

that enhanced neural responses result from multimodal stimuli that are likely to be associated with the same event, whereas attenuated responses are obtained when the stimuli are unrelated in space and time. Such interactions are surely important for determining the orientation responses that are mediated by the superior colliculus. Again the authors' own studies indicate that this is so by demonstrating that principles of multisensory interaction similar to those described at the cellular level do indeed apply to overt behavioral responses. The book concludes with a consideration of the consequences for multisensory integration of changes in the relative position of different sense organs that may occur either voluntarily or as a result of developmental changes in the size and shape of the head.

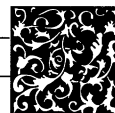
The book is written in a chatty and informal style, which for the most part works very well. Although adequately referenced, it does not provide a complete review of all the research that has been carried out on this subject. Accomplishing this would no doubt have rendered the book much less readable and accessible. Still, I was surprised that the authors do not mention any of the studies revealing cross-modal competition during development, where the loss of one sensory input leads to what is generally considered to be a compensatory improvement in the processing of inputs from other modalities.

The volume is enhanced by a number of excellent and effective drawings (one of the authors was trained as a medical illustrator). Arguments are introduced clearly and areas most in need of further investigation are highlighted. Occasionally I found the text somewhat repetitive and digressive, although readers less familiar with the field may not agree. On the other hand, on several occasions I found myself wishing that the authors had provided more detailed support for their arguments. Perhaps inevitably, there is also the odd point of confusion or factual error (for example, auditory neurons in the superior colliculus are not, as stated on page 72, "exquisitely sensitive to differences in the [interaural] temporal interval").

Overall, this is an excellent, highly readable book that would make a valuable addition to any physiology or neuroscience library. I imagine that its principal achievement will be to convince those who normally think of different sensory systems as anatomically and functionally distinct of the prevalence and significance of multisensory integration.

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Vignettes: Short-Lived Phenomena

It may be my fate to be a kind of comet, or flaming meteor in science, in the regions of which (like enough to a meteor) I made my appearance very lately, and very unexpectedly; and therefore, like a meteor, it may be my destiny to move very swiftly, burn away with great heat and violence, and become as suddenly extinct.

—Joseph Priestley, in *Philosophical Empiricism* (1775), as quoted by Jan Golinski, in *Science as Public Culture: Chemistry and Enlightenment in Britain, 1760-1820* (Cambridge University Press)

In his ruminations on the 1835 Chilean earthquake, Darwin remarked that earthquakes alone were sufficient to destroy the prosperity of a country. To illustrate the case he tried to imagine the effects of violent earthquakes beneath England: Government being unable to collect the taxes and failing to maintain its authority, the hand of violence and rapine would remain uncontrolled.

It is true that the North Wales 1984 earthquake dislocated traffic lights in Dublin. But the weight of evidence is against Darwin. For all their indiscriminate horror, earthquakes seem to have little effect on the flow of history.

—Claudio Vita-Finzi, in *Understanding Catastrophe* (Janine Bourriau, Ed.; Cambridge University Press)

Interpreting Europe

A Continent Revealed. The European Geotraverse. DEREK BLUNDELL, ROY FREEMAN and STEPHAN MUELLER, Eds. Illustrated by Sue Button. Cambridge University Press, New York, 1992. xii, 275 pp., illus., + maps + CD-ROM. Paper, \$34.95 or £15.95.

The idea of reconstructing the geological evolution of the European continent through a large-scale, interdisciplinary study of its lithosphere was discussed in 1980 during the 26th International Geological Congress in Paris. Soon afterward, under the aegis of the European Science Foundation, the European Geotraverse (EGT) project was launched to collect and coordinate the needed data. The geotraverse was conceived as a three-dimensional north-south transect (4600 kilometers long, 200 to 300 kilometers wide, and 450 kilometers deep) from northern Scandinavia to North Africa. It was designed to encompass the Archean domain (formed more than 2.5 billion years ago [Ga]) and extend into the seismically active Mediterranean areas, crossing parts of the continental crust that evolved during Karelina (2 Ga), Cadomian (600 million years ago [Ma]), Caledonian (400 Ma), Hercynian (300 Ma), and Alpine (200 Ma to the present) times. Along this transect, existing data were compiled and field experiments and laboratory analysis were conducted to identify the geophysical markers and to correlate them with geological structures and surface data. Because the section crosses seven

orogenic systems—most of them spatially superimposed—and many countries, the work and its coordination were complex. The committee set up to organize the seven-year project coordinated various workshops and intensive "retreats" to provide participants with an opportunity to analyze and interpret the data and lay the groundwork for publication of the study results.

Twelve years after the EGT was first conceived, *A Continent Revealed: The European Geotraverse* presents the results of this ambitious cooperative undertaking. The book begins with an explanation of when, how, and why the program was conducted and goes on to describe the general dynamic and tectonic framework of the chosen transect. Subsequent chapters are dedicated to the seismic structure and physical properties of the European lithosphere as well as its recent activity. Finally, a bold outline of the tectonic evolution from Precambrian time to the present is proposed and some major questions for future research are presented.

Synthesis of data on the structure of the lithosphere is always needed, and the reader will learn much from this book. From the Baltic Shield to the Mediterranean area, earth scientists can now correlate some deep (mostly crustal) geophysical features with well-known surface structures (though some of these are of debated significance). The locations of the main subsurface crustal discontinuities are presented in the third chapter. Deep seismic reflection cross sections and numerous wave-velocity cross sections can be positioned on a general sketch map

showing the thickness of the lithosphere. We should recall that wave-velocity cross sections are the sole basis for models of the nature and distribution of the different deep crustal materials. An attempt to construct such models is made in the next chapter in light of gravity measurements as well as heat flow and electric conductivity data.

The chapter dedicated to recent tectonic activity is no less interesting. We learn that the Baltic Shield is not very stable and is the locus of many earthquakes, albeit of small magnitude. Seismic activity can be compared with a generalized stress map and recent volcanic areas, but no seismotectonic data are reported here, even for the Mediterranean area, where many studies have recently been carried out.

Although *A Continent Revealed* incontestably improves our knowledge of the European continent, it has some frustrating flaws. The data and their interpretation are not well integrated. For example, the cross sections showing the geophysical models are presented as several small pieces, and no clue is given to the crucial role of these data in the development of ideas about the structure, tectonic evolution, and geodynamics of the European basement. Although an EGT Atlas (as well as a CD-ROM that contains some of the Atlas data) is available separately, the problems related to the coordination of material could have been alleviated by the presentation of the maps and cross sections as fold-out documents.

While the EGT was being carried out, other groups were collaborating in studies of the structure of the European crust by deep seismic reflection profiling (for example, the *Etude de la Croûte Continentale et Océanique par Réflexion Sismique* [ECORS] in France and Spain, the South West Approaches Transect [SWAT] in England), and it is frustrating that the results of these other projects are not sufficiently incorporated. For instance, a complete deep crustal transect from South England and Belgium to Spain through the Hercynian and Alpine domain is also available, and a comparison of its data with the EGT section results would have been fruitful.

Finally, it is unfortunate that a separate bibliography of the publications arising directly out of the workshops and retreats organized for the EGT project is not provided. Such a reference list would have helped to justify the considerable financial support that the program enjoyed as well as enhancing the value of the book itself, which can serve as a general introduction to the more specialized literature.

Pierre Choukroune
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Reprints of Books Previously Reviewed

A Feeling for the Organism. The Life and Work of Barbara McClintock. Evelyn Fox Keller. Freeman, New York, 1993. Paper, \$13.95. Reviewed 223, 482 (1984).

Four Neotropical Rainforests. Alwyn H. Gentry, Ed. Yale University Press, New Haven, CT, 1993. Paper, \$32.50. Reviewed 252, 1008 (1991).

Knowing Children. Experiments in Conversation and Cognition. Michael Siegal. Erlbaum, Hillsdale, NJ, 1992. Paper, \$19.95. Reviewed 254, 446 (1991).

Teller's War. The Top-Secret Story Behind the Star Wars Deception. William J. Broad. Simon and Schuster, New York, 1993. Paper, \$13. Reviewed 256, 1043 (1992).

Topobiology. An Introduction to Molecular Embryology. Gerald M. Edelman. Basic Books, New York, 1993. Paper, \$17. Reviewed 243, 1373 (1989).

Books Received

The Advancement of Science. Science Without Legend, Objectivity Without Illusions. Philip Kitcher. Oxford University Press, New York, 1993. x, 421 pp., illus. \$39.95.

Bacillus subtilis and Other Gram-Positive Bacteria. Biochemistry, Physiology, and Molecular Genetics. Abraham L. Sonenshein, James A. Hoch, and Richard Losick, Eds. American Society for Microbiology, Washington, DC, 1993. xiv, 987 pp., illus. \$125; to ASM members, \$98.

The Battle of the Gods and Giants. The Legacies of Descartes and Gassendi, 1655–1715. Thomas M. Lennon. Princeton University Press, Princeton, NJ, 1993. xiv, 420 pp. \$59.50. Studies in Intellectual History and the History of Philosophy.

Biology of Depressive Disorders. Part B, Subtypes of Depression and Comorbid Disorders. J. John Mann and David J. Kupfer, Eds. Plenum, New York, 1993. 2 vols. Part A, A Systems Perspective. xii, 272 pp., illus. \$45. Part B, Subtypes of Depression and Comorbid Disorders. xii, 183 pp. \$37.50. Depressive Illness Series, vols 3–4.

Canada's Cold Environments. Hugh M. French and Olav Slaymaker, Eds. McGill-Queen's University Press, Montreal, 1993. xxii, 340 pp., illus. \$45. Canadian Association of Geographers Series in Canadian Geography.

Data for Agrarian Development. C. D. Poate and P. F. Daplyn. Cambridge University Press, New York, 1993. x, 387 pp., illus. \$79.95; paper, \$32.95. Wye Studies in Agricultural and Rural Development.

Ensayos Sobre el Gran Nayar. Entre Coras, Huicholes y Tepehuanos. Phil C. Weigand. Centro de Estudios Mexicanos y Centroamericanos de la Embajada de Francia en México, Lomas de Chapultepec, Instituto Nacional Indigenista, Tlacopac, y Colegio de Michoacán, Zamora, Michoacán, México, 1992. 236 pp., illus. Paper, Mex\$40.

Fits, Passions, and Paroxysms. Physics, Method, and Chemistry and Newton's Theories of Colored Bodies and Fits of Easy Reflection. Alan E. Shapiro. Cambridge University Press, New York, 1993. xviii, 400 pp., illus. \$69.95.

Going from C to C++. Robert J. Traister. Academic Press, San Diego, CA, 1993. xiv, 188 pp., illus., + diskette. Paper, \$34.95.

Handbook of Bereavement. Theory, Research, and Intervention. Margaret S. Stroebe, Wolfgang Stroebe, and Robert O. Hansson, Eds. Cambridge University Press, New York, 1993. xii, 546 pp., illus. \$69.95; paper, \$29.95.

Immunophysiology of the Gut. W. Allan Walker, Paul R. Hartz, and Barry K. Wershil, Eds. Academic Press, San Diego, CA, 1993. xxvi, 448 pp., illus. \$70. Bristol-Myers Squibb/Mead Johnson Nutrition Symposium, 11. From a symposium, Boston, Aug. 1991.

Low Dimensional Properties of Solids. Mats Jonson and Tord Claesson, Eds. Physica Scripta, Stockholm, and World Scientific, River Edge, NJ,

1992. 219 pp., illus. \$86; paper, \$48. From a symposium, Gothenburg, Sweden, Dec. 1991.

MacClade. Analysis of Phylogeny and Character Evolution. Version 3. Wayne P. Maddison and David R. Maddison. Sinauer, Sunderland, MA, 1993. xii, 398 pp., illus., + diskette. Paper, \$40; with Macintosh diskette, \$75; chapters 3–6 only, \$10.

Nutrition in Cardio-Cerebrovascular Diseases. Kyu Taik Lee, Yasaburo Oike, and Takemichi Kanazawa, Eds. New York Academy of Sciences, New York, 1993. xiv, 370 pp., illus. Paper, \$110. Annals of the New York Academy of Sciences, vol. 676. From a conference, Aomori City, Japan, April 1992.

100 Billion Suns. The Birth, Life, and Death of the Stars. Rudolf Kippenhahn. Princeton University Press, Princeton, NJ, 1993. viii, 268 pp., illus. Paper, \$16.95. Translated from the German edition (Munich, 1980) by Jean Steinberg. Reprint, 1983 ed.

Origen y Desarrollo de la Civilización en el Occidente de México. Homenaje a Pedro Armillas y Ángel Palerm. Brigitte Boehm de Lameiras y Phil C. Weigand, Coordinadores. Colegio de Michoacán, Zamora, Michoacán, México, 1992. 382 pp., illus. Paper, Mex\$45.

Paleobotany and the Evolution of Plants. Wilson N. Stewart and Gar W. Rothwell. 2nd ed. Cambridge University Press, New York, 1993. xii, 521 pp., illus. \$49.95.

Quantum Field Theory. A Modern Introduction. Michio Kaku. Oxford University Press, New York, 1993. xx, 785 pp., illus. \$49.95.

Race in North America. Origin and Evolution of a Worldview. Audrey Smedley. Westview, Boulder, CO, 1993. xii, 340 pp. \$48.50.

Sex and Gender Hierarchies. Barbara Diane Miller, Ed. Cambridge University Press, New York, 1993. xx, 401 pp., illus. \$64.95; paper, \$19.95. Publications of the Society for Psychological Anthropology, 4. From a conference, Mijas, Spain, Jan. 1987.

A Short Guide to Writing About Biology. Jan A. Pechenik. 2nd ed. HarperCollins, New York, 1993. xvi, 240 pp., illus. Paper, \$14.50. Short Guide Series.

Theoretical Mechanics of Biological Neural Networks. Ronald J. MacGregor. Academic Press, San Diego, CA, 1993. xii, 377 pp., illus. \$69.95. Neural Networks.

Theory and Calculation of Applied Solar Energy Concentrating Systems. R. A. Zakhidov, G. Ya Umarov, and A. A. Weiner. Gujarat Energy Development Agency, Vadodara, India, 1992. ii, 146 pp., illus. Paper, Rs250. Translated from the Russian edition (Tashkent, Uzbekistan, 1977).

A Theory of Latticed Plates and Shells. G. I. Pshenichnov. World Scientific, River Edge, NJ, 1993. xii, 309 pp., illus. \$58. Series on Advances in Mathematics for Applied Sciences, vol. 5.

Tumor Necrosis Factor. Molecular and Cellular Biology and Clinical Relevance. Walter Fiers and Wim A. Buurman, Eds. Karger, New York, 1993. x, 256 pp., illus., + plates. \$258.50. From a conference, Veldhoven, Netherlands, May 1992.

200% of Nothing. An Eye-Opening Tour Through the Twists and Turns of Math Abuse and Innumeracy. A. K. Dewdney. Wiley, New York, 1993. x, 182 pp., illus. \$19.95.

Usability Engineering. Jakob Nielsen. Academic Press, San Diego, CA, 1993. xiv, 358 pp., illus. \$39.95.

Veterans at Risk. The Health Effects of Mustard Gas and Lewisite. Constance M. Pechura and David P. Rall, Eds. National Academy Press, Washington, DC, 1993. xx, 427 pp., illus. Paper, \$39.95.

A View to a Death in the Morning. Hunting and Nature Through History. Matt Cartmill. Harvard University Press, Cambridge, MA, 1993. xvi, 331 pp., illus. \$29.95.

Visit to a Small Universe. Virginia Trimble. American Institute of Physics, New York, 1993. xiv, 336 pp., illus. \$25. Masters of Modern Physics, vol. 4.

Wetlands of the World. Inventory, Ecology and Management. Vol. 1, Africa, Australia, Canada and Greenland, Mediterranean, Mexico, Papua New Guinea, South Asia, Tropical South America, United States. Dennis Whigham, Dagmar Dykijová, and Slavomil Hejrný, Eds. Kluwer, Norwell, MA, 1993. xx, 768 pp., illus. \$286. Handbook of Vegetation Science, vol. 15/2.