

BOOK REVIEWS

Vocal communication in birds by Clive K. Catchpole. Published by Edwin Arnold, pp. 68, \$ 2.40.

Among all the sounds produced in nature, there are probably few rivals to birdsongs for aesthetic appeal to a human listener. In terms of the complexity that such songs can attain and their mode of transmission, they suggest interesting parallels to human speech. The book under review gives an excellent introduction to the biology of song and other forms of vocal communication in birds. The second half of the book is devoted to song, particularly to its developmental and communicatory aspects, and the first half to methodology, techniques of measurement and the role of calls as signals. The sonagram—a continuous recording in time of the frequency of emitted sound, with thickness of trace representing intensity, is a faithful representation of the bird call. Just about all the work on the structure of bird vocalizations has been based on an analysis of such recordings. Following a brief introduction to this, the author considers the classification of bird calls, particularly with reference to the context in which the calls are used—as an alarm signal, when mobbing a bird of prey, or whatever. Most calls are used as intraspecific signals from one individual to another; interesting variants are the African honeyguides whose call and flight signal other animals to bee hives, and cave dwelling birds, which emit sounds (in the audible range) for use in navigation by echolocation. The sections on song are more detailed and include topics such as the extent to which a song is stereotyped or variable, what elements in it (including rhythm) are crucial to recognition, and the role played by imprinting at an early age in guiding an adult bird to sing its 'proper' song. Briefly, the observations indicate a large amount of variability among songbirds in these properties. Two well-recognised functions of song have to do with delimiting the singer's territory and with attracting a mate. However, neither of these seems to provide a sufficient cause for the tremendous complexity in some songs. Similarly, the mode by which present-day songs evolved is not very clear. There are two observations made during the course of the book which are of fundamental interest in their own right and may also have some bearing on these problems. One is the strong evidence that birds can have *individually* distinct calls and songs, recognisable as such by other birds. The finding has to be considered in the context of the generally increasing evidence that individual recognition is possible in lower animals and may (therefore) strongly influence interactive behaviour between individuals in any species capable of learning. The second point of interest relates to the work of Jenkins showing that songs are not only transmitted culturally in an island population of saddlebacks, but that occasional 'song mutants' arise—on account of the chance addition or removal of elements from an existing song—and are in turn faithfully propagated through exposure and learning. All in all, this is a very fine

book ; the one drawback it has is that its high cost will make it inaccessible to many of those interested in the subject.

V. NANJUNDAIAH

The origin of life by Fred Hoyle and Chandra Wickramasinghe. Published by University College Cardiff Press, P.O. Box 78, Cardiff, U.K., 1980, pp. 18, Price not mentioned.

This booklet is a short essay by the authors on the question of the origin of life. This is one of the fundamental questions on par with the origin of the universe (cosmology). And they have made some outlandish and revolutionary suggestions.

Ever since Darwin's work on the origin of species, the evolutionaries have gained strength along with the progress of science on all frontiers. Accordingly, the question centres around the evolution of life, in all its complexities, on earth and other bodies in the universe which can sustain life. Evidences so far indicate that the planet earth does provide the narrow range of conditions under which life would have evolved. This is not so for other planets of the solar system. What about other stars and their planets in our own galaxies or other galaxies? Theoretically, earth-like conditions might be existing in a large number of objects in various galaxies around their stars. Thus the authors want to emphasize the non-geocentric origin of life. In fact, they argue that conditions on the earth about 3.8 billion years ago were such that even building blocks of life could not have evolved. Yet the study of slices of rocks, which date back to more than 3.83 billion years, show fossil cells resembling present-day yeasts. This cannot be due to recent biological contamination. Accordingly, they conclude that the earth was showered with living cells from the beginning of its formation.

The next question is, if not on earth, where did life originate? Their answer is that the 1000 billion comets provide better conditions for the evolution of life than the earth. In support of this, is the argument that many bacterial and viral diseases (for example small pox and influenza) have a record of abrupt entrances, exists and reappearances on a periodic seeding basis. The bacteria and viruses, according to them, rain on earth from the passing comets which periodically cruise around the solar system. Some of these ideas are very akin to those of Velikovsky (*Worlds in Collision*, Dell, New York, 1965) wherein he postulates that insects fell on earth from comets during the biblical exodus. However, there are serious refutations of Velikovsky's idea (See Carl Sagan, *Broca's Brain*, Coronet edition, Hodder and Stoughton, Great Britain, 1980). Nevertheless, the discovery of several organic molecules in interstellar space in recent years has emboldened the authors to come out with another startling hypothesis. It is that the interstellar dust clouds are in fact bacterial cells. In our own galaxy these cells (bacterial and viral) will measure up to ten million times the mass of the Sun. Thus the space is filled with living cells, in a frozen dormant state. They come to life on coming in contact with warm watery comets. These comets

crashing on to the earth produced ocean, atmosphere and life. In short, life did not evolve on the earth. It has been there in the interstellar space. It rained on earth through comets and other extra-terrestrial agencies.

The thesis is staggering and hard to be accepted by the evolutionists. It has the tinge of steady-state theory of cosmology in which the universe has been there all the time—no beginning and no end, timeless and eternal. Similarly, living cells are there in the space, how long, we don't know. Perhaps like the universe—they have been there all the time—without a beginning. While these concepts of eternity are very appealing from philosophical points of view, only persons with rich imagination and fantasy will readily accept them. We need hard facts and evidences to prove that this can be so.

In short, the booklet does provide an exciting origin of life—although difficult to accept.

K.P. SINHA

What must humanity do ? by Javed Husain. Published by Dorrance and Company, Ardmore, Pennsylvania, 1980, pp. xi + 39.

In this short book, the author shows his deep concern for the future of humanity, suggests some remedies and ends with an optimistic note. He is a scientist and is aware of the role that science can play in destroying or preserving our civilization. He traces the history of civilization along with the giant strides that it has taken with the progress of science and technology. But the very fruits of these developments have brought us to the brink of destruction as seen from the threat of global war and destructive capability that has been developed by several countries. Perhaps the entire humanity is aware of these evil warnings. But most of us are helpless witness and cannot control the act of a few mad men who can trigger war.

Such concern has been shown by other scientists also—Einstein, Russel and many more.

The author has provided some valuable data regarding population density in various countries and some crucial scientific and technological developments which may change the course of history. These are developments in computers, communication, transportation, space science, new forms of matter, the energy problem and its solution, ecology, food front and life sciences. No doubt enlightened scientists are aware of these areas of science and technology.

The author feels that the solution lies in ethics, sense of international justice and the formation of world government. In short, a change of heart of each individual constituting the humanity. I do not think the book can provide the answer to this age-old problem. It has been attempted by many religious prophets in the past—but the total

change of heart has not taken place. The author feels that once the problems of poverty, food, population, energy and aggression are solved (by 2125 A.D.) the humanity will live happily thereafter. Let us hope his wishes come true.

K. P. SINHA

Light and plant life (The Institute of Biology's Studies in Biology, No. 124) by Jean M. Whatley and F. R. Whatley. Published by Edward Arnold (Publishers) Ltd., London, U.K., 1980, pp. 91, \$ 3.40.

The Institute of Biology, London, has sponsored a series publications entitled "Studies in Biology" to provide authoritative reviews on biological topics so that teachers and students can learn significant developments in particular areas and update their knowledge. This booklet is one in the above series and describes the effects and importance of light in growth, physiology and biochemistry of plants.

Light is of fundamental importance to living organisms. Besides its conversion to chemical energy through photosynthesis, light influences many plant physiological processes that range from germination and growth to flowering and senescence. While light acts like a substrate in photosynthesis, its role in other physiological processes is subtle and catalytic. Furthermore, the effects of light on plant life depend on three basic properties, viz., its intensity, spectral quality and duration. The dual roles of light and the manner in which its different properties regulate plant processes were clearly brought forth in this book.

Most plant responses to light are mediated through pigments, particularly the chlorophylls and phytochrome. Therefore, two of the six chapters in this book are devoted to a description of the spectral activity, morphological location and mechanism of action of plant pigments besides giving the essential facts of biochemistry and physiology of photosynthesis. In the other chapters the effect of light acting as trigger in germination, seedling establishment, shoot growth and many other developmental processes have been briefly but succinctly dealt with. In addition, the authors have also discussed light as a factor in the ecosystem and its influence on plant distribution. In keeping with the objectives of this series a final chapter on suggestions for practical work and further reading has been included. Thus, this booklet contains many concepts of plant life and would serve as a very useful introductory text.

P. S. SASTRY

Henderson's dictionary of biological terms, Ninth edition, Sandra Holmes. Published by Longman Group Limited, London, 1979, pp. 510, £ 9.95.

The book cover states that the main objective of this dictionary is to provide students entering college or university to study any of the biological sciences, with a handy source of information on their own and related fields. It will also be very useful to established workers and teachers in biology.

A major change from the eighth edition is the incorporation of new terms and the redefinition of existing ones. The number of headwords also has been increased from 16,500 to 22,500.

The dictionary of biological terms is a misnomer, because this book is written primarily in the style of an encyclopaedia. For this reason it gains the advantage of including related words in a single entry. For the most part this is done quite well. The large entries become textbook-like and are well written on the whole.

The content of the dictionary is well distributed in the field of general biology. There is a heavy emphasis on subjects of interest to those in classical biology, but there are many entries in biochemistry, microbiology, genetics and molecular biology. The book would have added value if some illustrations had been included to explain some of the more difficult terms.

The dictionary is on the whole very well written, and the information is accurate. There are virtually no typographical errors. The subject matter is very broad and overall will satisfy the users in various fields which it tries to cover.

Because of its encyclopaedic nature, it could be used as a supplement for a textbook, especially at a 200 level where a course in general biology would cover many subjects. For others interested in having a handy reference to help understand the many facets of this discipline, this would be a useful volume.

T. RAMAKRISHNAN

ANNOUNCEMENT

New lab manual for hospitals in tropical countries

With a view to help hospitals in developing countries, a new medical laboratory manual with special reference to the needs of tropical countries is being brought out on a non-profit basis. The first volume of the manual is slated for release in mid-1981.

The introduction of the manual contains material on safety, ordering, use and care of equipment, microscopes and details of setting up a laboratory. The anatomy and physiology section discusses laboratory diagnosis. The chapter on clinical chemistry deals with the organisation of a biochemistry department, absorption spectrometry (colorimetry), flame emission spectrometry (photometry), collection of specimens, quality control, reference ranges and tests to investigate renal function, liver, gastrointestinal and other metabolic disorders. Detailed preparation of reagents, addresses of manufacturers of lab-oriented products and useful tables are also provided. Along with the book are supplied a set of charts and illustrations for wall display, SI unit conversion tables and labels to mark dangerous chemicals.

The manual has been prepared by Miss Monica Cheesbrough and is available from her at 14, Bevills Close, Doddington, Cambridgeshire, England PE15 0TT. Orders from developing countries are executed at £ 4.70 (plus £ 1.25 postage) and those from developed countries at £ 7.60 (plus £ 1.75 postage) per manual.

ERRATA

The title of the paper by S. Ramaprasad [Vol. 62(C), No. 12, 1980, 83] should read as

“The crystal structure of N-acetyl-L-prolyl-D-alanyl-methylamide hemihydrate by the method of packing analysis *based* on contact criteria”

instead of as published.

(Essentially the word *based* in the above title is missing in the original version. We regret the error.)