BOOK REVIEWS

BIRD STUDIES

MIGRATION AND SURVIVAL OF THE BIRDS OF ASIA

H, ELLIOTT McCLURE.

U.S. Army Medical Component, SEATO Medical Research Laboratory, Bangkok, 1974, *pp.* 476.

Ten years of dedicated leadership, collaboration from dozens of biologists in many countries, and uninterrupted financial support are what produced this major work on the migration of birds in Asia. The study compiles and analyzes the results of placing bands on 1,165,288 birds of 1218 species, of which more than 7000 were recovered. This "Migratory Animal Pathological Survey" (MAPS) is admitted to be 'a stepchild of "sputnik", funded largely by the U.S. Army Research and Development Group, Japan.' It was motivated by a desire to learn more about the potential role of wild animals in harboring and transmitting zoonoses, particularly arboviruses. A happy result has been this interesting and important summary of new information concerning migration patterns of birds residing or wintering in southern Asia. Major banding and recovery efforts were conducted in South Korea, Japan, Okinawa, Hong Kong, Taiwan, Philippines, Thailand, Malaysia, Singapore, India and Indonesia, with some effort in a half-dozen other countries. The People's Republic of China is a large void on all the migration maps, however, because of a refusal to cooperate. The difficulties of obtaining band recoveries or reports from this large, multilingual, and culturally heterogeneous part of the world were both amusing and frustrating. For example, Thai workers were disappointed to learn that trappers were noting down the last three digits on the bands found to purchase lottery tickets, and then discarding the band without further concern.

The first part of the book contains discussion of previous migration studies in Asia, major Asian migration routes or "flyways", and probable evolution of modern migratory patterns. The wintering area for Asian migrants is considerably smaller than the vast breeding area to the north. Three major flyways reach south from northern Asia: one from western Asia and eastern Europe leading to southern Africa, one from central Asia over the Himalayas into India, and one rather complicated series of routes down eastern Asia into the Indochinese peninsula and the East Indies. The last may involve passage down the Chinese coast, or island hopping through Japan and the Philippines. These patterns are discussed with respect to three major factors which have shaped them: geological patterns of continental change dating to the drift of southern India from Gondwana Land, the more recent glaciations during the Pleistocene, and the present availability

of ecologically favorable wintering area. It is argued that the present flyways must have a history dating back to the origin of the earliest bird families. The bulk of the book is a complete species by species summary of band returns and recaptures, replete with helpful maps and tables. Excellent sketches of the birds by a Japanese artist (Dr. Nagahisa Kuroda) adorn most of the maps. Also included are tables summarizing survival records by species and recovery percentages by family, and a catalogue of all individual recoveries by species.

Although the data collected are extensive, there is little attempt to analyze ecological survivorship. This normally requires netting and recovering all birds on their breeding grounds, to which they return with high fidelity, so there is some justification for defining such an analysis as out of the scope of the study. However, some discussion of the amount of netting effort per season per location might have been of some use, or whether any of the netters intended to study survivorship. Banding studies ordinarily underestimate survival, but rather high survivorship is indicated by some of the recapture records from Malaya for resident species in families which are predominantly nonmigratory, such as Picidae, Timaliidae, and Pycnonotidae. The annual recapture rate was often as high as, or higher than, 80% per year. Some individuals, whose territories were evidently near the banding sites, lived through the duration of the study. This would be unusual for temperate zone migrant passarines. Such high survival can be predicted from the relatively low clutch sizes of tropical species, but little population work has been done in the tropics. Thus, while migrant species have a greater potential for dispersing zoonoses, the longer-lived tropical residents may serve as more effective reservoirs.

All serious students of migration and bird distribution will went to own this important and nicely printed book. I also recommend it to local bird enthusiasts who are curious about where many of our familiar birds go during the spring. They will often be surprised.

Warren Y. Brockelman

BIRD GUIDE OF THAILAND (2nd ed.)

BOONSONG LEKAGUL and EDWARD W. CRONIN, JR.

Kurusapa Ladprao Press, Bangkok, 1974, *pp* 324, *200 baht.*

"I believe that this Guide Book will stimulate more interest in birdlife, not only for nature lovers, but also for youngsters so that they will throw away their sling shots or trade their shot guns for binoculars. Watching birds is really more fun than killing them."

This credo appears in the preface to the first edition of this book. The new edition states it in more sophisticated but somewhat less revealing style ("Birds can add a valuable dimension to one's life"). It is a personal response to the appeal of the natural

world to our senses and intellect, and one which readers of this new journal should be hopeful that more young people follow. Many scientists begin their careers quite young as diligent bird finders or other nature enthusiasts, because being a scientist is basically an aesthetic response to nature, as is birding. Of course, we justify our strange activities with such 'rational' purposes as pursuing a Ph.D., helping to fight disease, promoting progress of one kind or another, or other excuses. There is nothing very rational about committing oneself to science, regardless of the ultimate benefits. If you think hard enough about it, there is no compelling rational reason for wanting to eliminate disease or do anything to improve the world, for that matter. These things concern our level of consciousness, to use a current expression. Once you are rid of the superficial layers of argument, there is no very important qualitative distinction between wanting to save one bird species and saving all of Thailand. You either want to or you do not care. The tendency to make a distinction appears to be conditioned in us by those who would find some selfish reason for wanting to discount birds or trees, or who are fenced in by the arbitrary bounds of some ideology, especially since there are now plenty of "practical" and economic reasons for saving many of Thailand's forest and wildlife resources from their present course of virtually irreversible destruction. In any event, Dr. Boonsong's book, as well as his other publications, has contributed greatly towards raising the consciousness of young people in Thailand. And of course a person's consciousness does not only deal with birds. We, in training new scientists, should look for and cultivate honest aesthetic and intellectual responses to nature; otherwise, loss of commitment and failure are almost inevitable. This is one reason why a new edition of this highly successful field guide is welcome; there are many others, of course.

The second edition, which describes 849 species, is an improved and more polished version of the first. It has benefited from the help of Edward Cronin, a Peace Corps volunteer. Approximately 50 of the 112 plates are new, mostly those in the first part of the book, and most of the others have been retouched or rearranged to aid identification. The color reproduction is better, apparently free of the flaw in the printing process that marred the color balance of many plates in the first edition. However, many of the plates in the new edition seem to be somewhat lighter than they should be. The species descriptions have been rewritten and made more complete. Adjacent to each is a small map of Thailand showing the species' distribution, a very helpful feature. The introduction to bird watching in the front has been expanded somewhat. The English names of 211 species have been changed over the old edition, and so a list of synonyms is provided.

All these features make it important to own the newest edition, but if you still have the old one, don't throw it out. Remove the last paragraph of the Preface and glue it into the new edition. Don't worry about the number of "dimensions" to your life—get your binoculars and enjoy the fun, away from the traffic and noise of the city.

Warren Y. Brockelman

HUMAN ANATOMY AND PHYSIOLOGY

THE HUMAN ORGANISM (4th ed.)

R.M. DECOURSEY

McGraw-Hill, New York, 1974, *pp.* 644, *ISBN* 0–07–016234–4.

The Human Organism is a well written text about the working of the human body. In this book anatomy and physiology of various systems of the body are treated together. The functional anatomy is emphasized rather than the factual details as usually found in classical texts of anatomy or physiology. The content of the book also includes minimal but essential biochemical information. Simplified general biochemical concepts such as chemical composition of the cell, energy source, energy utilization, and metabolism are presented together, well integrated with cell structure and cell physiology in the first unit of the text. In addition, special biochemical information are timely included in various chapters, for example; the chapter on muscular system also included the biochemistry of muscle contraction, the chapters on respiration also include essential biochemical concept of cellular respiration, etc. Certain information on general genetics and medical genetics are incorporated for illustrative rather than comphrehensive purpose. The main virtues of this book are, firstly, information from the disciplines of anatomy, physiology and biochemistry are co-ordinated and synthesized together to illustrate the working principles of the human body. Secondly, the text presents much new knowledge incorporating the results of recent researches, though not necessarily the complicated methods of how scientific information is procured. Thirdly, the concepts presented are greatly simplified. Thus the text should be a good supplementary reading for undergraduate students majoring in biology. The book could be suitably used as a standard text for students majoring in nursing, paramedical sciences or education. It is also recommended for high school biology teachers who have to teach some principles of the working of human body. The material in the text is too simplified and carries too little detail for advanced graduate and medical students; however it should serve as a very good introductory reading.

Prasert Sobhon

CLINICAL CHEMISTRY

THE DETECTION OF HEMOGLOBINOPATHIES

R.M. SCHMIDT, T.H.J. HUISMAN, and H. LEHMANN, EDS.

CRC Press, Cleveland, Ohio, 1974, *pp* 101, *ISBN* 0–87819–124–0, 358 *baht* ($17.50).

There is a strong interest in hemoglobinopathies in Southeast Asia, both because of their high prevalence and the simplicity of many aspects of experimental ap-

proach. Unlike most other proteins, hemoglobins can be collected, purified, identified and estimated without having to depend on sophisticated instruments research laboratories in this part of the world can rarely afford. Among the techniques for identification and estimation are electrophoresis on starch gel and cellulose acetate, and ion-exchange chromatography. Probing deeper into the primary structure of the abnormal hemoglobins, the investigator has the peptide mapping procedure as a powerful tool at his disposal. These investigations often require only relatively inexpensive chemicals, and simple apparatus which can be locally made. Thanks largely to the pioneering efforts of a number of local hematologists and clinical chemists, and the experimental conveniences mentioned, a few significant studies on abnormal hemoglobin structures and the mechanisms of α– and β–thalassemia have been made in research laboratories in Thailand, Taiwan and Malaysia, to mention a few countries in this region. The next level of development should be aimed at bringing the diagnostic and treatment facilities, as well as facilities for handling of samples for research, closer to the rural communities. This will be achieved by organization of regional and mobile laboratories equipped with inexpensive equipment for simple and reliable means of detection of hemoglobinopathies and allied disorders.

Central to the co-ordination of research efforts in various laboratories all over the world is the selection and standardization of techniques. The monograph *The Detection of Hemoglobinopathies* is the product of the First International Conference on Standardization of Laboratory Methods and Reagents, sponsored by WHO, attended by participants from 26 countries. At this conference papers were presented which should form the basis for international agreement on methods and reagents in the field of abnormal hemoglobins and thalassemia. The subjects ranged from sample procurement and simple diagnostic tests to separation of hemoglobin chains and their peptide fragments. Most papers are short, containing only concise instructions for techniques well worked out earlier and published in detail elsewhere. Typically a paper would end with a short discussion of problem areas, new developments and recommendations. Although a few papers are so short and sketchy as to be of little value, the monograph on the whole provides a convenient working instructions for various aspects of routine and research work. Particularly worthy of mention is the contribution from W.P. Winter and D.L. Rucknagel on peptide mapping of hemoglobin, which gives a deatiled instruction of the method complete with figures of the apparatus and peptide maps of a number of α–and β-chain variants.

A small contribution from P. Wasi and S. Pootrakul gave a summary of material and methods for laboratory diagnosis of α–thalassemia, with a summary of findings in Thailand.

Apart from serving as a source of collected experimental procedures, the monograph may also be conveniently consulted for typical results obtained in the laboratories of the originators of this procedure. If these main uses are borne in mind, then the reader can perhaps ignore the inconsistency of the references citation system, and a few printing errors such as α– for β-in the second section of Table 3, p. 67 and the misspelling of one of the editors' names on the cover.

Yongyuth Yuthavong

PHYSICAL BIOCHEMISTRY

THE HYDROPHOBIC EFFECT: FORMATION OF MICELLES AND BIOLOGICAL MEMBRANES.

C. TANFORD.

John Wiley and Sons, New York, 1973, *pp.* 200, *ISBN* 0–471–84460–8, 280 *baht.*

Biochemists and physical chemists familiar with Tanford's earlier classic *Physical Chemistry of Macromolecules* will not be disappointed with this small monograph which reflects the author's recent incursion into the field of biological membrane structure. Despite the historical roots associated with the study of transport processes across membrane it has only been within the past few years that one could discuss membrane structure that was related in any meaningful way to its function. Understanding of the structural basis of biomembranes came through the realization that the formation of lipid bilayer and the association of protein with it could be discussed in terms of the intermolecular forces involved in removing a hydrophobic molecule from an aqueous environment and replacing it in a non-polar one.

The book is divided equally between a discussion of the thermodynamics of of micelle formation, shape and size distribution, and then extends the analysis to the situation whereby protein is added to micelles composed of biological lipids. Within the confines of 200 (15 x 23 cm) pages, there is a mine of information, ranging from the structure of water, the reason for two-chain amphiphiles of phospholipid to form bilayers and not globular micelles, or the limitation of the fluid mosaic model (as suggested by S.J. Singer) to adequately account for membrane function. The lucid and nonmathematical presentation make for profitable reading by both the active researcher or the advanced student. For the latter, it should be noted that the glycolipid content of human erythrocyte is principally polyhexosides and gangliosides, whereas 80% of human myelin glycolipid is cerebroside and 20% is sulfatide (the converse is indicated in Table 12–1, p. 97.).

Prapon Wilairat

THERMODYNAMICS

ORDER AND CHAOS

STANLEY W. ANGRIST and LOREN G. HEPLER

Penguin Books, London, 1973, *pp.* 210, *ISBN* 014–02–15999, 27 *baht.*

This paperback is a simple and enlightening account of the Laws of Thermodynamics, their implications and applications. It begins by providing interesting and amusing anecdotes about some past protagonists in the field: Count Rumford must rank as the most

flowery character, Josiah Willard Gibbs as the most humble, and Julius Robert Mayer the most frustrated.

The book is abundantly illustrated and its treatment of the Laws is very relaxed. One learns about thermometers and temperature scales before being told the Zeroth Law, which appears so obvious that its triviality has to be negated by an analogy about a love triangle. The First Law is presented as a bookkeeper's delight. In this act of accounting, nature serves as the auditor who denies any violation which would lead to the non-conservation of energy. I find one particular application of the First Law captivating. Knowing the First Law, the authors show how one could use electricity, the ground reservoir of heat and the ambience to provide heating in winter and cooling in summer–all with a minimum expenditure of energy. Besides, other aspects of the First Law are discussed at length: the nature of the state functions, Hess Law, world energy consumption, combustion and metabolism of foodstuff, basal metabolic rate, food chain, etc. Entropy, the crux of the Second Law, is looked at from various angles: in terms of degraded energy, disorder, probability, and loss of information. The concept of equilibrium, dubbed as the "time arrow's target", is also excellently explained. In the process, the relationship between equilibrium constant, enthalpy, entropy and free-energy is given. Then Statistical Thermodynamics is discussed using, as examples, the distribution of particles in all possible energy levels. The Third Law is briefly mentioned. A simple diagram tells us how to approach the absolute zero by a magnetization-adiabatic demagnetization process. In the chapter entitled *Demons, Poetry, and Life,* the Demon is equipped with a headlamp shining negentropy, most European Humpty Dumpty's were *irreversibly* damaged after the fall, and living things feed upon the energy and negative entropy from the sun. The final chapter recapitulates the essence of previous chapters and carries us to the doorstep of Non-equilibrium Thermodynamics. Although the reading list at the end is far from comprehensive, it introduces the newcomer to books that will definitely broaden his scientific horizons.

For those who dread the sight of mathematics, this book should not scare them away. Although mathematical equations are included, these are so simple and well explained that the reader will never stumble over them. I would like to recommend this book for anybody who wants and needs some understanding of energetic concepts that have, so far, eluded him. Finally, those people who love juicy tidbits in science will find the footnotes and digressions very revealing as well as entertaining.

Bhinyo Panijpan

SCIENCE DEVELOPMENT

The Building of Science in Less Developed Countries

By Michael J. Moravcsik, Institute of Theoretical Science, University of Oregon, Eugene, Oregon, USA

The first comprehensive book dealing with this subject, it is both a survey and an assessment of the status and the future of science development in the emerging countries. With about 100,000 words and a bibliography of 500 sources, it can be used as a reference, as a textbook, or as a monograph. Its novel double structure allows either an introductory reading for the less involved, or a thorough, documented study for the specialist.

It is aimed at scientists throughout the world, at organizers and policy makers of science, at scholars and managers of international development assistance, at students of the problems of science and society, and at the public interested in having a glimpse at science in the making.

Table of contents:

1. Why Science in LDC's?
2. Education and Science
3. Manpower
4. Scientific Communication
5. Scientific Research
6. Planning, Policy, and Management of Science
7. International Aspects
8. The Big Intangible
9. Where Do We Go From Here?

The book will be published by the International Development Research Center of Indiana University, and an attempt will be made to supply free copies of the book to countries other than in Europe, United States, Canada, or Japan, on a first-come-first-served basis, one copy per request, until the supply is exhausted.

Expected publication date: Late Spring 1975.

Requests for copies should be sent to Dr. William Siffin, Director, International Development Research Center, Indiana University, Bloomington, Indiana 47401, USA.