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The story of Ruth by M Schatzman; Duckworth, London, 1980, 306 pages, £6.95 (US: $11.95)

The Story of Ruth is a fascinating account of a twenty-five-year-old woman whose remarkable ability to imagine things turned from being a childhood source of refuge and companionship into a cause of intrusive nightmares and ‘daymares' in adult life.

Ruth's traumatic childhood includes a sexual assault by her father. He starts to haunt her, appearing initially in dreams and later in the waking state. The book is a fast-moving narrative describing the apparitions and the circumstances under which they occur. The apparitions are sometimes so real to Ruth that she can distinguish them from the physical presence of her father only by a process of logical deduction. The imagined person occludes objects behind him and casts shadows. He generally behaves in a manner appropriate to the physical and social setting, rather than in a manner to which ghosts are accustomed. Thus he sits in chairs, walks through doors but opens them first, and indulges in mannerisms appropriate to one who has just interrupted a tea party, or appeared in the marital bed.

Schatzman (Ruth's psychiatrist) describes how he encourages his patient to gain control over her apparition. He does so in part by asking her to generate apparitions of persons with a more friendly disposition, including Schatzman and eventually Ruth herself. It is when Ruth's apparition of herself moves towards her and ‘takes her over' that Ruth is enabled, apparently at will, to regress in age and behave as if she were up to twenty years younger.

Schatzman's storybook style is admirably suited to a description of Ruth and her experiences. It is less well suited to a description of the various experiments of a scientific and pseudoscientific nature that Ruth takes part in. Many of these experiments are undertaken by well-known names in British psychology and psychiatry, and some of the findings are most intriguing. Ruth can, for example, attenuate or eliminate both auditory and visually evoked potentials by appropriate hallucinations. When she is in an age-regressed state, her behaviour in a variety of psychological tests closely mimics that of children of the appropriate age.

Unfortunately the experiments are loosely described, and such details as are given are relegated to footnotes. It would, of course, be silly to condemn this book for failing to meet the standards of a scientific treatise, since it is clearly the author's intention to provoke thought amongst scientists and nonscientists alike. Nevertheless it is frustrating that the only available account of these interesting studies is insufficient to enable their evidence to be evaluated.

A J Wilkins
MRC Applied Psychology Unit, 15 Chaucer Road, Cambridge CB2 2EF, England

Behavioural neuroscience: an introduction by C W Cotman, J L McGaugh; Academic Press, London, 1980, 838 pages, £13.80 (US: $20.95) cloth, £6.25 paper

The curse of many textbooks of biology is that they (all too often) propagate myths, old wives' tales and nineteenth-century attitudes—usually because the authors know no better. However, parts of Cotman and McGaugh's text (notably chapters 3-6) are refreshingly modern and up-to-date in the overall picture that they present. The nervous system is shown as a dynamic, ever-changing structure, with continuous movement of cell components, molecules, ions, and electric currents. The description proceeds as far as the characterisation of neurones by their chemical transmitters before any detailed account of anatomical projection pathways is given. Thus students do not have to unlearn the picture of a static, fixed tangle of interconnections, each pathway looking very much like the rest, which is the impression that they get from traditional anatomical studies of dead brain tissue.

Unfortunately, this standard is not maintained throughout the book. Although the chapters on brain dynamism lead well into the discussion of learning, the latter is couched in the terminology of behaviourism and does not lead on to modern ideas about the organisation and function of
human memory. Indeed, most of the psychology in this book is animal psychology, not human psychology. (The illustration of 'associative learning' reproduced here shows the level of analysis at which the book functions.) In some chapters, brief references are made to cognitive factors, Gestalt principles in perception, for example, but these are never pursued in depth, and the coverage of many topics is therefore more barren than it otherwise might be. This is especially noticeable in the rather skimpy coverage of the cerebral cortex and consciousness in the final chapter.

Vision means, of course, the Gospel according to Hubel and Wiesel, even unto autoradiographs of cortical columns and hypercolumns. However, much else is mentioned besides, including spatial frequency analysis, deprivation studies and ‘why is there a lateral geniculate nucleus?’, although W, X and Y cells are not covered, nor is the work of Gross and Zeki beyond the traditional studies of the ‘visual’ cortex. This is obviously not a field that the authors have worked in themselves. One can forgive the implication that rods are panchromatic (pp 416–417), or that hypercomplex cells analyse even more complex shapes than corners (p 453), but the myth that complex cells ‘recognise edges more or less independent of the position’ (p 453) is reaching epidemic proportions among psychologists and should be stamped out ruthlessly: complex cells have small receptive fields, especially near the fovea.

The chapter on hearing contains some elementary psychophysics and a section on disorders of hearing. The somatosensory system is given its due accord—two pages: if only physiology textbooks were so rational!

What does the brain do? Cotman and McGaugh seem to accept the view of Lord Adrian that “the chief function of the nervous system is to send messages to the muscles which will make the body move effectively as a whole” (p 2). However, this leaves the question as to why we need to move. The traditional answer is: to maintain homeostasis and to reproduce the species. The chapters devoted to eating, drinking and sexual development are readable, up-to-date, and (like the chapters on learning) contain good criticisms of work in the field. However, readers of Perception will realise at once that the sole purpose of movement is to alter the pattern of sensory inputs to our receptors, in order to maintain our awareness of our surroundings! But seriously, another common misconception is that sometimes the brain is just ‘idling over’, then suddenly it decides to move the body, and completion of the movement is the end-point or goal. If the brain is as dynamically active as Cotman and McGaugh describe, then there is no tabula rasa onto which a ‘decision’ is inscribed, and execution of the movement alters both the external world and the sensory inflow to the brain. The treatment of movement as a topic in isolation is just as much
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'man-in-the-head' thinking as the assumption that the delivery of topographic information to the relevant primary sensory cortex is necessary and sufficient for perception. Yet in certain parts of the book, this is the impression one obtains (pp 32, 42). For logistical reasons, however, chapters entitled ‘Movement’ have to appear in textbooks. Cotman and McGaugh’s is very good at presenting the concept of motor subroutines such as spinal movement generators. But no clear idea comes across of what the cerebellum does, and many of the principles described could have been made coherent if the proposals of Kornhuber (1974) had been included.

The chapter on sleep does not come to grips with the questions of why or how we sleep, but the chapter on lifelong development (including ageing) is done well. The section on ‘Behaviour disorders’ deals very briefly with psychoses, and not at all with neuroses, but goes into great detail with drug addiction, even so far as to include the (presumably Californian) street names of drugs. However, language development and biological rhythms are discussed more with respect to animals than to humans.

One impression which comes from this book is that the authors have not sat down and read through their writing carefully. There are three ways in which this shows. First, the level of student for whom this book is written is not clear. Thus on pages 114–115 the authors explain what electricity is, what volts, amps, and resistors are, and what Ohm’s law is (if American university students really do not know these things, then no wonder the United States is no longer a leading world power!). Also, the first two chapters are written at an extremely general level, in ‘purple prose’ full of analogy, simile, and anthropomorphism. On the other hand, a lot of technical terms are introduced without explanation (epithelial cell, enzyme conformation, recruitment, massed practice, PSTH, and so on).

Second, the prose is often unclear or ambiguous. Typical examples are: “artificially produced squint in monkeys indicates that binocular representation in the visual cortex is largely deficient” (p 447), or “signals from small sectors of retina are represented in the cortex and analysed for orientation and shape of receptive fields” (p 432). My favourite is: “unless treated, patients [with epilepsy] become extremely disabled and eventually die” (p 784); what is this treatment that prevents death?

Third, the absence of some obvious cross-references between chapters leads to some contradictions. For example, retinal amacrine cells are described in chapter 6, but are omitted completely from the detailed discussion of the retina in chapter 10; different mechanisms of analgesia are described in chapters 12 and 17.

A wide range of approach can also be found in the illustrations, which vary between the over-simple (see the example reproduced above) and the overcomplex or unexplained, as well as in the text, which varies between on-the-ball criticism and high-as-a-kite speculation. For in those sections where Cotman and McGaugh are explaining the dynamic patterning of whole brain activity their style tends toward fanciful, unsupported speculation. This is, of course, unavoidable because the flow of information round the brain can only be conjectured in a general way, but the authors do not make this explicit, and a gullible student might accept their confident assertions as well-established facts.

The book does have many positive aspects. The introduction and glossary in each chapter are helpful (although the summaries are sometimes paraphrased to the point of being misleading). Most of the book is easily readable, and a very wide range of topics is covered at an elementary level. The authors fulfil their promise in the preface to make the book interesting and exciting, and the modern approach presented in places can be described as a welcome breakthrough.

D Rose
Department of Human Biology and Health, University of Surrey, Guildford, Surrey GU2 5XH, England

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Kornhuber H H, 1974 “Cerebral cortex, cerebellum and basal ganglia: an introduction to their motor functions” in The Neurosciences: Third Study Program Eds F O Schmitt, F G Worden (Cambridge, Mass: MIT Press) pp 267–280
NATO conference series, series III, volume 13. Processing of visible language 2 edited by P A Kolers, M E Wrolstad, H Bouma; Plenum, New York, 1980, 616 pages, $49.50 (UK: £31.19)

This volume presents the proceedings of a conference held at Niagara on the Lake, Ontario, in September 1979, sponsored by NATO, The International Reading Association, and Communications Canada. The conference was the second of its kind, the first being held in 1977(1). The aim of this second conference was the same as that of the first—to encourage interaction between designers, psychologists, and engineers interested in developing new communications technology.

Processing Visible Language 2 contains thirty-six specialist papers grouped into seven sections. As in volume 1, each section contains an introductory tutorial paper which either reviews the overall scene or treats some particularly significant issue in it, and then, on average, five additional shorter papers which present more recent work.

The separate sections are paired as follows: writing systems and graphic systems; textual literacy and graphic literacy; textual technology and graphic technology. The whole is rounded off by a section on theory. Each section is introduced by one of the three editors and there is an author and subject index.

This structure clarifies the text, but it negates one of the principal ideas expressed within it—this is that the dichotomy between text and graphics is a false one, since the majority of texts contain elements of both. Indeed, one may have text with graphics (although not without typographic enhancement), but one rarely has graphics without text. Nonetheless the structure does give volume 2 a unity which was lacking in volume 1.

In “Writing Systems”, the tutorial paper by Gelb provides an historical account of the development of writing systems. A recurrent theme in this section is the emphasis on the mixture of types of information encoded in many systems. Thus, phonemic, syllabic, morphemic, and semantic information may all receive partial representation, often in an apparently unsystematic way. Smith and Pattison, for example, examine the abbreviated language found in newspaper small ads and also shorthand systems. They argue that such systems are used by people under pressure (of space or speed) and that the resultant products thus reflect the essential elements of written language. From an examination of different systems of shorthand, the authors conclude that the users of these systems employ and combine several different types or levels of linguistic information at the same time, and that this cannot be accounted for by a strictly hierarchical information-processing model. It would be interesting to see this theoretical analysis supported by studies of people actually taking shorthand or writing small ads.

Other papers discuss different writing systems, but Taylor’s paper on the Korean writing system is the only one in this section to contain experimental data. However, these are so fragmentarily and inconclusively reported as to be puzzling rather than illuminating.

In “Graphic Systems”, Doblin’s tutorial paper on “A structure for nontechnical communication” makes useful points and provides interesting illustrations, but it lacks the profundity of scholarship that we have come to expect from such tutorial papers.

Unfortunately one can make similar comments about other papers in this section. Paine’s paper on “Some problems of illustration” is lavishly illustrated (Paine is art director of the magazine National Geographic) and raises many issues not considered by psychologists, but it provides examples and comments rather than research.

Wainer presents an entertaining disquisition on “Making newspaper graphs fit to print”, with good illustrations of what not to do. He concludes intriguingly with suggestions concerning standards for constructing graphs—standards which are currently being implemented by computer programs. This paper too is a disappointment, although this is because it is a conference paper (one to provoke and entertain an audience), rather than a textbook paper (one to provoke and guide the reader to further knowledge). For instance, Wainer gives no advance reference to his excellent recent review paper on graphics (Wainer and Thissen, 1981).

Again, only one paper in this section presents experimental data. Szlichcinski asked naive subjects to draw pictorial instructions for operating a set of switches. The results, whilst interesting, are insufficiently well described to allow one to assess the claim that they shed light on the syntactical organisation of pictorial instructions.

(1) For our joint review of the proceedings of this first conference, see Perception 9 245–247 (1980).
In “Textual Literacy” this topic, which dominated the previous volume, is now confined to a single section. The excellent tutorial paper by Wright on ‘usability’ is all that we have come to expect of tutorial papers in this series. Wright wants people (designers, psychologists, and engineers) to consider the usability of documents, rather than just their readability. Usability, unlike readability, takes into account the context in which the document is to be used, the characteristics and purposes of the readers, and the constraints that might operate in using a particular document. Research on each of these facets is outlined and integrated, and illustrations are provided to show how producers of documents can take these issues into account (or have failed to do so).

It is hard not to apply the notion of usability to the remaining papers in this section (and, indeed, to the whole book). Thus Chapman and Stokes, in their report on how children get better at perceiving text cohesion as they grow older, implicitly attack simple readability notions. Similarly, Shebilske provides a prolegomenon for an approach to the study of comprehension and comprehensibility of paragraphs and larger units of text.

Two other, rather different papers complete this section. Henderson untangles some of the conceptual threads which psychologists have confused with the use of the notion that “words are perceived as wholes”; Waller argues for incorporating an analysis of typographic functions into linguistic analyses of text.

In “Graphic Literacy”, Perkins’s tutorial paper examines experimental research in the light of ways in which pictorial representations differ from ‘real things’, and the implications of this for establishing the nature of the processes to be learned in order to perceive pictures appropriately.

Of three papers on map reading in this section, only that by Sholl and Egeth has a clear theoretical significance and is adequately reported. These authors examine cognitive problems in map reading and drawing. Labelling circles with north–south axes helps to speed up judgements of location, whether or not the north–south label is presented vertically or rotated 90°. It also appears that students draw maps from an egocentric point of view when information about short distances is to be conveyed, but from a topographic point of view when large distances are involved. Nothing is said, however, about how large or small these distances have to be before changes of approach appear.

Roller points out that many tests of graph reading ability do not require the reader to integrate graphs with related text. Her interesting experiments purport to show that text makes graph reading more difficult. However, there is a need for better control of the stimulus materials and the experimental conditions before one can accept this conclusion.

In “Textual Technology”, the tutorial paper by Myers presents a comprehensive account of present-day techniques for displaying, storing, presenting, and retrieving text and graphics, in both hard and soft copies. Other papers in this section give tantalising glimpses of the problems faced in these domains.

Moray provides a succinct summary of the trials and tribulations of operating an electronic journal, and Baer and Turoff discuss how graphics can be edited and enhanced by different users in the context of computer conferencing. Frase, Keenan and Dever suggest how computers might be used in the future to support document writers, document users, document translation, and mechanical documentation systems. Unfortunately no details are provided of their own highly interesting work on computer-aided writing.

Treurniet is trying to devise international standards for the spacing of characters on a television display by conducting experiments on the legibility of individual letters when the space between and below them is systematically varied. This work resembles earlier work with printed text, but it is not known how well research from one medium will translate to another. Furthermore, this work will have to be extended: the spacing between words, between groups of words, and between groups of lines are also important issues in the presentation of text.

Pynte and Noizet are looking at one aspect of this problem. Sentences, or parts of sentences, are presented on a television screen temporally segmented in different ways. Pynte and Noizet conclude that it is possible to accelerate the comprehension of short sentences by dividing them into noun and verb phrases, but that this is not the case for longer sentences: here there seems to be little difference between presenting the sentences as a whole or dividing them up into numerous segments.
In “Graphic Technology”, Baecker’s tutorial paper “Human–computer interactive systems” is a state-of-the-art review. The discussion adds sound, speech, and music to our consideration of devices that can be used to facilitate interactions with machines.

Baecker's paper is followed by two exceptionally interesting contributions: one on providing simultaneous television subtitles for the deaf, and one on teaching the blind to draw three-dimensional representations. The paper by Baker et al on using a Palantype device to provide simultaneous speech transcription is perhaps the most interesting paper of the two because (i) it distinguishes between different kinds of deafness, (ii) there are experimental tests of the system, and (iii) it is clear that different kinds of users respond differently to different kinds of subtitling. Vincent's paper on teaching the blind to draw does not have these three aspects. Nonetheless both of these papers provide excellent illustrations of the successful applications of the interdisciplinary work advocated at this conference. Both are flawed, however, in that they fail to go beyond ad hoc theorising about the psychological processes involved.

In “Theories of Representation”, the papers are mixed. Howard’s tutorial paper is a curious one. Those with a bent towards linguistic philosophy will enjoy his analysis of the concepts of ‘representation’ and ‘symbol’, but the discussion seems tangential to the concerns of the conference.

Dutka’s paper on processing anaphoric relations (ie the amount of backtracking required to locate antecedent information necessary to understand, for example, a pronominal such as this) reiterates the notion of usability (rather than readability) to describe the text. Snodgrass’s paper presents a useful, if selective, review of relevant experiments in discussing an information-processing approach to the representation of words and pictures in memory.

Wright presents a lucid summary of the research of experimental psychologists on cognitive aspects of reading and writing. She asks “What do psychologists know about x?” under three headings: “What questions have been asked?”, “What answers have been given?”, and “What issues have been overlooked?”. The topics discussed are reading letters, words, sentences, and paragraphs; and writers’ conceptual approaches, presentation options, and evaluations of their communications.

The final paper in this section is by Bertin on “The basic test for a graph”. Bertin argues that we do not read graphs, we query them. Thus, he suggests, we only need to ask two questions to decide on how to construct a graph. Graphs are seen as the transcription of a two-dimensional table of data, so the two questions are (i) what are the x and y components of the table of data; and (ii) what are the groupings in x and the groupings in y that the data generate? These questions are then applied to a series of examples and rules of procedure are given. Constructing graphs becomes a matter of being able to ask the right questions (which possibly assumes that all users want the same information) and of being able to use appropriate graphical techniques to make the question and its answer clear to the reader at a glance.

In our review of Processing Visible Language 1, we were concerned that there seemed to be no interactions between the psychologists, the designers and the engineers involved. We expressed the hope that such an interaction would be more apparent in volume 2. We think it is. Many authors display an awareness of the need to design with particular users in mind, and many consider the cognitive demands of users in terms of both the text and the technology. Some use the techniques of experimental psychology to attempt to evaluate what they are doing and even the master practitioners indicate a willingness to subject their techniques to scientific scrutiny. However, we should not be sanguine. Several papers show a lack of awareness of research in other related fields, and there is little evidence of collaborative research between experienced psychologists, designers, and engineers, which, as we argued in our review of volume 1, is the most desirable outcome of these conferences.

Generally speaking, however, the contributions in volume 2 are more even than they are in volume 1, although there are fewer outstanding tutorial papers, and many of the authors who present data do not do so with sufficient clarity. As far as psychologists are concerned, many of the papers are often disappointing because they do not address themselves directly to a well-defined set of theoretical or empirical issues. Nevertheless the editors have assembled a set of contributions which does real justice to the breadth of concerns which can be subsumed under the title Processing of Visible Language. Volume 2, as a whole, represents a solid achievement.
Last year we recommended volume 1 to readers at least for the library if not for private purchase. This year we do the same for volume 2. These two books taken together, provide a rich resource for research on the presentation of text.

J Hartley, J A Sloboda
Department of Psychology, University of Keele, Staffordshire ST5 5BG, England

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Wainer H, Thissen D, 1981 Annual Review of Psychology 32 191-241

Human memory: structures and processes (second edition) by R L Klatzky; W H Freeman, San Francisco, 1980, 358 pages, $17.00 cloth, $8.95 paper (UK: £11.80, £5.40)

This is the second edition of a well-known book on memory; over half the material is new. As current developments in the study of memory dictate, memory is examined as part of the cognitive system as a whole. For example, a full chapter is devoted to pattern recognition and attention. This chapter includes an account of speed recognition by the HEARSAY program, which makes use of top-down processing. Top-down processing in man is made possible by the knowledge stored in long-term memory (LTM). There is also a chapter on LTM and the structure and processing of knowledge, with good accounts of models such as those of Collins and Loftus (1975), Smith, Shoben and Rips (1974), and the propositional model of Anderson (1976)(1). Short-term storage of information—a topic barely mentioned in texts of two decades ago—is the subject of no less than four of the eleven chapters: these include discussions of sensory storage, of visual codes in short-term memory (occupying a whole chapter), and of the so-called ‘working memory’. Other chapters cover such topics as organization and retrieval, encoding specificity, and recognition failure of recallable words. Throughout, the exposition is competent, thoughtful and keeps up the interest of the reader. I think it is therefore excellent for its intended purpose, that is, a textbook for students. Many others will also enjoy reading it.

J Brown
Department of Psychology, University of Bristol, 8-10 Berkeley Square, Bristol BS8 1HH, England

(1) Full references to these models are included in the chapter.

Books received
Fraser J T The Voices of Time: A Cooperative Survey of Man’s Views of Time as Expressed by the Sciences and by the Humanities (second edition) University of Massachusetts Press, Amherst, Mass (distributed in the UK by Feffer and Simons, 24 Red Lion Street, London WC1R 4PX, 1981, 710 pages, $12.50 (UK: £7.50)

Friedman M P, Das J P, O’Connor N NATO Conference Series III. Volume 14: Intelligence and Learning Plenum, New York, 1981, 624 pages, $42.50 (UK: £26.78)

Klinger E (Ed.) Imagery. Volume 2: Concepts, Results, and Applications Plenum, New York, 1981, 397 pages, $35.00 (UK: £22.05)

Kubovy M, Pomerantz J R (Eds) Perceptual Organization Lawrence Erlbaum Associates, Hillside, NJ, 1981, 506 pages, $44.95 (UK: £21.95)

Levine M, Shefner J Fundamentals of Sensation and Perception Addison Wesley, Reading, Mass, 1981, 516 pages, $26.00 (UK: £15.35)

Mayer R E The Promise of Cognitive Psychology W H Freeman, Oxford, 1981, 120 pages, £8.00 cloth, £3.70 paper

Springer S P, Deutsch G Left Brain, Right Brain W H Freeman, Oxford, 1981, 243 pages, £10.70 cloth, £4.95 paper

Walk R D, Pick H L Jr (Eds) Perception and Perceptual Development. Volume 2: Intersensory Perception and Sensory Integration Plenum, New York, 1981, 415 pages, $32.50 (UK: £20.48)

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.