ions to move is one of considerable interest, but the excitation of nerve itself may perhaps be more profitably studied using real cathodes, since more is known about the way in which they function. However, it is conceivable that once one has the mechanism of excitation of nerve worked out, it may be possible to work backward and to piece together the intermediate processes occurring in the visual organ.

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Book Reviews

The American Illustrated Medical Dictionary, 22nd ed. W. A. Newman Dorland, Ed. Philadelphia-London: Saunders, 1951. 1736 pp. $10.00.

As science makes advances new terms are constantly being added. The job of keeping a medical dictionary up to date is difficult and complicated, and such a book requires numerous revisions and editions. Saunders medical dictionary, now in its twenty-second edition, has long served as an authority in its field, and this latest edition, published on its fiftieth anniversary, maintains its previously high standards of excellence. New terms are covered adequately, and old terms have been retained and elaborated upon in a satisfactory manner.

The volume is in a new typography and format, characterized by many illustrations to keep abreast of modern findings and changes in nomenclature.

Among new features in the book the editor has included a valuable preliminary article on the fundamentals of medical etymology and a table of modern drugs and dosages. He and the publishers are to be congratulated on this new edition; its excellence should assure continued publication for the next fifty years.

ALLEN E. HENKIN

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The Computation of Elements of Eclipsing Binary Systems. Zdeněk Kopal. Cambridge, Mass.: Harvard College Observatory, 1950. 181 pp. $5.00, $4.00 paper.

Eclipsing variables make it possible to study many properties of the stars which would otherwise be almost, or completely, closed to our investigation. Almost all our reliable information about their diameters and densities comes from this source, and under favorable circumstances it becomes possible to enter analytically the otherwise inaccessible interior, and find the internal concentration of density.

Modern photoelectric methods make observation of the light of an eclipsing system a simple matter—for the expert—with an accuracy approaching one part in a thousand. From such observations, covering the whole period, and showing fully the effects of the eclipse of each star by the other, a remarkable amount of knowledge may be derived.

Analytically, the theory that deduces the size and brightness of the stars, the orbital inclination, etc., is surprisingly complicated. Even the simplest case (two spherical stars and a circular orbit) can be solved only with the aid of extensive numerical tables of special functions. With their aid a precise solution is usually possible, but there remain cases in which a solution is indeterminate without additional information. In the more complex cases, when the stars are close together, distorted by tidal forces, and heated on the facing sides by each other's radiation, a fair approximation may be reached by a theory, first suggested nearly forty years ago, that assumes the components to be similar ellipsoids. Methods for improving this solution to any desired degree with the aid of very extensive expansions in series were later developed by Dr. Kopal. Still more complications, such as the presence of streams of gas escaping from the stars, or of bright patches on their surfaces, sometimes occur, but are not yet amenable to theory. Eclipsing systems, therefore, are as interesting to the mathematician as to the astrophysicist.

The present work supplements the author's earlier volume, *An Introduction to the Study of Eclipsing Variables,* published in 1946, and deals with methods for the numerical solution of the various forms presented by the problem. Though no numerical examples are given, the presentation of theory and practical procedure is complete and lucid. The specific treatment is highly technical (as it should be) and comment on its details may well be left to reviewers in professional journals.

It appears more to the point to note certain differences in the manner of discussing even such recondite matters when seen from different angles. These are primarily differences of taste and preference and all the more interesting because of the traditional impossibility of resolving the dispute.

Dr. Kopal's approach is that of a fairly pure mathematician who feels strongly the element of uncertainty and of personal idiosyncrasy involved in the use of a freehand curve drawn to represent the observations. He prefers to make even the first of the successive approximations required in the solution by a discussion of all the relevant observations by least-squares—even though it is clearly recognized that the first approximation must ordinarily start with such