The Abstracts of the Second National Conference of Cybernetics

"Nowadays cybernetics has an increasing importance in the management of industrial and economical processes, in reducing the special productivity of man's work, in the overall progress of mankind"

NICOLAE CEAUȘESCU

from the Message addressed by the President of the Socialist Republic of Romania to the Third International Congress of Cybernetics and Systems.

Hold in a period in which throughout the world people examine the actual ways of peace protection and strenghtening, the participants to the conference have given their increasing anxious oppinions, of their governments and nations with respect to the new elements of international life tension and real great dangers accumulated as a result of violental politics and interference in the internal affairs of other peoples, of taking up arms without restrictions, of increasing existing hot regions with tension and conflicts, of big disproportions in the world social and economic system, and mainly of aggravating economical discrepancy and nondevelopment.

Regarding this status of affairs and the strong positon of President Nicolae Ceaușescu, the General Secretary of our Party, who has given his firm No to War, fighting actively against the installation of new medium range action missilles in Europe, for the distruction and retiring of existing weapons, for disarmament, for an overall pace and collaboration, the cyberneticians, the scientistis, the researchers from all countries are strongly polarised by the passionate callings of President Nicolae Ceaușescu, by Socialist

Unity and Democracy Front ideas, animated by the common aim of all scientists throughout the world, of all people, to create the strongest weapon—the weapon of unity, peace and collaboration.

Since 1978, when President Nicolae Ceauşescu has been given the golden medal "Norbert Wiener" by World Organization of General Systems and Cybernetics, he said: "You are very right considering cybernetics is playing an important role along with a lot of other genious human achievements. It is asserting itself in the frame, of a new better world construction, in which people can prove their knowledge, each nation can provide his own and free development, in which personal and national personality shall be demonstrated", and underlyined the following words: "I wish to express, again, the hope of increasing efforts from you, workers in such a revolutionary scientific field, not only for the development of cybernetics and other sciences, but also to rise the role of scientists, of sciences in general, for the provision of peace and progress throughout the world".

The Romanian cyberneticians, mobilized by these ideas and totally conscious regarding their role, are present to the appeal of Romanian National Commettee "The scientists and the peace" led by acad.dr.eng. Elena Ceauşescu, throughout the world reputed savant, increasing and focusing their efforts for large promotion of cybernetics, according to the provisions of Communist Party documents. "In the view of modern planning and management activities achievement, actions should be taken to extend the computing technique and create the progressive national data processing system, technical and documentation information systems, to promote cybernetics. and informatics in the fields of production and administration (10 th R.C.P Congress Directives).

In this spirit, the work of eleven sections of the Second National Cybernetic Conference have been conducted. The large number of sections was imposed by the great number of papers (showing the deep penetration of cybernetics in all social economical, scientifical, technological fields, stimulated by our political strategy), as well as by the development, better then any previous expectations, of science and technique. This truth is confirmed by all of 430 authors and 440 joint authors, out of which 5 are members and onorific members of Romanian Academy, 60 are professors, out of which 16 docent doctors, 50 are associated professors, 130 with PhD, many of them from high schools and universities, scientists, the rest without exception are engineers, economists, mathematicians, phisicians, byologists, agronomists, zootechnicians, phisics, with direct preoccupation in the practical economical productive and social life, with direct connections with production from various sectors, but also ready for cybernetis, informatics and automation promotion and implementation (more than 50 of these specialists are managers in our enterprises or in social and economical sectors), which provide the guarantee of a high theoretical and practical value for the majority of papers and of their originality.

1st SECTION: CYBERNETIC SYSTEMS AND CYBERNETIC MODELLING

The section heading has been provided by prof.dr.eng. Mircea Petrescu, prof.dr.eng. Paul Postelnicu, general dr.eng. Ion Angheloiu, prof.dr.eng. Emil Ceanga and the scientific secretary comprised of eng. Mugurel Ciochină and mathematician Cătălin Arsene.

53 papers have been recorded in the section programme, out of which 38 have been actualy presented, generating more than 100 discussions and comments.

Covering the fields of fundamental research of theoretical cybernetics and management, informational processes, modelling and simulation, cybernetic systems behaviour and their performances evalution, the papers of first section approached very actual and of real theoretical and practical value problems, pointing out applied concepts in industry and economy, trends in development of cybernetic science in our country.

Valuable scientifical and phylosofical papers opened the work of first section, presenting the contribution of our Romanian school to the cybernetics genesis (prof.dr. E. Niculescu-Mizil — Computer Centre of Chemical Industry, Bucharest), the Odobleja consonantic concept and Wiener information (prof.dr. T. Irimie — Cluj-Napoca University), euristical value of feedback connection concept in generalized cybernetics (prof.dr.eng. P. Postelnicu — Polytechnic Institute of Bucharest), the work and problems of dr. Ştefan Odobleja (eng.S.Bajureanu — Nuclear Reactors Institute of Piteşti), fundamental mathematical research and application of games strategies in hierarchical systems (dr.mat. D. Farcaş — Computer Centre and Medical Statistics), mathematical modelling of continuous nonlinear systems, statistical sector system, normal generalized distribution law parameter estimation (ass.prof.dr. N. Visinoiu, lect.dr. D. Baz, lect.dr. V. Badiu — Academy of Economis Studies), concepts for management status recognition (prof.dr.eng. E. Ceanga from Galaţi University), multicriterial decision problems agreggation (mat. A. Baciu, mat. A. Pascu, mat. E. Puşcaş from Ştefan Gheorghiu Academy), general theory of entreprise administration (prof. dr. Gh. Boldur from Academy of Economic Studies) cybernetic models of operational managerial behaviour (sc. R. Grosu, psih. A. Papadima from Technology Design for Light Industry) games strategies (dr.mat. D.Farcas) 2-D systems synthesis for shape recognition (V.Droaşcă, D.Stănescu from Polytechnic Institute of Bucharest, Research Institute for Computing Technique of Bucharest).

New concepts and methods in cybernetic system modelling, application of theoretical results in practical enterprises management, automatical systems and industrial robots realization have been also presented.

The proliferation of data collection, transmission and processing systems is asking for protection and security systems using the methods of criptology for data confirmation in cybernetic systems. Very interesting papers have been presented in this field (general dr.eng. I. Angheloiu, ass. prof.dr.eng. E. Görfi — Military Academy of Bucharest).

Cybernetic systems performances evaluation and their complexity have been approached by many authors. Mathematical models for data processing systems reliability, queuing theory models, matriceal statistics applied to cybernetic systems have been developed (prof.dr.eng. Gh. Ciobanu — Military

Academy of Bucharest, eng. D. Bersadschi — Chemical Combinat of Dudești — Bucharest).

A real interest generated prof.dr.eng. P. Constantinescu from Design Institute for Land Improvement of Bucharest with his paper on principle of steady state entropy and the role of information in the systems modelling.

To make appropriate the cybernetic science results and the users, and to implement it in management practice, the mathematical modelling of large systems is calling for some heuristical methods, linguistical simulation of some economical processes, which is leading to better quality of management models and is achieving real technical and economical performances (dr.eng. F. Stănciulescu — Central Institute for Management and Informatics of Bucharest, ass.prof.dr. M. Mihalyi, lect.dr. C. Raischi — Academy of Economic Studies Bucharest).

The followers have taken the profit of very interesting papers from theoretical and practical points of view, but also from the very competent discussions and comments, of real value, given by prof.dr.eng. P.Postelnicu, prof.dr.eng. M. Petrescu, prof.dr.eng.B. Ceanga, prof. dr. eng. P. Constantinescu and prof. dr. I. Irimie, who underlined the new and genuine elements and concepts, showed the field of application for theoretical research, the ways for some undergoing research activities, new directions in formalization and conceptualization in cybernetic application for economical, technical, technological and social systems management.

2nd SECTION — LIVING SYSTEM CYBERNETICS

The section head has been provided by acad. Eugen Macovschi, acad. S. Milcu, prof. dr. doc. eng. Edmond Nicolau, dr. Constantin Bălăceanu, prof. dr. doc. Pătru Firu and by the scientific secretary of phis. A. D. Iacobas and eng. Adriana Gheorghiu.

Out of total 70 papers recorded in the section programme, 53 have been presented, generating more than 150 discussions from about 350 participants.

The permanent and competent guidance of section board provided a good understanding and cooperative athmosphere during the section works. The free and clear discussions were given on friendly basis between members, at high level of quality, without contradictions.

The topics approached by authors covered the general problems of biocybernetics, medical cybernetics, cardiovascular system cybernetics, nervous system cybernetics, medical informatics, cybernetics of movement (in sports), cybernetics and ecology.

Of a real interest, the paper of acad. Eugen Macovschi "Cybernetical aspects in biostructural theory of cancer genesis" scientifically fundamented the biostructural theory of cancer genesis and the cybernetic aspects of biochemical and physiological processes interferring with its mechanisms.

The work "Cybernetics and the scientific-phylosophic category of living-nonliving" (phis. I. Mamulaș from Electrography Laboratory and Applied Bioengineering of Bucharest) determined numerous discussions related to the actual and future connections between physics and biology, as

well as the role of cybernetics in structuring the new types of relations between sciences.

Prof. dr. eng. P. Postelnicu (Polytechnic Institute of Bucharest) presented "The intrinsic connection concept and its utilization in biocybernetics", showing that feedback connection is less utilized in the specialised cybernetics related to a concrete or material loop, but in the biocynetics the closed causal chain could be realised also through an abstract loop which could be materialised by process analysis or by mathematical relations and, only in this case, one could utilise the term of intrinsic feedback connection.

Prof. dr. doc. eng. E. Nicolau (Polytechnic Institute of Bucharest) in his works (individual or with others as dr. E. Tocineanu, eng. Sonia Hermann): "Growth models", "Biological oscilators and Hopf bifurcation theory", "System approach and cybernetic interpretation of imunological relations", "Cybernetic models of cardio-vascular system", "Genesis and propagation of oscillant potentials in heart-cybernetical aspects", underline the cybernetical aspects of biological systems using the presented models.

An interesting systemic and cybernetic approach on the novelty and its role upon creativity has been presented by dr. C. Bălăceanu — National Institute for Geriatry and Gerontology of Bucharest and his team.

A scientific novelty, has been first time presented by acad. S. Mincu in his paper "Blocking cybernose in the systemic pathology of endocrine glands".

A team of specialists from Virusology Institute Stefan S. Nicolau of Bucharest (dr. chem. V. Eşanu, prof. dr. M. Cajal onorific member of S.R.R. Academy, phis. A. Cristea, phis. F. Brumfeld etc.) have presented some of the most interesting papers on cybernetic approach of methabolic cycle, breathing, normal and abnormal excretion and others, as well as the connections with the human cybernetic system (as a living one), with the general medical cybernetic system and with the general management cybernetic system which operate in the national economical, social, political space.

The cybernetic system of dental-maxillary has been presented with competence by prof. dr. doc. Pătru Firu (Medical and Pharmaceutical Institute of Bucharest).

An interesting formula for the calculation of biological information quantity which demonstrates the informational superiority of human brain with respect to other big mamiphers has been presented by dr. C. Portelli from Medical and Pharmaceutical Institute of Bucharest.

Ass. prof. dr. M. D. Nicu form Polytechnic Institute of Bucharest came with a series of works, out of which a special interest and value has been demonstrated by his genuine paper "Topological — algebrical model of connections between the central nervous system levels" written with G. Bursteni, in the fifth year student at Automation Faculty.

Ass. prof. dr. O. Aramă from Medical and Pharmaceutical Institute of Cluj-Napoca presented the paper "Cybernetic model of oxigen homeostasis", in collaboration with prof. dr. doc. I. Baciu.

Ass. prof. dr. Gh. Drăgoi from Medical Institute of Craiova presented three papers concerning the biocybernetic applications in the anatomy study (theoretical fundaments of a cybernetic anatomy), cybernetic systems with

regulating role in the ossification and osteogenesis, as well as control and regulation elements in the heart excito-controlling system.

A novelty in the application of Hooke and Jeeves algorithms to determine water absorbtion by the normal and tumoral tissue has been presented by phis. I. Kindlein and Stela Kindlein (Oncologic Institute of Cluj-Napoca).

A team led by dr. M. Tj. Răzuș from Electrography and Applied Bioengineering Laboratory of Bucharest, presented a series of interesting works regarding the nervous system cybernetics and psychocybernetics, as well as the original devices designed and realised to put into evidence the electrodermic reflex with possible utilizations for nervous system cybernetic approach.

In the field of medical informatics we are mentioning the papers of eng. Ioana Cicani (Computer Centre of Chemical Industry) named "Data base for pharmaceutical products" which could be considered as a world novelty in this field, ass. prof. phis. A. D. Iacobaș (Medical and Pharmaceutical Institute of Bucharest) "Computer optimization algorithm for some medical treatment procedures" which tries to give some abstract medical functions and human body evolutionary equations during the medical treatment, with an important conceptual value, dr. V. Enătescu (Mental Health Laboratory — Satu Mare) "Extraverbal communication automatic analysis laboratory" and "Doctor-patient dialogue, the informational therapye" which are openning new directions in medical practice and generated a real interest.

Eng. E. Tocineanu (Assembly and Service for Automation and Telecommunication Institute of Bucharest) in his paper "EKG automatic processing" is offering a set of tested programs which could be given to users for automatic diagnosis and control of cardiac rhythm deviations by any physician, not only by cardiologist.

Sports cybernetics has been largely presented by Sport Research Centre papers (biophys P. Hillein "Critical analysis of information circulation in the technical correction processes in the professional sport" and prof. psyh. Maria Șerban "Psychocybernetic analysis of the emotional high performance sportsman behaviour. Difficulties and premises") and National Council for Education and Sport (dr. O. Popescu with his paper "Compensatory self-regulating length — frequency under cycling tiredness").

An important place has been taken by "Cybernetics and ecology" where ass. prof. dr. V. Cireașă, dr. Elena Cireașă) (Agronomic Institute of Iași) and student Cristina-Maria Cireașă (Medical and Pharmaceutical Institute of Iași) presented "The cybernetic approach of the landscape architecture" and "The fruit-growing cybernosys as an effect of cybernetical deterioration". One cannot omitte the paper of dr. biol. V. Soran "Natural ecosystems cybernetics" given with competence by the author (S.R.R. Academy — Cluj-Napoca branch).

The works of "Living system cybernetics" section have been developed at a high scientifical level accuracy and originality and generated realistic discussions.

3rd SECTION — ECONOMIC-SOCIAL SYSTEM CYBERNETICS

The section head has been provided by prof. dr. Mircea Bulgaru, prof. dr. doc. C. Ionescu, prof. dr. E. Niculescu-Mizil, dr. Moisa Altar, dr. Radu

Stroe and the scientific secretary of. ec. Liliana Dumitrache and mat. R. Serban.

55 papers have been recorded in the programme, out of which 35 have been presented, followed by 126 interventions, discussions and opinions.

The papers presented in this section have been oriented to cybernetics applications in the social systems on national territory and sector basis, economical-social development problems, where aspects of systems evolution and applications in the sociological research have been tackled (Poliana Ştefănescu and S. Stefănescu from Computer Centre of Bucharest University) actual problems in our national social structure evolution, the perspective of selfregulation mechanisms have been analysed, showing its development under complementary and contradictory actioning processes as: social homogenity, social-professional differentiation, step by step substructure disappearance, implementation of some different historical factors. It is shown that social cybernetic approach requires theoretical-qualitatively models *for analysis and explanations, based on which concrete studies with diagnosis* value could be undertaken (prof. dr. C. Ionescu-Economic Studies Academy of Bucharest and dr. O. Hoffman — Sociology Research Centre of Bucharest).

Problems of cybernetic approach of management actions and decisions in the international turism have been debated, definying the international turism as a part of the national economy general cybernetic system (dr. C. Zmeu, dr. M. Manole — Turism Ministry), problems of industrial and economical structures optimization under new development conditions in our country, going into analysis of rules which should be considered in the structuring process (prof. dr. C. Pintilie — Economic Studies Academy of Bucharest, A. Pintilie — Aircraft Electric Services, Research Institute of Bucharest).

A special attention has been paid during the section works to the national economic potential reproduction and regulating factors of financial-economical mechanism (papers of prof. dr. M. Bulgaru from Economic Studies Academy of Bucharest and dr. Ana Bulgaru — State Planning Committee of Bucharest).

The industry-agriculture cybernetic connection including territory aspects is comprising of total local resources valorification, expressing the requirements of our general economical law, of social work and national working time resource economy. The regulation of these activities is taken under the strategical objective defined by the overall national economy development and should take into consideration the conditional reflexes generated and induced by each other, due to their development, as well as in the general national economy cybernetic system (prof. dr. M. Bulgaru, ass. prof. Magdalena Stanciu, dr. R. Stroe — Economic Studies Academy of Bucharest, dr. Ana Bulgaru — State Planning Committee of Bucharest).

A special interest rised the researches on some aspects of the economic equilibrium modelling, using complementary theory, the existence conditions for model solution has been established, and defined the equivalence between the model and a certain nonlinear complementary problem (mat. T. Dumitrescu — Economic Studies Academy of Bucharest).

Economic growth models considering the scientifical research potential has been analysed, where it is distinctly considered in the macroeconomical production function, as well as throughout an equation with a certain dynamics. The qualitative properties of optimal trajectories have been analysed (dr. M. Altăr — Economic Studies Academy of Bucharest, ec. Liliana Dumitrache — Computer Centre of Chemical Industry) as well as economical growth models by which the fix productive resources dynamics is analysed by means of accumulation and increase of labour force skill-investments in the labour force (C. Hîrtu — Economic Studies Academy, Bucharest).

Another group of papers which rised interest, approached the problem of cybernetic systems for producing and saving energy. We are mentioning the cybernetic model for optimization of crude oil processing and valorization in the chemical industry and the efficiency indicators calculation on each industrial complex (refineries and petrochemicals), then their agreggation at the level of ministry, considering the internal circulation of products (dr. ec. V. Biță. eng. M. Ciochină from Computer Centre of Chemical Industry of Bucharest) as well as the risk analysis and costs in crude oil extraction (ass. prof. V. Tarbujaru, ass. prof. I. Gîrleșteanu — Craiova University).

Cybernetic models for economic efficiency improvement, production costs reduction, better specific consumption have been presented, by research studies on the intensive economic growth factors (ass. prof. dr. D. Ciucur, lect. dr. C. Popescu — Economic Studies Academy of Bucharest) as well as problems on the reformulation of energy concept in the frame of consonantism (a team of scientists from Research and Energy Development Institute of Brașov).

Cybernetic models and informatic systems on the optimization of enterprises activity, simulation programming packages at the enterprises level were presented (prof. dr. M. Bulgaru, ass. prof. I. Roxin, ass. prof. Magdalena Stanciu, ass. prof. I. Smeureanu — Economic Studies Academy of Bucharest as well as production planning optimization in industry.

A large number of discussions and opinions have given the opportunity of fruitfull exchange of ideas and opened new directions in the field of cybernetic methods in the economical-social systems.

4th SECTION — INDUSTRIAL SYSTEMS CYBERNETICS

The section head has been provided by ass. prof. dr. eng. Adrian Gheorghe and prof. dr. eng. Francisc Kovacs, as well as by a scientific secretary, comprising of dr. Liliana Spircu and eng. Mircea Tiberiu Gruescu.

There were 84 announced papers, 69 presented papers, all these representing the contribution of 106 authors. There were almost 153 participants in the sections works — research people and scientists from 37 institutions of our country. Regarding the presented materials, 28 participants have had the floor and rised problems and discussions.

At the end of session, a round table has been organized, the main discussions being the systems reliability, with 12 participants.

From the debates, as well as from the presented works, the following conclusions were drawn:

— Industrial cybernetics is a branch of cybernetics which has already penetrated in the economical-productive life of our country, as a reality through its applications achieved in our country. At the same time, all the participants mutually agreed that future offers a wide field for cybernetic applications in the industrial practice, especially by automation and cybernetics on technological processes, actions which will rise the labour productivity on high rate basis equal-proportionally with the investitions which will be made in the process of cybernetization, improvement of economical efficiency for technological processes by the reduction of the specifical consumptions of raw materials and energies, as well as the optimization of technological processes towards the society's requirements and the available material resources.

The main directions of the industrial cybernetic development in the coming years will be provided in the department of processes control by equipments with incorporated microprocessors, stressing the microtechniques of equipments and their hierarchy and distribution in the architecture of systems, mecatronical equipment constructions, penetration of automatical quality control methods in the fabrication system, rising the tendency of getting closer the discontinuous processing industry towards the industry with continuous flows, by robots implementation. Testomatics will participate to provide the required production quality.

The production process will be integrated more and more in complex fabrication systems, with logistic as well as maintenance processes, ensuring in this way, the system functionality by reliability of all its cells. An important contribution to solve all these problems will be made by terotechnics, industrial logistics and reliability theory as well as by telematics.

A special effort of industrial cybernetics will be continuously developed in the field of improvement of interference between man and computer, an essential factor in the complex human management of processes by cybernetic equipments provided with artificial intelligence.

VOXART synthetizer has been presented as an exceptional work achievement, able to synthetise the humann language, one of the most efficient channels of human communication with other people.

5th SECTION — THE AGRICULTURAL SYSTEMS CYBERNETICS

The section's head has been provided by prof. dr. doc. Bujor Mănescu, dr. eng. Valeriu Pescaru, dr. eng. Sergiu Hartia, dr. biol. Alexandru Ionescu, as well a scientific secretary composed by Claudia Toader — analyst an,d Constantin Antonescu — university lecturer.

Within the framework of the section, 40 papers have been debated regarding the agricultural systems — cybernetic systems, cybernetic modelling for agricultural production, optimization, controlling and planning in agriculture by means of the cybernetic methods and techniques, ag ricul tural informatics, water economy and land improvements in systems approach-

All the presented papers have given new and original contributions, defining the agriculture concept as cybernetic system (dr. doc. Bujor

Mănescu, dr. Radu Stroe — Economic Studies Academy of Bucharest), the qualitative cybernetic model of agricultural production (dr. eng. ec. Valeriu Pescaru — The Informational and Computer Centre of Ministry of Agriculture and Food Industry), the informational system basis of ecological sources from our country (dr. doc. Dumitru Teaci, eng. Silviu Radu, teacher Maria Munteanu — Academy of Agricultural and Forest Sciencies of Bucharest) the role of feedback connexion in the theory and practice of the forest arrangements (ass. prof. dr. eng. Ștefan Tamaș, Brașov University).

A lot of the debates were given on applicative character at national, zonal and agricultural complex level. There were noticed papers like: "Automation of technological alternatives elaboration for the field cultures" (scièntist Tatiana Condratenco — Agricultural Economy Institute of Bucharest), "The automatic model for the territorial distribution of the agricultural production — MARTA" (dr. eng. S. Hartia — Agriculture Economy Institute of Bucharest), "Optimum redistribution algorithm for the deficit or surplus of resources for agricultural units "(mat. Cornelia Scutaru, ec. Cecilia Neculai — Agricultural Economy Institute of Bucharest).

Out of problems debates resulted the requirements for simple problems formulation which are leading to the maximum efficiency at the level of production farms of medium size. It was underlined the reasons of cybernetics and informatics implementation in agriculture, by some specialists, the best method to prove their need being the efficiency and actual results.

The section's works correlated problems and joined specialists form various fields to achieve new collaborations, for example investigations for optimal herbicide utilization.

6th SECTION — BUILDINGS AND CONSTRUCTION MATERIALS SYSTEMS CYBERNETICS

The section head had been provided by dr. eng. Mircea Georgescu, dr. eng. Virgil Ioanid, dr. arh. Mircea Enache, eng. Ion Stăncioiu, as well as by a scientific secretary composed by lecturer ec. Ilie Niculescu and eng. Ioana Cicani.

From 18 registred papers 11 works have been presented by authors.

All the communications rised interest shown during the discussions and questions.

All the works followed the general conference topics, approaching very actual problems in the construction activity, utilization of modern computer facilities in the design research, planning, execution and production activities, with great aplicability character.

At the same time, references to the specialized works issued in the country as well as abroad, have been given.

A lot of authors debated the problem of cybernetics utilization in the decisional processes as well their informational processes.

The high scientific level of all these presented works did not allow their quality classification.

The papers problems joined the research and production to provide applicative studies with immediate efficiency.

7th SECTION — TRANSPORT AND TELECOMMUNICATIONS SYSTEMS CYBERNETICS

The leading guidance had been provided by dr. eng. Mihai Mihăiță, ass. prof. dr. eng. Eduard Rădăceanu and the scientific secretary by dr. eng. Aurel Pușcă.

On the framework of section, 18 scientifical communications have been presented with large topics in the field of transports and telecommunications as cybernetic systems, showing the virtues of using modern management methods, computer technique and mathematic modelling of approached processes.

The communications, devided in 6 thematic groups, have taken into account the followings:

— Cybernetical approach of transport activities in the framework of national economy (dr. eng. M. Mihăiță, Electronic Computer Center of Transports and Telecommunications Ministry — Bucharest).

— Cybernetical approach for design and utilizaton of informatic systems for railways transport management, for optimization of transport routes, management of railways technical stations (eng. D. Rotaru, eng. M. Untea end eng. Dorina Cobianu) administration of passengers vaggons rolling stock and the observance of the districts self supplying principle, and the transports with maximum economic efficiency (eng. A. Ștefănescu, mat. F. Filipoiu, ang. I. Untea, eng. E. Pop) — Electronic Computer Center of Transports and Telecommunications Ministry of Bucharest.

Mathematical models for optimum routes for domestic and in international transportation of goods for maximum efficiency of auto and railway transport with substantial reduction of energy consumption and improvement of hard currency savings (V. Pop — analyst, Romtrans — Foreign Trade Company, dr, phiz. R. Homescu, ass. prof. I. Roxin, M. Mironesco-math. — Economic Studies Academy, Violeta Leoveanu-math., E. Benea-math,. Electronic Computer Center for Transport and Telecommunications Ministry — Bucharest, ec. Carmen Trifan, analyst R. Toma from Romtrans — Foreign Trade Company — Bucharest, eng. Th. Bancu, math. Melania Bogdan from Auto Transport Department — Bucharest).

Technical problems regarding the development of technological transporting systems in the field of continuous fabrications for light industry with extension possibilities in other fields (eng. A. Buzescu, eng. L. Stănilă, eng. M. Steiu, eng. D. Cipoianu, math. I. Bălan from Technological Design, Institute for Light Industry, as well as by automatic control of underground ways (eng. Moise Mizil — Polytechnic Institute "Gh. Gheorghiu Dej" — Bucharest) with a modern view and very good experimental results.

— Special technical problems regarding the cybernetics application in telecommunications optimal design and for telecommunications equipment utilization.

All presented works approached prioritary problems for national economy, of special interest in the field of transports and telecommunications as for instance to meet all transport requirements at the national economy level with minimum of energy consumption and providing transports quality and maximum running security.

The presented communications have been followed with interest and all discussions hold on these bases created a large change of experience and information transfer between all the participants from high graduated institutes, computer centers, research institutes and enterprises.

The communications have been characterized by their scientific level, original solutions with possibility of immediate applications, most of all regarding works already applied, others being just in running or in experimental phase.

The obtained results for the systems which have already implemented, as well as those which are proposed for the present aplicable works and especially for the works which are to be realised, stressed the real possibilities for cybernetics utilization and of others technico-scientific revolution achievements in the economical and social activity — mainly telecommunications and transport field, taking into account cybernetics utilization in transport processes in our country have been presently exceeded the beginings. We have now a large experience in utilizing up to date efficient methods for processes management with very important economical effects. There was mentioned also the possibility of some valuable solutions from the technical and economical point of view generalization, and the necessity of continuing the sustained effort for the promotion of cybernetics for transports and telecommunications activities management.

8th SECTION — GOODS AND SERVICES CIRCULATION SYSTEM CYBERNETICS

The section leading has been provided by prof. dr. A. Sobaru, dr. Georgeta Grigoriu, ec. P. Mustaţă and a scientific secretary composed by ec. Gh. Orzan and dr. Constantin Bob.

Besides 9 works registred in the program and sustained in the section, there were also presented 2 more, totally 11 works. On this occasion, 32 discussions have taken place and the number of participants was 40 in total.

The section's works presented, on one hand, the goods circulation system role in the frame of cybernetic system of the large socialist reproduction, and on the other hand, the systemic connections between the goods circulation's subsystems.

Taking into account these two objectives, the speakers debated conceptual aspects of the cybernetic system for goods circulation, its compounds, its integration in the national economy system assembly, on one hand, and in the world economic circuit on the other hand.

Simulation and cybernetic-mathematical modelling of the population's goods requirements at national level and territorial profile had an important place during the section debates.

The cybernetic system of goods circulation was approached as a complex system comprising of subsystems regarding to the demand's of goods identification and services, as well as subsystems for meeting requirements in structure and dynamics.

All the discussions have shown the cybernetics included in the goods circulation system within the national economy system, with the main flows

between them, as well as the respective feedback mechanisms. The effects appearing in the context of national economy integration in the world economic circuit have been underlined.

It was stressed the role of goods circulation cybernetic system in its integration as a repartition system for the socialist reproduction system, in the context of new economic and financial mechanism application.

All the works and discussions have relevated the efforts made within the goods circulation system for the welfare and life quality growing, as a strategical objective of our party and state policy.

9th-ASECTION — INFORMATICS — MANAGEMENT INFORMATION SYSTEMS

The section leading has been provided by ass. prof. dr. T. Baron, ass. prof. dr. I. Văduva, dr. ec. eng. V. Biță, dr. eng. math. P. Constantinescu, dr. eng. V. Marinescu and a scientific secretary composed by eng. Ioana Cicani, math. Anca Petrescu and. ec. Horațiu Dragomirescu.

Out of 84 registred works, 84 have been presented assisted by 140 participants.

The central place of the presented works have been taken by the informational system utilization problems in the filed of enterprises management and especially the production management as well as the direction of new economic financial mechanism utilization.

The works have made clear some theoretic-methodologic methods of prioritary importance in achieving these informatic systems categories, pointing out the rich experience of electronic centers as well as the economic effects obtained in the enterprises and other economic and social users of the respective informatic systems.

A distinguish place within the section problems came to the cybernetics principles application for the achievement of national informatic system and regional informatic systems.

A lot of communications debated the development of technology for informatic systems as means of cybernetization of economical and social activities, presenting some outstanding results obtained in the field of data bases programming packages, programming languages as well as computer equipments.

On the occasion of communications presentation there were discussions on present achieved status regarding cybernetization and informatization as majore forms of scientific and technical progress, creating possibility at the same time to an useful and consistent exchange of experience between the participating specialists for generalizing valuable experiences in this field.

9th-BSECTION — INFORMATICS FOR ENGINEERING AND TECHNOLOGICAL PROCESSES CONTROL

The section leading has been provided by dr. eng. Marius Guran, dr. eng. Adrian Davidoviciu, univ. prof. dr. eng. S. Puşcaşu, eng. M. Neguţ, eng.

M. Sîrbu and a scientific secretary composed by: eng. D. Mihalca and. eng. Aurora Crusti.

From all 92 registred works only 62 have been sustained. The total number of participants was around 200 from 36 different entreprises, research and design institutes, high schools, universities or production.

The works topics were the followings:

— control and supervision with mini and microcomputers of production and electrical energy distribution (microcomputer automation of thermo and hydroelectric stations, supervision systems for energy distribution networks, computer design and functional optimization for equipment provision etc.).

— computerized control systems for technological and production dispatching, utilities dispatching, refineries control etc.);

— industrial cybernetics applications and perspective in metallurgy (metallurgical processes optimization, energo-technological simulation of some procedures, optimization of inland transportation systems);

— integrated systems for supervisory and control of machine building industry activities;

— computerized design in research and design from various fields (machines building, food industry, light industry, metallurgy-syderurgy, informatics etc.,)

— informatic systems development on standardized elements basis.

Further to discussions, regarding the exposed works, the following conclusions were considered:

— high economic efficiency of control applications by mini and micron computers of technological and production processes were presented in almost all papers;

— it has been ascertained a continuous ascendent evolution of the implemented applications number and approached fields;

— certain requirements for various commputing equipments production are comming (high reliability, better and specialized peripheral equipments etc.);

— equipment maintenance and personell training for industrial cybernetics are more and more stringent;

— it has been stressed the systemic approach requirement for computer technique introduction at the economic units level (basic and auxilliary technological processes, technical and technological computerised design, economic management).

— it is necessary to provide an operative comunication between programers to minimize the duplication of efforts.

10th SECTION — CYBERNETICS IN HUMANISTIC SCIENCES

The section guidance has been provided by prof. dr. doc. Aristide Halanay and a scientific secretary of dr. Vincenţiu Dumitru and dr. Florica Luban.

The presented papers in this section (17) have proved a sustained preoccupation in our country regarding the cybernetic methods and models implementation in humanistic sciences and such section should be present in the future cybernetic symposiums.

In the section, a group of papers concerning the development of some ideas of previous scientists in this field, firstly of Stefan Odobleja, using the actual cybernetics concepts, have been remarkable.

Another group of papers theoretically approached formal aspects of languages, with some important results in our country. One presented topics with very soon expected results in automatic translation devices or in pattern recognition of unknown authors writtings.

The computer utilization in the learning process or in the school administration gives notable results in our country, but the actual potential results could be much better since the universities have been provided with computer techniques with priorities. For this reason the papers in this field will stimulate better results as soon as possible.

In the frame of this topics, besides the works related to the management of some urgent solvable activities as university entrance examination, some remarkable papers are discussing the analysis of learning process itself, in the very diverse fields, starting with tests on the fundamental notion learning of some classical discipline, untill the understanding and optimization of habituations in the musical education or in the aerospatial staff training technique.