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CIBERNETICA ŞI APLICAŢIILE EI ÎN TEHNICA ŞI ECONOMIA INDUSTRIEI

(Cybernetics and its Applications in the Technics and Economy of Industry)

Editura Academiei Republicii Socialiste România, Bucureşti, 1973, 290 pag.

The publication of the work we are reviewing is an interesting contribution to the knowledge of cybernetics and of its applications in technics and economy; it also fills a gap which has long been felt in our literature of speciality. A science of interdisciplinary synthesis in full development and in an ample process of clarification, cybernetics ensures a modern outlook and a complex thinking of the phenomena and processes which are taking place in nature and society. Being determined by the implications of the contemporary world technical-scientific revolution, through its economic branch, cybernetics mirrors the profound realities in present practice and expresses the essential directions, in a large prospect, of the speedy progress in economic life, both at a micro and macro-economic, national and international level.

The development just as the discovery of cybernetics as a new field of scientific knowledge is an objective process, having significance for the progress of scientific research. The interdisciplinary explorations as well as the new fields of science, a fruit of contemporary scientific and technical-economic progress push society towards higher steps of human civilization and culture.

Through its problems, through the content, through the way of approach and analysis, as well as through its structure, the study contributes to clarifying many scientific problems, to outling the essence, principles and working techniques offered by this new science, to showing the ways and means for the application of the knowledge discovered in the management of material production and society, in the improvement of the productive forces of mankind, and in other fields.

Based on a rich documentary material, the work tackles both the defining problems of cybernetics as a border science and the connections between cybernetics and the other sciences. After describing the main categories operating in cybernetics and after explaining the universe as a cybernetics system, the author directs his preoccupations towards clarifying many aspects concerning the consideration of the social systems as cybernetic systems. Special attention among the cybernetic systems is given to those in economy. On this occasion, economic cybernetics is defined as a science of economic management, the use of models in economy is explained and the relations between the theory of information and the theory of decision and the management of economy are defined.

Further, the author analyses the automated machines as technical means of cybernetics, the data processing systems and he dwells on the use of electronic computers in economy and on the economic effects

obtained through their use in the management of technological processes in the chemical industry.

The presentation of cybernetics as a science of control and communication of the systems is achieved through the analysis of the process of creation and development of the new science the foundations of which were laid by Norbert Wiener. The definition of cybernetics is comprehensively analysed by the critical presentation of the ideas of various specialists. On this occasion, the author formulates a definition of his own, trying to remove the shortcomings of those given by various specialists, respectively their unilateral character.

The study also brings valuable contributions in connection with the application of the method of materialistic dialectics in the cybernetic study of phenomena and processes. The grounded clarifications are continued on: the main cybernetic categories: system, control of systems, information-communication, connection and inverse connection, adjustment and selfadjustment, etc.

The conclusions presented allowed the author to develop logically and well groundedly his ideas about the universe as a cybernetics system and to make a number of considerations on the relations between cybernetics and economy.

The implications of the contemporary technical-scientific revolution on the development of economy are multilaterally presented, stress being laid on the preoccupations for raising economic efficiency in all fields. Presenting the role of cybernetics in the study of social systems, the author expresses his opinion that, as the Marxist philosophy shows, they "cannot be considered globally, but, individually, in keeping with the class essence and the specific character of the laws acting in each system taken separately". The cybernetic analysis of the social systems cannot be made globally either, but, "it must take into account the particularities of each of them, particularities causing the cybernetic laws to act quantitatively and qualitatively, differentiatedly from a form of social system to another" (page 51). The arguments brought in support of the enunciated thesis are of a high scientific value, conclusively showing who is right.

Equally valuable contributions of a philosophical nature are made on the occasion of the examination of the concept of economic model and of the relations between the theory of information and the theory of decision and the economic systems.

Passing to the presentation of the automated machines as technical means of cybernetics and of data processing systems, the superiority of man, and of human thinking is shown. An original classification of the automated devices, machines and systems is presented, and of the computing machines as the most perfected and wide-spread technical means of cybernetics. The data processing systems are being classified in a technical-economic outlook, according to several criteria, such as: 1. the number of problems processed on the computer; 2. the way of connection of the computer with the studied process; 3. the relation in time between the data processing process and the respective physical

process; 4. the complexity of the tasks carried out successively or parallely in the same time unit in keeping with the established programme.

The use of electronic computers in economy is tackled as a necessity and possibility for selecting and processing the economic data, underlining: the fields of utilization and organization of the introduction of electronic data processing equipment; the historical background of the utilization of electronic computers in industrial processes; the improvement of automation in industry on the basis of the utilization of electronic computers.

The last chapter approaches the economic effects of the use of computers in the management of technological processes in the chemical industry and concrete proposals with a practical applicability for the optimization of a fabrication process, on the example of the "Danubiana" works are presented in conclusion.

The work is extremely useful for practice, not only through the analysis of the orientation of the existing and recommended preocccupations but also through the concrete, clearly and systematically formulated proposals, such as that on the establishment of the tasks of the Computation Centre of the chemical industry.

The author's concern to present the contributions of our country and the economic policy of the Romanian Communist Party, on the basis of which a rapid progress is scored on the road to the application of cybernetics in the technics and economy of industry, can be noticed from the analysis of the entire problems of the work.

The clear, well grounded and militant exposition causes the volume to be accessible and extremely useful and instructive for a wide circle of readers. Appreciating the utility of this work, in the preface signed by the late academician Grigore C. Moisil, it is pointed out that "the present volume is a valuable aid for those wishing to inform themselves about computers and their utilization, especially in the chemical industry, about their evolution in the world, and, especially in our country. The present book shows chemical workers, chemical engineers, economists in the chemical industry and enterprise managers in this industry how large are the prospects opened up by the Romanian Communist Party and by the Government of the Socialist Republic of Romania to the future of our people by adopting computing technique, cybernetics and data processing". We cannot but fully subscribe to these high appreciations.

In the formation and development of a cybernetic thinking, the reviewed work is a contribution from which will benefit specialists in practice, in higher education, the students of the faculties with a technical and economic character and in other fields in which the new science finds an ever larger applicability.

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