Reviews

Structure of the human brain: a photographic atlas by S J DeArmond, M M Fusco, M M Dewey; Oxford University Press, New York, 2nd edition, 1976, 186 pages, £5.95

As a reference atlas of the human brain, this volume has much to recommend it. It contains about eighty large photographs of the brain in surface view or section, with associated labelled diagrams. There are many interesting and unusual sections, including close-ups of points of importance. The spinal cord and parts of the brain stem are shown in both fibre and cell body stains, and the parasagittal and horizontal sections of the brain stem are a welcome complement to the more usual transverse views. The atlas is comprehensive yet clear, and is well-indexed.

There are, however, a number of faults, both major and minor. This edition includes an excellent new chapter on computerized tomography, in which sections of the brain are shown cut in the same planes as are commonly examined in brain-scanning. The authors make the crass mistake, however, of putting this chapter near the beginning of the atlas, where it is not only out of place, but where it messes up all the cross-references between the figures in the rest of the book, which have not been corrected to allow for this. The reader’s comprehension of the layout of the telencephalon would be aided by unmagnified views of transverse sections in addition to these near-horizontal ones. Indeed, the atlas often fails to give an overall perspective on the shapes of large structures such as the lateral ventricles and the hippocampus (you can’t see the brain for the nuclei?). In the photographs, the brain is almost completely denuded of blood vessels, which will please the pure neuroscientist, but might be considered a disadvantage by the clinician. The diagrammatic illustrations of the blood supply in the final chapter go some way towards making up for this, and their comparison with the angiograms is another good feature of the atlas. Some of the minor errors include the labelling of the oculomotor nerve as nerve VI in figure 3, and the description in figure 20 of the sacral parasympathetic nucleus as the sacred parasympathetic (which is a matter of belief, I suppose!). Nor is the index free from error: for instance, different sets of page numbers are given for ‘locus ceruleus’ and for ‘nucleus of locus ceruleus’.

This book is an excellent reference manual for looking up the locations of brain nuclei, and for interpreting brain scans and angiograms. It does not concern itself with functional anatomy or practical dissection. Even with this limitation in mind, it is good value for its price.

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Visual evoked potentials in man: new developments edited by J E Desmedt; Clarendon Press: Oxford University Press, Oxford, 1977, 558 pages, £21.00

An old problem, that of human visual perception, has been approached during the last three decades by a new methodology, that of evoked potentials (EPs), used to study brain electrical activities time-locked to various discrete stimulus or subject conditions. Visual Evoked Potentials in Man is a most comprehensive attempt to present in a single volume the areas covered and the results obtained by this new approach in recent years.

The volume has its origin in the Brussels Symposium on Cerebral Evoked Potentials in Man, in 1974. Neither the Symposium nor the book itself could be considered as a teaching exercise. The idea was for an opportunity to be created where scientists active in the field of human brain physiology could meet and discuss their technological and conceptual problems and results. These discussions have for the most part been incorporated by individual contributors in the final presentation of their particular topic as a chapter of the book. The thirty-five chapters address five main topics, the largest coverage being afforded to the topics of perceptual correlates of EPs with the eye(s), either steady or during movement, and to the clinical applications of EPs. The methodology of EP recording and analysis has been given relatively little space and even less has been allocated to the neurophysiological origins of the scalp-recorded macropotentials. The use of
visual EPs to study cognitive aspects beyond the psychophysical characteristics of visual perception has not been dealt with at all.

The scope and value of visual EPs appears most persuasively in the chapters discussing the eye–brain functions related to visibility, luminance or movement detection, depth or column recognition, and the mechanisms and perceptual implications of saccadic or voluntary eye movements. The clinical applications of the method in assisting the diagnosis of various eye–brain diseases takes sixteen of the chapters, of which five concentrate exclusively on disseminated sclerosis.

The present state of the methodological procedures for recording and analysis of the visual EPs is the subject of a special chapter of the book. This chapter deserves to be carefully studied by the research or clinical users of visual EPs as it contains a rational basis for the standardization of procedures. The extent to which standardization is necessary becomes very apparent when one notes, that, in the thirty-five chapters, no two sets of contributors use identical electrode locations for their recordings. This technological diversity coupled with wide deviations in the procedure by which the different components of the evoked responses are measured emphasizes the lack of homogeneity between the various chapters and makes both reading and the extraction of comparative information difficult.

At present the technology of EP recording, the method of analyzing the recorded waveforms, and the topics studied by this method are in a continuous state of evolution and expansion. For those already actively engaged in studying the visual system in either a research or a clinical context the book is of great value. For the beginner in these fields the book is also valuable but it should be noted that, as it presupposes an extensive multidisciplinary vocabulary, it will not be easy reading for the uninitiated.

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Spatial contrast edited by H Spekreijse, L H van der Tweel; North-Holland, Amsterdam, 1977, 153 pages, Dfl.55.00 (US: $22.50)

The book reports the proceedings of an international conference or ‘workshop’ on the theme of spatial contrast in vision, held in Amsterdam in January, 1976. It is divided into six sections—Formulation of the problem, Psychophysics of contrast, Electrophysiology of the visual pathway, Cortical evoked potentials in man, Contrast and development, and Models and general concepts—and each section contains six or seven papers by recognized and eminent workers in the field. Thus with some thirty-eight contributions surveying various research areas and presenting new work, one could expect an important and weighty volume. Important, perhaps; but weighty it is not: the papers average only 3–5 pages long, with two or three figures each. Even more curiously, the papers were not written by their ostensible authors, but ‘ghosted’ by the editors in order “to summarize the papers in a uniform style”, with subsequent vetting by the authors. No doubt the editors have done a good job in their summaries, and no doubt the book will be a handy aide-mémoire for those who attended the meetings, as I did, but for a wider readership the book could prove to be baffling and frustrating in its brevity and condensation.

It begins in patchy style, with van der Tweel presenting a number of stray thoughts on linear systems and Fourier analysis, but rapidly improves with a lucid piece from Nachmüns on the issues involved in multiple-channel models of visual pattern processing. One major concern throughout is the application of spatial and temporal Fourier analysis to visual neurophysiology (with pieces from Robson, Tolhurst, Shapley, De Valois and Maffei) and psychophysics (Kelly, Keesey, Sekuler, Fiorentini, Atkinson). However, unless the reader is already well-versed in the area, the book will present problems, for few concessions are made to nonspecialists. Shapley’s important but difficult work on the temporal harmonic analysis of Y-cell responses, for example, merits only one page of text and two figures. We get fascinating but tantalizing glimpses of new work, e.g. by De Valois, on the spatial frequency selectivity of units in monkey striate cortex, who “pointed out that cortical cells are much more narrowly tuned to sine wave gratings of different frequencies than to lines of different widths”. Unfortunately, the evidence for this is not given, presumably for lack of space. De Valois also demonstrated dramatic differences between cells in their spatial selectivity: some (Fourier-type) cells are sharply tuned for both spatial frequency and orientation, while others are sharply tuned for frequency or orientation, but not both. Maffei also presented a large body
of work on spatial frequency selectivity, in the cat's visual cortex, but several interesting results did not find their way into the book. Missing, too, is any record of the informative and sometimes heated discussion periods which took place at the meeting.

The book's strength is that from one slim volume one can quickly gain a broad view of current ideas and developments in the three interlocking disciplines of visual neurophysiology, evoked potentials and psychophysics. There is a useful reference list for more detailed reading. The book's weakness is that it is too impenetrable for students and too sketchy for researchers. We sorely need a readable, teachable textbook of 'gratingology'. Spatial Contrast does not fit the bill, but may be useful until something bigger and better comes along.

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Sensation and perception: an integrated approach by H R Schiffman; John Wiley, New York, 1976, 434 pages, $20.95 cloth, $10.80 paper (UK: £11.80, £6.15)

This book is written for the familiar target audience of advanced undergraduates and commencing graduate students. It aims to present the concepts and principles of sensation and perception from a psychological viewpoint. All the sensory systems are covered and the distribution of space amongst them corresponds roughly to their conventionally assigned importance (vision 56%; audition 17%; somesthesia and orienting 11%; taste and smell 10%; the remainder being accounted for by two brief chapters, on Psychophysics and Time Perception, which commence and conclude the book). A twenty page glossary of sensory and perceptual terms forms a useful appendix. The amount of material covered is enormous, ranging from receptor anatomy to the visual cliff. In spite of much acknowledged borrowing from Geldard, Gibson and others, it is clear that a great deal of painstaking work has gone into the assembly of the material. Factual errors are very rare (although incredibly the classical Hubel and Wiesel hierarchy is misrepresented), but in several sections (for example, dark adaptation and colour perception) the emphases seem unusual.

The main reservation about the book paradoxically centres around the evenness of the treatment. Amidst the welter of material few indications are given of what the writer judges to be of high importance and what of less. Little sense of scientific progress is conveyed. This is enhanced by some puzzling omissions. For example in the section on vision, although considerable reference is made to physiological findings, one searches in vain for any mention of the superior colliculus or the sustained versus transient dichotomy. Nor is there any account of transfer functions either spatial or temporal. Finally there is no reference made to letter perception, word perception, or reading. Surely these must all be accounted growth areas of perceptual study. The omissions cannot be attributed to conservatism since much work done in the seventies is presented and indeed several pages are devoted to Noton and Stark's scanpath theory, a contemporary perceptual framework of perhaps similar heuristic value to those omitted but one which has received less empirical study.

Another disappointment concerns the failure of the author to fulfil the promise made in the preface to organise the material around an evolutionary theme. There is, to be sure, a section on the evolutionary progress of the basilar membrane but otherwise the theme seems merely to turn into a variety of examples from comparative physiology and psychology. (Did you know that the number of taste buds per animal shows a species variation ranging from 0 in snakes, 24 in chickens, to 9000 in humans, 17000 in rabbits and 100000 in catfish?) But no mention is made of encephalization, which has at least the semblance of a theme. Indeed a theme of any sort is difficult to discern in the book. Phenomena and mini theories appear on almost every page but are not fitted into any general framework.

The shortcomings are ones that it might have been difficult to avoid given the extent of material covered. The book certainly offers a great deal of Sensation and Perception for the price; even though seekers after the Integrated Approach may not be entirely satisfied.

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Psychobiological aspects of cognitive growth by R Kohen-Raz; Academic Press, New York, 1977, 127 pages, $11.00 (UK: £7.80)

This book aims to draw relationships between neurophysiological aspects of growth and processes of cognitive development. The conceptual framework advocated, 'biosemiotics', offers a means of interpreting biological processes by rules analogous to the syntax of spoken language. In the first four chapters, the author reviews various facets of the approach; genetics, ethology, cybernetics, Piaget's interactionism, sensoritonic theory, and biosemiotic theory. Since this is covered in a mere forty-three pages, the reader is left with less than a complete understanding of the theory. Perhaps this is responsible for the occasional impression that 'biosemiotics' suffers some of the faults of phrenology. For example, the anterior spatial arrangement of the frontal lobes, relative to the more posterior location of the association areas, is said to symbolize the function of these systems in coding future or past in psychological time (p 37). On this basis, structures located in between are presumably concerned solely with the specious present. Nevertheless, despite some reservations, the introduction does attempt a genuine biopsychology, in which body and mind are related. There are eminent precedents for this in the work of Coghill (1929) and Merleau-Ponty (1962).

In the remaining five short chapters, applications of psychobiology to infancy, 'school readiness', cognitive development as a function of birth season, and cognitive development during puberty are discussed. The chapter on infancy contains useful hypotheses on the relation between postural and cognitive development but perhaps attributes too specific a role to instrumental action in cognitive growth. The author claims that bimanual coordination at eight months is important in the acquisition of the concept of object permanence (the belief that objects continue to exist when outside immediate sensory experience). Yet he acknowledges that infants born without limbs nevertheless develop the concept and he makes little attempt to reconcile this incompatible finding. The importance of bimanual coordination may not lie so much in the instrumental activity itself as in the direct evidence it provides the psychologist for the emergence of intentionality in behaviour. The child uses one hand as a means to an end for the other. It remains an open question whether intentionality per se (and the concepts of space, time, causes, and objects which are said to flow from it) is rooted in any specific motor activity.

The remaining chapters seem less closely connected to the biosemantics advocated in the introduction. Their content consists mainly in correlations between aspects of biological growth and psychometric measures of cognitive functioning, a juxtaposition rather than a synthesis. Various neurological measures, e.g. of laterality, or physical measures such as height are correlated with basic school abilities such as reading, writing, and arithmetic between the ages of five and seven years. The superior performance of children born during the summer, on psychometric tests administered even as late as the adolescent period, is thought possibly to be related to a critical phase in early infancy and more efficient synthesis of brain DNA in the summer months. Shifts in hormonal balance during the growth spurt of puberty are thought perhaps to be related to development of formal operational reasoning.

As the author states in the conclusion, a comprehensive theory of the psychobiology of mental development is not possible. Although the book is well intentioned and may indeed contain the germ of truth, it is neither argued in sufficient detail nor sufficiently self-critical to be other than premature.

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References
Coghill G E, 1929 Anatomy and the Problem of Behaviour (London: Cambridge University Press)
Merleau-Ponty M, 1962 The Phenomenology of Perception (London: Routledge and Kegan Paul)
Books received

Berkowitz L (Ed.) Cognitive Theories in Social Psychology: Papers from Advances in Experimental Social Psychology Academic Press, New York, 1978, 528 pages, $14.50 (UK: £9.40)

Boddy J Brain Systems and Psychological Concepts John Wiley, Chichester, Sussex, 1978, 461 pages, £12.50 cloth, £5.95 paper (US: $27.50, 14.00)

Held R, Leibowitz H W, Teuber H-L (Eds) Handbook of Sensory Physiology volume 8 Perception Springer, Berlin, 1978, 295 pages, DM240 (US: $120.00)

Hulse S H, Fowler H, Honig W K (Eds) Cognitive Processes in Animal Behavior Lawrence Erlbaum Associates, Hillsdale, NJ (distributed by John Wiley, New York and Chichester, Sussex), 1978, 465 pages, $42.00 (UK: £21.00)

Logan F A, Ferraro D P Systematic Analyses of Learning and Motivation John Wiley, New York, 1978, 486 pages, $19.75 (UK: £10.50)

Mayzner M S, Dolan T R Minicomputers in Sensory and Information-Processing Research Lawrence Erlbaum Associates, Hillsdale, NJ (distributed by John Wiley, New York and Chichester, Sussex), 1978, 280 pages, $23.75 (UK: £12.70)

O’Connor N, Hermelin B Seeing and Hearing and Space and Time Academic Press, London, 1978, 157 pages, £6.80 (US: $14.00)

Stelmach G E (Ed.) Information Processing in Motor Learning and Control Academic Press, New York, 1978, 315 pages, $21.00 (UK: £13.65)

Posner M I Chronometric Explorations of Mind Lawrence Erlbaum Associates, Hillsdale, NJ (distributed by John Wiley, New York and Chichester, Sussex), 1978, 271 pages, $21.00 (UK: £10.50)

Walsh K W Neuropsychology: A Clinical Approach Churchill Livingstone, Edinburgh, 1978, 371 pages, £7.00

All books for review should be sent to the publishers marked for the attention of the reviews editor. Inclusion in the list of books received does not preclude a full review.

Meetings

Design Research Society Conference. Design—Models, Machines and Morality: Retrospect and Prospect, Churchill Hall, University of Bristol, England 17th–20th September 1979

For the first half of the conference (Context and Retrospect) stimulus papers from invited speakers will be issued three months in advance. Participants will be encouraged to submit minipapers which extend or challenge the invited papers. The second half is open to wide ranging discussion on Impact and Prospects.

Preprints will be issued in June 1979 on receipt of the conference fee. The fee for members of DRS and DMG will be £50 (residential), £35 (nonresidential). For nonmembers the fees will be £55 and £40 respectively. There will be a surcharge of £1.50 for overseas participants to cover the extra postage costs.

Further details may be obtained from Dr Roger Gill, Conference Secretary, 91 Woodland Road, Bristol BS8 1US, England

European Conference on Visual Perception, Noordwijkerhout, The Netherlands 15th–18th October 1979

The topic of the conference is visual perception in man and other higher vertebrates, studied psychophysically or electrophysiologically. Cost is Dfl.350, including congress fee, accommodation, and meals. Deadline for abstracts: 1st June 1979

Further details may be obtained from J J Vos, Institute for Perception TNO, PO Box 23, 3769 ZG Soesterberg, The Netherlands.