

jumbling the translator's manuscript. There are careless errors in the rendition of proper names—for example, the famous site at Uolba Lake is variously rendered as Wolba and Yolba. And, lastly, there are an unnecessary number of typographical errors, despite the fact that, as the introduction takes pains to assure us, the typist is a Harvard graduate. I was disappointed to find on the first three pages of the text seven typographical errors, three errors of transcription, three instances of poor or unintelligible translation, and one obvious error in the Russian original faithfully reproduced (the Irtysh River is not by any stretch of the imagination in northwestern Kazakhstan).

All these shortcomings can surely be attributed to overhasty editing of the translation. May we therefore plead for just a little more care and effort in preparing the forthcoming publications on the Caucasus and Central Asia; such care and effort would immeasurably increase the value of this decidedly worth-while project.

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The Social History of Lighting. William T. O'Dea. Macmillan, New York, 1958. xiii + 254 pp. Illus. \$8.50.

Not since Henri d'Allemagne wrote *Histoire du Luminaire* in 1891 has the subject of artificial lighting been treated historically with so much care and authority as William O'Dea treats it here. Written with style and wit, having an almost anthropological perspective, and packed with well-documented information, this book will serve equally the historian of science and culture, the antiquarian, or the mere browser who enjoys pleasant reading in unusual by-ways.

O'Dea avoids the developmental or evolutionary approach to the history of lighting and also steers clear of the purely chronological approach. Instead, he divides his chapters under functional heading, according to the principal ways in which light has played a part in social history: "Light for the home," "Light for travel," "Light for work," "Light in worship and superstition," for example. The last two chapters deal with "The materials of light" and "Getting a light."

In the beginning chapter, entitled

"Bad light," we learn of the nocturnal difficulties that were endured by every one before 1800. When Boswell inadvertently snuffed out his candle while writing late at night, he had to wait for the night watchman and then call out the window for a light, lest in groping about for a tinder box he should disturb his landlord and be shot as a burglar. When tallow candles were the only means of stage lighting, "it was nothing for a snuff boy to come before the audience in the middle of the most emotional scene in order to tend a smoking candle."

The text is enlivened and documented not only by bright literary allusions but also by a splendidly chosen series of plates reproducing paintings, prints, and drawings that depict lighting devices in use. There are also many line drawings interspersed through the text.

One is constantly surprised by the encyclopedic coverage of the subject matter and by the broad frame of reference which surrounds it. The revolutionary importance of Ami Argand's combined invention of the tubular air-draft burner and the glass chimney in 1783 is reiterated here. But for the first time in a general history of lighting, it is shown how the balloon ascension of Argand's friends, the Montgolfier brothers, so completely overshadowed the new lamp that Argand was unable to attract enough attention to the lamp to cause its development. Only the unscrupulous Quinquet seems to have been aware of its significance and to have used the knowledge for his own ends. The point is gracefully stressed by quoting Dr. Johnson's remark to Mrs. Thrale: "You will observe, Madam, that the balloon engages all mankind."

We learn that Menier, the French chocolate manufacturer, lit his factories with arc lights in 1875, that Pullman cars were first lighted by kerosene lamps in 1874, and that the Duke of Brunswick illuminated a garden fete in 1741 with 5000, or more, float-wick oil lamps. We are told that Hooke in the 17th century used a spherical water condenser with sunshine as the source of light for his microscope, and that a scheme to illuminate the roof of the Capital in Washington, D. C., with arc lights in 1884 was vetoed after a trial period. An entire chapter is devoted to the history of lighthouses; this chapter begins with the Pharos of Alexandria, touches on the coal-burning beacons of 17th- and 18th-century England,

and ends with the electrification of these houses, which was started as early as 1858.

It is, perhaps, a commentary on the inadequacy of published studies on American lighting that O'Dea devotes little space to it. Little is said of the important role that whale oil played in early 19th-century lighting in America, and one wishes that the oft-repeated story which attributes to Franklin the invention of the two-tube whale-oil burner had been either avoided or substantiated.

The single, mechanical improvement in the organization of the book that I can suggest is to include plate numbers on the plates, since they are referred to by number in the text. For a work so thorough and so well-documented, however, these are merely quibbles. It is an excellent book, much the best that has yet been done on this subject.

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Advances in Chemical Physics. vol. 2. I. Prigogine, Ed. Interscience, New York, 1959. ix + 412 pp. Illus. \$11.50.

This second volume of the series maintains the high standards established by volume 1 [*Science* **129**, 833 (1959)]. Although many topics are treated, emphasis is placed on new developments in the theoretical evaluation of molecular electronic energies and on properties determined by electron dynamics. The extensive review of the many-electron problem in quantum mechanics is not only useful but also timely, in view of the great effort currently being applied to this problem.

The articles are rather uniformly of a review character, with some mention of important unsolved problems and some speculation on the nature of possible future developments.

The contents convey a reasonably accurate impression of what this volume has to offer. "Clathrate solutions" (57 pages), J. H. van der Waals and J. C. Platteeuw; "Inter- and intramolecular forces and molecular polarizability" (25 pages), Kenneth S. Pitzer; "The solubility of solids in compressed gases" (34 pages), J. S. Rowlinson and M. J. Richardson; "Thermodynamics of metallic solutions" (28 pages), R. A. Oriani; "Recent advances in polymer