

## Two complete brains

Hendrik Van der Loos

**Neurobiology, 2nd edn.** By Gordon M. Shepherd. Oxford University Press: 1988. Pp. 689. Hbk £35, \$47.95; pbk £19.50, \$32.95.

**The Human Brain.** By Paul Glees. Cambridge University Press: 1988. Pp. 204. £32.50, \$59.50.

In discussing two books in the same review, a compare-and-contrast approach seems inevitable. Here, that is perhaps not a bad thing because both are textbooks which deal with the whole brain, including that of human beings. Both are also new editions; Shepherd's book was first published in 1983, while Glees's appeared in German in 1968. (Or was it 1971? The answer is not made clear.)

Single-author volumes that cover as much ground as these two are an increasing rarity, and we could do with more of them. But while *Neurobiology* demands admiration for its completeness, *The Human Brain* leaves one uneasy. Far too many important areas have been left out — why, for example, is there nothing on Geschwind and brain asymmetry; on Mountcastle and the posterior parietal cortex; on Hökfelt and multiple transmitters; on Aguayo and regeneration? The omissions from Shepherd's book are on a much smaller scale. In the fine chapter on developmental neurobiology, the remodelling of neurons, including their axons, might perhaps have received more attention, as might the factors that shape the central homoeomorphic representations of peripheral sensory sheets. The same holds, in the chapter entitled "Sensory Systems", for the projections from cortex to thalamus and to the nuclei of termination.

As to the books' heuristic value, the figures in Shepherd complement the text well and both are clear. One exception is the very first diagram, with its legend and surrounding text, which fails to explain fully the link between "nervous organization and behavior", held by the author to be a key issue. Again, *The Human Brain* suffers in comparison: several figures do not make the point they are supposed to make; others show items not mentioned in the text; yet others do not seem to make

• A new contender in the reference-book stakes is *Dictionary of Biology*, by W.G. Hale and J.P. Margham, both of Liverpool Polytechnic. Running from Å to zymogen granule, and covering aspects of medicine and agriculture, as well as biology, the entries have been written primarily with school students and undergraduates in mind. Publisher is Collins.

any point at all. Some statements in the book are impenetrable. For example (here I paraphrase) the five brain vesicles are said to "contain the imprints of the genetic programmes which emerge in birds after hatching"; gonadal activity ceases early (in aging) and thus, Glees suggests, neuro-secretory nerve cells stop functioning before those neurons that generate impulses only; the high degree of orderliness seen in the cerebral cortex is not found at lower brain levels "where neurons are lumped together in scattered groups referred to as nuclei" — here I suggest that the student should get hold of a microscope and have a quick look at retina and cerebellar cortex for themselves.

The two authors take a comparative approach, but a totally different one. For most tasks carried out by the brain, Shepherd shows how invertebrates and vertebrates go about solving them — an interesting way to teach the subject (for example in "Communication and Speech", one is told about insect song and birdsong). Glees instead begins with the brain of the lamprey and, by a set of edicts, converts it into the human brain. In places the body leads the way ("The forearm . . . becomes reconstructed . . ."); elsewhere, the brain appears to be the prime mover of evolutionary change; and elsewhere still, the

senses are in charge. All of these factors may have a role in evolution. But to my mind the time is not ripe to integrate them, and Glees certainly does not try.

In standard of production, both volumes have defects. The paper on which Shepherd's is printed could have been better. In my copy, text from the verso side of a page can sometimes be read in mirror image on the recto. And some pages consist of two pieces glued together (fortunately with generous overlap), which diverts one into idle reflections on how books are made. Glees's seems to have escaped normal quality control; figures commonly lack scale bars and the reproduction of many of them is substandard. The text is so riddled with misprints that not even German words and names have been spared.

Each book contains a wealth of data and insight, and *aficionados* of neuroscience will appreciate that. Novices will come away from *Neurobiology* enriched — though perhaps overwhelmed (there are over 600 pages of text). But although such readers may emerge from *The Human Brain* with a heightened sense of curiosity, they will also emerge confused. □

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## Worlds together

Alan Brafield

**The Invertebrates: A New Synthesis.** By R.S.K. Barnes, P. Calow and P.J.W. Olive. Blackwell Scientific: 1988. Pp. 582. Hbk £32.50, \$57.53; pbk £15.95, \$28.24.

Twenty years ago, in the preface to his *Invertebrate Structure and Function*, E.J.W. Barrington wrote that "the business of animals is to stay alive until they have reproduced themselves, and the business of zoologists is to try to understand how they do it". Such an understanding requires appreciation of two very different things: the enormous diversity of animals, and the unifying features of comparative physiology and behaviour. Barrington's book was a milestone in the comparative functional approach as against the phylum-by-phylum treatment. He was ahead of his time. In the genre, only G.S. Carter's *A General Zoology of the Invertebrates* had appeared earlier, and few such books have been written since. With the functional approach, rather than detailed anatomy and systematics, now being in favour, the time is ripe for a synthesis of the two philosophies.

Here it is. *The Invertebrates: A New Synthesis* canters through the groups and then considers comparative physiology

and behaviour. It is an attempt at the best of both worlds, and it works. Some provocative opinions expressed in the first part (for example that molluscs are acelomate and simply jumped-up flatworms which have gained a shell and a radula), though possibly nearer the truth than the conventional view, should have been explained at greater length, because students will not find such heresies in other books. My only other serious criticism is that the inclusion of full classificatory trees listing all the orders (48 in the case of the molluscs) is inappropriate here — particularly as there are numerous drawings of common genera, to show the range of form, in which the animals are unfortunately not identified.

The second part of the book is thought-provoking, up-to-date and very well illustrated. The chapter on respiration is too short; this is a wide-ranging subject which deserves more than half the space afforded to feeding. But the one on biomechanics and locomotion is interesting and comprehensive; that on defence stimulating; that on reproduction and life cycles scholarly; that on embryology and development informative; and that on control systems (by D.W. Golding) superb. Students will like this book. It deserves to succeed. □

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