

sionally the sex of specimens was mistaken. Gates Clarke claims that Meyrick's genus *Stenoma* is "one of the largest conglomerations of unrelated species ever brought under one name in the Lepidoptera". The illustrations of this genus in Vol. 2 show an astonishing diversity in the structures portrayed and will greatly help revisers of the group.

This pair of volumes is a landmark. It is a joint project of the United States Department of Agriculture, the Smithsonian Institution, and the British Museum (Natural History). The last-named authority is to be congratulated for the far-sighted decision to permit the dissection of so much type material. Would that comparable illustrated guides to the Linnaean and other great collections were available. The extension of this sort of work is vital to the understanding of the old descriptions of animals and plants, on which the stability of nomenclature depends.

Considering the quality of the production and the large number of excellent half-tone illustrations, the volumes are not expensive. Vol. 2 would have been more useful with an index and a table of contents, particularly since some species listed in Vol. 1 only under their original generic names are transferred to different genera in Vol. 2.

G. C. VARLEY

## GENERAL THERMODYNAMICS

Thermodynamics from the Classic and Generalized Standpoints

By Dr. Joseph Louis Finck. Pp. xv+224. (New York: Bookman Associates, 1955.) 7.50 dollars.

THIS book presents ideas which the author has developed over a number of years in papers published principally in the *Journal of the Franklin Institute*. These ideas relate to a study of thermodynamics from what the author calls a generalized point of view, which concerns itself with the thermodynamics of metastable states and irreversible processes as well as with the stable states and reversible processes of classical thermodynamics.

The author admits that the transition from classical to his generalized thermodynamics involves concepts which his readers may be reluctant to accept and, in order to facilitate this transition, he gives in the first half of the book a presentation of the subject-matter of classical thermodynamics, in which emphasis is placed on the limitations of the classical approach. This section of the book suffers from a confused presentation of the concept of heat itself, illustrated by the frequent appearance of statements such as "in an actual case when a force is applied to a body, heat is involved". This is the more unfortunate in a book in which the main theme requires a clear appreciation of the difference between the definition of heat in classical thermodynamics, and the layman's concept of heat, which usually includes vague ideas arising from phenomena associated with friction and other dissipative effects. It is, indeed, with these energy dissipative effects that the remainder of the book is principally concerned.

In the second half of the book the author introduces his own concept of a 'complete' system, in which the total number of independent variables required to describe the state of the system completely includes those which are beyond the control of, and the exist-

ence and variations of which may be unknown to, the observer. By this means the author claims to show how 'incomplete' systems acquire dissipative properties such as viscosity and electrical resistance, and why in some cases these properties vanish at very low temperature. The phenomenon of catalysis is among the other subjects studied.

Although the reader is certain to find cause for disagreement with the author in not a few places, and although he is unlikely to conclude that the author's presentation of 'generalized thermodynamics' has answered his own questions to the degree of satisfaction which the author claims for himself, the book is thought-provoking, and the author invites comments from his readers.

R. W. HAYWOOD

## NORTH AFRICAN PREHISTORY

Préhistoire de l'Afrique

Par Prof. Raymond Vaufrey. Tome I: Le Maghreb. (Publications de l'Institut des Hautes Études de Tunis, Vol. 4.) Pp. 458+60 plates. (Paris: Masson et Cie., 1955.) n.p.

PROF. RAYMOND VAUFREY has written a magnificent monograph, profusely illustrated, on the prehistory of Algeria, Tunisia and Morocco, the "Isle of Maghreb". So rich is it in documentation that one can confidently assert that it is never likely to be entirely replaced. Prof. Vaufrey is a professor in the Institute of Human Palaeontology, Paris, and he has visited and worked in North Africa repeatedly. He has also absorbed the very considerable literature on the prehistory of the area which has not infrequently seen the light in obscure journals not easily obtainable.

After an introductory chapter and another on the history of research in the region, the Lower and Middle Palaeolithic periods are considered. Accounts of the geological conditions and deposits are given, and excellent half-tone and line diagrams illustrate the chapter. Next the main Capsian culture is dealt with. Here Prof. Vaufrey seems to have accepted the conclusion that, in spite of the presence of some pigmy flints in the levels, a connexion with the Perigordian must be postulated. Incidentally, as regards the pigmies, it has been suggested that in these more southern latitudes softwood trees occurred in much greater numbers than in France during the Perigordian period. Microlithic industries are indicative of composite tools, and the best material for hafts would surely be softwood. Pigmy flints, then, in the main Capsian levels may merely mean that in these regions softwood was of commoner occurrence than it was farther north. A chapter on the late Capsian and another on the early Neolithic follow, and the palaeontology of the region is then considered. A chapter of general conclusions brings the book to an end.

As already remarked, the volume as a whole is a magnificent piece of work which will long remain the classic account of the prehistory of the "Isle of Maghreb". The drawings alone, some thousands of them from the pen of that acknowledged expert, the Abbé Bouyssonie, provide a corpus of information indispensable to the student. Prof. Vaufrey is to be congratulated on the production of such a magnificent contribution to the prehistory of Africa.

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