

papers. Van der Drift and Kok utilize EEG to assess the effects of intracerebral steal, whereas Torres and Ellington describe EEG changes due to carotid compression and associated blood pressure alterations. The latter findings are in general agreement with those reported previously.

The present volume is beautifully illustrated and many, but not all, of the papers have adequate bibliographies. The discussions are of particular interest, but unfortunately some of the sections give only a summary of the exchange, rather than a verbatim account. On the whole, this is a very worthwhile report that provides an internationally representative sample of current research on cerebral circulation. It is highly recommended for specialists in the field but should also be valuable to clinicians and scientists in related disciplines.

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*Electroenceph. clin. Neurophysiol.*, 1972, 32: 718-719

**Psychophysiology of learning and memory.** — E. Maggio. (C. C. Thomas, Springfield, Ill., 1971, 180 p., \$10.00).

The biographical notes accompanying "Psychophysiology of Learning and Memory" indicate that the author is an Italian otolaryngologist and biochemist who turned his interests to psychiatry a few years ago, after two decades in professional life. Involved in his psychiatric residency, he gave a lecture on learning and memory at the New Jersey State Hospital in 1968. From this his interest grew, motivating him to summarize what he had read and learned and to write the present volume. Both the strengths and weaknesses of this book derive in a straightforward fashion from this somewhat unusual background.

The book is organized into traditional sections in which the psychological, anatomical, physiological and biochemical aspects of memory and learning are reviewed. This is difficult reading, not so much because the concepts are complicated but because the writing is not in idiomatic English and, at times, becomes almost incomprehensible. The author often uses Ciceronian periodic sentences whose length taxes the short-term memory of the reader. The exposition of each section deviates from the straight-line approach of didactic scientific writing, digressing into areas that allow the author to dwell on tangentially relevant topics that especially interest him. Here he takes certain liberties, and it is not always clear which statements represent the author's opinions and which are established facts.

Conceptually, Dr. Maggio takes a number of eccentric positions. For example, he states in the preface that, "... learning and memory are not approached from the clinical standpoint. . . because the study of learning and memory alterations does not contribute significantly to the understanding of the mechanisms of normal function". This extraordinary statement is certainly far from the view of many investigators who have found the memory loss of patients with hippocampal lesions or with transient global amnesia to provide invaluable insights. Elsewhere, there is a rather confused description of memory impairment in

epilepsy in which *déjà vu* and *jamais vu* phenomena are somehow combined with the retrograde amnesia that may follow a seizure.

After considering the scientific bases of memory, the author attempts to integrate the information into a unifying concept. He states, "The electrical and biochemical events may integrate each other when one considers that the newly synthesized (*sic*) protein formed during learning and accounting for the memory storage may constitute an electrogenic material responding to electrical fields of brain tissue; it may also undergo conformational changes, activate chemical transmitters, alter the physico-chemical state of synapses, and be incorporated in the cell membrane in a stable configuration". Although this sounds *au courant*, numerous re-readings have failed to reveal to this reviewer more than a vague understanding of what the author had in mind, although he has apparently touched as many bases as possible. Elsewhere, he surprisingly concludes that a holographic model of memory (based on an analogy with the holographic pictures produced by interference effects with a coherent light source) is a *probable* model for human memory, rather than a barely explored (if intriguing) possibility.

Over-all, "Psychophysiology of Learning and Memory" is flawed by its literary style and unevenness of content. Although much of it represents solid library scholarship, some of it is less authoritative; to distinguish the two requires considerable background on the part of the reader. It is a sincere and scholarly effort, however, clearly printed, and with a bibliography that may be of value to interested students of memory.

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*Electroenceph. clin. Neurophysiol.*, 1972, 32: 719

**Neuroscience. A laboratory manual.** — J. E. Skinner (W.B. Saunders, Philadelphia, 1971, 244 p., £2.95).

Until one reads the *Foreword* by Donald B. Lindsley, the format and contents of this book are puzzling and confusing. We are told that the book just grew, as did the author's course of scientific development and study. As a result, this is not a comprehensive manual. Unfortunately, what *is* included is not always presented with good writing and organization.

The first chapter on electrical activity in brain discusses neuron anatomy, membrane electrophysiology, genesis of the EEG and evoked potentials. Instructors and students may well find this chapter to be of questionable value. Ambiguous statements and inaccuracies are easily found. A few examples will be illustrative. In speaking about the local response on the membrane the author says, "The potential does not regenerate and propagate but remains locally on the membrane where it is initiated". It is stated that local responses, "... tend to depolarize the membrane potential", or "... hyperpolarize the membrane potential". To say that muscle receptors detect muscle stretch is incorrect. In this chapter and elsewhere it is said that the central ner-

vous system does not include the spinal cord. Frequently "nerve" is used when an axon or nerve fiber is meant.

The second chapter is unusual in that it contains a guide for dissection of cow and sheep brains. There are coronal and sagittal sections, colored sections and sections to be colored. Also included, without heading or rationale, is a rat brain atlas in color and with uncolored sections. The sections are small, but the atlas is reproduced again in larger size in the last chapter. This is a useful and good chapter, but one is annoyed by the poor organization.

A third chapter is on surgery and histology of the rat brain. There are many good figures, tables and drawings. The section on histology will be useful for many, and the discussion of the economical hand-held microtome is amply illustrated.

The basic electronics discussed in Chapter four are illustrated with mostly good figures. All too frequently, though, figures and captions are allowed to stand alone without text discussion and, because of this, a beginning student is likely to find additional material necessary for an adequate introduction to electronics as presented here.

Many useful devices and techniques are to be found in Chapter five. There is an especially good section on cryoprobes and systems. Most devices, although not so stated, are for use with the rat. Again, good organization of the material is lacking. The author should not be severely criticized for the many techniques he didn't include, but in this reviewer's opinion, several important omissions would seem appropriate for inclusion in this chapter. Not mentioned are such things as the widely used Nichrome wire for inexpensive electrodes, low noise wire and cables for chronic

recording, quick fill technique for capillary micro-electrodes, types of surface or stimulating electrodes, and simple chronic unit recording techniques for use with the rat.

The final chapter contains a new rat brain atlas. The author has made his own atlas by using brain tissue perfused and fixed with 40% formaldehyde, which reduced shrinkage to 6%. Coronal sections are 0.5 mm apart. A cross check with other atlases showed differences in locations of some selected structures to be 0.25 to approximately 1.0 mm.

Other than minimal shrinkage of tissue used for the atlas, two other advantages claimed by the author, extension of coordinates posteriorly into the medulla and two sets of reference points for each section, are already found in one other atlas. There are several glaring redundancies in the organization and writing of this chapter as there are elsewhere in this book. For example, a section titled, "Nomenclature" on one page is followed by another 6 pages later.

Most who have taught the subject matter and techniques depicted in this manual will probably have mixed feelings about Skinner's presentation. On the whole, though, it should prove to be a useful manual for a beginning graduate student in the brain sciences. The annoyances of inaccuracies and poor organization and writing can be mostly overlooked, with the possible exception of the first chapter. The many good figures, drawings and the atlases make the book worth the price.

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*Electroenceph. clin. Neurophysiol.*, 1972, 32: 719-720