illustrations contain some original material. Several new terms are proposed for male genitalia in the chapter on external anatomy. The last chapter is a concise summary of modern pest control as applied to cockroaches, with a review of basic effects of different groups of insecticides.

Personally, I would not be without this book. Every department of entomology or biology should have it in the library.

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Rock Mechanics

Engineering Properties of Rocks. I. W. FARMER. Spon, London, 1968 (U.S. distributor, Barnes and Noble, New York). x + 182 pp., illus. $5.75.

Rock Mechanics in Engineering Practice. K. G. STAGG and O. C. ZIENKIEWICZ, Eds. Wiley, New York, 1968. xiv + 442 pp., illus. $14.50.

Although rock mechanics still finds its widest application in engineering, many aspects of this growing field are of interest to geologists and geophysicists. Each new book in rock mechanics will be scrutinized by earth scientists for clues to the earthquake source mechanism and for guides for earthquake prediction, for new studies of the effect of fluids on attenuation, for a better understanding of the relation of properties of rocks *in situ* and in the laboratory, and for new model studies of the deformation and failure of rock masses, to name but a few areas of overlapping interest. The two present volumes offer a rather broad treatment of rock mechanics as a whole. However, only one is likely to have much appeal for earth scientists and engineers.

Engineering Properties of Rocks was written to furnish engineers with a concise review of rocks as a structural material. There are sections on elastic properties, rheology, strength and failure, rock testing, the effect of water, and the effect of pressure and temperature. Measurement of stress and strain is reviewed, and some general design criteria are enumerated.

The book falls far short of its stated purpose. Most topics are treated without regard to modern work, and some without any real understanding of rock mechanics. For example, the physical and chemical roles of water are confused with regard to the effect on strength and elastic properties. It is stated that Poisson's ratio of rocks may be assumed equal to 0.25 for engineering purposes. The significant changes in sound velocity at high stress are overlooked. Because of such shortcomings, I cannot recommend this text for the engineering student or for the practicing engineer, much less for the earth scientist concerned with applications of rock mechanics to the earth.

Rock Mechanics in Engineering Practice is a remarkably coherent advanced textbook in rock mechanics, written by 12 individuals. Although most of the authors are in British universities, reference to the world literature is unusually complete. The book comes very close to achieving its stated purpose of summarizing progress in rock mechanics and suggesting promising lines for future investigation.

As in most textbooks, there are high and low points in the presentation. I found Hendron's review of mechanical properties of rock particularly good, as are Hoek's treatment of brittle failure, Stagg's review of *in situ* tests, and Morgenstern's presentation of limit equilibrium methods. There are excellent chapters on the measurement of stress and strain in rock masses, the dynamic behavior of rock masses, the applications of continuum mechanics, particularly finite-element analysis, in rock mechanics and model simulation of two- and three-dimensional problems. The chapter on the influence of interstitial water is somewhat confusing, and would have been more so had not the editors added a short section giving the modern view of effective pressure. Although the different methods of stress measurement *in situ* are carefully described, I looked in vain for quantitative comparisons of the different methods, for statements as to their relative sensitivity and accuracy. I missed any reference to studies of the effect of size on strength; nor was there mention of thermal stresses. The index to this text is perhaps its weakest part. I came across information quite by accident, and the specialist will simply have to take the time to read the entire book.

In terms of future work, the use of high-speed computers with finite-element and limit-equilibrium methods seem particularly promising, as do the modeling techniques for jointed rock. Further work is needed on a reliable way of determining *in situ* modulus from laboratory tests, although Hendron and Ambraseys suggest an empirical technique which might serve as a good starting point.

All in all, this book is of high quality and, although it assumes a knowledge of elementary elasticity, should be in the hands of most engineering geologists and mining engineers and of any earth scientist concerned with mechanical behavior of rocks under near-surface conditions.

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Active Integrated Circuit Synthesis. Robert W. Newcomb. Prentice-Hall, Englewood Cliffs, N.J., 1968. xx + 292 pp., illus. $11.95. Prentice-Hall Electrical Engineering Series.

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