

BOOK REVIEWS

Tektites. John A. O'Keefe, ed. 228 pp. Univ. of Chicago Press, Chicago, 1963. \$10.95.

Reviewed by S. Fred Singer, University of Maryland.

The origin of tektites is controversial; the experts tell us that they come either from the earth, or from the moon, or from somewhere else; each source has its partisans, vociferous, vehement, and even a little violent. It is my hypothesis that the subject attracts people who have a natural abundance of these 3-V characteristics.

Be this as it may, there are at least some facts about tektites which are not in controversy. They are usually small and round; their weight may range from 0.1 g to 3000 g; their shape ranges (alphabetically) from buttons and boats, through dumbbells, gherkins and gumdrops, on to teardrops. They are glassy, with the chemical composition resembling acidigneous rocks. (There are minor differences, but there lies one of the "rubs").

They are found in strewn fields in certain areas of the world, from which they derive picturesque names. They show evidence of melting and ablation from high-speed travel through the atmosphere. The falls took place some millions of years ago (with a considerable spread); the lack of ^{26}Al implies a cosmic-ray exposure of less than 5×10^6 years; the K/A ages agree roughly with the fall dates.

It is at this point where the proponents square off, J. A. O'Keefe favoring a lunar origin, A. J. Cohen a terrestrial origin. Both parties agree that the immediate cause was a meteorite impact and that the tektites represent ejecta from either the lunar or terrestrial surface. But which hypothesis is correct? The reader is left with the evidence and may decide for himself.

The evidence is presented in the form of very nicely done survey papers. They provide an excellent foundation for additional theoretical speculations concerning the origin of tektites. But perhaps the most fascinating implications, many as yet unexplored, relate the tektite formation to the history of the earth-moon system. Of course, the first analysis of a lunar rock sample may settle the tektite problem, or at least delimit some of the speculations.

Modern Applications of Physical Optics. By M. Françon. No. 13 in Tracts on Physics and Astronomy, edited by R. E. Marshak. Translated from the French by Scripta Technica, Inc. 106 pp. Interscience, New York, 1963. \$4.50.

Reviewed by Stanley S. Ballard, University of Florida.

The field of optics has been undergoing a quiet revolution during the past two decades. The reading public has been made well aware of outstanding recent developments through the wide coverage given to lasers and their applications. This little book gives an excellent description of some of the less gaudy aspects of "the new optics". It is written by an acknowledged expert in the field, and he has selected the phenomena in which he is personally most interested and on which he can speak authoritatively. I refer especially to the current treatment of image formation by the use of the Fourier transform, and the associated practical applications of spatial frequency filtering in order to increase the contrast in images (Chapter 2). This seems to me to be the high point of the monograph.

I also like the straightforward introductory material on interference, with special reference to thin films and filters, and including applications to the infrared and ultraviolet spectral regions; this comprises Chapter 1 and

about half the book. This material can be found in the research literature but is seldom collected into as compact and readily available a form as is given here. The subject of interference microscopy is one in which a good deal of work has been done recently, and again an admirably succinct treatment is given.

The third and final chapter, on polarization, is short but is valuable for its description of the use of polarized light in the observation of transparent objects, i.e., those whose refractive indexes differ only slightly from that of the surroundings.

In brief, this is a timely, well-written little book that will be worthwhile reading for anyone who wants to be brought up to date in a hurry on some of the forward steps that have been made in physical optics and its applications during recent years.

Lattice Theories of the Liquid State. By J. A. Barker. Vol. 1 of Topic 10 of The International Encyclopedia of Physical Chemistry and Chemical Physics, edited by E. A. Guggenheim, J. E. Mayer, F. C. Tompkins. 133 pp. (Pergamon, Oxford) Macmillan, New York, 1963. \$8.50.
Reviewed by R. B. Lindsay, Brown University.

It is well known that the liquid state is characterized by high cohesion (leading to low compressibility), lack of rigidity, and relatively low resistance to flow. But the attempt to account for these properties theoretically on the general assumption of a molecular constitution has been so far much less successful than in the case of solids and gases. Nevertheless there exists a very large body of statistical mechanics of liquids, some of which the present volume summarizes in clear and succinct fashion. The author confines his attention to the so-called "lattice" theories, and hence does not discuss the theories based