weakest areas in behavioral ecology. This is borne out by R. Sibly and P. Calow, who attempt to reduce the complexity of selection generated from habitats to two dimensions: juvenile growth rate and survivorship. This approach ignores the contributions of life history theorists such as Brian Charlesworth, Eric Charnov, William Schaffer, and Steven Stearns, who base their models on relationships in age-specific survival probabilities and fecundities. Since its incorporation into behavioral ecology is surely one of the most important future directions for the field, it is unfortunate that life history theory is not better represented.

The book lacks a balanced international authorship (over 80% of the 55 authors are British), and most of the papers are based on studies of birds or mammals (there are only two papers on insects, both on parasitic wasps; one on a marine invertebrate; one on a crustacean; and one on a fish, studied in the laboratory). The papers it contains are generally well written and of high quality, however. Its ecological approach and emphasis on population dynamics complements the evolutionary approach of the collective volume *Behavioural Ecology* edited by John Krebs and Nicholas Davies (Sinauer; second edition, 1984).

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The Fishing Problem

Exploitation of Marine Communities. R. M. MAY, Ed. Springer-Verlag, New York, 1984. x, 367 pp., illus. $20. Dahlem Workshop Reports; Life Sciences Research Report 32. From a workshop, Berlin, April 1984.

The basic premise of traditional fishery management has been that fish populations can be exploited to produce a maximum sustainable yield in a naturally persistent equilibrium condition. Single-species population models based on mortality, growth, and reproduction (recruitment) and data on size-selective mortality induced by a fishery are combined to prescribe fishing tactics intended to maximize and stabilize the yield over time. This approach developed, in part, from observations of how individual fish populations and catches responded to increases or decreases in fishing effort. However, with its general application, fish populations are typically overexploited and yields decline or even cease. In short, "fisheries are not being managed well."

May and his 47 distinguished co-authors primarily address the idea that the "fishing problem" has been too narrowly defined, that we are exploiting not a single species but communities of interacting species, usually in multispecies fisheries. They also point out that equilibrium fishing may be undermined by genetic changes in populations induced by fishing, by changes in external factors such as climate, and by the inability of our institutions to implement the appropriate management measures because fish are treated as a common-property resource. They make it clear that application of fishery science is always in an arena filled with uncertainty that requires decision-makers to be ready to react and adapt to change or to the unpredicted.

To me the exciting feature of this excellent book is that the authors raise many questions and make many insightful suggestions about how fishery science should proceed now that we realize that the issues to be addressed have to do with the exploitation of communities rather than populations per se. The book does not present a consensus but rather the sometimes contradictory ideas of individual authors or working groups. Yet even with its contradictions the book signals a significant change in perspective: fishery scientists and marine ecologists are attempting to cope with the broader causes of uncertainty and to develop new approaches that incorporate uncertainty into management recommendations. Development of more predictive models that incorporate the complexities discussed is one of the major challenges to fishery science and its application in the decades ahead.

Exploitation of Marine Communities is full of quotable statements for consideration in courses in fisheries or to provoke thought or action. A selection follows:

R. J. H. Beverton et al.: "Clear and unambiguous evidence of interspecific interaction in major marine ecosystems, which could be used directly to achieve a significant improvement in single-species assessments, as yet hardly exists."

G. Sugihara et al.: "Exploited fish populations are embedded within a complex web of interactions involving species from many different taxa existing together in a variable environment." The task at hand is "how to best characterize and simplify complex systems to highlight change and to understand structure in marine communities."

J. H. Steele: "Historical evidence suggests that regional fish stocks can change very markedly and very rapidly between high and very low levels of abundance at intervals of about 50 years." "Principles of fishery management, which assume a single underlying long-term equilibrium, were developed during a period (1920–1970) when there was a relatively stable situation." "We should replace the single equilibrium assumption by the recognition of possible multiple states, each markedly different from the others, with the changes between them occurring rapidly, and with the frequency of change increasing with increased predatory fishing pressure."

J. A. Gulland: "The simple single-species models that have been the basic tools of the fishery scientists for the past twenty years can be used to give advice with only a small number of unpleasant surprises (e.g., the collapse of the Peruvian anchovy), and advice given now, based on these single-species models, is much more useful to the manager than a situation in which he gets no advice until more sophisticated models are developed."

The editor sees the book as "essentially a tentative statement—often by several dissonant voices—about directions in which we may be heading" and represents it as "intended to stimulate, not to codify." I agree and appreciated the stimulation it provides.

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Influences in Psychology

Points of View in the Modern History of Psychology. CLAUDE E. BUXTON, Ed. Academic Press, Orlando, FL, 1985. xiv, 468 pp. $58; paper, $29.95.

Points of View in the Modern History of Psychology offers a significant departure from the usual ways in which psychologists assess their past. Histories of modern psychology typically have been Whiggish: charts of scientific progress illuminated with great men, great discoveries, and great currents of thought. One form these histories have taken is exemplified by E. G. Boring's chronicle of the experimental approach, a work that is nearly as revealing for what it omits as for what it recounts. Another form is what has come to be called the "schools and systems" approach, where competing theories are each analyzed in terms of their premises and historical roots and sometimes traced back to pre-Socratic thought. *Points of View* is an attempt to transcend these tropes of history, offering students a treatment of psychology's past not as a progressive march but as an assemblage of variegated points of view that have been constructed during the modern era. Also, rather than offering only internalist history (dealing solely with intellectual issues within the field) the editor urged externalist accounts that would enable read-

ers to locate these varied points of view within the broader historical tableau.

How does the history of psychology look within such an expanded framework? For one thing the common view of American psychology as more or less an extension of the German experimental tradition is rejected. The volume vividly demonstrates the influence of evolutionary theory, British associationism, French philosophy and psychiatry, and Russian physiology, along with a pragmatism and functionalism indigenous to North America. Other misconceptions associated with a monolithic story of origins are also corrected. For instance, Arthur Blumenthal's chapters on Wundt and on experimentalism illustrate the competing visions about what was to constitute proper research methodology. Similarly, several chapters debunk the myth of psychology's purported struggles to disentangle itself from biology on the one hand and philosophy on the other. The relations between psychology and these two neighboring disciplines were far more complicated. Among the cogent accounts the volume presents of other issues that are either omitted from or misrepresented in most texts are Steele's deconstruction of the history of psychoanalysis and his illuminating discussion of new advances, which includes a roster of theorists with whose work psychologists should be but generally are not acquainted; Mitchell Ash's erudite depiction of Gestalt psychology and its turbulent move from the Continent to the United States; Buxton's sensitive interpretation of the varieties of functionalism; and Frank Kessel and William Bevan's précis on the recent emergence of cognitive psychology.

Laudable as this endeavor to revise the historical portrait of psychology is, it still falls short of providing a genuine pluralistic and contextual perspective. Most (though certainly not all) of the chapters tacitly subscribe to a view of psychology as a natural science relying on experimental evidence as the primary criterion of truth and embracing a clear-cut subject. The special problems inherent in a science that uses experiencing humans as both the observers and the objects of observation are skirted, as are the persistent problems of experimental bias and the quantification of experience. The presentation of psychology as a natural science leaves no place for contemplating how it might (also) be a social or interpretative science (with the notable exception of Steele's chapters on psychoanalysis). Perhaps because of these static precepts, the fields of personality, developmental, and social psychology are not represented. Another consequence may be a restricting of what counts as "external" or "contextual" analysis, such that the volume attends to the influences of biology and philosophy but does not rethink psychology's relations to sociology, anthropology, linguistics, and engineering sciences. More important is the failure to discuss how psychology was shaped by forces in addition to intellectual ones, despite the fact that historical research is beginning to decipher how economics, politics, and culture shape the sciences. This contextualist scholarship unfortunately has been left unmined by most of the contributors to the volume.

These problems may turn out to be nothing more than temporary wrinkles if future textbooks in the history of psychology heed the innovations attempted here. The refinement of contextual analysis will depend on advances in historical research, but its acceptance will depend on the extent to which psychologists are truly willing to give their students a pluralist perspective.

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Wave Propagation

The Propagation of Radio Waves. The Theory of Radio Waves of Low Power in the Ionosphere and Magnetosphere. K. G. BUDDEN. Cambridge University Press, New York, 1985. xvi, 669 pp., illus. $89.50. Revised edition of *Radio Waves in the Ionosphere* (1961).

The propagation of radio waves through the ionized layers of the earth's atmosphere is of importance in radio communication, navigation, and surveillance, and a thorough knowledge of the characteristics of propagation is important to the efficient use of the spectrum. The presence of plasma and the earth's magnetic field and the occurrence of collisions between electrons and molecules render the ionospheric plasma birefringent, absorbing, and dispersive, so that radio waves are distorted as they travel.

These phenomena are considered in Budden's *The Propagation of Radio Waves*, which is more than an updating of his classical treatise *Radio Waves in the Ionosphere*. The book covers the topics covered in the earlier book as well as some additional ones. In particular, the new book includes discussions of magnetospheric phenomena, including topside soundings, and such aspects of plasma physics as Debye shielding, ion-cyclotron waves, and plasma resonances. Such new techniques for probing the ionosphere as partial reflections, Faraday rotation, and wave interaction are discussed. On the other hand, the author wisely avoids discussion of the scattering of radio energy by irregularities, which enables him to concentrate on the magnetoionic aspects of wave propagation.

Among the topics that are new or that receive considerably expanded discussion are reciprocity, which is tackled from the points of view of both ray theory and full-wave theory; the kinetic treatment of collisions and the Sen-Wyller formulas for refractive indexes; the coupling of characteristic waves, including the important cases of limiting polarization at the base of the ionosphere, and radio windows; and general ray tracing of complex rays and pseudo rays in absorbing media. Another important feature of the book is the long list of references to textbooks and published papers, both current and historical.

There is a great emphasis in the book on the WKB solutions. These solutions are of considerable value to those interested in understanding wave characteristics, but not to the practical radio engineer, who can use full-wave (computer) solutions. Three chapters are devoted to full-wave theories and their applications to such topics as resonance and barriers, resonance tunneling, and inversion of reflection measurements. Full-wave treatments are given for linear, linear piecewise, exponential, parabolic, and Epstein electron density models. The book emphasizes an understanding of the basic physical principles on the premise that a user who understands the physics is well equipped to tackle specific problems. The reader is assumed to be familiar with calculus, the theory of complex variables, vectors (including differential vector operators), matrixes, and basic electromagnetic theory.

The use of the term "Appleton-Lassen" rather than "Appleton-Hartree" for the refractive index formula will be welcomed by the German ionospheric community.

Budden's new book is recommended as an essential part of the libraries of all workers involved in any aspect of ionospheric radio communication or radio soundings of the ionosphere.

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Books Received

The Apocalyptics. How Environmental Politics Controls What We Know about Cancer. Edith Efron. Simon and Schuster, New York, 1985. 590 pp. Paper, $10.95. A Touchstone Book. Reprint, 1984 edition.

Applied Superconductivity, Metallurgy, and Physics of Titanium Alloys. Vol. 1, Fundamentals: Alloy Superconductors: Their Metallurgical, Physical,

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