technical racial analyses, though they are employed in the chapter on the prehistoric background.

In his assessment of the physical types and their interrelationships, Briggs places much weight on resemblances and differences in the A, B, O blood group percentages of populations; but this is a feature controlled by alleles of a single gene, and alone it is hardly an adequate basis for determining racial affiliations. Although the thesis that genetic features of a population are subject to change through mutation and selection is acknowledged in the introduction, the only explanation offered for resemblances in A, B, O blood group percentages in the racial analyses themselves is in terms of admixture. Thus, Briggs accepts a high incidence of type B blood as suggestive of negro admixture among the Moors, and as "unquestionably" due to negroid admixture among the Chaamba. Furthermore, conjecture as to how miscegenation might have taken place through liaisons of light-skinned aristocrats with their negroid slaves or servants is followed by the supposition that persons higher in the social scale are probably more mixed than those less fortunate, since the former are more likely to keep servants or slaves. But this fanciful suggestion is contradicted by Briggs' statement, later on the same page, that the Zenata, an Arab people in the northern Sahara, are increasingly negroid from top to bottom of the socioeconomic scale!

Quibbling aside, anthropologists will be grateful for this book—certainly the best summary in English to date of the Saharan peoples and their cultures. Many French, German, and English sources have been utilized, and the information has been weighed against the author's own extensive field observations. A fine set of illustrations of typical Saharan living arrangements and portraits of typical physical types completes the volume.

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Polarography. In medicine, biochemistry, and pharmacy. M. Brezina and P. Zuman. Translated from the Czech by S. Wawzonek. Interscience, New York, rev. English ed., 1958. xviii + 862 pp. Illus. $19.50.

It is fitting that an English edition of this treatise should appear shortly before an International Congress of Polarography is to be held in London. It illustrates the broadness of application that this electrochemical method has attained since its discovery 35 years ago by J. Heyrovsky, who has contributed the foreword to the volume. It is to be hoped that editorial reaction will no longer be, "a rather restricted field" or "not the method of choice," and so on.

The early development of polarography was largely confined to Czechoslovakia and was reported in the Collection of Czechoslovak Chemical Communications. The writings of Otto Müller and of Kolthoff and Lingane have now acquainted the American scientist with the literature in general.

Brezina and Zuman collected and digested all the polarographic literature on medicine, biochemistry, and pharmacy, and from their edition (in Czech), S. Wawzonek of the department of chemistry of the State University of Iowa developed the English edition. In the process he extensively enlarged and revised the original. There are 2000 references, twice the number in the Czech edition. The subject matter included in the book is broad enough to make it valuable to any biologist using polarography.

The format of the book is of the fine quality characteristic of the publisher. Unfortunately, the English edition lacks the author index included in the German edition, but a list of references follows each chapter, and a bibliography of monographs and reviews is included at the end of the book. A frontispiece shows J. Heyrovsky with R. Brdicka and the Nejedly polarographic apparatus. There are numerous clear diagrams of apparatus and typical polarograms of substances of biological interest. A collection of data on buffers and the half-wave potentials of compounds occupies 58 pages in part 7. The theoretical aspects of polarography are not developed, but the reader is referred to other sources for this information; only four pages are given to the "Nature of polarographic analysis."

The authors' objective is "to show laboratory workers the possibilities of polarographic methods as well as to provide them with a practical manual in which entire procedures are described in great detail."

The main parts of the book cover the determination of (i) inorganic compounds, (ii) organic compounds, (iii) proteins, (iv) enzymes, and (v) polarographic maxima. In each case the procedures for analysis in biological material are given—for example, for determination of magnesium in serum, epidermis, plants, and water. Examples of quinones considered are phthiocol, juglone, and adrenochrome.

In the section on proteins the work of Brdicka and others on the catalytic waves of protein and their diagnostic value in cancer and various other diseases and the titration of active groups in protein are developed in detail. The chapter on enzymes is but 15 pages long and deals mainly with hemin, catalase, and milk enzymes. The sections on hormones, vitamins, alkaloids, and so forth contain many valuable analytical procedures. The section on *maxima* describes the analysis of many biological fluids by measurement of their maxima suppressive activity; for example, the aqueous humor of the eye has a surface activity of protein 16 times greater than the value for serum protein.

The authors' style is clear and to the point. Enough detail is given with respect to any substance occurring in biological material so that the polarographic analytical possibilities are apparent. The book should be a useful source of information to anyone concerned with experimental biology or medicine in the broadest sense.

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Manuel de Paléontologie Animale. Léon Moret. Masson, Paris, ed. 4, 1958. 771 pp. Illus. Paper, F. 3200.

Like the third edition, published in 1953, this is a reprinting, without changes in the text. New information is incorporated in an "Addendum," which in the present edition amounts to some 34 pages and constitutes an annotated bibliography of recent work, with special emphasis on French contributions.

The book is well designed as an introduction to general paleontology. Nine chapters deal with the principal invertebrate phyla, five with the vertebrates. Illustrations are line drawings and are more numerous than the stated 274 would suggest, for many of the numbered figures are comprised of several parts.

Each section and each chapter begins with a general statement as to classification, morphological terms, and so forth, followed by more detailed reviews of important family groups and, usually, by a discussion of evolutionary trends, phylogeny, and stratigraphic significance. That the author should draw most heavily upon the work of his fellow countrymen in the literature cited and the classifications adopted is perhaps inevitable. For at least one group—the pelecypods known as rudists—this is a happy circumstance: the 20 pages devoted to the pachyodonts form probably the best available modern summary on these complex bivalves. The 62 pages on Foraminifera provide a compact and usable summary. Zoologists, however, may deplore the undifferentiated phyletic group *"Les Vers."* In this connection, also, one must point out that the author has perpetuated a common confusion by placing the annelid genus *Tubulostium* [now generally considered

a synonym of *Rotularia*] under the gastropod family Vermetidae and labeling the figure as an aberrant turritellid.

Names for taxa of family group level and higher are given in a French vernacular form; this would be a serious disadvantage if the book were to be used in America as a primary text. However, as a supplementary reference work, it seems worthy of commendation.

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Arctic Bibliography. vols. 6 and 7. Prepared for and in cooperation with the Department of Defense, under the direction of the Arctic Institute of North America. Marie Tremaine, Ed. Department of Defense, Washington, D.C., 1957 (order from the Superintendent of Documents, Government Printing Office, Washington 25, D.C.). xiii + 1208 pp.; xiii + 1071 pp. Maps. $4.50; $4.25.

With the publication of the seventh volume (fourth supplement), this excellent, specialized, annotated bibliography now covers 43,464 entries on arctic subjects. The literature is reported up to 1955. The general task of the project was fully explained by the chairman of the directing committee, Henry B. Collins, Jr., some years ago in *Science* [**119**, 3A (26 March 1954)] after the publication of the basic bibliography [volumes 1–3 (1953) (4478 pages)] containing entries 1 to 20,003 and the subject index.

Some words may be said about volumes 4 and 5, announced by Collins but not reviewed in *Science*. These two volumes cover the literature issued in the years 1950 to 1953, inclusive, and contain the entries Nos. 20,004 to 33,125. They form the first two supplements to the basic bibliography and include also publications issued earlier than 1950 but for various reasons not listed in the three first volumes.

Volume 6, published in 1956, reports the literature on arctic subjects published in 1954, and includes, also, earlier studies dating back to before the 19th century which were omitted previously. It covers entries 33,126 to 38,410. Volume 7, issued in 1957, includes the arctic publications for the year 1955 (entries 38,411 to 43,464) and also reports earlier literature not included in the previous volumes.

The whole bibliography is an extremely impressive example of fine and conscientious teamwork, performed under the direction of Marie Tremaine. She and the members of her staff are to be heartily congratulated.

The four supplements as well as the three volumes of the basic bibliography enumerate the publications in alphabetical order, by author, including the first and second names of the authors and dates of birth and death. Where a publication has more than one author, careful cross references are given to the name of the first author, the title (abbreviated), and the running entry number. Though the different subjects are mixed, the extended and complete indexes enable the user to find every subject very easily. Titles of publications are given in the original language (languages using letters other than roman have been transliterated) and in English translation. In spite of the innumerable titles in foreign languages that are included, there are practically no mistakes in spelling. In this respect the *Arctic Bibliography* can be cited as a model for similar undertakings. German users will especially appreciate the fact that the nouns in German titles are not "decapitalized," as they often are in such publications. It is really astonishing to find that even words which had to be broken are divided according to the rules of the language in question. References to periodicals and (for separate publications) to editors are given in an extremely clear manner; included are the full title of the periodical, the number of volume and part, the number of pages, plates, figures, and maps, the year (for journals), and the editor's name and the place and date of publication (for separate publications). Misleading abbreviations have been avoided; this facilitates finding the original publication, especially since at least one library in the United States where the publication has been seen by the analyst is mentioned for each report. (These libraries are listed at the beginning of every volume.) The annotations are very extensive and give, generally, a good idea of the subjects treated in the publications.

This bibliography is still incomplete, doubtless because of the great task involved in reporting the literature for such a large geographical area, but each new volume serves to bring it nearer completion. Volume 5 contains a table showing the names and the subjects treated by the members of the staff of the Arctic Bibliography project; in the previous volumes these were mentioned only in the introduction. Starting with volume 6, the index gives the titles only in English, whereas the indexes of the previous volumes gave them in the original language. This change is a contribution to clarity and facilitates use of the index. In the two recent volumes, 6 and 7, the reports are still more extensive than in the previous volumes, and therefore even more useful.

In future volumes perhaps an effort might be made to complete the author citations with respect to first and second names and to dates of birth and death; these have been left out in many cases in the published volumes. Finally, one might be interested to know the name of the reporter of a publication; he might be cited, by his initials, at the end of the report.

Without any exaggeration, the *Arctic Bibliography* may be called a milestone in its field and may be taken as an excellent example for all similar undertakings. Especially for scientists it is an indispensable reference work, due to its broad basis, and not only for those who are students of the arctic regions. It would be extremely useful if similar projects could be undertaken for other areas, for the antarctic and the tropics in particular.

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Semiconductors and Phosphors. Proceedings of the International Colloquium, 1956. M. Schön and H. Welker, Eds. Interscience, New York; Vieweg and Sohn, Braunschweig, Germany, 1958. viii+864 pp. Illus. $16.50.

This proceedings volume of the international colloquium held at Garmisch-Partenkirchen in 1956 presents the complete text of the 100 papers contributed by American, Dutch, English, French, German, and Russian researchers. The papers cover a wide field, from general properties of semiconductors and phosphors to specific problems, such as thermoelectric phenomena, incorporation of foreign atoms in phosphors, trapping mechanisms, hole motion, magnetic properties, and energy-transfer problems.

The articles, written either in English, French, or German, offer interesting and stimulating reading and will be highly welcomed by researchers and all other scientists interested in this rapidly expanding field.

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The Green Flash and Other Low Sun Phenomena. D. J. K. O'Connell. (Vatican Observatory publication.) North Holland, Amsterdam; Interscience, New York, 1958. 192 pp. Illus. $6.

The green flash, or the green ray as it is sometimes called, is a phenomenon resulting from atmospheric refraction. The last bit of the setting sun or the first tiny segment of the rising sun may be a vivid green or at times a bright blue. In presenting an accurate and detailed account