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mechanochemistry of muscular contraction.

R. D. Preston's brief and compact discussion of ultrastructure and kinetic aspects of solute translocation in plant stems begins by pointing out that sugars move in plant stems at linear rates that are as much as 80 000 times the rates that would occur for ordinary diffusion flow. The paper presents a vivid, though technical, picture of the aggressive nature of living cell systems. The paper has included in it contributions by R. Kollmann, D. C. Spanner, and P. E. Wheatley.

Several basic questions of the physical interaction of ionizing radiations are appraised by L. G. Augenstein. G. Scholes reviews current data and concepts in the radiation chemistry of aqueous solutions of nucleic acids and nucleoproteins. A timely review of a recently developed and lively subject is given in M. Grunberg-Manago's paper on the enzymatic synthesis of nucleic acids. O. Kratky reviews the much newer field of x-ray small-angle scattering with substances of biological interest in diluted solutions. The last paper is on the mechanochemistry of muscular contraction, a critical reevaluation of in vivo studies, by F. D. Carlson.

The six papers maintain the high level of scholarly excellence one has come to associate with this series. Although the title has been changed, the format is still the same as that of the previous volumes.

Mathematical Methods in Engineering and Physics. Special Functions and Boundary-Value Problems. By David E. Johnson and Johnny R. Johnson. 273 pp. Ronald, New York, 1965. \$9.50.

Reviewed by Donald A. McQuarrie, North American Aviation Science Center.

There are indeed a great many books on applied mathematics or boundary-value problems (as there are in most areas) but any new book which is well written and well planned should still be welcome. The emphasis of this book is on the solutions of boundary-value problems and on the orthogonal polynomial systems which arise from these problems. Out of sixteen chapters ten are devoted to special functions, viz., orthogonal functions, Legendre functions, the gamma func-

tion, Bessel functions, Hermite polynomials, Laguerre polynomials, Chebyshev polynomials, Mathieu functions, other special functions, and a general class of orthogonal polynomials. The remaining six chapters discuss Fourier series, series solution of differential equations, boundary-value problems, partial differential equations of mathematical physics, Laplace and Fourier transforms, and Sturm-Liouville transforms. Contrary to most texts at this level there is no discussion of complex-variable theory, nor is it assumed (until the last chapter where it is peculiar to do so since it could have been used to advantage several times before).

The book is well written and quite free of typographical errors. The discussion of the method of separation of variables is one of the best available at this level and the problems in the chapter on partial differential equations in mathematical physics are both numerous and worthwhile. Many books of this type are so slanted toward special applications that they are useless to the general reader, but the authors have done well not to base any developments on electrical engineering applications, say. This makes the book easily understood by any senior majoring in science or engineering.

Although most developments are clearly written, there are very few worked examples. A great deal of important material is introduced by way of problems. Why is the treatment of such an important technique as Laplace transforms shorter than either of the treatments of Hermite polynomials, Laguerre polynomials, or Chebyshev polynomials? In summary, this is a fine choice for a course in boundary-value problems for seniors where for one of a number of reasons the instructor does not wish to use or discuss complex variable theory.

Optical Masers. By George Birnbaum. 306 pp. Academic, New York, 1964. \$9.50.

Reviewed by Herbert Malamud, Sperry Gyroscope Company, Division of Sperry Rand Corporation.

The book is Supplement 2 to the well-known series "Advances in Electronics and Electron Physics", edited by L. Marton of the National Bureau of