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vincing.

In a word, this new addition to the self-organization archipelago is dignified and moderately interesting, but not outstanding. It is worth having in the library, but don't rush to the bookstore.

FRANCISCO VARELA
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Synergetics: From Microscopic to Macroscopic Order

Edited by Eckart Frehland

259 pp. Springer-Verlag, New York, 1984. \$37.50

This volume is another in the Springer Series on Synergetics, and like many others in the series it contains the papers presented at an international symposium on synergetics—this one held at the Institute for Advanced Study in Berlin in July 1983. It contains contributions on such topics as biological evolution and order and chaos in physical and biochemical systems. There is a section on biological membranes and another on the social sciences. My overall evaluation of the volume might have echoed the comment made by Francisco Varela about the companion volume [see the review above]—"The book is one more addition to this blossoming field, no more, no less"—but in fact a more critical judgment is warranted.

Little effort has been made to give this volume a semblance of unity, with the exception of Hermann Haken's "Introductory remarks on synergetics," which seem to have been added after the fact. Such a shortcoming is all the more telling given that one of the chief aims of synergetics is, as Haken notes, "searching for unifying principles." Yet technical papers are interspersed here with only occasional attempts to refer to the basic categories of synergetics. This is particularly striking in the case of papers dealing with research that has already been the subject of numerous publications (Peter Schuster on polynucleotide replication, P. M. Allen on the application of the formalisms of dissipative structures to human systems, Günther Palm on associative memory, and so on).

Synergetics is in many respects like cybernetics: It exhibits the same goal of unifying disparate avenues of research and is marked by the same contrast between a "holistic" ideology and a reductionist method. Cybernetics had much more rigorous epistemological norms, but ultimately they did not save it from failure.

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sciences on a physicalist basis must demonstrate its ability to deal with the social sciences. This was one of the stumbling blocks of cybernetics, and synergetics may very well have the same problem. On this score, the papers presented in this volume are not up to par. With the exception of Haken's remarks, they are not linked to the categories of synergetics, and the vague analogies upon which they are based are too naively behaviorist to be taken seriously. Of course it is quite appropriate to present the central problem of the social sciences—the relation between the individual and the group—as amounting to a form of “synergetics.” But there is a history to the manner in which the social sciences have dealt with this problem, and it would help to be cognizant of it: for example, that three fundamental kinds of models of the problem have been proposed—the contract, the market and the crowd. It is striking that synergetics only seems to be aware of the last of the three, the one that relies least upon the subject's own conscious representations. From the perspective of the social scientist, the papers collected here are the equivalent of what it would be for today's physicist to discover that the world was created when the atoms signed peace treaties (*foedera naturae*) in the manner recounted by Epicurus and Lucretius.

I am far from opposed to attempts to facilitate dialogues and exchanges across disciplinary boundaries—and even confess to attempts of my own along these lines. Yet such initiatives can only succeed when the proper means are available. And if an interdisciplinary trade agreement is what one is after—and eventually a political alliance—it's bad policy to smuggle cheap goods across the disciplinary borders!

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new books

Elementary particles and high-energy physics

Charged-Particle Interactions: Theory and Formulas. H. van Haeringen. 657 pp. Coulomb, Leiden, The Netherlands, 1985. ISBN 90-71421-00-7. \$24.90. *Monograph*

Nuclear physics

An Introduction to Nuclear Physics. W. N. Cottingham, D. A. Greenwood. 210 pp. Cambridge U.P., New York, 1986. ISBN 0-521-26580-0 \$44.50 hardcover; ISBN 0-521-31960-9 \$14.95 paper. *Text*

Hydrogen Properties for Fusion Energy. P. C. Souers. 391 pp. U. of Calif. P., Berkeley, 1986. ISBN 0-520-05500-4. \$65.00. *Text*

New Vistas in Electro-nuclear Physics. NATO ASI Series B: Physics 142. Proc. Inst., Banff, Canada, August 1985. E. L. Tomusiak, H. S. Caplan, E. T. Dressler, eds. 491 pp. Plenum, New York, 1986. ISBN 0-306-42388-X. \$79.50. *Compendium*

Nuclear Data for Basic and Applied Science: Vols. 1 and 2. Proc. Int. Conf., Santa Fe, May 1985. P. G. Young, R. E.

Brown, G. F. Auchampaugh, P. W. Lisowski, L. Stewart, eds. 1744 pp. Gordon and Breach, New York, 1986. ISBN 0-677-21360-3. \$380.00

Relativistic Nuclear Physics: Theories of Structure and Scattering. *World Scientific Lecture Notes in Physics* 2. 238 pp. L. S. Celenza, C. M. Shakin. World Scientific, Singapore (US dist. Taylor and Francis, Philadelphia), 1986. ISBN 9971-50-010-8 \$42.00 hardcover; ISBN 9971-50-011-6 \$23.00 paper. *Monograph* □

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