At present, when many private organizations produce translations for profit, it would seem that the discipline of good taste can only be imposed by economic failure. I believe it is pertinent to re-examine the current translation program and at every point to discourage useless publications. In my opinion this book should never have been translated and its appearance reveals some very interesting facets of the publishers' policies.

Mechanical Behavior of Materials at Elevated Temperatures. John E. Dorn, ed. 529 pp. McGraw-Hill Book Co., Inc., New York, 1961. $14.50. *Reviewed by E. H. Dill, University of Washington.*

A SERIES of lectures given at the University of California on the nature of dislocations and their behavior under stress is the basis for the fifteen chapters of this book. Each chapter is written by a recognized authority. The stated purpose of this lecture series was to point out to scientists and engineers the physical basis of the behavior of materials, with emphasis on applications of the theory of dislocations.

The first few chapters explain the principles of dislocation theory. Several chapters are then devoted to the theory of metals and their sources of strength at normal and slightly elevated temperatures. Some important areas of application, including thermal shock, creep, and fatigue, are discussed in the final chapters.

This is not a suitable textbook, but it is a valuable source of information for anyone interested in understanding the physical origins of the mechanical properties of metals.

Forces and Fields. The Concept of Action at a Distance in the History of Physics. By Mary B. Hesse. 318 pp. Thomas Nelson and Sons Ltd, Edinburgh, 1961. 35s. *Reviewed by R. B. Lindsay, Brown University.*

MUCH of the historical development of physics may be looked upon as an intellectual struggle between the contrasting views that physical phenomena are best described and interpreted by the motion and interaction of particles on the one hand or by the behavior of continuous media on the other. Numerous books have been written to interpret the views of the founders of physical theories along these two main lines, including such popular works in English as E. T. Whittaker's *History of the Theories of Aether and Electricity* (1951, 1953) and E. A. Burtt's *The Metaphysical Foundations of Modern Physical Science* (1932). The volume under review, by a well-known British woman philosopher of physical science, provides a continuation of this tradition in terms of a historical and philosophical examination of the concept of action at a distance. This notion gave great trouble to our predecessors in the construction of physical theories. Even Newton, whose principle of universal gravitation in the form usually employed necessarily

involves it, was much bothered by the apparent need to assume that a particle of matter can act "where it is not". Presumably much of the opposition to the atomic hypothesis in the sixteenth and seventeenth centuries was due to the unwillingness of many scientists to swallow this concept.

Miss Hesse traces the story of the vicissitudes of the concept of action at a distance with clarity, though naturally with necessary skilful compression. She then discusses the development in the eighteenth century of the attempts to study the motion and other behavior of continuous media, as illustrated by the hydrodynamical and elementary elastic wave propagation theories of Euler, the Bernoullis and D'Alembert. This leads up to the general concept of field in electricity and magnetism as exemplified by George Green, Faraday, and Maxwell. The book closes with a brief excursion into relativity and modern quantum physics, which though clear somehow to a certain extent seems to get off the track of the main theme. This does include an interesting and sympathetic critique of Bohm's recent attempt to restore determinism to quantum physics.

Those interested in the general methodology of physics will find the first chapter of Miss Hesse's book ("The Logical Status of Theories") worthy of careful study. She comes down rather hard on the traditional "realist" and "positivist" views of scientific theories, and advocates a return to a "model" theory, expressing the strong feeling that uninterpreted formal systems are not satisfactory for the provision of theoretical explanations. Here of course the author treads on highly controversial ground and the matter needs much more careful consideration than she has been able to give it in her book.

The volume can be highly recommended to all who are interested in the history and philosophy of physics.

Direct Methods in Crystallography. By M. M. Woolfson. 144 pp. Oxford U. Press, London & New York, 1961. $4.80. *Reviewed by J. Gillis, Weizmann Institute of Science.*

DIRECT methods have been a central topic in crystallography for the past fifteen years, and it was certainly time for a book on the subject to enable us to assess the present status of this approach to structure determination. Dr. Woolfson has performed that service and is entitled to our gratitude.

The problem is insoluble in the sense that without the use of chemical information there are always a nondenumerable infinity of possibilities. How much chemical information is needed to make the solution unique is still unknown and certainly depends on the particular structure. The now classical inequality relations take into account the non-negativeness of the electron density, and the literature includes several structures where this has sufficed. It is where it fails that direct methods become complicated. Presumably the logical answer would be to seek the stronger