details of the interaction is called *universality* and has important consequences both for physics and mathematics, as we now explain.

A typical correlation length in statistical mechanics might be 10^3 times the atomic spacing. This means that on the distance scale of atomic spacing, statistical mechanics is typically near its critical point, hence independent of many of the details of the intermolecular forces, hence governed by the "general" laws of physics (as opposed to "compound dependent" laws of chemistry).

The significance of universality to mathematics is that it indicates the existence of a general theory, whose qualitative (and quantitative) features describe a broad range of phenomena. This theory, once completed, might belong to the subject of non-Gaussian stochastic processes with index space R^d or Z^d, $d \geqslant 2$. For example the $d = 2$ Ising model critical point, seems to be related to a theory of random nonoverlapping closed curves in the plane, and thus to a two dimensional generalization of the Poisson process.

Thompson's book is elementary, both in its mathematical and its physical content. The reviewer found that it served well as a text for portions of an introductory mathematical physics course. It is also a good companion to the mathematically more advanced book by Ruelle [**1**] in providing some of the motivation and insight which are valuable to mathematicians working on this interdisciplinary field. Chapter 4 is an introduction to phase transitions and critical phenomena in terms of simple solvable models such as the van der Waals gas and the mean field magnet. Chapters 5 and 6 are the core of the book. They present a pleasant account of the exactly solvable two dimensional Ising model as an illustration of phase transitions and critical phenomena, following the method of [**2**]. Chapter 7 contains an application of the Ising model to the role of hemoglobin in the transport of oxygen.

The Lenard book is at the level of a graduate seminar. There is an excellent introductory article by Lanford in this volume which does not require prior knowledge of the subject and should be accessible to a graduate student with a background in probability and/or functional analysis. The series by Domb and Green is also a collection of individual articles. These articles are at the level of advanced monographs, but again the opening article by Griffiths provides a good general introduction to the subject.

REFERENCES

1. D. Ruelle, *Statistical mechanics: rigorous results*, Benjamin, New York, 1969. MR **44** #6279.

2. T. D. Schultz, D. C. Mattis and E. H. Lieb, *Two dimensional Ising model as soluble problem of many Fermions*, Rev. Modern Phys. **36** (1964), 856–871. MR **31** #4509.

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Applications of algebraic topology, by Solomon Lefschetz, Applied Mathematical Sciences, vol. 16, Springer-Verlag, New York, Heidelberg, Berlin, 1975, viii + 189 pp., $9.50.

Are there applications of algebraic topology? Certainly a subject, conceived by Riemann and delivered into the world by Poincaré, ought to have