A new contribution of the Romanian school to the development of research in the field of cybernetics[1)]

The ample penetration and influence of the technical and scientific revolution characterizing the process of developing our socialist economy has as an essential feature the uninterrupted technical progress in all fields of activity whose introduction is achieved to an ever greater extent in close connection with cybernetics. The cybernetization of production is defined by the President of the Republic, Nicolae Ceaușescu as one of the main ways to ensure best conditions for unfolding the production processes, for improving the scheduling of technological processes, for raising the technical and qualitative level of the entire material production.

The Romanian school of cybernetics, regrouped around the Cybernetics Commission of the Academy of the Socialist Republic of Romania has repeatedly evinced its creative capacity of solving major problems of economic practice and of material goods production: the automation and optimizing of production processes, the increase of social labour productivity, the improvement of the management and organization of the economic activity, of increasing its efficiency, etc. The vigour, originality and creativeness of the Romanian scientific school, have fully been tested in the practice of material production and also in prestigious international scientific events in many of which Romania's participation has become traditional, such as, for instance, the Congresses of the World Organization for General Systems and Cybernetics.

"Cybernetics and the Progress of Society" is an expression of the contribution made by the Romanian school of cybernetics at the Fourth Congress of the World Organization for General Systems and Cybernetics held in Amsterdam, Holland in 1978.

The 21 articles comprised in the volume, synthetically prefaced by Academician, Prof. Manea Mănescu represent almost the whole trends of research along which the Romanian cybernetics has developed: economic cybernetics, management in cybernetic systems, the general theory of cybernetics, energy cybernetics, cybernetics and the educational process, informatics.

A founder of economic cybernetics under the guidance of a high scientific conduct of Academician, prof. Manea Mănescu, the Romanian school was present with valuable papers at this congress as well, these papers being found in the volume as preoccupations in the macroeconomic field, for which an original contribution is made in substantiating

[1] "Cybernetics and the Progress of Society", Editura politică, Bucharest, 1980, coordinators: Acad. prof. Manea Mănescu, Prof. dr. Ed. Nicolau, dr. eng. C. Bilciu.

the optimal criteria (M. Altăr), as well as in the macroeconomic field for which a concept is presented in connection with the modelling of a production section and the scheduling of production processes within it, based on a system of models (global, operational, a.s.o.), (L. Tővissi, I.T. Ivan, E.N. Moscovici).

The general theory of cybernetics, the definition of its basic concepts and the philosophical aspects of substantiating these concepts are masterly developed in the monographic article "Cybernetic-Economic Systems" by Academician prof. Manea Mănescu. The article substantiates the concept of cybernetic-economic systems and underlines their specific qualitative properties :man's direct and conscious presence, the dynamic and continuously improvable character. It also analyses the feed-back connexion in the cybernetic-economic systems and the structure of the cybernetic-economic systems, originally defining the analysis indices, such as the feed-back connexion multiplier, the coupling degree, the complexity degree, etc.

The volume contains original results in the approach of other aspects of the general theory of cybernetics, such as: entropy in cybernetic systems, the organization of production processes (St. Bîrlea, T. Homoş, C. Suciu), the invariance in cybernetic systems modelling P. Constantinescu, Ed. Nicolau, N. Nicorovici, V. Porumbaru), fuzzy systems (C. V. Negoiţă), the diversity and novelty in cybernetics (St. Odobleja). Thus, in connection with the entropy in cybernetic systems, prof. dr. St. Bîrlea substantiates the hypothesis of three categories of systems (black boxes) in defining the self-adjustment process: effectuating and control systems, the contact environment system and the perturbative system (a reunion of systems); equally, the concept of entropic function as a mathematical expression of the dynamics of the system's entropy.

The problems linked with the scheduling of systems are found in the volume, within the preoccupations concerning the stability and quality of the automatic adjustment systems (S. Bajureanu, C. Bude), the scheduling of educational activity (C. Bilciu, G. Diaconescu), information in designing large-scale technological systems (A. V. Gheorghe), new trends in management (C. V. Negoiţă). The informatic system for scheduling activity in education outlines a concept, consistent in the still more precise quantitative substantiation of the development plans and of long-term forecasts in this field, placing in a new light the organization of management and elaborating new, modern working methods, techniques and instruments. The scheduling of wide-scale, complex technological systems is tackled with cybernetic means in the light of passing to concrete applications in the field of energy (the designing of complex energy systems, their risk and reliability in functioning, their maintenance and safety, stability and resistance). By all this, the passage is made to another important field of preoccupations: cybernetics in the field of energy. Noteworthy in this domain are the preoccupations regarding the applications of mathematical programming in solving the problem of energy regulator (V. Dumitru, Fl. Luban, R. Serban), the dynamic beviour at perturbations (M. Eremia, A.V.

Gheorghe), optimal strategies for developing an integrated nuclear energy system (M. Pavelescu, H. Dumitrescu, M.V. Stoica, A.V. Gheorghe), mathematical modelling in the physics of plasma (C. L. Simionescu).

The applications of cybernetics in the educational process form the object of several articles, such as: learning and understanding (Ed. Nicolau), fuzzy systems and learning models (A. Taşnadi). Learning and understanding are tackled as cybernetic processes for which systems with specific feed-back connections are defined and optimal models are worked out.

The volume presents an extremely interesting article about the applications of cybernetics in biology: neurocybernetic systems and models (Ed. Nicolau). Starting from the definition of the cybernetic system and model, the author elaborates a logical model of the neuron on the basis of which he presents its behaviour.

Informatics is present in the volume with articles about data optical processing (R. Homescu) and of data banks (V. Pescaru and I. Catona). The data optical processing methods based on holography are tackled from the point of view of the characteristic of the transfer of the recording environment, the author developing a few linear optimizing methods — optimization in the case of successive expositions and optimization with "Spline" functions. The problem of data banks, of their organization and use is approached in connection with the integrated informatic systems, an original concept of implementation through the SOGER system being presented.

The volume as a whole is a full success both as regards the rich ideas and the variety of subjects and as regards the elaborate presentation, richly illustrated and with an elevate methodological apparatus. It expresses the high scientific level at which cybernetic research is being carried out in our country and creates sure fundamental premises for original achievements and accomplishments in carrying out the demands formulated by the Party Twelfth Congress in connection with the development of this science, with its contribution to solving the major problems of our economy: production cybernetization, the cybernetized scheduling of technological processes.

Dr. R. STROE