

... Pituitary

schizophrenics who had not benefited from conventional drugs. One was a 19-year-old female suffering from hallucinations and delusions and engaging in magic rituals. After six days of receiving the analog, her psychotic symptoms vanished and didn't return when she stopped taking the drug. On the basis of these findings, the researchers concluded, "a controlled trial seems justified."

A number of psychopharmacological effects for methionine enkephalin (and for a related brain protein with only one amino acid difference — leucine enkephalin) have also been noted in animals. After the enkephalins were identified in 1975 by John Hughes and Hans Kosterlitz of the University of Aberdeen in Scotland, American, Swiss and British investigators reported what investigators had been hoping for — that the enkephalins are indeed the brain's own natural pain-relieving molecules (natural morphine, so to speak). In 1976, Candace B. Pert and colleagues at the National Institute of Mental Health revealed that an enkephalin analog caused profound, long-lasting pain relief when injected into rats. Last year Kastin and David Coy developed an enkephalin analog that relieved pain in rats for a period 30 times longer than the natural enkephalins could. They also found that methionine enkephaline can improve learning in rats (SN: 7/23/77, p. 59). And earlier this year, the natural enkephalins

were found to have three more psychopharmacological effects on rats — the ability to induce pleasure, trigger epilepsy and reduce memory loss (SN: 4/29/78, p. 280).

That scientists have documented so many fascinating and largely beneficial psychopharmacological effects for various beta-lipotropin segments, of course, does not make these segments available at the corner drugstore. Before that happens, the protein segments must be approved as drugs by the Food and Drug Administration and marketed by a drug company. Fortunately for those eager to obtain the proteins, pharmaceutical companies are already actively exploring the marketing potential of various proteins and of their analogs.

Scientists at Sandoz Ltd. in Basle, Switzerland, for instance, synthesized a number of compounds similar to the natural enkephalins but with much greater stability. They have zeroed in on one compound — FK 33-824 — because it showed good pain-relieving activity in animals after being given orally. They are now testing this compound in human subjects to see how well it relieves pain, whether it produces addiction and tolerance like the natural enkephalins do, and whether it triggers any other psychological or behavioral effects. Researchers at Eli Lilly and Co. in Indianapolis have also designed a number of enkephalin analogs that they hope will be more stable than the natural

molecules but will relieve pain just as well. They are now testing the most promising analog in mice. Investigators at Burroughs-Wellcome Co. in Research Triangle Park, N.C., are likewise pursuing the ideal analog of the pain-relieving enkephalins. So far they have shown that some of their analogs, if given orally or by injection, can get through the brain's blood-brain barrier and relieve pain.

Taking these drug company efforts into account, as well as the usual decade lag time between discovery and marketing of a new drug, it's quite possible that one or more beta-lipotropin segments, or their analogs, might become commercially available within the next 10 to 15 years. This certainly is the view of Kastin, Kline and some other scientists in this field. In fact, Kastin predicts that more psychopharmacologically active pituitary proteins may pop up as well, because the first amino acid stretch of beta-lipotropin has not yet been examined with that goal. Also, there are indications that beta-lipotropin may be part of an even larger pituitary gland chemical, one three times its size (SN: 7/2/77, p. 6; 2/18/78, p. 102). If this is indeed the case, then one can visualize segments of this protein, upon injection, producing still a new welter of psychopharmacological effects. Sound preposterous? Sure it does. But no more so than what has already happened with that marvelous molecule discovered by Li 14 years ago. □

BRAIN BOOKS

New Listing

PROGRAMS OF THE BRAIN — J. Z. Young — Oxford U Pr, 1978, 325 p., illus., \$14.95. Written for the layman and the scientist by an emeritus professor at University College, London, this book shows how various parts of the brain work together to produce a unified operating system, based on the hypothesis that the most important acts of human life are responses to other people. In order to talk about how recent research in neuroscience can help in our daily lives, the author chooses the analogy of a program, indicating that the lives of human beings and other animals are governed by sets of programs written in their brains and genes. [1]

Recent Neuroscience Books that have been of special interest to SCIENCE NEWS Readers

THE DRAGONS OF EDEN: Speculations on the Evolution of Human Intelligence — Carl Sagan — Random, 1977, 263 p., illus., \$8.95; paper, \$2.25. A better understanding of the nature and evolution of human intelligence might help us to deal with the future as well as aid us in our quest for extraterrestrial intelligence. [2]

MECHANICS OF THE MIND — Colin Blakemore — Cambridge U Pr, 1977, 208 p., illus., \$24.50; paper, \$7.50. A review for the layman of the current state of knowledge about the human brain, profusely illustrated and including the history of research in this area. Based on the 1976 Reith Lectures broadcast on BBC radio. [3]

MIND AND SUPERMIND: A Saturday Review Report — Albert Rosenfeld, Ed. — HR&W,

1977, 296 p., \$9.95. Articles about the human brain that originally appeared in SATURDAY REVIEW. Organized in three sections, Expanding the Limits of Consciousness, Inside the Brain and The Spectrum of Psychotherapy. [4]

THE MINDFUL BRAIN: Cortical Organization and the Group-Selective Theory of Higher Brain Function — Gerald M. Edelman and Vernon B. Mountcastle — MIT Pr, 1978, 100 p., drawings, \$10. Two papers that examine from different directions the relationships that connect the high brain function — learning, thinking, memory — with what goes on at the most basic levels of neural activity, with particular stress on the role of local neuronal circuits. [5]

THE MYSTERY OF THE MIND: A Critical Study of Consciousness and the Human Brain — Wilder Penfield — Princeton U Pr, 1978, 123 p., drawings, paper, \$3.45. This book, written by a neurosurgeon for the layman interested in an understanding of the brain and the mind, was originally published in 1975. Now in paperback. [6]

THE ORIGIN OF CONSCIOUSNESS IN THE BREAKDOWN OF THE BICAMERAL MIND — Julian Jaynes — H-M, 1977, 478 p., drawings, \$12.95. Recent laboratory studies with the brain's hemispheres and study of archaeological evidence are the bases of this psychologist's hypothesis that contemporary consciousness is not the product of animal evolution but of human history and culture. The author concludes with deductions to explain some modern phenomena. [7]

THE PSYCHOBIOLOGY OF MIND — William R. Uttal — LEA (Halsted Pr), 1978, 785 p., illus., \$29.95. This book reviews the history, restates the issues, acknowledges the difficulties and surveys the present empirical knowledge in its attempts to elucidate conceptual foundations for the science concerned with the relation of the mind and the body. [8]

THE PURPOSIVE BRAIN — Ragnar Granit — MIT Pr, 1977, 244 p., drawings, \$12.50. Explains and integrates two major brain systems — the physiology of vision and the control of motor activity. Visual perception is seen as an input system, motor control as an output system with the goal-oriented brain mediating between. [9]

YOUR BRAIN AND NERVES — J. Lawrence Pool — Scribner, rev. ed., 1978, 211 p., drawings, paper, \$3.95. A neurosurgeon discusses for the layman nerve and spinal injuries, skull and brain injuries, the aching back and head, brain tumors, strokes, neuromuscular disorders and other neurological problems. Includes the recent strides made in research in this field. [10]

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