

BOOK REVIEWS

edited by H. PETSCHÉ and JOHN R. HUGHES

Integration in the nervous system. — H. Asanuma and V.J. Wilson (Eds.) (Igaku-Shoin, New York, 1979, 357 p., U.S. \$ 52.50)

This volume is a collection of papers presented at a symposium held at Rockefeller University in 1978 in honor of David P.C. Lloyd and Rafael Lorento de NÓ. The focus of the presentations is upon integrative mechanisms at various levels of the nervous system, including spinal cord, vestibular system, as well as some sensory and motor systems involving cortical mechanisms. The participants are well respected investigators who have worked in this area for many years.

Anatomical and physiological techniques are skillfully interwoven to develop cohesive concepts. For example, Burke and his colleagues have investigated the detailed anatomy of Ia sensory afferents within the spinal cord. They have been able to make direct counts of functionally identified and anatomically labeled Ia synapses impinging on similarly identified motor neurons. Based on their data they raise the possibility (along with other investigators) that under normal conditions action potentials will sometimes fail to invade some branch points of the axon. This may have theoretical implications in the study of epilepsy. Specifically, efforts to explain neuronal synchrony could invoke an increase in conduction efficacy at branch points as one of the pathophysiological changes in the disorder.

In another work by Asanuma and his colleagues, the afferent input to the motor cortex was examined to determine if such input was transferred from sensory cortex or was directly transmitted to the motor cortex from the thalamus. Using HRP labeling, intracortical microstimulation and evoked potentials, it was shown that at least some somesthetic information was delivered directly to the motor cortex from the thalamus rather than from the sensory cortex.

In general, this volume is an excellent source for review of current physiological concepts. Much of the information that would be of interest to readers of the *EEG Journal*, however, is not easily identified simply by scanning the titles of the individual presentations. Although it is doubtful that this symposium will provide directly applicable information to those engaged in clinical studies, there is also no question that it should serve as a good resource for the research physiologist.

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Current practice of clinical electroencephalography. — D.W. Klass and D.D. Daly (Eds.) (Raven Press, New York, 1979, 544 p., U.S. \$ 45.00)

The information contained in this substantial volume covers the technical, normative and electro-clinical correlative aspects of electroencephalography deemed important to the practice of EEG by ten of the foremost teachers and practitioners in the field. The text is strongly supported by a profusion of instructive illustrations. The index is not exhaustive but generally adequate.

The organization of the material derives in part from the fact that the editors and the authors of the individual chapters have been closely associated with the annual continuation courses on EEG sponsored by the American Electroencephalographic Society. Thus, in addition to sections organized along standard lines — polarity convention, principles of localization, artifacts, parameters of the normal EEG, the use of EEG in epilepsy, activation procedures, and others — there are chapters devoted to such topics as optimal display of EEG activity, EEG in the evaluation of headache, and EEG patterns of uncertain diagnostic significance, giving emphasis to special areas of importance.

The technically oriented material, comprising almost one-third of the text, is provided by R.G. Bickford, R.J. Ellingson, C.E. Henry, R.L. Mulsby and M.G. Saunders. While it is outstanding in completeness for the most part, the lack of systematic coverage of relevant basic electronic concepts and principles of operation of the EEG machine might lead the student to thinking erroneously that a grasp of this type of knowledge is unessential for the clinical practice of EEG.

The chapters on the normal EEG in adults and children by P. Kellaway and the EEGs of premature and full-term newborns by R.J. Ellingson deserve careful study. These contain the essential information required to distinguish between normal and abnormal EEG patterns in the young. The emphasis on the range of variability of such patterns as anterior theta activity, posterior slow waves, hypersynchronous slow activity of drowsiness, vertex waves, fast activity during sleep, and positive sharp occipital transients of sleep in normal children is well taken. Similar attention is given to temporal transients in adults. The use of the term, 'asymptomatic,' in legends of illustrations to describe the subject from which a sample of ostensibly normal but atypical EEG pattern is obtained results in a question, nonetheless, as to the precision with which certain patterns can be classified.

The possibility that the apparent frontal "spikes" might represent pickup of 14 and 6 c/sec positive discharges by the ear reference is not mentioned in relation to an illustration of "spike-like components" in an "asymptomatic" drowsy child. The pitfall of the active ear reference is amply covered elsewhere, however. A cautionary note that the age limits given for manifestation of the various EEG patterns of pre-matures should not be followed rigidly in assessing the normality or abnormality of the record is worth stressing.

The closely reasoned discussion by D.D. Daly on the use of EEG in the diagnosis and evaluation of epileptic seizures and nonepileptic episodic disorders contains a wealth of useful information and is extensively referenced. It suffers some from its basic organization which requires that clinical entities be discussed under headings designating particular electrophysiological phenomena. Thus one finds that the clinical correlative material included in the section devoted to 3 c/sec spike-and-slow-wave ("classical") complexes is focused largely upon its association with clinical absence with only indirect reference given to its occurrence in interictal EEGs of epileptics with generalized motor convulsions. An early admonition that "no electrical event is unique to a particular type of seizure" does much to counter any misconceptions that might arise. The EEG changes associated with brain tumor are extensively documented along with their pathophysiological significance by E.S. Goldensohn. Metabolic conditions and toxic states are well covered by M.G. Saunders and B.F. Westmoreland. Additional but limited material on drug effects is found in a chapter by M.D. Low devoted to the use of the EEG in psychiatric disorders. Regrettably, the treatment of EEG changes in cerebral disorders other than epilepsy and brain tumor is, on the whole, quite abbreviated. As an example, the index entry, "Cerebrovascular disease," refers the reader to a single short paragraph contained within a brief section entitled "Degenerative Conditions." The lack of a reference to Reye's syndrome is also surprising in view of the extensive use of the EEG in this condition. R.G. Bickford capably handles two assignments, one, "Activation Procedures and Special Electrodes," the other, "Newer Methods of Recording and Analyzing EEG's." The material on the neurophysiologic substrates of EEG activity by E.S. Goldensohn provides a satisfying conceptualization of the generation of normal and epileptiform EEG waves including the role of the thalamus. M.D. Low's chapter on event-related potentials serves as a brief introduction to the rapidly growing literature on their clinical applications.

This book can be highly recommended for its broad and authoritative coverage of the essentials of clinical electroencephalography to students, both professional and technical, and to current practitioners

of the discipline. It will also be useful to individuals concerned with clinical correlative aspects of electrographic data, particularly in relation to epilepsy, syncope, headache, neoplastic lesions, and metabolic and toxic disorders. Neuroscientists will find extensive basic information on normal and abnormal electrocerebral activity over the entire human life span. It is an opportune reminder, in this day of availability of a multiplicity of diverse noninvasive technologies for investigation of brain function, that electroencephalography remains the major source of functional data beyond direct patient observation. The wide scope and peculiar complexity of these data underscore the crucial need for expansion of full-time training programs in order to insure a high general level of medical EEG practice.

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Sensory integration in children. Evoked potentials and intersensory functions in pediatrics and psychology. — T. Shipley (Thomas, Springfield, Ill., 1980, 154 p., U.S. \$ 15.50)

This book represents an extension of the timely topic of evoked potentials into the pediatric population and deals especially with intersensory responses. The account that follows on intersensory functions can be considered both the strength and the weakness of this book. Although a pioneer in this new discipline, Shipley has not been able to present sufficient data to convince the very discriminating reader, especially since he depends too much on a few illustrative cases. In a field well known for variability, the evoked potential of a few patients with a given diagnosis is only the beginning of a study and should only illustrate a point developed from the statistics of many patients with that same diagnosis. On the other hand, the author should be complimented for presenting some data on intersensory integration, an area which will clearly develop in the future, since large numbers of children exist who can process information separately from two modalities, but cannot when those modalities are simultaneously presented.

This volume is divided into 5 chapters. The first one deals with theory and application and is written for the novice who knows virtually nothing about evoked potentials. The next section is entitled 'Multi-sensory evoked cortical potentials in clinical pediatrics' and features a number of case reports. The third chapter is the heart of the book since it deals with intersensory functions. The penultimate chapter describes some interesting behavioral tests in cognitive intersensory function while the last chapter is a