

New order for the apiary

John B. Free

Biogeography and Taxonomy of Honeybees. By Friedrich Ruttner. *Springer-Verlag:1988. Pp.284. DM 158, £53, \$87.50.*

PROFESSOR Friedrich Ruttner is the foremost authority on the taxonomy and distribution of honeybees. He has now presented us with a masterly account which incorporates the results of many years of his own research and study into the evolution, taxonomy, ecological adaptation, geographical variability and comparative behaviour of the four honeybee species in the sub-family Apinae. This is the first one-volume overview of the subject.

The classification of honeybees, and especially of their sub-species, has been a subject of continuous discussion and argument. Indeed, Ruttner reminds us that Linnaeus himself first described the Western honeybee as *Apis mellifera* in 1758 and three years later changed the name to *A. mellifica*. Traditional methods of systematics, which proved to be confusing and inadequate, have now been largely replaced by effective methods of morphometric analysis of honeybee populations.

Ruttner's own results and conclusions are based on the more than 1,400 population samples in the morphometric bee databank at the Institut für Bienenkunde, Oberursel, of which he was formerly director. Many of these samples, particularly those collected by Brother Adam of Buckfast Abbey, are probably now irreplaceable because of man's movement of honeybee colonies from one region to another. To discriminate between samples up to 40 characters may be used, and lists of these characters, the methods of their selection, measurement and statistical analysis are provided. Clear discrimination between the bees of two races is important for practical bee-keeping and bee-breeding programmes. Fortunately, a few characters only may suffice for particular purposes, such as distinguishing between Africanized and European colonies in South and Central America.

Compared to *A. mellifera*, the three Eastern honeybee species (*A. cerana*, *A. dorsata* and *A. florea*) have been little studied; for example, the only information Ruttner was able to provide on such an important subject as the division of labour in *A. cerana*, the sole Eastern species kept in hives, was from unpublished observations made by a student in a 'flight room' in Germany! Nonetheless, interesting advances have been made in

the past decade or so, and the comprehensive reviews of the existing literature on these species are especially welcome and serve to illustrate the need for more research in order to take advantage of their full economic potential as pollinators and honey-producers.

For many readers the prime value of the book will be the clear presentation of the classification, characterization and distribution of the 24 races of *A. mellifera*. These range from races that can be maintained throughout the year in the Arctic circle to those kept in the extremely hot and arid conditions of Arabia. Such adaptation to the environment must not be jeopardized by importing honeybee races from other areas. The common European black bee, for instance, is now heavily hybridized and has vanished completely

from many areas in central Europe; Ruttner found that the imported black English bee living in the trees and cliffs of Tasmania is more 'typical' of the race than the present descendants of their common ancestor in Britain.

We can hope that definition of the taxonomic unit to which a colony belongs will eventually allow accurate prediction of the colony's behaviour. In the past many research workers have given too little attention to the particular race of honeybee they were studying. Until recently the classification was so confused that there was some excuse; that is no longer so. □

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Mountains of facts

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McGraw-Hill Encyclopedia of the Geological Sciences, 2nd edn. Editor-in-chief Sybil P. Parker. *McGraw-Hill:1988. Pp.722. \$85, £65.*

AN ENCYCLOPAEDIA should be easy to use, informative and up to date. On these counts, the new edition of the *McGraw-Hill Encyclopedia of the Geological Sciences* is only partly successful.

The information is well set out in a two-column format and the illustrations, both line drawings and photographs, are of a uniformly high quality. But although the overall presentation is pleasing, the organization of the material is less satisfactory. Finding a complete run-down of a particular topic is not an easy matter; time and persistence are needed. Related subject matter tends to be scattered throughout the volume so that a great deal of rummaging around and background knowledge is needed before the information can be successfully extracted. Aspects of geochronology are dealt with under at least six different headings, and although most of the thumb-nail sketches such as "Earth, age of" and "Rock age determination" are succinct, clearly written and enjoyable reading, there is considerable overlap and repetition from one section to another. Although many entries also lead the reader to other, related topics, and the index is generally useful, there are some surprising omissions — for example, I could find neither fossils nor palaeontology (or rather paleontology) included either among the main headings or in the index.

Most of the main aspects of geology are covered, including evolution of continents, marine geology, metamorphism and petroleum geology, to name but a

few. A quick search, however, for more specific topics, failed to reveal any information about komatiites or pyrochlore. It took some time to track down the trilobites, tucked away in a few lines under the entry for Cambrian.

There is, too, a dated air about many parts of the *Encyclopedia* — the most recent reference for palaeomagnetism is 1979, and the references for several other topics could have been more up to date. There is no excuse for including a map showing the arrangement of mountains and continents of the world (without a legend!) dated 1935.

It's easy to criticize a volume containing material of such an interdisciplinary and wide-ranging nature, and the book does have its uses. It will serve as a general reference work or for browsing; it contains a great deal of useful information and the entries are consistently well written in a clear, concise style. Some sections, such as those on feldspar and geological thermometry, are excellent. But for the general reader interested in tracking down a specific subject, or for the researcher wanting the latest information on a topic, the book is decidedly deficient.

Most of the material was previously published in the sixth (1987) *McGraw-Hill Encyclopedia of Science and Technology* and reorganized into the present format, which might explain some of the weaknesses. If the editors are to make the next edition an essential acquisition for Earth scientists, careful pruning and pulling together of related subject matter will be needed, as well as better judgement over establishing the relative importance of the various topics — in the present volume, for example, continental drift merits half a page, amber a page and a half. □

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