statement of the process by which the conclusion was reached.

Not the least contribution of these books is stimulating discussion in a field too often neglected by scholars in this country. That much more research needs to be done on many levels is evident; this is indicated, for example, by the surprisingly few points of contact in these two presentations or, for that matter, between either of them and D. Westermann's *Geschichte Afrikas.*

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Principles of Optics. Electromagnetic theory of propagation, interference and diffraction of light. Max Born, Emil Wolf *et al.* Pergamon Press, New York, 1959. xxvi + 803 pp. Illus. $17.50.

It is gratifying to have Max Born's *Optik* now translated and revised. *Optik* and its successor, by Born and Wolf differ enough, with some topics enlarged and others restricted or omitted, that the authors can claim they have written "a substantially new book." It is not my intention to repeat the table of contents here, but to give some reasons why I think the new book will become a great book. In addition to Born and Wolf, A. B. Bhatia, P. C. Clemmow, D. Gabor (holograms), A. R. Stokes, A. M. Taylor, P. A. Wayman, and W. L. Wilcock contributed to the volume. Their contributions may be identified by reading the preface.

The sections on dispersion, the geometrical theory of image formation and aberrations, the physical theory of diffraction and aberrations, and the treatments of interference and diffraction with monochromatic and partially coherent light are all excellent.

The treatment of periodic film structures (to which F. Abeles and B. H. Billings contributed) will be helpful to the inventors who have yet to create the new applications of stratified media that the future holds (such as reflection filters for use in the far infrared).

The coverage of topics of current interest, such as diffraction and partially coherent light, will please the reader interested in theory; the chapters on image-forming instruments and on interference and interferometers will be approved by those who apply optics.

And yet there are, inevitably, some disappointments, such as the inadequate treatment of Savart's plate and the absence of a discussion of apodizing. I missed items such as the Lyot polarization filter. Topics in which the atomic and molecular nature of matter play a decisive role are treated in the "new book" in terms of Maxwell's phenomenological theory. Thus, much of the original text, especially spectroscopy, is omitted in this volume. Planck's celebrated formula appears only as $K(\nu,T)$.

The writing, generally good, is sometimes incomplete—on page 24 the authors do not explicitly define the problem they solve so beautifully. The book has a good balance between examples and word pictures, on the one hand, and esoteric analysis, on the other. It is embellished by two dozen handsome halftones and an abundance of conventional line drawings. In the areas covered, the book treats the right subjects at the right level (for reference use).

Finally, the authors have retained the flavor and inherent stimulation of the original sources in their treatment of many topics, and the citations to those sources will afford an excellent bibliography for the scholar who is expanding his knowledge.

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Nicholas Biddle. Nationalist and public banker, 1786–1844. Thomas Payne Govan. University of Chicago Press, Chicago, Ill., 1959. xii + 429 pp. $7.50.

As its author points out, this is not a full biography of Nicholas Biddle: "It is in biographical form, but it is not a full story of Biddle's life. I have written of him as nationalist and public banker, for it is here, in my opinion, that his significance lies. I could not write of him as son, husband, parent, private citizen, or even as a man without having these remarks appear as irrelevant intrusions into the already too complex narrative" (page ix). There are brief discussions of other aspects of Biddle's life: his boyhood; his brilliant record as a student at Princeton; his literary interests and activities, including his editing of the Lewis and Clark journals; his experience as secretary to the American ambassador to France and as a traveler in Europe and the Near East; his courtship and happy marriage; his brief career as a lawyer; and his term as a member of the Pennsylvania legislature. But the central interest of the book is in Biddle's role as head of the great Second Bank of the United States, the political controversies centering on the bank and its policies, and the dramatic conflict between Biddle and Andrew Jackson.

In preparing this volume, Govan has drawn not only on published materials but also on masses of official papers and Biddle's copious correspondence. The result is an interesting and important book which sheds much new light on Biddle, the Bank, and the controversies surrounding them. It now becomes even clearer than it was before that Biddle recognized fully the powers of the Bank and was highly sophisticated in his use of those powers. He was, of course, interested in the commercial activities of the Bank and in promoting its profitability. But his deeper interest was in the Bank as an instrument of national policy, and he deliberately used its central banking powers to promote the national interests as he, and many others, saw them. Some of the actions that he took deliberately to influence the state of the credit markets, the behavior of business activity, and the nation's balance of international payments evidenced both boldness and an understanding of central banking principles quite rare in his time.

This book is destined to be highly controversial, for its verdict is almost completely favorable to Biddle and wholly adverse to Jackson. Those who seek to reverse this verdict, and they will probably be numerous, will face formidable evidence.

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Soviet Research in Crystallography, 1956. English translation. Consultants Bureau, New York, 1959. 77 pp. Illus. $10.

This is the third volume in a series that was inaugurated two years ago [reviewed in *Science* **129**, 324 (1959)]. We are told in the preface that the volume contains English translations of papers selected from six Russian chemistry journals; evidently the contents of the previous volumes were also restricted to the same sources. These