects of comfortable mediocrity, where those who "merely participate" are just as well off as those who win.

We must move farther along the road leading to a strengthened relationship between the research activities of the institutions and practical work. I do not mean primarily that we need to do more studies serving the needs of production. I mean instead that our institutions should perform their work over the long and medium range so that it becomes more systematic and becomes part of the entire system encompassing research-development-production-sales. Such a research activity must be performed together with the study of the most important factors for the growth of the branch of science concerned, considering the possibilities of division of labor with national and international research organizations. The success of this kind of activity depends, in addition to the personal and material resources, on the degree to which the work is planned and organized. Not all our institutions have recognized the importance of the organization and planning of research. Our Academy must consider this matter so as to make the work of the institutions more fruitful and to use the experiences for the good of all.

Of course — as has properly come up during yesterday's debate — our economic progress depends on technological development and the level of our technology; scientific research forms the basis of the latter. In my personal opinion, technological development is the key of development today. The goals of technological development are determined taking the economic and science policy factors into consideration, and strictly implementing the principle of consistency when evaluating the opinions and suggestions received. In this manner we also have a greater chance of succeeding in carrying out our research work in a more rational and successful manner, and utilize our existing capacities best.

While on this subject, I repeat and supplement the thought that came up during the last general assembly: "The operation of independent research establishments is justified if they deal with such medium- and long-range studies that are of decisive importance for social progress and at the same time significantly affect the growth of the science branch concerned, and contribute toward the practical introduction of the results of research in practice."

The foregoing also reflects, to some degree, the tasks of scientific supervision. This supervision must, on the one hand, accomplish the management of the academic research system so that it performs the tasks needed on the national level. The draft resolution submitted to the general assembly provides for this. In my opinion, it is very important — and I have stressed this in all debates dealing with the reform of the Academy — to define precisely the tasks of the Academy both in the field of administration and scientific supervision. The discussions, debates, and evaluations to date have helped considerably in the more precise formulation of the administrative and science-supervisory tasks. No doubt, the debate during the general assembly will provide further assistance.

2542
CSO:2502

PROCEEDINGS OF ACADEMY GENERAL ASSEMBLY PUBLISHED

Budapest MAGYAR TUDOMANY in Hungarian No 6, Jun 77 pp 448-450

[Unattributed article: "The 1977 General Assembly of the Hungarian Academy of Sciences"]

[Text] The 1977 General Assembly of the Hungarian Academy of Sciences, the 137th such event, opened at 1000 hours on 4 May, in the Congressional Hall of the former royal palace. The following attended the opening session: Gyorgy Aczel, deputy chairman of the council of ministers, chairman of the science policy committee; Miklos Ovari, secretary of the central committee of the MSZMP, and the members of the political committee. The following were the attending presidium members: Janos Szentagothai, appointed president of the Academy; Ferenc Marta, general secretary; and the deputy chairmen and deputy general secretaries of the Academy. In his opening address, Janos Szentagothai paid tribute to the members of the institution who died since the last general assembly. He described the grievous losses of the Hungarian mathematical community and eulogized Tibor Erdey-Gruz, former president of the Academy. Then he presented the Gold Medal of the Academy and the 12 Academic Prizes. The presidium of the Academy unanimously awarded the Gold Medal this year to Academician Istvan Friss, scientific consultant of the Institute of Economic Sciences of the MTA [Hungarian Academy of Sciences]. (The activities of the recipients are described elsewhere in this journal.)

The presentation of the awards was followed by a speech of T. Ivan Berend, academician, entitled "Our Present Economic Policy From the Historical Viewpoint." Then, the general assembly debated the speech.

The Debate of the Keynote Speech

The commentators praised the fact that the presidium of the Academy placed the subject of overall economic policy on the agenda. The debate concerned

some of the major points of the speech, and offered supplements to them. Several commentators stressed the fact that economic and technical progress are intimately related. The basic task of science is production; thus, science cannot stand by idly and watch the problems and tasks of agricultural production. Historical experience tells us that Hungarian industry always flourished in specific fields when it obtained research results to make this possible. Several commentators mentioned the fact that a circumspect economic policy is based on technology which in turn is based on scientific research; there are examples to illustrate this.

Several commentators mentioned that they concur with the point made in the speech: we face a peculiar situation now that world economy and the domestic economy are undergoing a major change. This situation creates short-term and long-term tasks for our science policy and economic policy. It was emphasized that countries with a socialist and with a capitalist system react differently to the changes taking place in world economy. It is an important fact that in socialist countries, including Hungary, the production facilities are in the hand of the society as a whole. The great advantage of the countries with a socialist system is that they can systematically guide their own fates through common endeavor; however, it is an essential task to know about the internal factors of development and its prerequisites.

Several commentators discussed the "open character" of the Hungarian economy. They stated the following: there are those who see the future in terms of vigorous foreign-treade, and there are those who see it in terms of turning inward. The effect of the world market affects the national economy favorably if the response is elastic. International division of labor and large-scale international product barter are means which force us to work more efficiently and to produce more modern goods.

Insofar as efficiency is concerned, the commentators stated that although our economic information system is quite advanced, even by the international scale, we know relatively little about matters related to efficiency. It was stressed that efficiency is a complex matter, which cannot be interpreted in narrow terms. The statement of Academician Berend was true that one of the most important conditions of our economic progress is the ability to adapt elastically to the changes that take place. We know from history that those countries did well in times during which major changes took place which were able to grasp the new potentialities caused by the changes. But the ability to do this is not only a matter of decision; it is also affected by internal conditions, infrastructure, and — particularly — by the educational system.

T. Ivan Berend responded to the comments made in the course of the debate. He stated the following: export-oriented development is essentially the same as technological development. He indicated that the change in our economic development was accomplished under socialistic conditions. The presence of the socialist world is a basic aspect of the present situation.

The debate of the keynote speech continued during the joint session held in the afternoon of 5 May. The following commented: Academicians Pal Benedek, Frigyes Csaky, Laszlo Cselotei, Istvan Friss, Jozsef Lukacs (Department VI), Gyorgy Ranki, and Karoly Szendi; Laszlo Drechsler and Antak Stark, doctors of economic sciences; and Janos Szita, doctor of economic sciences, deputy minister, and head of the International Economic Relations section.

Debate of the Reports

The joint session of the general assembly then continued under the chairmanship of Zsigmond Pal Pach on the afternoon of 5 May. Miklos Ovari, member of the political committee of the MSZMP, and secretary of the central committee, attended. The general assembly appointed a committee for the nomination of the chairman of the Academy, and a committee for voting and resolution drafting. Then it listened to the proposals of the presidium presented by Janos Szentagothai. This was followed by the report of General Secretary Ferenc Marta. The debate of the reports of the presidium and the general secretary, which started at the Thursday session, continued on Friday, 6 May. At the latter date, Gyorgy Aczel, member of the political committee of the MSZMP, deputy chairman of the council of ministers, also attended. The following commented during the two-day debate: Academicians Jozsef Balo, Janos Balogh, Denes Berenyi, Lorand Farkas, Istvan Friss, Janos Harmatta, Tamas Keleti, Dezso Kiss, and Ferenc Kovacs; Ferenc Kovacs, general secretary of the MTESZ [Association of Technical and Scientific Societies]; and Academicians K. Pal Kovacs, Bela Kopeczi, Gyorgy Lako, Andras Levai, Jozsef Lukacs (Department VI), Janos Magyar, Janos Meszaros, Elemer Nagy, Gyorgy Osztrovszki, Lenard Pal, Janos Prohaszka, Zoltan Szabo, Sandor Szalai, Imre Tarjan, and Tibor Vamos.

A central theme of the intense and complex debate was the manner in which the achievements of science can be utilized in practice. Several commentators stated that the direct benefit of scientific research is best evident in the so-called contract studies. The factories and enterprises usually know very precisely what they need and expect from scientific research. For the formulation of the goals and the tasks, which is very important, we need higher-level programs.

Several commentators sought an answer to the following question: have there been enough outstanding research results in Hungary during recent years? It was the consensus that no definitively negative answer can be given to this question since, for one thing, the term "outstanding" is a relative one. From the example of agricultural research and agricultural operations we know that not only outstanding but also consistently high-level research results can give us significant development. Agricultural research is also an example for the fact that a specific discipline can no longer exist without the contribution of other scientific disciplines. Thus, the commentators unanimously stressed the need for an interdisciplinary approach and the relationships between science and practice.

Several commentators stressed that the quality of research results is a key factor not only for our science policy but also for our economic policy. Scientific factors translate into practical reality under defined technological conditions, and even the most outstanding scientific achievement may be useless if there are no proper conditions for its "reception." This is why technological studies are important today and will become even more important as time goes on. Several commentators mentioned the problems related to the practical implementation of new scientific achievements, and to the unity of research, production, and sales, as well as to experimental factories.

Numerous commentators discussed the status of research in universities and the situation of the university researchers. The greater standards imposed on science show very clearly that higher education must create versatile experts. The internal resources for accomplishing this exist in the universities, but the educators face a difficult task. They perform educational and scientific work (they heal in the clinics), and they also participate in the activities of the ministries, government departments, public life, and scientific societies. At the same time — so it was stated — major prerequisites for intensive scientific work are lacking.

The debate also covered the status of patents and inventions originating from fundamental research. Patenting of an invention has many ideological and bureaucratic barriers, so that not only will the inventor be discouraged but also the economy as a whole will be a loser. The Academy has a job to do to help change the situation.

Much discussion concerned scientific debates; everyone agreed that they are important and significant. There were several commentators who thought that there is a need for more sincere, more correct debates based on facts and objective judgments; at the present time there is much formalism and evidence of the attitude that "the boat should not be rocked." The debates

must not be restricted to the discussion of plans and reports at infrequent intervals; theoretical debate and criticism must become a continuous activity of our scientific life.

The commentators agreed that the science-administrative activities of the Academy must be made more effective, that the relationships between the institutions and the supervisory organs should become more intensive, and that efforts must be made to suppress bureaucracy which still exists in some occasions. Several commentators praised the manner in which the science administrators facilitate the work of the scientific researchers. Some commentators mentioned that there is a long lag before scientific publications are issued. This is a disadvantage for Hungarian science today, when there is intense international competition.

Janos Szentagothai, appointed chairman of the MTA, and Ferenc Marta, general secretary, answered to the comments. Then, Janos Szentagothai proposed the appointment of honorary members of the MTA. The general assembly appointed, by secret ballot, the following as honorary members: Arnold Hauser, the renowned art-sociologist residing in England, and T. Attila Szabo, retired professor of Babes-Bolyai University, a major personality in Hungarian linguistics. Also by secret ballot, Janos Szentagothai was elected president of the Academy. Academician Andras Somos became the new deputy president.

The general assembly approved the reports of the presidium and the general secretary, and passed resolutions about the current tasks. Finally, it took positions concerning the matters brought up in the reports of the presidium and the general secretary. (The text of the resolution will be published in the next issue of this journal.) A special resolution was passed to honor the achievements of the late Tibor Erdey-Gruz, past president of the MTA. This completed the three-day activities of the 1977 general assembly of the Hungarian Academy of Sciences.

2542
CSO: 2502

ROSTER OF DOCTORS AND CANDIDATES OF SCIENCES PUBLISHED

Budapest MAGYAR TUDOMANY in Hungarian No 6,Jun 77 pp 479-481

[News from the Committee of Scientific Qualification: New Doctors and Candidates of Sciences, March 1977]

[Text]. I. The Committee of Scientific Qualification declared

Csaba Hadhazy, doctor of biological sciences, on the basis of his dissertation entitled "Regenerating Articular Surface"; the opponents were: Bertalan Csillik, Ferenc Guba, and Bela Mess, doctors of biological sciences;

Ferenc Kajtor, doctor of medical sciences, on the basis of his dissertation entitled "The Sensitivity and Hierarchical Organization of Some Human Wakening Structures to Barbiturate"; the opponents were: Gyorgy Adam and Kalman Lissak, academicians, and (the late) Bela Horanyi, doctor of medical sciences;

Istvan Kende, doctor of historical sciences, on the basis of his dissertation entitled "History of the Wars Following World War II (1945-1972)"; the opponents were: Laszlo Salgo, doctor of historical sciences, Mihaly Simai, academician, and Ervin Liptai, candidate of historical sciences;

Kalman Kiraly, doctor of medical sciences, on the basis of his dissertation entitled "Treponema reaction in the Diagnosis of Syphilis"; the opponents were: Janos Gergely and Lajos Szodoray, doctors of medical sciences, and Zoltan Alfoldy, candidate of medical sciences;

Ferenc Maksay, doctor of historical sciences, on the basis of his dissertation entitled "Settlement Order of the Hungarian Village in the Middle Ages"; the opponents were: Gyorgy Szekely, academician, Gyula Laszlo,

doctor of historical sciences, Tamas Hoffmann, candidate of historical sciences;

Miklos Moser, doctor of chemical sciences, on the basis of his dissertation entitled "Microstructure of Aluminum Oxide and Silicon Carbide Ceramics"; the opponents were: Maria Vogl, academician, Marta Dery, doctor of technical sciences, and Bela Csakvary, doctor of chemical sciences;

Zsuzsa L. Nagy, doctor of historical sciences, on the basis of her dissertation entitled "The Liberal Bourgeois Parties During the Consolidation in the Bethlen Era (1921-1931)"; the opponents were: Tibor Erenyi and Ferenc Poloskei, doctors of historical sciences, and Ervin Pamlenyi, candidate of historical sciences;

Imre Ruzsa, doctor of philosophical sciences, on the basis of his dissertation entitled "Individualities in Modal Logic"; the opponents were: Sandor Szalai, academician, Sandor Szekely and Laszlo Harsing, candidates of philosophical sciences;

Isvtan Szorady, doctor of medical sciences, on the basis of his dissertation entitled "Pharmacogenetics: Principles and Pediatric Aspects"; the opponents were: Odon Kerpel-Fronius, academician, Karoly Kelemen, doctor of medical sciences, and Endre Czeizel, candidate of medical sciences; and

Lorant Tilkovszky, doctor of historical sciences, on the basis of his dissertation entitled "Policy for the German Minority Group and Hungary (1938-1945)"; the opponents were: Endre Arato and Gyula Merei, academicians, and Ervin Pamlenyi, candidate of historical sciences.

II. The Committee of Scientific Qualification declared

Gaber Ibrahim Mostafa Allam, candidate of physical sciences, on the basis of his dissertation entitled "Preparation of an Infrared Detector With Large Limit Wavelength";

Adam Anderle, candidate of historical sciences, on the basis of his dissertation entitled "Political Movements in Peru Between the Two World Wars"

Andras Balogh, candidate of historical sciences, on the basis of his dissertation entitled "Socio- and Politico-Historical Backgrounds of the Indepdndence of India (1905-1947);

Imre Bekesi, candidate of linguistic sciences, on the basis of his dissertation entitled "Constructional Forms of the Paragraph With Verbal Significance";

Tamas Buban, candidate of agricultural sciences, on the basis of his dissertation entitled "Production-Control Measures Based on the Flower Bud Differentiation of Apple Types";

Zoltan Sandor Enyedi, doctor of literary sciences, on the basis of his dissertation entitled "Theater in Transsylvania in Hungarian Until 1849", defended in the Socialist Republic of Romania";

Agnes Erdelyi, candidate of philosophical sciences, on the basis of her dissertation entitled "Socio-Scientific Efforts in the German Philosophy During the Turn of the Century";

Maria Gecs (Mrs Ero), candidate of chemical sciences, on the basis of her dissertation entitled "Investigation of the Radiochemical Processes of Organic Substances With the Aid of ESR [Electron Spin Resonance]";

Emil Fischer, candidate of biological sciences, on the basis of his dissertation entitled "Investigations in the Field of the Separation of Exogenous Organic Anions With the Bile";

Istvan Gyori, candidate of mathematical sciences, on the basis of his dissertation entitled "Functional Differential Equations on Symptotic Behavior";

Gyula Horn, candidate of economic sciences, on the basis of his dissertation entitled "Special Features of the Yugoslav Economic Model, Its Functioning and Experiences";

Laszlo Horvath, candidate of agricultural (forestry) sciences, on the basis of his dissertation entitled "Development of Modern Forestry Methods in the Sandy Region Between the Danube and Tisza Rivers";

Miklos Iskum, candidate of medical sciences, on the basis of his dissertation entitled "Cardio-Vascular Effects of Glucagon";

Emma Ivanyi, candidate of historical sciences, on the basis of her dissertation entitled "The Palatinate of Pal Eszterhazy (1681-1713)";

Gyorgy Jalsovszky, candidate of chemical sciences, on the basis of his dissertation entitled "Analysis and Quantum-Chemical Approximation of Infrared Absorption Intensities";

Lajos Juhasz, candidate of medical sciences, on the basis of his dissertation entitled "Epidemiological Studies on Breast and Stomach Cancer in Two Trans-Tisza Districts";

Tibor Kantos, candidate of chemical sciences, on the basis of his dissertation entitled "Investigation of Some Theoretical Aspects of Spectrochemical Powder-Technology Methods With Alumina and Corundum Model Substances";

Orsolya Karsay, candidate of linguistic sciences, on the basis of her dissertation entitled "Comparative Aspects of Byzantine Metrics";

Gabor Keller, candidate of medical sciences, on the basis of his dissertation entitled "Operative Radiation Treatment and Healing of Uterine Cancers and Factors Affecting the Recovery";

Viktor Kertesz, candidate of technical sciences, on the basis of his dissertation entitled "Methods of Measuring the Arc Resistance of Free Transmission Line Insulators" (jointly with Tibor Mihalkovics);

Mohamed Kamal El Khishin, candidate of agricultural sciences, on the basis of his dissertation entitled "Antifidant and Antiovipositional Effects of Metal Chelate Compounds on Some Herbivorous Insects";

Adam Kiss, candidate of physical sciences, on the basis of his dissertation entitled "Investigation of the Collective Properties of Light Nuclei With the Aid of the Inelastic Scatter of Deuterons of 60 to 90 MeV Energy";

Jozsef Komar, candidate of medical sciences, on the basis of his dissertation entitled "Diagnostics and Therapy of Tunnel Syndromes";

Arpad Kovacs, candidate of economic sciences, on the basis of his dissertation entitled "Information System for the Implementation of Investments";

Laszlo Lako, candidate of philosophical sciences, on the basis of his dissertation entitled "General Philosophical Problems of Information Theory";

Nandor Marek, candidate of chemical sciences, on the basis of his dissertation entitled "Energy Processes of Photoinduced Chemical Changes of the Thionine-Iron System";

Ferenc Szucs, candidate of chemical sciences, on the basis of his dissertation entitled "Investigation of the Decomposition of Aluminate Liquor for the Intensification of the Stir-Precipitation Technology";

Aniko Tausz, candidate of historical sciences, on the basis of her dissertation entitled "Structural Composition, Status, and Economic Movements of the Hungarian Industrial Worker Group in 1919-1929";

Tamas Toth, candidate of economic sciences, on the basis of his dissertation entitled "Policies and Methods of Enterprise Foreign Trade";

Laszlo Varga, candidate of technical sciences, on the basis of his dissertation entitled "Investigation of the Contraction and Fracture of Tungsten and Molybdenum Wires";

Borbala Vermes, candidate of chemical sciences, on the basis of her dissertation entitled "Structure-Confirmation Synthesis of Polyhydroxyglycosides Containing One, Two, and Three Sugar Units";

Istvan Vermes, candidate of medical sciences, on the basis of his dissertation entitled "Relationships Between the Serotoninerg System and the Function of the Suprarenal Cortex";

Gyula Veszely, candidate of technical sciences, on the basis of his dissertation entitled "Use of the Part Feed Line Method in Inhomogeneously Charged Pipe Feed Lines";

Laszlo Vincze, candidate of agricultural sciences, on the basis of his dissertation entitled "Factors Affecting the Market Value of Feed Proteins of Broiler Chicken"; and

Jozsef Zachar, candidate of historical sciences, on the basis of his dissertation entitled "The Austrian-German Liberal Movement (Constitution Party) and Political Power Between 1861 and 1881."

2542
CSO: 2502

Andor Maroti, candidate of philosophical sciences, on the basis of his dissertation entitled "Developmental History of the Concept of Culture";

Erno Marosi, candidate of art-historical sciences, on the basis of his dissertation entitled "Beginning of Gothics in Hungary - Esztergom in Hungarian Art During the 12th and 13th Centuries";

Tibor Mihalkovics, candidate of technical sciences, on the basis of his dissertation entitled "Methods of Measuring the Arc Resistance of Free Transmission Line Insulators" (jointly with Viktor Kertesz);

Dieter Pfaff, candidate of political and legal sciences, on the basis of his dissertation entitled "Arbitration Methods in the Foreign Trade of Socialist Countries With the Federal Republic of Germany, With Emphasis on International Civil Jurisprudence";

Voverite Ramune, candidate of medical sciences, on the basis of his dissertation entitled "Role of Biogenic Amines in the Development of the Conditioned Reflex";

Mihaly Rokob, candidate of agricultural sciences, on the basis of his dissertation entitled "Possible Applications of Synthetic Fungicides Against Major Grape Diseases";

Balint Sari, candidate of medical sciences, on the basis of his dissertation entitled "Clinical Significance of the Activity Changes of Red Blood Corpuscle Enzymes";

Kornel Solt, candidate of philosophical sciences, on the basis of his dissertation entitled "The Definition";

Endre Szava-Kovats, candidate of literary sciences, on the basis of his dissertation entitled "Half Time of the Obsolescence of Trade Literature";

Lena Ajzatulina (Mrs Mihaly Szilard), candidate of literary sciences, on the basis of her dissertation entitled "Leonid Andreyev and Some Problems of the Russian Short Philosophical Novel";

Mrs Zoltan Szilvassy, candidate of chemical sciences, on the basis of her dissertation entitled "Investigation of the Cavity-Cathode Excitation Processes and Their Application in Emission Spectroanalysis";

ACADEMICIAN DISCUSSES CEMA NUCLEAR COOPERATION

Budapest MUSZAKI ELET in Hungarian 1 Jul 77 p 3

[Excerpts] According to academician Gyorgy Osztrovszki, vice president of the National Technical Development Committee, president of the National Atomic Energy Committee, the permanent committee on the peaceful uses of atomic energy organizes scientific-technical cooperation and the exchange of information. It also convenes numerous councils and conferences. Between 1976 - 1980 there will be cooperation in 13 fields on 70 themes. About 90 institutes of the CEMA countries will participate in this. Where Hungary is concerned, this will involve primarily the Central Physics Research Institute and the Isotope Institute. A large part will also be played by the experimental reactor of Budapest Technical University, the Power Plant Planning Enterprise [EROTERV] and other institutions. An international research group whose job it is to carry on research on Paks type reactors with the ZR 6 installation is working at the Central Physics Research Institute.

This does not mean that the Paks Nuclear power plant is not a fully developed type. It is, after all, a more advanced version of the Voronezh type of power plant. Significant development is being carried out primarily on the safety installations for Paks. Some specialists consider the enormous towers being built at Paks an exaggeration. The first four reactors being built here will have an output of 440, possibly 500 MW's. However, Paks' fifth and sixth reactors will have an output 1000 MW's. This calls for a certain amount of development work. One advantage of this higher capacity is that it operates about 15 percent more cheaply. This remains to be calculated more precisely. This, too, will be one of the tasks of the international research group working at the Central Physics Research Institute. The latest meeting of the permanent committee established that the group is working so effectively that the designation "temporary" should be deleted from its name, especially since it was established in 1972.

Investigation of the cooling system of the power plants is very important. It is estimated that at Paks the power plant will raise the temperature of the Danube by 1.5^{o}C. This temperature rise should be kept to a minimum. The most important work of the committee is in the field of atomic energy.

Preparation of energy prognoses is also one of its functions. It appears that around the year 2000 approximately one-half or more of all energy will come from atomic power plants. The question is what type of reactors are to be used. It is important for the power plants to make the most efficient use of their fuel. Investigations needed to determine this are made possible by the 2 MW equipment of the Central Physics Research Institute. This equipment makes it possible to model operations or breakdowns of reactors at temperatures up 200°C and up to 200 atomspheres of pressure. The committee is also concerned with the secure placement of materials which emit radioactive contamination, with all matters pertaining to radiation security, with cooperation in the field of nuclear instruments, with use of isotopes in the field of medicine. Cooperation in instruments is important because 20 percent of instruments in nuclear power plants are for a special purpose and not available at other power plants.

The CEMA countries set up INTERATOM-INSTRUMENT with headquarters in Warsaw. This association deals with nuclear instruments. About one-fourth of all CEMA exports in this category are shipped by Hungary. The Gamma Works, the Hungarian Optical Works [MOM] and the Central Physics Research Institute play an important role in this activity. The Gamma Works play a leading part primarily in connection with medical instruments. At this year's fair the camera with the aid of which isotope examinations which ordinarily take several hours could be completed in a few minutes through a system which included a Videoton computer attracted much attention. The CAMAC modules of the Central Physics Research Institute are important devices for automation. With them it will become possible to realize fully automatic power plants. Naturally a computer will also be required. The MEDICOR Works also has an important part in the peaceful uses of atomic energy. It produces one-quarter of a billion radiation-sterilized hypodermic needles annually.

CSO: 2502

COMMUNICATIONS ENGINEERING RESEARCH INSTITUTE ADVERTISES IC'S

Budapest HIRADASTECHNIKA in Hungarian No 6, Jun 77 pp 187-190

[Text] Integrated Circuits From the Research Institute for Industrial Communications.

Our institute has developed thin- and thick-layer hybrid integrated circuits for over a decade. During this period, we made available a large variety of circuits to our customers. Many of the circuits designed were made for specific uses and on individual requests. For example, we develop and produce on an experimental scale high-stability oscillators for the 100 Hz to 10 kHz frequency range ($\Delta f/f < 10^{-3}$), pulse amplifiers, low-consumption audio-frequency amplifiers and pulse formers supplied from a low feed voltage, and others encompassing the entire range of electrical technology. We also develop and make special amplifiers for high temperatures ($T_k > 150°C$). The problems occurring in this versatile development are solved with the aid of extensive design experience and technological accomplishments. Combining the advantages of highly stable passive components (thin- and thick-layer resistors, Ta-based thin-layer capacitors), we offer solid-state devices developed specially for hybrid integrated circuits to permit the users to produce highly reliable and special-purpose circuits.

On the basis of the trends observed in industrially developed countries we may expect that more and more hybrid integrated circuits will also be used in Hungary in the following areas: telecommunications, data teleprocessing, industrial metrology, automation, transportation electronics, medical electronics, and consumer electronics. This applies particularly to active RC filters and various analog conversion modules. Thus, our designers developed, with several years of study, a family of active RC filters and a computerized program system for the designing of a cost-minimized filter system best adapted to the given tolerance scheme, and for realizing the filter system in hybrid integrated technique.

In addition, we established an engineering advisory service which, together with the experts who use the active filters, optimizes the filtration problems to be solved to the properties of the active RC networks. The parameters of the active filters developed and introduced by us agree with those of filters from abroad, and in some respects surpass them. The filters we make are second-degree blocks which, tuned to the appropriate parameters, may be connected into cascades with step numbers depending on the specifications in effect.

Frequency range: 10 Hz to 20 kHz.
Typical frequency accuracy: 2% (may be reduced with external elements).
Temperature coefficient: ±0.03 - ±0.13%, depending on the filter type.
Pole quality: Q = 0.5 to 50.
Q tolerance: ±10%.
Typical power consumption: 3 to 12 mA, depending on the type, at ±15 V.

The more than 20 filter types meet most demands since they are low- and high-pass, elliptical versions, band filters, hole filters, and all-pass (running-time correctors), as ordered.

The advantages created by hybrid integration are particularly useful in dynamically expanding analog conversion modules, as well as analog-to-digital and digital-to-analog converters. In our institute we followed the needs observed on the international marketplace and considered the domestic potentialities to develop a number of analog-to-digital and digital-to-analog converters. We also carried out successful preliminary experiments for the development of logarithmic/exponential transmission-factor amplifiers, precision multiplier circuits, and RMS-DC converters.

Below we describe the analog-to-digital, digital-to-analog, and multiplier circuits which we have already developed and are already manufacturing. We developed the HUR-01 voltage-to-frequency converter for a variety of uses. The stability of output frequency and its linearity meet the needs of eight-bit accuracy. The conversion factor is 1 kHz/V ±5%. The circuit is accommodated on a 25 by 25 mm unit, using the thick-layer technology. The circuit is very well suited as an analog-to-digital converter and for control-engineering functions.

The D4 and D10 type 4- and 10-bit digital-to-analog converters meet medium-severe technical requirements. These two circuits illustrate well that the monolithic devices developed specially for hybrid integration (dual diode in the present instance) give a novel, cheap, and easy-to-manufacture solution in conjunction with a high-precision resistor network. The circuit diagram illustrated shows one possible application of the D4 converter. We see a follower-type eight-bit analog-to-digital converter.

The first element of the analog conversion units is a four-quarter multiplier circuit, which does not require an external adjusting element. The characteristics of the multiplier correspond to a μA 795 multiplier. The higher-speed version meets the applicable specifications up to a frequency of 10 MHz.

Our hybrid integrated circuits are made to meet the needs of our customers, and they include everything from resistor networks to multi-chip circuits. The K-7 target program enabled us to establish an advisory service which is at the service of everyone who has a problem involving integrated circuits or the applications of hybrid integrated circuits. (Our address is Budapest X, Martinovics Ter 5, HIKI Aramkortechnikai Osztaly.)

The vast possibilities offered by hybrid integrated circuits can be used to best advantage if our circuit designers are consulted in the stage of system designing already. These designers know the technological details and can offer the most economical solutions. We do not necessarily wish to push those circuits which are already developed; we are prepared to produce complex integrated circuits which best meet our customers' needs. In spite of the great variety of circuits shown in the various catalogs, there is often the need for an additional one for a specific task. The complex hybrid circuits offered by the Institute combine the advantages of insulator-based and solid-state circuits. The use of the hybrid circuits solves many user problems since these circuits permit the combination of various technological processes so as to offer an optimum solution.

2542
CSO: 2502

COMPUTER SYSTEM CONTROLS NATIONWIDE TRANSPORT NETWORK

Budapest FIGEYLO in Hungarian 6 Jul 77 p 6

[Article by Janos Koncz: "The Computer as Direct Production Controller, Freight Organization at the Volan Trust"]

[Text] The Volan Trust, with about 90,000 workers and more than 17,000 trucks and other vehicles, is one of the largest enterprises of Central Europe. It stands virtually alone in its own category as a great transportation enterprise. In the production process of Volan material is not changed, it only changes places; thousands of trucks carry raw materials, parts and finished products between factories and industrial centers. Within the trust production control means controlling the movement of vehicles, ensuring optimal use of capacity, economical freight organization and loading in both directions, "to" and "from." Since 1 May 1976 the control or organization of long distance freight--the economically most significant--at the Volan Trust has been done by a computer as direct production controller.

The "Pre-Reporting System"

A national dispatcher network has guided and kept track of the freight organization of the Volan enterprises for more than 2 decades. The chief task of the National Dispatcher Service of the Volan Trust and of the linked megye and smaller regional dispatcher services is coordination of the Volan trucks and the freight tasks appearing, the realization of organized two-way shipping.

The ideal situation for organizing freight is for one customer to order a truck from town A to town B while another need appears for a truck from B to A. If the two trips can be made at one time then we can speak of an optimal case for the vehicle involved need not travel empty and the "supplemental" freight is guaranteed. (This is what transportation experts call the load on the return trip.)

But in the majority of cases things are not so simple. "Matching" freight needs may arise as in the above example but there are many cases in which

the customer cannot guarantee supplemental freight, that is a load for the return trip. Obviously, loading a vehicle only one way is uneconomical.

In order to solve the problem the traffic experts of the enterprise worked out a so-called "pre-reporting system" applicable to countrywide conditions which created the basic conditions for organized long distance supplemental shipping, the optimal loading of trucks on return trips which would otherwise travel empty and unused or only partly loaded one way. The essence of this system is that the dispatcher service of the initial Volan enterprise is obligated to report in advance to the regionally appropriate receiving enterprise all trucks dispatched with a one way load in long distance traffic (giving carrying capacity of truck, body type, route and expected arrival time) so that a load can be organized for it for the return trip.

The system has justified the hopes held for it on the basis of the practical experiences of the time elapsed; it has proven correct in principle. The following data show the vitality and effectiveness of the "pre-reporting system."

Development of Supplemental Freight Output

	Freight-ton-kilometers in millions	Units in thousands
1960	20.9	63
1965	49.9	122
1970	79.1	103
1975	110.0	125

But the traffic experts are not yet satisfied with these results. The trip use percentages for the trucks have still not improved to the greatest degree possible. For long distance traffic this index moves around 80-85 percent while for local traffic it is only about 50-55 percent.

With traditional methods, which require a great deal of manual work, effectiveness or the economical and optimal use of vehicles can be guaranteed only "catch-as-catch-can." The swift increase in the shipping needs of the people's economy, optimal organization of the large volume freight requirements and economical route linkages made necessary the development and introduction of a new and more modern work organization method.

The Program and the Technical Tools

The traffic experts of the National Dispatcher Service of the Volan Trust and the computer technology experts of Volan Electronics recognized that the computer, with its great storage capacity, ordering ability and ability to review variant possibilities substantially more quickly and on a broader scale than is humanly possible, could provide a high level of information to dispatchers about the national freight situation and could carry out a modern linkage of freight and runs.

In the first step of realizing a computerized freight and run linkage system two basic, theoretical matters had to be cleared up. One was the structure of the computer program and the other was the selection of the technical tools to ensure the operation of the system.

In working out the computer program the Volan workers relied on their own practical experiences and on the opinion of computer technology experts and determined that at the present organizational level of the enterprises an economical freight organization (organization of supplemental freight) could be best controlled by a computer system in which the computer provides the alternative freight linkage possibilities but a human decides in each case of freight task selection.

The position of the Volan experts is innovative and correctly indicates the position of the computer in control. Such computerized optimalization programs have failed in several places where the decision was left exclusively to the computer. This sollution is incorrect even in principle for the work of human beings cannot be guided exclusively on the basis of logical or rationalization points of view. In practice the entire system could be rendered inoperable, for example, if at the last minute one truck driver got sick, if a shipping task arose which could not be postponed for economic reasons, etc. When the optimalization system proves unsuitable many users of computers question, incorrectly, the place of the computer in guidance; it does have a place, but it must be defined appropriately!

In the interest of increasing the efficiency of long distance shipping the Volan experts wanted to use an "intuitive real time" system to process remote data. The technical requirements made on the system were as follows:

--The users (the Volan enterprises) must have direct access to and communication with the computer;

--Every user should be able to use the services of the computer directly (even many at the same time);

--In accordance with the requirements of highway shipping the system should operate continuously;

--It should record input and output data;

--It should ensure the quick accessibility of information;

--It should not require special training on the part of the users to operate the data transmission units;

--Direct communication should be realized as cheaply as possible, if possible using already operating communications systems.

A direct linking of the computer and the national telex network satisfied these requirements. Thus, instead of the much more expensive and more

complex dedicated lines or telephone linkages a more usable system was built up everywhere where there was telex service with direct access to the computer making use of all its services. The 65 telex machines of the freight offices throughout the country, the Videoton 1010 B computer and its peripherals at Volan Trust Electronics, the telexes of the National Dispatcher Service, a VTS display and a printer represent the technical frame of the system.

A National "Freight Bank"

The computerized freight linkage system has been realized in several stages. It was designed in advance to be capable of continual further development. The system can be broken down logically into the following basic activities:

Input into the computer of the one-way long distance shipping tasks awaiting solution. The computer constitutes a national "freight bank" consisting of the shipping tasks being continuously reported from which every Volan enterprise or service office can receive shipping tasks. Establishing contact with the computer corresponds to the method of calling any domestic telex station thus it is possible for any large shipper with a telex station desiring to link up with the freight and run linkage system to put into the computer directly the shipping tasks awaiting solution for the purpose of freight linkage. The program has a built-in control system which prevents erroneous data from getting into the freight bank. The megye dispatchers of the Volan enterprises are obligated to report in every case, when dispatching trucks, to the National Dispatcher Service (that is, to the computer), for the purpose of freight linkage, those trucks for which they cannot guarantee freight on the return trip.

In the currently operating version of the system every provincial Volan enterprise or service office has access via telex to the information stored in the computer and processed in various ways and can freely select from among the possible alternatives. As a first service the computer seeks a shipping task corresponding to the truck which is the subject of the prereport. Thus the following is written out via telex:

Shipping tasks in the direction of a locality corresponding to the home site of the truck; shipping tasks in the direction of a locality corresponding to the home site of the truck from the zone of attraction of the place the truck is staying; shipping tasks in the direction of the zone of attraction of a locality corresponding to the home site of the truck; and shipping tasks to be carried out along the hypothetical route of the return to the home site. Weighing the possibilities offered, the local dispatcher selects the most suitable and "removes" the selected task from the freight bank. The system records the submitted shipping tasks together with time limits for their completion and transmits the time limits when listing the shipping tasks which can be selected.

In addition the program offers numerous special services. Among other things it writes out the possible routes between optional localities, the

shipping tasks requiring given types of trucks, commissions valid within certain time limits or outside of certain time limits, shipping tasks directed toward or from a given collection point, etc.

Foreign Interest

Several decrees and measures have been passed recently for the purpose of saving energy and reducing the empty kilometers of public trucks. A decree also states that every public body must report one-way empty trips between megye capitals to the National Dispatcher Network of Volan. With the aid of the existing computer system it would be possible for Volan to organize freight for trucks which would otherwise be returning empty and thus to decrease the number of uneconomical empty kilometers. Unfortunately, however, partly in the absence of administrative measures (it should be known that the public bodies are obliged only to report and are not obliged to accept return freight) and partly in the absence of indirect incentives such use of the computerized freight organization system is insignificant.

More significant is the foreign interest in the system for the system developed by Volan is very modern and very progressive in regard to the correct and useful use of the computer by the enterprises. In the second quarter of 1976 the Transportation and Highway Affairs Section of CEMA dealt with the question of the international utility of the system in connection with developing an international dispatcher network. Czechoslovakia submitted concrete requirements for modernization of shipping between the two countries.

The computer can now maintain contact simultaneously with two telex machines and one display; according to plans this will be increased to six telexes and two displays. In the event of successful Hungarian-Czechoslovak cooperation more CEMA countries may join the system.

Thus a highly centralized, modern freight organization system is in existence; further progress depends on the attitude of present users and the joining of new users. The possibilities for a further development of domestic and international cooperation are virtually unlimited.

8984
CSO: 2502

CONTRIBUTIONS OF ROMANIAN PHYSIOLOGISTS CITED

Bucharest FLACARA in Romanian 2 Jun 77 p 9

/Article by Razvan Barbulescu/

/Text/ The last 1976 issue of the prestigious French review PATHOLOGIE-BIOLOGIE, in its columns of unique contributions carried a lengthy article by four Romanian research workers. The article focused on the metabolism of liver and global collagen under conditions of irradiation, world scientific pioneering in the area of molecular physiology. This item, unspectacular to lay people, has, however, aroused great interest in many countries. Outstanding personalities in this area like P. Janiaud (France), A. Keturkeniei (USSR), C. I. Levene (Cambridge), Donald V. Cannon (Boston), and H. Struck (West Germany) sent many letters to the Bucharest "D. Danielopolu" Institute of Normal and Pathological Physiology, specifically to physiologist Constantin Vladescu, senior researcher, initiator of the above-mentioned survey, and leader of the team which includes Dr Nicolae Gheorghe, researchers Elena Ganea and Liliana Petrescu and assistant Nancy Bacruban, requesting the article and highlighting the major importance of the study.

Says Constantin Vladescu: "So far collagen under conditions of irradiation was studied especially in terms of its physical and chemical properties and most often in vitro. Our investigations have been conductedin vivo and studied the metabolism of collagen after total irradiation through an amino acid which does not occur naturally and is only synthesized by the collagen molecule. By studying the rate of elimination of this amino acid we may draw conclusions on the metabolic condition of global collagen or of the collagen occuring in the organ surveyed. In the first place, the practical significance of these studies involves the fact that for the first time on a worldwide scale the problem of biological dosimetry is posed, an area in which the body is its own dosimeter. This also permits the singling out of the consequences of the degree of irrradiation to which the system involved has been subjected. In the second place, it is possible to study the side effects of therapeutical irradiation and irradiation-caused sickness is spotted with a minimum amount of probability." But what is the road to this success?

Constantin Vladescu is 38. He was born in the Grecesti-Dolj commune. Immediately after graduating college, in 1962, at 23, he joined the research field. Five years later he became doctor of physiology by submitting a survey of comparative endocrinology, the youngest doctor of science as he was told at the Ministry of Education at that time. Says he: "My training as a physiologist began in the third year of college when I started to be involved in the physiological center at the Bucharest University, headed by the late professor Nistor Santa, at that time head of the academy's section of physiology. Why did I choose physiology? Because it provides you with the satisfaction of constantly decoding the unknowns of the functioning of the body and its relationships with the environment. In high school I dreamt of becoming a lawyer and I knew nothing about physiology. I thought that in addition to a multitude of cases regarded as human, social experience which a lawyer handles, hence in addition to the spectacular facet of the profession I would also be able to make use of a specific judicial spirit which some had noticed in me and which myself had discovered in a few occurrences during my adolescence. But research also requires this spirit. Professor Santa told us that the results of research work also depended on our honesty and integrity and on the manner in which we blend into a research team, in which we respect each other's work, fighting for an idea and not for promotion."

It was from the illustrious professor that Constantin Vladescu inherited the ambition and strength not to give up after one failure and found out that patience actually is the primary condition of success. Of course, all these qualities must be based on talent and study. Because a favorable circumstance might set one's name under the title of a survey, among other researchers, but time will surely obliterate it if one does not represent value. Hence, the results of his doctoral thesis, published in domestic and foreign reviews, were quoted as unique results in a monograph of Prof Herbert C. Dessauer, of the New Orleans Faculty of Medicine. The outstanding professor later sent him the monograph which included many bibliographical data on the surveys of the Romanian physiologist Constantin Vladescu. He also stressed in a letter the importance of Vladescu's contributions to the comprehension and clarification of the mechanism of control of metabolism. As a matter of fact, those years were years of maturing. At 33, Constantin Vladescu, at that time a research worker at the Bucharest Institue of Geriatrics, was the author, together with Dr C. Vescan and Dr Gabriela Stoia, of an innovation regarding the possibility of injecting the biotrophic substance Gerovital H3 directly into the spot affected. Intensive study and the accumulated knowledge of assiduous research showed their impact. The same year, in 1972, his procedure thin-layer chromatography, attested as an innovation at a point when no one in the world used this method for determining procaine in biological and pharmaceutical products, permitted the formulation of a complete documentation on Gerovital. A member of the European Society of

Comparative Endocrinology and member of the French Sciety of Endocrinology at the age of 29, laureate of the Academy of the Socialist Republic of Romania in 1975, with more than 60 papers published at home and abroad, Constantin Vladescu has made significant contributions to evolutionist physiology, to molecular biology, and radiobiology.

"Since the time of Claude Bernard, the father of experimental physiology, researchers have been studying the function of and the interaction among organs and among living beings and the environment by recording epiphenomena (external phenomena). But until these extreme effects appear, in the inner biological structures changes occur which at first sight are apparent but which in the final stage induce important changes which can be recorded by physiological methods. This is precisely the role of molecular physiology: to discover the inner changes of biological structures which precede the phenomena that may be recorded in the normal or in the pathological system."

Says Dr Constantin Vladescu: "In 1973, as part of the subject matter of radiobiology, I had begun to study the metabolism of collagen in the systems irradiated. It was very interesting to know, a fact unknown in world specialized literature, to what extent irradiation may cause changes at this level and whether these changes could be objectified. The same as for any other innovation, the studies gave rise to discussions and controversies. Some were less scientific. I recall that at a scientific session someone reproached me in a fairly violent manner and with vague scientific arguments that the problem was known for about three quarters of a century and that collagen was an insignifcant protein. The person involved wished, for resons unknown to me, to minimize work conducted for many years. My only defense, which of course would also be convincing, was asking a simple, but scientifically sensible question: Who were the authors and the papers that the esteemed colleague used to found her allegations? This question received this astounding reply: I cannot recall now. As if it was a minor matter. I am a sociable person, but, like everyone, I have a certain amount of pride without turning it into fervor, to say so. Life also has some obstacles in store. They are not significant. Of course they may deprive you of a few years of work but they cannot prevent you from achieving your aim."

11710
CSO: 2702

ROMANIANS PIONEERS IN PRESERVING BONE MARROW

Bucharest FLACARA in Romanian 2 Jun 77 pp 1, 9

/Article by Dumitru Graur/

/Text/ Press agencies report: Pioneering. A group of research workers at the American Cancer Research Institute reported that they devised a method for preserving bone marrow for up to 24 weeks. According to American specialists, this will permit a much more effective chemotherapy in some cancer cases. In this connection it is recalled that most of chemotherapies in the case of cancer destroy the malignant cells but at the same time also considerably affect healthy cells, including the cells of bone marrow. If it were possible to extract and preserve bone marrow under satisfactory conditions and later return it to its location, great progress would be made in the fight against cancer. Researchers hold that they succeded in preserving the bone marrow cells intact for several weeks in a medium of liquid nitrogen vapors, at at least 248 degrees Farenheit. The first tests gave satisfactory results.

However.... The truth is that the above report, disseminated throughout the world by press agencies (and recently also carried in our newspapers) from the beginning did not seem to us very new. It reminded us of an older experiment about which we did not learn anything new for a long while. But the suspicion existed, together with the eagerness to make a closer survey. This is what we learned.

"As early as in 1968 we began to use intensive chemotherapy under the shield of bone marrow restoration. During that period, a team of Romanian physicians headed by Dr Vlad Apateanu and Eugen Iercan succeeded in preserving alive the bone marrow cells by freezing. They were collected by a simple technique: iliac puncture. At that time we used mechanical freezers in which we only reached a temperature of minus 80 degrees Celsius which ensured bone marrow preservation over a period of no more than 3 or 4 weeks. In this context we decided to begin using intensive chemotherapy in the treatment of cancer. Of course, at the beginning, it was

fairly difficult. I must confess that sometimes we were afraid of the possible failures involved in our innovation, because, without question, the life of each patient must be above any experiment made only for the sake of experimenting. We were using intensive chemotherapy, administering up to 20-25 mg cyclophosphamide for each kg of the body, hence between 1.5 and 1.8 g a day, attaining up to 15-18 g cyclophosphamide for a treatment, while, normally, such a treatment does not exceed 200 mg a day, but only in 3 days of the week. Thus, we could go as far as maximum treatment, in which the patient's leukocytes reached zero level in peripheral circulation, practically, no white cells in the body. At that point we intravenously injected the bone marrow which had been earlier extracted from the same patient. Result: in 4,5 days the bone marrow produced cells the same as before, the blood formula was completely restored, the patient recovered, and after a while, was fit for more chemotherapy." This statement is by a Romanian, Dr Constantin Paun, of the Section of Radiobiology of the Fundeni Clinical Hospital. Actually, they undoubtedly prove, as we shall also see below, that the method of freezing bone marrow extracted from the human body has been used in Romania for almost 10 years now, moreover, with better and better results. We shall dwell on cancer treatment proper in order to inform the reader about the importance of the method described above.

It is known that at this point there are two best known methods of treatment and control of malignant cell proliferation in the human body: irradiation and chemotherapy. Undoubtedly, the aim is to destroy the cells which have the property of reproducing very rapidly: of course, the malignant cells. Unfortunately, at the same time, healthy cells are also affected, including the bone marrow cells, the cells which produce the white and red cells which are required for blood regeneration. Hence, in consequence of the treatment with cytostatics a certain amount of malignant cells are destroyed but at the same time there is a considerable decrease in the number of white cells (especially) in blood and in the body's capacity of producing them, as a result of the death of the bone marrow cells. In this case, the only solution is to stop the treatment, to send the patient home, and wait for the regeneration of the bone marrow cells. But, of course, much time is lost, and in the treatment of cancer, loss of time is always detrimental to the patient! The Romanian specialists' idea precisely involved preserving a specific amount of bone marrow which, later injected in the same body easily restores the function of producing the blood cells destroyed as a result of the treatment. Hence, we go over to the problem of specific preservation of bone marrow, a method which now American specialists boast of having discovered it as pioneers.

"Dr Constantin Paun recently told us: Here, difficulties involved ensuring the lowest possible temperature required for the perfect freezing of the cells. In Romania, today, we achieve freezing in

liquid nitrogen at minus 176 degrees Celsius. It is known that the human body, with all its cells, is composed of almost 80 percent water. It is also known that water freezes in the form of crystals, of needles, if you like. But this crystallization must be avoided in the freezing of bone marrow because the above-mentioned needles would break the cell membrane and consequently the cells would die. However, the method for avoiding crystallization is known on a worldwide scale: it involves using cryoprotective agents which permit freezing without crystallization. It is in this manner that we freze the cells of bone marrow only not for the period of a few weeks, as stated in the report quoted at the beginning, but for an indefinite period. I must stress that we have used preserved bone marrow even 2½ years after it was extracted from the patient involved. Moreover, by the method we have been using currently, also defrosting is simpler -- practically dipping into water heated at 38 degrees."

As indicated above, Dr Constantin Paun and his chief aide, Dr Gheorghe Cioba, have been using intensive chemotherapy under the shield of bone marrow restoration for almost a decade. However, according to their own admissions, they have done it in quiet, only reporting their results, whenever they had the opportunity, at various meetings of Romanian or foreign medical societies. The first of these reports given at home (Rapid Restoration of Hematopoiesis After Administration of High Doses of Endoxan, Union of Societies of Medical Sciences, Society of Hematology) is dated September 1968. Meanwhile, there have been many addresses to world congresses (including the address to the World Congress on Hematology in Munich, in 1970) and to a few international meetings, including the one held last year on radiobiological studies needed for upgrading radiotherapy (International Atomic Energy Agency, Vienna, 22-26 November 1976). At this last-mentioned meeting, Dr Constantin Paun was elected chairman of the section of clinical radiobiology, after he read his survey "Model of Potentialization of Radiotherapy," which aroused great interest among the 132 participants (from all over the world) at the meeting.

Says radiobiologist Constantin Paun: "During about 8 years we treated more than 30 cancerous patients by intensive chemotherapy followed by perfusion of defrosted bone marrow. This method yields good results especially in bone cancer, in osteosarcoma. In some of these cases the patients were healed. Of course, the major problem remains early detection of the cancerous cells and it is unfortunate that in most cases the patients come to us only when the disease is in a very advanced stage. However, in the cases in which we did not obtain clinical recovery, survival was two and a half longer than in the case of traditional treatments." Here are a few examples. S. E.: A 19-year-old first-year student in whom bone cancer in the left shoulder was detected. Her cancer was in an advanced stage and

doctors gave her only a few months to live. Today, 7 years after the treatment, she is alive, has graduated from college, is married, has one child, and leads a normal life. S. O.: A 20-year old woman who arrived at the Fundeni Clinical Hospital with a pathological femur fracture as a consequence of the bone cancer in full proliferation. Her condition was serious and she had only a few months to live. Today, 4 years later, she is in the stage of total clinical recovery and walks without any problems.

After the Vienna Meeting Dr Paun received a letter of almost three double-spaced typed pages in which the American specialist R. E. Toya of the Alabama University of Birmingham requested his Romanian colleague to exactly answer 12 questions on his method. Said Dr Paun: "Of course I replied. We feel that in the case of cancer there should be no secrets and every discovery should be promptly passed on to all specialists. The war against a common enemy, cancer, is a major one and it must be waged by all mankind! Hence, I hope that the details I gave Professor Toya will help in the cure of cancer for American patients as well." Consequently, less than 2 months ago, the Alabama professor sent the following letter of reply to the Romanian Dr Constantin Paun:

Dear Dr Paun:

Thank you for your letter of February 1977 containing the replies to the many questions I asked you. I look forward with great expectation to reading of the thirty-two cases of osteosarcoma that you plan to publish, and share your optimism concerning the first cases you treated and their survival. Without question, you are to be congratulated on your innovation and apparently highly successful approach to this disease...."

(The photostat of this letter is published below).

This is the real story of bone marrow preservation, a method which has been used by Romanian radiobiologists for almost 10 years or, if you like, what may sometimes be hidden behind an ordinary brief report in the regular "From All Over the World" columns. Of course, from all over the world, but especially from Romania.

List of Surveys Proving Romanian Priority in Intensive Chemotherapy Under the Shield of Bone Marrow Restoration

"Restorarea Rapida a Hematopoezei Dupa Doze Mari de Endoxan" (Rapid Restoration of Hematopoiesis After High Doses of Endoxan), Session of Society of Hematology, Bucharest, September 1968 (Published in the Bulletin of USSM /Union of Societies of Medical Sciences/ for 1968).

"Restauration Rapide de l'Hematopoese par Autotransplantation de Moelle Osseuse Chez un Malade Ayant Recu de Fortes Doses de Cyclophosphamide" (Rapid Restoration of Hematopoiesis by Autotransplantation

of Bone Marrow in a Patient Who Received High Doses of Cyclophosphamide) (Published in the volume Congres Mondial d"Hematologie, Munich, September 1970. Compte Rendu du Congres).

"Avioperedska Kostogo Mozga u Neoplasticeskih Posle Intensivnoi Himioterapii Ticlofosfamidom", Pervala Radiobiologhiceskaia Konferentia Sotialisticeskih Stran, October 1974 (Published in Bulletin cm. 374 - Bedrjicov, USSR).

"Grefa Autologa de Maduva Osoasa la Bolnavii cu Neoplazii Dupa Terapie Intensiva cu Ciclofosfamida" (Autologous Graft of Bone Marrow in Patients With Neoplasia After Intensive Therapy With Cyclophosphamide), Union of Societies of Medical Sciences, Society of Radiology, 20 March 1975 (Published in the Bulletin of USSM Events for 1975).

"Model de Potentializare a Radioterapiei" (Model of Potentialization of Radiotherapy), Second National Conference on Biophysics, Bucharest, 9-10 September 1976 (Published in the Bulletin of USSM Events for 1976).

"Model of Potentialization of Radiotherapy," International Atomic Energy Agency, International Symposium of Radiobiological Research Needed for the Improvement of Radiotherapy, Vienna, 22-26 November 1976.

11710
CSO: 2702

END