of the relative merits of ectothermic and endothermic herbivory. For example, data in this volume show that iguanas have metabolic rates only 3 to 6 percent of those of mammalian or avian herbivores of the same size (Nagy, chapter 3) but that these rates may be maintained at the expense of activity: even breeding males spend 80 percent of their time sitting perfectly still, and the figure goes beyond 90 percent for non-breeding individuals (Dugan and Wiewandt, chapter 17).

The major problem with the present volume is that its organization and scope do not do justice to its subject matter. Most of the chapters focus on narrow aspects of the biology of one or two species. Many authors do not compare their results with those available for other iguanas, and sometimes authors seem unaware of relevant information contained elsewhere in the volume. There is considerable repetition of some themes (at least seven authors discuss their pet hypotheses for large size in iguanines), whereas some trends apparent to a perspicacious reader of the book are not discussed by any author (for example, reasons for the low reproductive output and strict breeding seasonality of iguanines as compared with other tropical lizards). The only attempts at integration are made by the editors, who provide a useful general introduction, and by four review chapters (out of a total of 23 chapters). The book provides the raw material for review of many aspects of iguana biology but provides finished reviews for only a few.

Another shortcoming of the book, which will probably hurt sales among nonherpetological readers, is the failure of many authors to point out the general significance of their results. For example, the section on digestive energetics, dietary physiology, and morphology would have benefited from a more complete comparison with the systems found in nonreptilian herbivores, and none of the chapters on reproduction, survival, or growth cites the burgeoning literature on the evolution of life-history strategies. With the exceptions of two reviews of iguanine mating systems, the lack of focus on broad issues of ecology, behavior, and evolution will make it difficult for the casual reader to evaluate the importance of the individual papers and of the book as a whole.

In one respect, however, the book is an unqualified success. One theme repeated by most of the authors and expanded in the final chapters of the book is that many of the species in this unique taxon are on the verge of extinction. Iguanas are not only losing habitat to a tide of human expansion, they also have the misfortune to be edible, and even when rare they continue to be hunted as a delicacy. In pointing out the importance of these animals and in showing how meager even our "state of the art" knowledge is on iguanas, the book makes an eloquent plea for their preservation. In addition, the information it contains should be invaluable for those responsible for protecting and managing the populations that still exist. Philanthropic individuals and organizations might be encouraged to send a copy of the book to individuals or government agencies in countries with endangered iguanas. Without a substantial preservation effort, the present volume could well be the last comparative book on iguana biology.

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Genetic Toxicology

Mutagenicity. New Horizons in Genetic Toxicology. JOHN A. HEDDLE, Ed. Academic Press, New York, 1982. xvi, 474 pp., illus. $55. Cell Biology.

Genetic toxicology, the use of mutagenicity, cytogenetic, and DNA-repair assays to assess the carcinogenic potentials of pesticides, drugs, food additives, environmental pollutants, and so forth, is a rapidly developing field. Short-term in vitro assays not only are far quicker and cheaper to perform than full-scale carcinogenicity tests with animals, they are also often useful methods for the study of molecular mechanisms, metabolic pathways, and so forth. Though a variety of fairly well standardized tests are now routinely used by many laboratories, new tests are developed each year, and all seem to have their advocates. Furthermore, interpretation of the results of genetic toxicology tests is not always straightforward. The quickest and cheapest tests, like the Ames *Salmonella* reverse mutation test, utilize prokaryotes, raising questions about the validity of the results as quantitative, and sometimes even qualitative, predictors of human hazard. Tests with higher eukaryotes, like *Drosophila* or mice, are far more expensive and time-consuming but are thought to yield data more directly applicable to human hazard prediction. Nevertheless, data on cells from humans themselves seem even more germane, so there are advocates of such test systems. Finally, of course, in vitro testing, even with human cells, cannot take into account questions of transport and metabolism in the human body, and systems for monitoring exposed populations directly for genetic end points in somatic cells, usually peripheral blood lymphocytes, are coming into general use.

In *Mutagenicity* Heddle has assembled a series of 16 papers by an international group of authors. The first five papers deal largely with bacterial assays, leading off with a thoughtful review by John Ashby covering the design, validation, and application of such assays. The other four papers discuss recent applications of such tests to specific subjects of concern: occupational mutagenesis and mutagenic substances occurring naturally during the preparation of food.

Three papers are devoted essentially to mammalian tissue culture assays. One covers the mutational assays. Another, by A. T. Natarajan and G. Obe, deals with cytogenetic assays. It is quite global, reviewing not only testing applications but basic cytogenetic theory, the use of cytogenetics to detect certain inherited human diseases, and certain applications to basic research. The third paper in this group reviews an end point not so obviously genetic, the in vitro transformation of the sort often referred to as "neoplastic."

Five papers deal with the detection of effects in exposed people. There are three on cytogenetic end points in lymphocytes; one on chromosomal aberrations, one a particularly nice discussion by Anthony V. Carrano and Dan H. Moore of the sister chromatid exchange assay, and one dealing with both end points as applied to monitoring occupational exposures. Albertini *et al.* review the mutational assay they have recently developed for thioguanine-resistant lymphocytes. The final paper in the group discusses the possibly controversial use of changes in numbers and form of spermatozoa as a means of detecting human exposures to genotoxic agents.

The final three papers deal with in vivo tests on higher eukaryotic organisms. In the first, Paul B. Selby describes his work with the dominant skeletal mutation method in the mouse. Another paper describes the use of plants as in situ detectors of atmospheric mutagens, and the last describes the similar use of fish for detecting aquatic mutagens.

It is perhaps not surprising in a volume subtitled "New Horizons" that coverage of genetic toxicology is quite uneven. Many currently important systems, for example those using *Drosophila* and many using mice, are not discussed at

all. Furthermore, the coverage of some of the methods that are discussed is quite uneven, with some methods only lightly touched upon and others dealt with, somewhat redundantly, in several papers. Nevertheless, the editor has succeeded in assembling a volume that will be interesting and useful to those concerned with the directions genetic toxicology is taking and particularly with developments in cytogenetics and in vivo monitoring in human populations. The book is nicely produced, with only a few errors, and includes a useful index.

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A Brain-Gut Peptide

Neurotensin, Brain and Gastrointestinal Peptide. Papers from a conference, New York, March 1982. CHARLES B. NEMEROFF and ARTHUR J. PRANGE, Jr., Eds. New York Academy of Sciences, New York, 1982. x, 444 pp., illus. Cloth or paper, $80. Annals of the New York Academy of Sciences, vol. 400.

Neurotensin, a tridecapeptide (that is, having 13 amino-acid residues), is a prototype of a new class of biologically active peptides found in neurons and endocrine cells of the brain and gastrointestinal tract. This readable and carefully edited volume discusses current experimental and clinical data accumulated in more than a dozen laboratories around the world. In the first two papers Carraway and Leeman record the discovery in 1973 of neurotensin in extracts of bovine hypothalamus and the subsequent characterization of an identical peptide in mammalian gut, including human gut. Twenty-four additional papers and 28 "poster" abstracts describe in considerable detail the anatomic distribution of the peptide in brain and gut and its physiologic and pharmacologic effects on blood pressure, vascular tone, and gut motility. Several papers deal specifically with the effects of neurotensin on the neuroendocrine and central nervous systems. Of the latter effects, emphasis is given to the ability of neurotensin to induce hypothermia, to cause changes in motor activity, and to elicit other behaviors, all subjects studied in some depth in the laboratories of the two editors.

Neurotensin has a widespread distribution in the brain and gut. In the CNS, it is found in highest concentrations in the hypothalamus, limbic system, and basal ganglia. It is also found in neurons of the dorsal horn of the spinal cord, where it is suggested to play a role (antinociceptive) in the transmission of pain. In the gut, neurotensin is found principally in secretory cells of the mucosal layer, particularly in the ileum and to a lesser extent in the jejunum, with only traces in the stomach and duodenum. Whether it exists also in intrinsic nerve fibers of the gut in avian species is disputed; evidence for such a site in mammals is lacking. Unusual and unexpected sites of neurotensin immunoreactivity include the thymus of avian species and the adrenal medulla of mammalian species. Of interest to the clinician is the common presence of neurotensin in tumors of the pancreas that are derived from neuroectoderm and in some medullary carcinomas of the thyroid gland. One of the current enigmas in clinical endocrinology is that patients with tumors that secrete neurotensin and with high levels of the peptide in the blood seem to have no adverse symptoms at all.

A coherent view of the physiologic roles of neurotensin is still not to be found. Kitabgi describes elegant in vitro experiments showing effects of neurotensin on intestinal smooth muscle. In the guinea pig ileum, neurotensin causes contraction by complex effects that include direct stimulation of muscle receptors and stimulation of nerve fibers containing acetylcholine and perhaps substance P. In the rat, neurotensin elicits relaxation of the longitudinal muscle of the duodenum and ileum. Rioux and colleagues review the effects of neurotensin on the cardiovascular system, where it elicits mild hypertension and chronotropism. There are prominent differences among species in the effects of neurotensin on the cardiovascular system. Both myogenic and neurogenic effects on the heart are postulated to occur.

It is in the reviews of the effects of neurotensin on the CNS that it becomes apparent how much information is yet required to provide a true understanding of the biological importance of neurotensin. Administration of neurotensin directly into the brain or cerebral ventricles elicits a number of effects, including alterations in the secretion of anterior pituitary hormone, changes in the responses of the autonomic nervous system, and perturbations in the regulation of body temperature. Although the last paper, by the editors, attempts a synthesis of the peptide's physiological role in the CNS, it leaves the reader unconvinced that sufficient information is currently in hand to explain the often overlapping, redundant, and inconsistent experimental results reported. A lack of information is common with current descriptions of the brain peptides. In the case of neurotensin, no information is available on the biosynthesis and cellular processing of the peptide, the molecular basis of its action, or the biochemical nature of the binding sites found in several tissues.

This volume will be useful to investigators interested in molecules that are synaptically active, to the brain-gut community, and to the neurobiologist or endocrinologist who wishes to review the latest in pharmacologic neuropeptide research. The volume will not hold the attention of the general biologist or the clinician who is unfamiliar with the general techniques and approaches used in the investigation of peptides.

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Books Received

Applied Probability-Computer Science. The Interface. Papers from a conference, Boca Raton, Fla., Jan. 1981. Ralph L. Disney and Teunis J. Ott, Eds. Birkhäuser, Boston, 1982. Two volumes. xxviii, 504 pp., and xiv, 500 pp. Each volume, $34. Progress in Computer Science, No. 2.

The Aquatic Ape. Elaine Morgan. Stein and Day, New York, 1982. 170 pp., illus., + plates. $14.95.

Aquatic Biota of Mexico, Central America and the West Indies. Being a Compilation of Taxonomic Bibliographies. Stuart H. Hurlbert and Alejandro Villalobos-Figueroa, Eds. San Diego State University, San Diego, Calif., 1982 (available from S. H. Hurlbert, Department of Biology, San Diego State University). xvi, 530 pp. Paper, $20.

BASIC Programming for the Classroom Teacher. Joan M. Miller, Ruth King Chaya, and Debra J. Santora. Teachers College Press, New York, 1982. xvi, 262 pp. Spiral bound, $15.95.

The Best Science Films, Filmstrips, and Videocassettes for Children. Kathryn Wolff, Joellen M. Fritsche, and Gary T. Todd, Eds. American Association for the Advancement of Science, Washington, D.C., 1982. xiv, 140 pp. $12.95.

Biochemical Approaches to Aging. Morton Rothstein. Academic Press, New York, 1982. xiv, 314 pp. $39.50.

Computed Tomography of the Head and Spine. A Photographic Color Atlas of CT, Gross, and Microscopic Anatomy. H. N. Schnitzlein, Edith Wright Hartley, F. Reed Murtagh, Laurence Grundy, and John T. Fargher. Urban & Schwarzenberg, Baltimore, 1983. x, 118 pp. $59.

Computer Simulation and the Statistical Mechanics of Adsorption. D. Nicholson and N. G. Parsonage. Academic Press, New York, 1982. xvi, 398 pp., illus. $55.

Enumerative Geometry and Classical Algebraic Geometry. Patrick Le Barz and Yves Hervier, Eds. Birkhäuser, Boston, 1982. x, 256 pp. $20. Progress in Mathematics, vol. 24.

Environmental Pathology. An Evolving Field. Papers from two conferences, Aspen, Colo., 1979 and 1980. Rolla B. Hill and James A. Terzian, Eds. Liss, New York, 1982. x, 376 pp., illus. $60.

Evaluation and Management of Hospital Infections. Papers from a symposium, Noordwijkerhout, Netherlands, Mar. 1982. Ralph van Furth, Ed. Nijhoff, The Hague, 1982 (U.S. distributor, Kluwer Boston, Hingham, Mass.). xii, 266 pp., illus. $39. New Perspectives in Clinical Microbiology 5.

Health and Human Values. A Guide to Making Your Own Decisions. Frank Harron, John Burnside, and Tom Beauchamp. Yale University Press, New Haven, Conn., 1983. xvi, 196 pp. Cloth, $24.95; paper, $6.95.

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