gests that our knowledge of marine forms is heavily biased in the direction of what individual investigators find personally interesting and that, as the book implies, we need a new paradigm for marine studies that incorporates all kinds of studies on all kinds of eukaryotic microorganisms.

Another topic of general interest is the role of marine fungi (*sensu lato*) in pathogenicity and in nonpathogenic interactions. Porter notes that even though parasitic marine fungi have been found in various associations with many animals, it is likely that we know today only a fraction of the interactions that actually exist. As economically important food organisms come under intensive monoculture, fungal epidemics surely follow. Polglase, Alderman, and Richards continue on this theme, including in their discussion organisms of little-known taxonomic affinity that cause ravaging diseases of fish. Fungal interactions with plants are discussed by Molina and by Kingman and Evans. The former is concerned with an invasive fungal (oomycete) pathogen of the red alga *Chondrus crispus*. Even though the alga has been studied and utilized commercially for many years, this is the first report of that particular interaction; one wonders how many others are out there waiting for their first report. Likewise, virtually nothing had been known about the true nature of the *Pelvetia-Mycosphaerella* interaction described by Kingham and Evans. We still know little, but their chapter clearly defines the problem and the possible solutions.

Commercial interests are well served in the chapters by Miller on secondary metabolites and their potential importance, by Hyde, Jones, and Moss on mycelial adhesion, a topic of major value in light of the concept that microbial interactions must start with adhesion, by Mouzouras on timber decay, one of the time-honored and well-recognized roles of marine fungi, and by Eaton on wood preservation.

The more traditional areas of morphology and taxonomy are well represented by seven chapters on Ascomycotina. This fungal group is not only the dominant one in marine habitats (by current estimate), it lends itself more readily to taxonomic treatment than do many of the more loosely associated organisms discussed in this book. The extensive summary by G. Hughes on biogeography and marine fungi effectively demonstrates the immense amount of work that must be put into studies of the marine fungi. Overall, this volume, though unevenly written, contains chapters of interest to many different kinds of mycologists and should be read by other biologists as well. For too long now have marine fungi been studied *in vacuo* and virtually ignored by nonmycological marine biologists. These organisms need to be incorporated as equal members in marine microbiological investigations.

IAN K. ROSS
Department of Biological Sciences, University of California, Santa Barbara, CA 93106

Sensory Physiology

Visual Neuroscience. J. D. PETTIGREW, K. J. SANDERSON, and W. R. LEVICK, Eds. Cambridge University Press, New York, 1986. x, 448 pp., illus. $125. From a celebration, Lord Howe Island, Australia, 1983.

The papers in this volume were written by colleagues, students, and scientific friends of Peter Bishop, formerly professor of physiology at the John Curtin School of Medical Research at the Australian National University in Canberra. The papers are renditions in print of presentations at a meeting in honor of Bishop held on Lord Howe Island, a few hundred miles off the coast of Australia, in 1983. From all accounts this was an exceptional event, and the present book is an exceptionally fine tribute to a well-known visual neurophysiologist.

Bishop's approach to science has been to emphasize precision of measurement and painstaking experimentation. His strategy for building the Department of Physiology was to assemble the best electronic and mechanical instrumentation and give younger researchers autonomy to pursue their own questions about visual neurophysiology. The camaraderie of his group was maintained by daily meetings and injections of enthusiasm and support by Bishop. This strategy resulted in significant progress on two major subjects of present concern in visual neuroscience, the neural basis of binocular depth perception and the multiple, parallel representations of the visual world in the brain.

That single visual cortical neurons can signal the distance of an object in depth, on the basis of horizontal disparity of their receptive fields in the eyes, was a major discovery by John Pettigrew in Bishop's laboratory. The evolutionary, clinical, and theoretical significance of this discovery is the subject of some of the more lively papers in the book, those by Pettigrew, D. P. Crewther and S. G. Crewther, and J. I. Nelson. Pettigrew's paper is distinguished by its enthusiasm and pugnacity toward theoreticians although his facts are not always straight.

The exploration of the multiple representations of the visual world in the arrays of X, Y, and many other types of retinal ganglion cells, and their targets in the visual cortex, constitutes a major fraction of the book. This emphasis is appropriate, because the group working under Bishop provided some of the best early evidence of the importance of parallel processing in the retina and central visual pathway. Papers on this subject by W. R. Levick, B. G. Cleland, H. Wässle, J. Bullier, G. Henry, B. Dreher, and J. Kaas are all interesting and offer new ideas as well as useful reviews of past accomplishments. An intriguing new investigation by J. Stone and D. H. Rapaport of the development of the retina, using knowledge about the multiplicity of ganglion cell types, provides a fresh perspective on an old and interesting unsolved problem. The book's most interesting paper on parallel visual pathways, in my opinion, is that by W. Burke on pressure block of Y cells in the cat optic nerve. There is some hope that Burke may finally have found a way to knock out the Y cells selectively and thereby define their role in visual behavior by measuring visual perceptual losses.

The book ends with a section on integrative aspects, an area that Bishop personally avoided but encouraged others to explore. This section includes two papers on illusory contours: a psychologist's analysis of the perceptual phenomenon of seeing a border that has no physical reality outside one's head, by R. H. Day; and an account by E. Peterhans and colleagues of recent neurophysiological experiments on single neurons in the monkey visual cortex that can "see" illusory contours like those perceived by humans. This subject is being intensely studied now in many laboratories because it seems directly related to fundamental mechanisms of the perception of form. The two papers in this book are excellent starting points for learning about the mysteries of, as well as some of the explanations for, subjective contours.

One of the special features of this book is the inclusion of the human side of science. In addition to the summaries of Bishop's career, there are brief reminiscences by many of the authors about the time they spent in his laboratories, either in Canberra or earlier in Sydney. There is also a strong implicit pride among the Australian contributors in the growth of Australian science, as exemplified by the successes of Bishop and his group. Alongside of the group's scientific accomplishments, the book gives ample evidence of Bishop's role in training a generation of Australian scientists and in building a department that attracted to Australia scientists from the United States, Britain, Japan, France, Belgium, Switzerland, Poland, and

Germany. The editors have succeeded in presenting a volume to Peter Bishop that does him justice and in giving neuroscientists and psychologists a book worth studying.

ROBERT M. SHAPLEY
Laboratory of Biophysics, Rockefeller University, New York, NY 10021

Books Received

Aggression and Community. Paradoxes of Andalusian Culture. David D. Gilmore. Yale University Press, New Haven, 1987. xviii, 218 pp. $24.50.

AIDS. Impact on Public Policy. An International Forum: Policy, Politics, and AIDS. Robert F. Hummel *et al.*, Eds. Plenum, New York, 1986. x, 170 pp. $45. From a symposium, New York, May 1986.

Air Battle Central Europe. Alfred Price. Free Press (Macmillan), New York, 1987. xvi, 192 pp., illus., + plates. $17.95.

Algal Biofouling. L. V. Evans and K. D. Hoagland, Eds. Elsevier, New York, 1986. x, 318 pp., illus. $84.50. Studies in Environmental Sciences 28. From a symposium, Gainesville, FL, Aug. 1985.

Alvarez. Adventures of a Physicist. Luis W. Alvarez. Basic Books, New York, 1987. xii, 292 pp. + plates. $19.95.

Amyotrophic Lateral Sclerosis. Therapeutic, Psychological, and Research Aspects. V. Cosi *et al.*, Eds. Plenum, New York, 1987. xiii, 357 pp., illus. $65. Advances in Experimental Medicine and Biology, vol. 209. From a congress, Varese, Italy, March 1985.

Animal Models. Assessing the Scope of Their Use in Biomedical Research. Junichi Kawamata and Edward C. Melby, Jr., Eds. Liss, New York, 1987. xvi, 384 pp., illus. $65. Progress in Clinical and Biological Research, vol. 229. From a symposium, Kyoto, Japan, Oct. 1985.

Another Icarus. Percy Pilcher and the Quest for Flight. Philip Jarrett. Smithsonian Institution Press, Washington, DC, 1987. xii, 226 pp., illus. $22.50.

Biology of the Adipocyte. Research Approaches. Gary J. Hausman and Roy J. Martin, Eds. Van Nostrand Reinhold, New York, 1987. xii, 291 pp., illus. $46.95. Van Nostrand Reinhold Advanced Cell Biology Series.

Brain Peptides and Catecholamines in Cardiovascular Regulation. Joseph P. Buckley, Carlos M. Ferrario, and Mustafa F. Lokhandwala, Eds. Raven, New York, 1987. xviii, 429 pp., illus. $55. Based on a symposium, Houston, TX, Jan. 1986.

Brain Reward Systems and Abuse. Jörgen Engel *et al.*, Eds. Raven, New York, 1987. x, 198 pp., illus. $56. From a symposium, Göteborg, Sweden, 1985.

Brown Melanoderma. Biology and Disease of Epidermal Pigmentation. Thomas B. Fitzpatrick, Michael M. Wick, and Kiyoshi Toda, Eds. University of Tokyo Press, Tokyo, 1987 (U.S. distributor, Columbia University Press, New York). viii, 232 pp., illus. $94.50. From a conference, Tokyo, June 1985.

Can the Cardiac Stand Trial? Meyer Texon. Hemisphere (Harper and Row) New York, 1987. xvi, 644 pp. $37.

Carnitine. Its Role in Lung and Heart Disorders. E. Kaiser and A. Lohninger, Eds. Karger, New York, 1987. x, 139 pp., illus. $37.25. From a symposium, Graz, Austria, Sept. 1985.

Cartography in France, 1660–1848. Science, Engineering, and Statecraft. Josef Konvitz. University of Chicago Press, Chicago, 1987. xx, 194 pp., illus. $39.95.

Cell and Molecular Biology. Phillip Sheeler and Donald E. Bianchi. 3rd ed. Wiley, New York, 1987. xviii, 704 pp., illus. $44.75.

Cell and Tissue Culture in Forestry. J. M. Bonga and Don J. Durzan, Eds. Vol. 1, General Principles and Biotechnology. xiv, 422 pp., illus. $78.50. Vol. 2, Specific Principles and Methods. Growth and Developments. xvi, 447 pp., illus. $82.50. Vol. 3, Case Histories. Gymnosperms, Angiosperms and Palms. xviii, 416 pp., illus. $76.50. Nijhoff, Dordrecht, 1987 (U.S. distributor, Kluwer, Norwell, MA). Forestry Sciences. Second edition of *Tissue Culture in Forestry*.

Cell Fusion. Arthur E. Sowers, Ed. Plenum, New York, 1987. xx, 540 pp., illus. $75.

Cenozoic Basin Development of Coastal California. Raymond V. Ingersoll and W. G. Ernst, Eds. Prentice-Hall, Englewood Cliffs, NJ, 1987. xii, 496 pp., illus. $64. Rubey Volume, 6. From a colloquium, Los Angeles, CA, Oct. 1984.

Characteristic Classes and the Cohomology of Finite Groups. C. B. Thomas. Cambridge University Press, New York, 1987. xii, 129 pp. $29.95. Cambridge Studies in Advanced Mathematics, 9.

Chernobyl. Response of Medical Physics Departments in the United Kingdom. J. K. Haywood, Ed. Institute of Physical Sciences in Medicine, London, 1986. xii, 99 pp., illus. Paper, £12.75. Report no. 50.

Children and Anthropological Research. Barbara Butler and Diane Michalski Turner, Eds. Plenum, New York, 1987. xii, 162 pp. $39.50. Based on a conference, East Lansing, MI, 1982.

Children's Eyewitness Memory. Stephen J. Ceci, Michael P. Toglia, and David F. Ross, Eds. Springer-Verlag, New York, 1987. xii, 259 pp., illus. $33.50. Based on a symposium, 1985.

The Emplacement of Silicic Domes and Lava Flows. Jonathan H. Fink, Ed. Geological Society of America, Boulder, CO, 1987. viii, 145 pp., illus. Paper, $18.75. Geological Society of America Special Paper 212. Based on a symposium, Reno, NV, 1984.

Energetics of Microbial Growth. Edwin H. Battley. Wiley-Interscience, New York, 1987. xxiv, 450 pp., illus. $59.95.

Environmental Decisionmaking in a Transboundary Region. Alison Rieser, Judith Spiller, and David VanderZwaag, Eds. Springer-Verlag, New York, 1986. xiv, 209 pp., illus. Paper, $26.70. Lecture Notes on Coastal and Estuarine Studies, vol. 20.

Environmental Impacts of Coal Mining and Utilization. M. J. Chadwick, N. H. Highton, and N. Lindman, Eds. Pergamon, New York, 1987. xxvi, 332 pp., illus. $75. Revision of Environmental Implications of Expanded Coal Utilization.

Environmental Radioactivity. From Natural, Industrial, and Military Sources. Merril Eisenbud. 3rd ed. Academic Press, Orlando, FL, 1987. xx, 475 pp., illus. $55.

Epidemics and Mortality in Early Modern Japan. Ann Bowman Jannetta. Princeton University Press, Princeton, NJ, 1987. xxii, 224 pp., illus. $30.

Essays on Science. Felicitation Volume in Honour of Dr. Salimuzzaman Siddiqui. Hakim Mohammed Said, Ed. Hamdard Foundation Press, Karachi, 1986. viii, 399 pp., illus. $35.

Essentials of Biostatistics. Robert C. Elston and William D. Johnson. Davis, Philadelphia. 1987. xii. 307 pp., illus. Paper, $22. Essentials of Medical Education Series.

Events of the Mid-Cretaceous. Final Report on Results Obtained by IGCP Project No. 58, 1974–1985. Richard A. Reyment and Peter Bengtson, compilers. Pergamon, New York, 1986. x, 213 pp., illus. $130. Physics and Chemistry of the Earth, vol. 16.

Exercises in Quantum Mechanics. A Collection of Illustrative Problems and Their Solutions. Harry A. Mavromatis. Reidel, Dordrecht, 1987 (U.S. distributor, Kluwer, Norwell, MA). xii, 181 pp., illus. $49.50. Reidel Texts in the Mathematical Sciences.

Handbook of Radiative Heat Transfer in High-Temperature Gases. R. I. Souloukhin and Robert Goulard, Eds. Hemisphere (Harper and Row), New York, 1986. xviii, 309 pp., illus. $95. Translated from the Russian edition (Moscow, 1984).

Heat Conduction. James M. Hill and Jeffrey N. Dewynne. Blackwell Scientific, Palo Alto, CA, 1987. xvi, 334 pp., illus. $39.95. Applied Mathematics and Engineering Science Texts.

Heat Transfer in Gas-Cooled Annular Channels. J. Vilemas, B. Česna, and V. Survila. A. Žukauskas, Ed. Hemisphere (Harper and Row), New York, 1987. xiv, 226 pp., illus. $73.95. Experimental and Applied Heat Transfer Guide Books. Translated from the Russian edition (Vilnius). J. Karni, English-edition editor.

Heat Transfer Science and Technology. Bu-Xuan Wang, Ed. Hemisphere (Harper and Row), New York, 1987. xviii, 944 pp., illus. $139.95. From a symposium, Peking, Oct. 1985.

Heretical Verities. Mathematical Themes in Physical Description. Thomas E. Phipps, Jr. Classic Non-Fiction Library, Urbana, IL, 1986. xvi, 637 pp. $29.

High-Energy Processes in Organometallic Chemistry. Kenneth S. Suslick, Ed. American Chemical Society, Washington, 1987. viii, 336 pp., illus. $69.95. ACS Symposium Series, 333. Based on a symposium, Anaheim, CA, Sept. 1986.

High-Speed Electronics. Basic Physical Phenomena and Device Principles. B. Källbäck and H. Beneking, Eds. Springer-Verlag, New York, 1986. x, 232 pp., illus. $39.50. Springer Series in Electronics and Photonics, 22. From a conference, Stockholm, Aug. 1986.

An Introduction to Behavioural Ecology. J. R. Krebs and N. B. Davies. 2nd ed. Sinauer, Sunderland, MA, 1987. x, 389 pp., illus. Paper, $18.95.

Introduction to Combinators and λ-Calculus. J. Roger Hindley and Jonathan P. Seldin. Cambridge University Press, New York, 1986. iv, 360 pp., illus. $49.50; paper, $16.95. London Mathematical Society Student Texts, 1.

An Introduction of Equations of State. Theory and Applications. Shalom Eliezer, Ajoy Ghatak, and Heinrich Hora. Cambridge University Press, New York, 1986. xii, 366 pp., illus. $69.50.

Introduction to the History of Medical and Veterinary Mycology. G. C. Ainsworth. Cambridge University Press, New York, 1986. xii 228 pp., illus. $49.50.

Investigating the Life Sciences. An Introduction to the Philosophy of Science. G. M. N. Verschuuren. Pergamon, New York, 1986. x, 148 pp., illus. $30. Foundations and Philosophy of Science and Technology.

Issues in Diagnostic Research. Cynthia G. Last and Michel Hersen, Eds. Plenum, New York, 1987. x, 349 pp., $45. Thirteen papers concerned with psychiatric diagnosis.

Johannes Müller and the Nineteenth-Century Origins of Tumor Cell Theory. L. J. Rather, Patricia Rather, and John B. Frerichs. Science History Publications (Watson), Canton, MA, 1987. x, 193 pp., illus. $15. Resources in Medical History. Including an annotated translation of Müller's *Ueber den feinern Bau und die Formen der krankhaften Geschwülste* (1838).

Kinetics of Nonhomogeneous Processes. A Practical Introduction for Chemists, Biologists, Physicists, and Materials Scientists. Gordon R. Freeman, Ed. Wiley-Interscience, New York, 1987. xvi, 874 pp., illus. $99.95.

Living with Seabirds. Bryan Nelson. Edinburgh University Press, Edinburgh, U.K, 1987 (U.S. distributor, Cambridge University Press, New York). vii, 253 pp., illus. $25.

Localization and Interaction in Disordered Metals and Doped Semiconductors. D. M. Finlayson, Ed. Scottish Universities Summer School in Physics, Edinburgh, 1986. xvi, 393 pp., illus. £36. From a school, St. Andrews, Aug. 1986.

Lovebirds, Cockatiels, Budgerigars. Behavior and Evolution. J. Lee Kavanau. Science Software Systems, Los Angeles, CA, 1987 xxvi, 1001 pp.. $69.

Lung Cancer. Current Status and Prospects for the Future. Clifton F. Mountain and David T. Carr, Eds. University of Texas Press, Austin, TX, 1987. xii, 423 pp., illus. $60. From a conference, Houston, TX, Nov. 1984.

Macro-Policies for Appropriate Technology in Developing Countries. Frances Stewart, Ed. Westview, Boulder, CO, 1987. x, 315 pp., illus. Paper, $29.85. Westview Special Studies in Social, Political and Economic Development.

Magmatic Processes. Physicochemical Principles. B. O. Mysen, Ed. The Geochemical Society, University Park, PA, 1987. x, 500 pp., illus. $65; to Geochemical Society members, $45. Special Publication no. 1.

Manganese in Metabolism and Enzyme Function. Vern L. Schramm and Frederick C. Weder, Eds. Academic Press, New York, 1986. x, 437 pp., illus. $59.

A Manual of Forensic Entomology. Kenneth G. V. Smith. British Museum (Natural History), London, and Comstock (Cornell University Press), Ithaca, New York, 1987. 205 pp., illus. $39.95.

Past, Present, and Future. Isaac Asimov. Prometheus, Buffalo, NY, 1987. viii, 374 pp. $19.95.

Peroxisomes in Biology and Medicine. H. Dariush Fahimi and Helmut Sies, Eds. Springer-Verlag, New York, 1987. xviii, 470 pp., illus. $93.50. Proceedings in Life Sciences. From a symposium, Heidelberg, F.R.G., July 1986.

Pesticides. Minimizing the Risks. Nancy N. Ragsdale, and Ronald J. Kuhr, Eds. American Chemical Society, Washington, DC, 1987. viii, 183 pp., illus. $34.95. Based on a symposium, New York, April 1986. ACS Symposium Series, 336.

Philosophy, Science and Social Inquiry. Contemporary Methodological Controversies in Social Science and Related Applied Fields of Research. D. C. Phillips. Pergamon, New York, 1987. xiv, 210 pp. Paper, $14.95.

Phosphorus Chemistry in Everyday Living. Arthur D. F. Toy and Edward N. Walsh. 2nd ed. American Chemical Society, Washington, DC, 1987. xiv, 362 pp., illus. $24.95.

Physical Metallurgy. Peter Haasen. 2nd ed. Cambridge University Press, New York, 1986. xvi, 392 pp., illus. Paper, $29.95. Translated from the German edition (Berlin, 1974) by Janet Mordike.

Physics. Richard Wolfson and Jay M. Pasachoff. Little, Brown, Boston, 1987. xviii, 1081 pp., illus. $49.75.