SYSTEM STRUCTURE AND DYNAMICS

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The volume is published in the series "Interdisciplinary Research" edited by Pierre Delattre and comprises the papers of an interdisciplinary seminar of the College of France, in collaboration with the European College Institute and with I.S.M.E.A. These international seminars are unfolding under the aegis of a group of three personalities, namely André Lichenorowicza, a member of the Institute, professor at the College of France, François Perroux, professor at the College of France, director of I.S.M.E.A, Gilbert Gadoffre, director of the European College Institute, professor at the Manchester University.

The work presents the speeches of the participants and the discussions that followed. The volume comprises eight papers in all, the first of which signed by Ch. Galperine and P. Trotignon is an introduction presenting the papers.

The first paper is owed to P. Delattre and is entitled "The Interdisciplinary Language and the System Theory".

The author who works at the Board of Atomic Energy of France points out that the interdisciplinary language is an instrument with which a certain system can be studied. He further dwels on the transformation systems and introduces several axioms. Thus, the first axiom affirms that the elements can be considered equivalent if they have identical peculiarities. The second axiom affirms that the transforming possibilities can be inexistent between two classes of data, in one-way or double sense. Delattre further studies the topological peculiarities and the order in a certain transformation system. He also deals with the category of systems for which the nature of elements is specified and studies the structure of a transformation system and the structure-function relations.

The second paper deals with structural stability and catastrophes, the author himself being the founder of the catastrophe theory, namely professor René Thom of the Institute of High Scientific Studies.

The author proposes to outline the program of a morphological theory. Obviously, the standard is higher and the tackling is rich in ideas, considering that Thom has created this theory of singular points on systems evolution, which proves to be so very fruitful in understanding reality in very different domains, such as embriology, animal behaviour, neurosis treatment, etc.

The following paper is signed by J.L. Lions, a member of the Academy of Sciences, professor at Paris VI University and a member of IRIA .Lions's name is well known to specialists; he has some valuable works in the digit resolution of problems, the theory of optimal adjustment, etc.

The author deals with the so-called big systems, especially with the so-called well-set problems, in Hadamard's meaning. He starts by

dealing with the state equations after which he passes to the problems of criteria on the selection of a solving strategy. He then enumerates some methods, such as the compression of the state equation, its simplification, composition and coordination methods.

Henri Atlan, also of the Paris VI University is the author of the paper "Network Dynamic Models and the Information Sources in Biology". He approaches, among other things, the problem of the protein synthesis cycle, problems on network thermodynamics — a method which has recently been developed by Aharon Katchalsky, George Oster and Alan Perelson — and then, he passes to connection graphs and chemical reactions. The author further deals with problems on diffusion and transport, control and adjustment in physical-chemical networks, Tellegen's theorem and networks with variable structures.

André Martinet deals with "Economy and Language Dynamics". Obviously, he discusses post Saussurian linguistics, other well known names, such as Chomsky, Shannon, etc. also appearing in it.

Maurice Gross of the Paris-Vincennes University and of the Laboratory of Documentary and Linguistics Automatics presented the paper "Empiric Methods in Syntax". He tackles problems on distributional classification, tranformations, the exhaustive studies in linguistics.

The last paper owed to Andrè Malan is a report on the Saclay colloquy organized by the European College Institute on the theme "Sciences, Structures, Structuralism".

It is pointed out how the notion of structure has been interpreted by mathematicians, what they mean by structure in physical sciences, in biology and generally, in the exact sciences. At the same time, reference is made to the history of sciences, studies of astronomy and others on the origin of structuralism in human sciences being mentioned. A short historical background is presented of the term of structure in linguistics, after which reference is made to structuralism in social sciences. The contribution of economy to the term of structure is underlined and the structuralist criticism in modern literature is mentioned.

Through the variety of the material presented in this volume, large categories of readers might be interested in it. It is, in the first place, a volume of ideas presenting principled methods — such as the catastrophe theory. By this very fact, certain major names, such as Thom and Lions, in the field of mathematics, or Delattre in the field of structure theory attract specialists and those wishing to be initiated into the problems of system structure and dynamics.

The reading is pleasant without many technical difficulties — which are practically inexistent, in exchange, the inclusion into the volume of the discussions carried on makes the reader more directly participate in the unfolding of the ideas.

The work is of interest to economists, mathematicians, biologists, philosophers and to all those who are concerned with systems, structure and dynamics and also with the history of the major ideas in science.

The publication of this volume is a success from all points of view, in the first place of the organizers of the colloquv and of the series "Interdisciplinary Research".

In our epoch, specialization and hyperspecialization raise the danger of an ultraspecialization in which the researcher preoccupied with the problems of his own field no longer can have a general view of some major domains of science.

The interdisciplinary studies and colloquies are happy occasions for researchers in different domains, allowing them a confrontation of ideas and of the points of view, eventually a two-way exchange of methods, which can only be a major benefit for all domains of human knowledge.

Prof. dr. Ed. Nicolau