figures assist greatly in the easy comprehension of the text. The pleasure of reading such a well-written treatise is increased by its fine production.

The short chapter "Gravity and geophysical surveys" is the least satisfactory part of the book for, with the exception of a few standard texts, references to modern work are restricted almost entirely to the British experience. "A surface feature can be traced beyond its visible outcrop, and anomalies can indicate the existence of a disturbance of some kind, but it is difficult to go much further" is a rather discouraging summary of the potentialities of magnetic surveys, in view of their extensive and successful use in ore location and in "depth to basement" studies. However, the chapter on geophysics is a minor sideline to Bomford's main topic, and any weakness there is more than compensated for by an excellent discussion of the reduction and use of gravity observations.

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Irreversible Processes

Non-Equilibrium Thermodynamics. S. R. de Groot and P. Mazur. North-Holland, Amsterdam; Wiley, New York, 1962. x + 510 pp. Illus. $15.50.

Nonequilibrium Thermodynamics. A phenomenological theory of irreversible processes in fluid systems. Donald D. Fitts. McGraw-Hill, New York, 1962. xviii + 173 pp. Illus. $7.95.

With the publication of *Non-Equilibrium Thermodynamics* by de Groot and Mazur, we have at last an authoritative and very nearly definitive treatise on the thermodynamics of irreversible processes. The volume is divided into two parts, A, on principles, and B, on applications. In the first four chapters of part A, the basic hydrodynamic and phenomenological equations, including the Onsager reciprocal relations, are introduced, and the modern version of the second law of thermodynamics is discussed. The remaining three chapters discuss some relevant aspects of the statistical and statistical-mechanical foundations of nonequilibrium thermodynamics. Part B is devoted to a survey of the applications of the principles to chemical reactions, to flows of heat and matter, to electrical phenomena in both unpolarized and polarized media, and to discontinuous systems. The monograph concludes with three appendixes, numerous problems, and author and subject indexes. It is difficult to find much to criticize about this excellent volume. The most that can be said is that an occasional argument is vague, that the book might be too mathematical for some tastes, or that not enough attention has been paid to the experimental foundations of the theory. However, these are merely matters of personal opinion. Without question, *Non-Equilibrium Thermodynamics* by de Groot and Mazur belongs on the bookshelf of every research worker in the field of transport processes.

Nonequilibrium Thermodynamics by Fitts is intended to be an introductory textbook on the advanced graduate level. It consists of 11 chapters, four appendixes, and name and subject indexes. Numerous references are listed. Interestingly, many are different from those cited by de Groot and Mazur. In the first five chapters, the transport equations of fluid systems are developed. The last six chapters are devoted to applications of the equations to systems that are undergoing transport phenomena. The author pays particular attention to the step-by-step derivation of each equation, and for this reason the book will be especially valuable to the beginning student. Although overly formal in places, the treatment of the subject matter is accurate on the whole. The reader should be forewarned, however, that the treatment of the rate of cooling in a magnetic field (in section 6–2) appears to be erroneous. The appearance of experimental results in the sections on diffusion and thermal diffusion lends some perspective to the general theory. The book would have benefited even more by lengthier discussions of how experimental data are related to theoretical transport coefficients. Although *Nonequilibrium Thermodynamics* is not without shortcomings, its pedagogical virtues certainly outweigh them. What it does teach, it teaches well. It can be highly recommended as a first textbook, either for classroom use or for self-study.

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Physics and Biology

Biophysical Science. Eugene Ackerman. Prentice-Hall, Englewood Cliffs, N.J., 1962. xiv + 626 pp. Illus. Trade ed., $13.35; text ed., $10.

Biophysics: Concepts and Mechanisms. E. J. Casey. Reinhold, New York; Chapman and Hall, London, 1962. xiv + 335 pp. Illus. $7.95.

It would appear that nature abhors a vacuum in the textbook field as well as elsewhere, and that the prior lack of textbooks in what may be termed general biophysics has accordingly been corrected. The two books reviewed here provide a pleasant surprise in the general similarity of the topics covered, and parenthetically they refute the occasional assertion that biophysics as a field is undefined. The stated purpose in preparing these texts is also similar; they are directed primarily to students of biology or medicine, although they presume different levels of previous training.

The selection of the material seems to have been dictated both by the inclinations of the respective authors and by the unstated admonition to apply physics where it is the most applicable. Yet it is interesting to compare the chapter headings with those in a standard textbook of general physiology and to note the similarity of coverage. The distinction drawn here between biophysics and physiology is not so much one of content, or perhaps even of viewpoint, as it is a distinction of technique and of the use of physics contrasted with talking about physics.

Biophysical Science, the more detailed of the two volumes, is nearly twice as long as *Biophysics: Concepts and Mechanisms*. It presupposes a knowledge of general physics and elementary calculus (actually, Laplace's equation and the diffusion equation are introduced, but the solutions are stated). A considerable portion of the book will be comprehended by the average undergraduate student of biology or medicine. Ackerman has divided his material among six main sections: Special Sensory Systems (on hearing and vision), Nerve and Muscle (nerve conduction and neural aspects of vision and hearing), Physical Microbiology (a miscellany of topics that includes cell radiobiology, ultrasonics, and viruses), Molecular Biology (x-ray diffraction, the radiochemistry of macromolecules,