

Given that the book is of largely historical interest, this simply obliges the reader to return to the French original. This was a perfect occasion to publish a complete list of the publications of P.M. Duffieux: since it has been lost, perhaps one of the optics journals could be persuaded to publish such a list together with their own review of the book.

It is very right and pleasing that Duffieux's book should be available, through a translation, to a wider audience. The loss of some of the trenchancy, even belligerence, of his prose is a small price to pay. Everyone interested in modern optics (and unable to read the original) will enjoy this English version. □

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## Postgate's fixation

John D. Tjepkema

### The Fundamentals of Nitrogen Fixation.

By J.R. Postgate.

Cambridge University Press: 1982. Pp.252. Hbk £20, \$37.50; pbk £7.95, \$12.95.

PRODUCTIVE agriculture depends on the use of nitrogen fertilizer or the inclusion of nitrogen-fixing species in crop rotations. Due to the rising cost of fertilizer, and the impracticality of its use under some conditions, research on nitrogen fixation has been given a high priority. This increased emphasis and breakthroughs in research methodologies have led to a spectacular increase in our knowledge of the process.

There has also been a spectacular increase in the number of books on nitrogen fixation, but many of these have been symposium volumes which rarely cover the field as whole. Thus John Postgate's book serves a very real need, being a concise, comprehensive and up-to-date review suitable for researchers, teachers or advanced students. The viewpoint is that of a microbiologist, who with his colleagues at the ARC Unit of Nitrogen

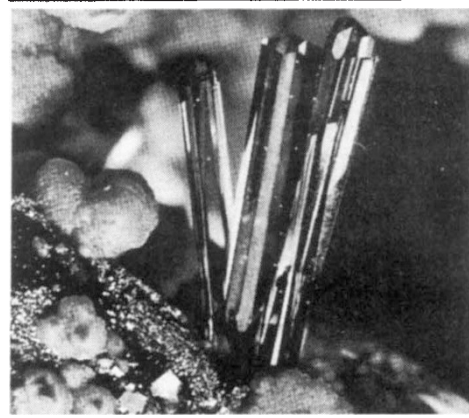
Fixation has been at the forefront of research in the area. Quite rightly it is the work of this group as well as Postgate's personal interests, such as the evolution of nitrogen fixation, that receive the greatest attention. Thus biochemistry, genetics and microbial physiology are covered in detail, while only 25 of the 200 pages of text are devoted to symbiotic nitrogen fixation. Those seeking more detailed information on this topic, which is of much current interest, or on nitrogen fixation in natural ecosystems, forestry or agriculture, are referred by Postgate to J.I. Sprent's recent book, *The Biology of Nitrogen-fixing Organisms* (McGraw-Hill, 1979), which emphasizes the more biological aspects of nitrogen fixation.

Of all the progress in nitrogen fixation research discussed by Postgate, I find that in genetics most remarkable. We started with almost no knowledge in 1970. By 1972 functioning nitrogen-fixing genes had been transferred from *Klebsiella pneumoniae* into *E.coli*, and by the end of the 1970s a detailed map of the cluster of 17 genes involved with nitrogen fixation in *K. pneumoniae* had been developed. Since the nitrogenase enzyme complex contains only three different protein subunits, this large number of genes was surprising and their study has illustrated the complexity of biological nitrogen fixation.

The style of Postgate's book is largely that of a review article, with 40 pages of references which provide a useful entry into the primary and secondary literature. Many of the sections and subsections are presented in a partially historical sequence, which gives the reader a better understanding of how present knowledge has developed. Sections vary substantially in their readability, however, and only an expert will find all of the book easy going.

Thus the book is not light reading for the lay person and would not serve very well as an introduction for the beginning student. But this is not its intended use, and overall I find the style excellent for conveying a clear picture of the current state of nitrogen fixation research to the advanced reader. □

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Clear crystals — the illustration (of vivianite,  $\text{Fe}_3(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$ ) is taken from a new wall-chart, *Minerals of the World*, published by Elsevier Scientific. The chart features 200 minerals, all in full colour; like the companion *Elsevier's Mineral and Rock Table* (for review see *Nature* 302, 183; 1983) it has been compiled by P. Lof. As well as the illustrations, the chart includes an index to the minerals shown, plus other data, and a display and general explanation of crystal forms. Price for a single copy is Dfl. 30 (\$13) and for 10 copies Dfl. 185 (\$78.75), with cheaper rates for orders of 20, 50 and 100 copies.

## On the beaches of Hong Kong

C.M. Yonge

### The Sea Shore Ecology of Hong Kong.

By John Morton and Brian Morton.

Hong Kong University Press: 1983.

Pp.350. Hbk \$HK 145; pbk \$HK 120.

HONG Kong with its associated islands and the intricately zig-zagged extension of mainland territory appears as a small spot on the map of China. It may therefore come as something of a surprise to learn that islands and territory have a combined coastline one-fifth as long as that of England and Wales. The nature of these shores could hardly be more diverse, ranging from fully exposed rock pounded by great Pacific breakers through many intermediate conditions to fully sheltered mud flats. While outer shores are washed by the fully saline waters of the South China Sea, southern coasts are exposed to the outflow of the Pearl River.

So much for nature; but man has major effects, razing mountains and filling in valleys to build towns of half-million populations. Shores are built over and extended. Plover Cove, a three-mile-long arm of the sea has been cut off, pumped dry and converted into a reservoir, its original marine population replaced by freshwater plants and animals. Meanwhile pollution spreads out from the "fragrant harbour" between Hong Kong and Kowloon.

Nevertheless a diverse and fascinating population persists, adapted for intertidal life with its hazards of seasonal and diurnal fluctuations in temperature, salinity and exposure. Richer than a corresponding Atlantic flora and fauna, it is also of dual origin, a mingling of the inhabitants of more northern, Japanese waters and those of the tropical Indo-West-Pacific. This second influence is responsible for the presence of mangrove areas and of an unexpectedly large, although always subtidal, assemblage of corals. Winter exposure would be fatal.

Description of these populations is the subject matter of this book. Both authors (who are unrelated) are exceptionally well-qualified, with similar, primarily malacological, interests. The book was planned during a visit, as Royal Society Professor, of John Morton from Auckland in 1975 to Hong Kong where Brian Morton has been working since 1970. The former has unique knowledge of southern Pacific shores and is the author, with Michael Miller, of the altogether admirable *New Zealand Sea Shore* (Collins, 1968). With the aid of successive groups of students, Brian Morton has with unique energy been intensively studying the marine invertebrates of Hong Kong, adding many