xerophytes and even the function of transpiration in general are discussed, but no firm conclusions are reached.

The book is not easy to read. The language lacks fluent style, and, worse, many interesting thoughts are buried in a plethora of rather trite information. Often it is difficult to distinguish between the ideas for which Gindel has some experimental data and those which are purely speculative. The diagrams are embarrassingly crude and misspellings and misprints common.

In general, one is left with the impression that the book was prepared and produced in a hurry, which is sad because many of the ideas which are presented in it are stimulating and iconoclastic.

PETER D. MOORE

Life in space and time

Biogeography: An Ecological and Evolutionary Approach. By C. B. Cox, I. N. Healey and P. D. Moore. Pp. viii+179. (Blackwell Scientific: Oxford, 1973.) £3.00.

THIS is a very attractive book which is well illustrated and written in a lively and engaging style, so that it is likely to appeal to students at universities for whom it seems to be intended. But as with so many new textbooks, it tends to skim the cream and omit much of the milk from which the cream rises. It is fair to ask if such books are a proper diet on which to nurture a critical appreciation of an essentially descriptive and analytical subject, for this is surely what biogeography really is. It is the branch of science concerned with the study of distribution on a geographical scale of both fossil and living organisms and the communities and ecosystems of which they form a part. It cannot be conceived as including ecology and cytogenetics without destroying the meaning of words.

The authors have too broad a definition of their subject, at least when attempting to present it so summarily. With only 179 pages at their disposal, which includes numerous maps, drawings and photographs, the treatment is inevitably often superficial, even to the point of being misleading. A model of what is really needed for universities is provided by Stanley Cain's *Foundations of Plant Geography* (Harper, New York and London, 1944), an outstanding contribution to biogeography which is surprisingly not even mentioned in the references. In fact, the chapters on life on small islands and on continental drift approach this quality and present lucidly both the essential evidence and the arguments so that they serve to emphasise the weaknesses in other chapters. For example, the account of

soils is unbalanced. What is clearly a podzol, though this is not stated, is described on page 49 and gives an impression that most soils conform to this basic structure. The process of podzolisation is described subsequently. Surprisingly in a book of this title, there is no account of the great latitudinal belts of zonal soil types and no discussion either of the relationship between these and the major ecosystems of which they are a part, or of the conceptual parallelism between zonal soils and vegetational climax. Surely if a book must be so concise, it is these fundamental relationships and ideas which should be included and illustrated with a few carefully selected and adequately presented examples. Moreover, examples must be recognisable as such and not be mistaken for generalities. In fact, this technique is used in the chapter on small islands and its value is at once apparent.

There are a few confusing statements and discussions. On page 16, *Arbutus unedo* is correctly stated to grow "wild" in western Ireland, yet on page 17 its morphology and phenology are given as evidence that it is "not native". Could the same be said of *Hedera helix*? The discussion of interaction of factors and limiting factors on page 30 suggests a fundamental misunderstanding in the authors' minds. The text is almost free of trivial errors but the caption on Fig. 17 implies a knowledge of German which is scarcely appropriate for those who aspire to be the heirs of Alexander von Humboldt.

C. D. PIGOTT

Alpha rhythm from eyes

The Origin of the Alpha Rhythm. By O. Lippold. Pp. ix+267. (Churchill Livingstone: London and Edinburgh, 1973.) £6.

THE alpha rhythm of the electroencephalogram consists of electrical oscillations at about 10 Hz which can be recorded from the scalp, especially the occipital scalp, in most people during most of the time that their eyes are in darkness. Since the work of Adrian and Matthews in 1934 it has been almost universally believed that it is generated by the brain. Dr Lippold proposes the revolutionary idea that it is generated by muscular tremor in the orbits. The evidence comes chiefly from the following three observations. (1) A tremor of the eyes can be recorded which correlates fairly well with the alpha waves. (2) If the amplitude of the corneo-retinal potential is made different in the two eyes by dark-adapting one eye, the alpha waves from the occiput become larger on the side where the corneo-retinal potential is larger. (3) If one orbit is cooled and the other warmed (thereby presumably raising the

tremor frequency on the warmed side and lowering it on the cooled side), the alpha waves become of higher frequency on the warmed than on the cooled side.

If these observations are strictly and regularly true, I do not think that Dr Lippold's conclusion can be escaped. I therefore eagerly await their independent confirmation.

The implications of the conclusion for the conduction of current within the brain are remarkable. It is somewhat surprising that electrical waves generated in the orbit can appear much larger in records from the occipital than from the frontal scalp. It is much more surprising that they can be very large in direct bipolar recordings from the occipital cortex and undetectable in direct bipolar recordings from the precentral gyrus, only a few centimetres away and slightly nearer to the orbital fissures and optic foramen. Yet this, according to Jasper, is true of alpha waves.

G. S. BRINDLEY

Through the Earth

Physics of the Earth and Planets. By A. H. Cook. Pp. x+316. (Macmillan: London and Basingstoke, September 1973.) £8.50.

THE author states that this book was written for second and third year undergraduate geophysics students and as background reading for graduate students. He defends the bias given to such topics as gravity, seismicity and certain dynamical behaviour of the planets on the grounds that present day students know more modern than classical physics. But the bias is rather narrower than this and the author seems to be only really sympathetic to those parts of earth science that make great play with displays of significant figures. How else is one to interpret the sentence (page 33) "The shape of the solid surface of the Earth is very irregular and of no general scientific interest"? Although there are chapters devoted to magnetism and crustal movement and some extremely sketchy descriptions of apparatus, my overall impression is of a book that could serve as an introduction to Sir Harold Jeffreys's *The Earth*.

There is a good introduction but later, in perhaps more important matters of detail than the consistent use of SI units, the standard of presentation becomes less meticulous than Sir Harold's. For example Laplace's equation is said to be "nothing more than a statement of the inverse square law" on page 27, whereas on page 28 that Laplacian fields are said to vary as r^{-n-1} . There follows a repetitious discussion of satellite motion and a treatment of geoidal shape, complicated