The reader who expects to find suggestions for sites to explore, or to mine, will be somewhat disappointed. Cronan has, wisely or unwisely, avoided recommendations for exploration targets. On the other hand, for the scientist engaged in exploration, he has provided the finest synthesis of information on the principal marine minerals, and in some cases ores, that has been published since H.M.S. *Challenger* scientists first discovered manganese nodules on the deep sea bed over a century ago. The book is readable, the discussion is well documented, the figures are crisp and clear, and the references are pertinent and up to date. Whether our interest in marine mineral deposits is the discovery of new resources in a metal-hungry world or simply the science of mineral genesis of such deposits, Cronan's book is the best idea factory on the subject to date.

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Brain Peptides

The Role of Peptides in Neuronal Function. JEFFERY L. BARKER and T. G. SMITH, Jr., Eds. Dekker, New York, 1980. xvi, 768 pp., illus. $95.

During the past decade the number of different chemicals thought to act as messengers transmitting information between neurons within the brain has increased dramatically. This has been due to the discovery of a new class of possible neurotransmitter candidates, the neuropeptides. Almost 30 small peptides have been found to occur within neurons and nerve endings in the mammalian central nervous system, and the peptides now heavily outnumber the ten or so previously described amine and amino acid transmitter candidates. Most of the brain peptides are substances previously described as hormones in the periphery, now appearing in new guise within the nervous system. The present volume, the proceedings of a meeting held in 1980, is the latest progress report on this rapidly growing field.

In planning how to cover this large and diverse area of research, one has the alternatives of dealing with the subject in terms of individual peptides or by more general reviews of various aspects of research strategy. In this volume both approaches have been used. Thus, the first half of the book consists of a series of reviews of general strategies for neuropeptide research, including coverage of the immunohistochemical and chemical analytical techniques that have been fundamental to much of the progress made so far. There are also reviews of peptide biosynthesis and release and of the use of electrophysiological techniques for studying peptide actions on single cells, both in vivo and with neurons in tissue culture.

The neurohormones vasopressin and oxytocin are the first known examples of "neuropeptides" synthesized by neurons in the hypothalamus and released into the blood from the terminals of these cells in the neural lobe of the pituitary gland. These peptides are now also known to exist in nerve endings within the brain and spinal cord, where they may serve different functions. The neurosecretory neurons of the hypothalamic-neurohypophyseal system, however, continue to serve as excellent and thoroughly documented models for understanding the general properties of peptidergic neurons. It is not surprising, therefore, to find no fewer than four chapters devoted to this topic, with good reviews of the biosynthesis (J. T. Russell *et al.*), release (J. J. Dreifuss *et al.*), and behavioral actions (R. Walter *et al.*) of vasopressin and oxytocin and of the electrophysiological properties of the hypothalamic neurosecretory neurons (J. D. Vincent *et al.*). Nor is it inappropriate that the opioid peptides, enkephalin and endorphin, receive similarly extensive coverage, with chapters on opiate receptors and endogenous opioids by H. W. Kosterlitz, W. A. Klee and R. A. Streaty, and P. G. Nelson *et al.* and a discussion of the behavioral pharmacology of the opioid peptides by J. W. Lewis *et al.* Other chapters deal with vasoactive intestinal polypeptide, cholecystokinin and bradykinin, hypothalamic releasing hormones, neurotensin, substance P, and some of the numerous peptides found in invertebrate nervous systems.

More than a dozen similar symposia have been held during the past two years; there have also been excellent reviews of the subject (see, for example, S. H. Snyder, *Science* **209**, 976 [1980]), and two new journals exist to cater exclusively to papers on neuropeptides. The reader may reasonably wonder whether there is not already something of a glut in this particular market, and one suspects that the present volume will appeal mainly to those directly involved in neuropeptide research. It can be criticized for the somewhat xenophobic selection of authors (22 of the 29 chapters are from laboratories in the United States, eight from the National Institutes of Health), but geographical balance can be restored by consulting the complementary volume, *Neuroactive Peptides*, arising from a meeting held at the Royal Society, London, also in 1980 (*Proc. Roy. Soc.* B. **210**, 3). The present volume contains a great deal of useful and up-to-date information and could certainly serve as a useful source book for those interested in finding out more about any aspect of this new growth area of neuroscience.

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