T. Poston and I. N. Stewart

TAYLOR EXPANSIONS AND CATASTROPHES

London: Pitman Publishing, 1976.

Catastrophe theory is the invention of René Thom of the Institute des Hautes Etudes Scientifiques at Bures-sur-Yvette in France [1]. Catastrophe theory has been applied during the past five years in many disciplines [2] [3] [4] [5].

The models based on catastrophe theory are severely criticized in Science, April 15, 1977 (Catastrophe Theory: The Emperor has no clothes).

This book is an attempt to make accessible this theory to all users. The proof of Thom's theorem is a difficult one, but the results of the proof are relatively easy to comprehend.

The authors hope that a little insight into the way the theorem arises may prove valuable for those who wish to apply it without working through the full mathematical proof, but also unhappy about taking the result entirely on trust in case this leads to misunderstandings or errors.

The first chapter is a sketch of the topological calculus, indicating briefly what the tools of the calculus are and what some of the key results say.

The second chapter is an intuitive approach to the Thom's classification theorem. The mathematical difficulties which arise in converting the sketch into a rigurous proof are isolated as a number of simple and relatively plausible assertions which can be taken on trust without interrupting the flow of the argument.

The third chapter is devoted to rules for determinasy and unfolding computations, extracted from the mathematical literature in a form accessible to the applications oriented user.

The last two chapter are devoted to the geometry of bynary quadratic forms and to gravitational catastrophe machines.

In writing a book at this level one has to cater for readers whose mathematical attainments are widely varied. A popular style fails to attract those who are most likely to contribute to the development of

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1. THOM R.: *Stabilité Structurelle et Morphogénèse.* Benjamin, New York, 1972.
2. ZEEMAN E. C.: *Catastrophe Theory.* Scientific American, April, 1976.
3. CASTI J., SWAIN H.: *Catastrofe Theory and Urban Processes.* In Optimization Techniques. Modelling and Optimization in the Service of Man, Springer Verlag, Berlin, 1976.
4. JONES D. D.: *Catastrophe Theory Applied to Ecological Systems in Simulation.* July, 1977.
5. NEGOITA C. V. and KELEMEN M.: *Qualitative Models in Economic Processes.* In Economic Computation and Economic Cybernetics Studies and Research, no. 3, 1977.

the subject, while attempts to avoid this early, lead to a book which is inaccessible to all but a small number of potential readers. What Poston and Stewart have succeeded in doing is to achieve a gracefull transition for the former group without loosing the interest of the latter. With its good organization and easy readability, this boog will become a reference for a variety of fields.

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