Book Reviews

The Living Races of the Sahara Desert. Papers of the Peabody Museum of Archaeology and Ethnology. vol. 28, No. 2. L. Cabot Briggs. Harvard University, Cambridge, Mass., 1958. xii + 217 pp. Illus. $7.85.

The greatest desert in the world, often popularly pictured as three million square miles of rolling sand dunes, uninhabited except for transient camel caravans, a few bands of brigands, and some venturous parties of petroleum prospectors, actually supports today a permanent though not always peaceful population estimated at about two-and-a-half million. L. Cabot Briggs reports that these desert dwellers descend from ancient peoples whose scattered remains attest a long period of occupation, and whose racial affiliations are gradually being worked out. North and Saharan Africa has its examples of fossil pithecanthropoids, neanderthaloids, and primitive *sapiens* types. However, the relative ages and the cultural associations of some of these types are by no means firmly established.

The author paints a picture of Saharan life made especially vivid because he has drawn upon the results of many kinds of research. We learn that in the rolling sandy plains and mountain masses which fill two-thirds of the Sahara (only the remaining third is dune-covered), wells and *foggaras* (underground channels) supply water, "often unpleasantly rich in magnesium and calcium salts, and even in sulphuric acid," for date and vegetable gardens and small grain fields, as well as for man and his domestic animals. Though the portion of the land under cultivation is only 0.4 percent in the north, decreasing to 0.0025 percent in the south, Saharan agriculture can be traced back to Neolithic times and includes cultivation of the date and of wheat, millet, and numerous other important food plants. Wild grasses as well as forage crops permit the grazing of herds of goats, sheep, and camels, and these in turn support their nomadic human masters, who depend in large part upon milk as their staple food. The use of domestic animals in the Sahara can also be traced back to times before the beginning of the Christian era; there is evidence that cattle and horses were kept before the Sahara became so dessicated, and it appears likely that indigenous camels may have been domesticated only when it was no longer possible to keep cattle and horses. In spite of the variety of foodstuffs produced, the Sahara is no land of milk and honey; almost the entire population—in particular the nomads, who depend most upon livestock—is reported to suffer from malnutrition and deficiency diseases.

Among the peoples of the Sahara today are to be found sedentary negroid Haratin sharecroppers, working lands owned by light-skinned Teda and Tuareg nomads, for the landed nobility here much prefer a wandering life in regions of problematical water supply and uncertain rations to a sedentary, albeit less hazardous, existence around the oases.

The light-skinned Berber peoples of North Africa have established tight-packed commercial centers and depend as much upon trading as upon farming for a livelihood, while the shaggy-headed and dusky-skinned Moors of the western extremity of the Sahara rely very largely upon their herds but are able to obtain some vegetable foods through trade. In recent decades, however, this type of life has given way to a greater dependence upon cultivation throughout the Sahara.

This is an area of many amazing cultural anomalies. Some which particularly whet my curiosity are the traces of matrilineal organization in the social systems of pastoral Moors, Tuaregs, and Tedas, as well as of the possibly related Bejas of the eastern Sudan. This is not at all in accord with theories concerning the necessary patrilineality of herding peoples whose men control and care for the livestock, and it invites study of both function and history.

The two-party political organization —another feature of many Saharan communities—may be the expression of a basic social force which, for some reason, emerges with particular clarity in the Saharan physical-cultural environment. This deserves further attention, though G. P. Murdock has already offered an explanation in which Saharan political moieties are shown to be defensive alliances ["Political moieties" in *The State of the Social Sciences,* Leonard D. White, Ed. (Univ. of Chicago Press, 1956), pages 133–147]. Murdock's article may have appeared too recently for inclusion in Briggs' list of references, but Briggs does not cite the earlier works by J. Chavanne and R. Montague to which Murdock refers, both of which deal with this peculiar feature of Saharan society.

Although Briggs' avowed purpose is to summarize "our present knowledge of the ecology and racial characteristics of the living tribes of the Sahara Desert," the greater part of the book is given over to a résumé of the archeological and historical background and the ethnological present of the Saharan peoples. These considerations no doubt have bearing upon physical type, and ethnologists will be happy to have the available materials so succinctly compiled for them. There are many data here, and the gaps which remain emerge clearly. Yet, the connections between environment and mode of life on the one hand and physical type on the other are presented in the main as fortuitous associations, and no new suggestions of causal relationship are proposed.

Since the work does, in fact, come close to being a comprehensive anthropological survey of the Saharan peoples in the widest sense, we may be permitted some suggestions with respect to what might have been added in order for it to attain that end. A major lack, I felt, is the absence of a map of the Saharan peoples; a sketch of the vegetation zones also would be useful. Although the major linguistic groups are charted, there is little discussion of the linguistic classification, and little use is made of it. For instance, Briggs notes that in somatic features the Teda are negroid but that they resemble the lighter-skinned Berbers in blood type. Therefore, he surmises, the Teda may be the descendants of an ancient Saharan stock with later admixture of negroid elements; in fact, the Teda, Tuareg, and Moors are "all remnants of a single far-flung population that was once essentially homogeneous physically and culturally, too." But the linguistic evidence is not here taken into account, for it clearly separates the Teda in this important aspect of culture from the other inhabitants of the Sahara, all of whom speak related languages. Granted that culture, including language, is by no means an invariable indicator of racial relationships, nevertheless the linguistic discontinuity demands explanation.

Briggs' summary of the physical types is straightforward and calls for little comment in a review. The data, often scanty, are compiled from many sources and presented in convenient tabular form, together with statistical measures of dispersion when available. A short and clear verbal description of each type is provided. The misleading terms *Hamitic* and *Half-Hamite,* which confuse race and language in spite of attempts to define the types from a physical standpoint, are avoided in the

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