

Frontiers in Bioorganic Chemistry and Molecular Biology

Edited by Yu. A. Ovchinnikov and M. N. Kolosov
Elsevier/North-Holland; Amsterdam, New York, 1979
xii + 232 pages. \$58.55, Dfl 120.00

This is a difficult book to review as the range of subject interest is very wide indeed. The volume is a memorial tribute to Professor M. M. Shemyakin and consists of a series of reviews of those areas which were of interest to Shemyakin. Pauling writes on the nature of chemical bonds in bioorganic complexes of the transition metals; Barton discusses the intellectual background to the development of new organic reactions with particular emphasis on photolysis; Woodward examines the stereochemical problems involved in the synthesis of the macrolide antibiotic erythromycin; Witkop and his colleagues describe the synthesis of pyrimidine nucleoside analogues as possible antiviral drugs and there is a related contribution from Lederer and Robert-Géro on the synthesis of analogues of *S*-adenosylhomocysteine which show antiviral activity and inhibit cell transformation by oncogenic viruses. Wieland and Faulstick review their work on the localized liver toxicity of phalloidin and its unique reaction with actin and Prelog discusses the

structure of the lipophilic antibiotic boromycin. The problems of selective transport across membranes is reviewed by Ovchinnikov with particular emphasis on recent work with simple ionophores; Braunstein and his colleagues review their own work on the catalytic mechanisms of pyridoxal phosphate dependent lyases and Khorana reviews his own classical synthesis of a biologically active gene.

As is evident from the above list, every article is by a world authority and while the thread linking the varied contributions is tenuous, each is clearly written and interesting, as is usual when the real expert concentrates on his own speciality. The text is clearly printed and typographical errors are trivial; unfortunately however the price (\$58.55) will put this book beyond the means of most scientists, particularly since few will wish to read more than a fraction of the selected articles.

T. S. Work

The Origin of Life. A Warm Little Pond

by Clair Edwin Folsome
W. H. Freeman; San Francisco, 1979
xii + 168 pages. \$12.00 (hardcover), \$6.10 (softcover)

Written at the level and in the style of Scientific American articles, this small book covers cosmic evolution, from the formation of stars to the origin of the genetic code. There is an effort to present new or unorthodox views at several places. Thus, the primitive atmosphere (chapter 4) is assumed to contain little methane and much carbon dioxide. Monomers, polymers and proto-cells were formed, according to chapter 7, nearly concomitantly thanks to electrical

discharges and ultraviolet radiation acting directly onto the water surfaces. On chirality, Folsome holds the extreme view that 'the physical properties of some enantiomers vary widely. Solubilities, melting points, and other properties are significantly different' (chapter 12). Primitive transfer RNA molecules are viewed as the various linear replicas that can be made of one mini-circular RNA (chapter 10). The background knowledge given in the book is too elementary to

allow the reader to judge whether or not the unusual proposals are backed by a deep critical evaluation of the scientific literature. Nevertheless, since the origin of life is a very speculative field, I believe that unor-

thodox presentations such as Folsome's are on the whole more profitable than mere repetitions of the traditional discourse.

Jacques Ninio

Approches Moléculaires de l'Evolution

by J. Ninio

Masson; Barcelona, Milan, New York, Paris, 1979

132 pages. 98.00 FF

This book has a number of highly positive aspects and a very irritating one: undue aggressiveness.

In a small volume, it gives a vivid and original view of a subject described adequately by the title and more explicitly in the 'warning note' (chapter 1): 'Je discuterai donc de l'évolution dans la nouvelle perspective, aussi loin qu'on peut le faire aujourd'hui, pour ce qui est de la logique moléculaire du vivant. Nous voulons savoir avant tout pourquoi le code existe, à travers quels tâtonnements l'organisation cellulaire, maintenant bien rodée, a pu se mettre en place'.

After a short outline of the chemistry of life, the author discusses what one can and what one cannot extract from comparisons between protein or RNA sequences (chapters 3 and 5). These two sections sandwich an interesting chapter on the tertiary structure of proteins. Chapter 6 (Réplication et bricolage génétique) seemed more superficial to me (but perhaps, is it because I know this field better?). Chapter 7 is a fascinating discussion on populations and the next four chapters deal with the origin of life, and especially of the genetic code. This is the core of the book; it is full of interesting ideas, as are the last four chapters, which deal with evolution beyond the level of the code.

The most typical example of the bitterness of the author is found on pages 86–90. Is it a good argument against the ideas of Manfred Eigen and other eminent physicists, to first call him 'un certain M. Eigen' (and only later concede that he and Prigogine have received — and deserved — the Nobel Prize)? In order to

describe Eigen's ideas, the author imagines the example of evolution — guided by God — from an initial sequence CHUNIMBORZOU towards 'l'archétype parfait MANFREDARAFAT'. What is dangerous in this kind of sport is that mockery masks the lack of objectivity of the description. What is given here as 'une tentative malheureuse d'Eigen et Schuster' is presented in the original paper as 'a little computer game'; and the purpose of the game is not to show that in the presence of a selective advantage one will tend towards a given sequence, but rather to figure in what range of values of two parameters one might expect this evolution to take place.

I advise everybody (not only molecular biologists) to read this little book. It is written without unnecessary technical words, it questions a number of accepted ideas, it induces people to think and even when one disagrees, it is always interesting. Except for some printing mistakes and the virtual absence of subjunctives, I found few material errors. (For instance, on p.51. People who suffer from sickle-cell anaemia do not produce a mutated haemoglobin β' *in addition to normal haemoglobin β* ; they are homozygous and produce *only* the abnormal β chain. The heterozygotes produce both chains, but they are not ill; as the author himself mentions, they have a selective advantage against malaria, which by the way, is not caused by a virus. And the disease is more characteristic of certain black populations than of the middle East.)

R. Thomas