the first derivative to essential singularities where all derivatives are bounded and continuous on either side of the critical point, but where a power series expansion about the critical point diverges. Up to now, progress in this field has been made by heavy applications of classical analysis, and it remains to be seen whether modern mathematical ideas have any relevance.

The last two chapters of the book are devoted to a modern development, namely, the identification of the states of a physical system by positive linear functionals on a suitable B^*-algebra. The translational, rotational and other invariances of the system manifest themselves as groups of automorphisms of the B^*-algebra. The great hope behind such an approach is to be able to avoid the problem of starting with a finite number of particles and tediously passing to the limit of an infinite system. The B^*-algebra approach to statistical mechanics does not at present meet with favor in all quarters, and it has a diffuse reputation of being arcane. It is another attempt to apply functional analysis to classical problems in physics. As Ruelle himself says, "the results are largely due to physicists with a background of axiomatic, relativistic, quantum field theory. This imparts a somewhat special flavor to the subject." To be candid, we must admit that so far no major breakthroughs in statistical mechanics have been achieved by such methods nor, on the other hand, has a dead end been reached. The next decade will perhaps decide the issue.

As I said in the beginning, I consider this work a milestone in statistical mechanics and in mathematics. It is also a work of considerable scholarship. The author has taken pains to be right and thorough in his bibliographical references. The book is not easy to swim through, however. Mathematicians will feel comfortable with the terse style, but they will probably be at a loss to understand the physical background and motivation of the material. Physicists, on the other hand, even specialists, may find the style terse almost to the point of opaqueness. The situation might have been alleviated to a considerable extent by providing a glossary of symbols and notation, but this has not been done. The hard work, both on the part of the author and on the part of the series reader, will be well repaid by the opening up of new and fruitful vistas in mathematical inquiry.

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Markov Processes with Stationary Transition Probabilities, by Kai Lai Chung, Springer-Verlag, Berlin, Heidelberg, New York, x+301 pp. $14.00

Markov processes, whose definition goes back to Markov (1907)