Behaviorists: Watsonian Connotations

A number of general criticisms could be made of this book. Lorenz is undoubtedly unfair in calling all American psychologists "behaviorists," especially as he appears to use the term with purely Watsonian connotations. And yet this does the book no harm, for he attacks neither the men nor their work, but only some arguments that they have raised against his work. Similarly, it is doubtful that all "modern, English-speaking ethologists" form a cohesive group, even with respect to the attitude to instinct theory he ascribes to them, yet he successfully deals with the inadequacies of this attitude (while ignoring the better results of their examination of the abundance of unlike phenomena sheltered under the term "instinct"). A prolonged attack on a paper exploring the concept of operationism with respect to differences between behavior patterns makes its point, but ignores the virtues of being able to deal with *differences* that are attributable to neither learning nor evolution *per se*, but to different experimental manipulations. Here he unfortunately skirts an important problem in casually dismissing the effects of pathology on behavior. This is not because he does not realize the potential magnitude of such effects, but because he believes (and with considerable reason) that he is capable of avoiding or recognizing pathology. Yet in many ways pathological and other changes can be extremely instructive and their intentional induction is a powerful technique (as it has been in some of his own imprinting studies). There are in addition a number of lesser cases in which his treatment of some terms and concepts is unnecessarily vague—for example, "information" (see especially p. 26).

What should be kept in mind is that Lorenz is arguing a very specific point, and the weaknesses of the book are all tangential to that point. We should possibly get a very different view of these issues if he chose to turn his attention their way. It is in fact enormously pleasing that he has produced such a clear statement of his views on the concept of the innate, and that he has largely eschewed the aggressive polemics which have occasionally marred discussion of this central topic in ethology.

A few minor criticisms are appropriate. In some late stage of editing it seems that frequently the written numeral "1" was transposed to the printed "7," and that many (but not all) page references which appear with the numeral "7" need interpretation (for example, "77" should be "11"). Also mildly annoying is an asterisk on page 12 which tantalizes but does not fulfill, and the use at times of the word chapter instead of section in reference to a preceding part of the same chapter. But such irregularities are few, and praise is due the publisher for producing an attractive format for this important little book. I strongly recommend the book to ethologists and comparative psychologists alike, as a lucid statement of the importance of phylogenetic adaptation in behavior.

Polar Cap Experiments

High Latitude Particles and the Ionosphere (Logos Press, London; Academic Press, New York, 1965. 328 pp., $16), edited by B. Maehlum, contains the proceedings of the symposium organized by the COSPAR Panel on Polar Cap Experiments and held in March 1964. Books of this type could be particularly useful to those who are unable to attend meetings but would like to keep in touch with their own fields of work. The inclusion of summaries of the discussion and the informal style of many of the contributions will be particularly helpful in this respect. The usefulness of such volumes as permanent records could be greatly enhanced by more rapid publication. Although the editor and the publisher have made this volume available with only a comparatively short delay, certain parts of the proceedings have already been published, and in a more detailed form, in recent issues of scientific journals.

The book will undoubtedly serve as useful source of references to the many new observations of particles and their ionospheric effects described in it; it also contains several good review articles.

The revolution in polar physics caused by the advent of rockets and satellites is discussed by R. L. F. Boyd, whose introductory lecture precedes several papers on ionospheric exploration by probe and propagation experiments from satellites and rockets.

Most readers will enjoy the stimulating discussion of particles and fields (including electric fields) by C. G. Fälthammer. Several other authors also stress the importance of electric fields and the difficulties of measuring them. Fälthammer's discussion precedes several descriptions of the methods used and the results obtained with particle detectors on the Injun I and III and the Alouette satellites and on rockets launched from Norway.

Observations of indirect effects of particles such as radio wave absorption and scattering, and changes in the phase of very low-frequency radio waves, form the subject of most of the remaining contributions.

I noted relatively few errors and misprints. One minor misprint, which could cause difficulties, is the reference to "injected positions," instead of "injected positrons" (p. 77). The book can be recommended as a source of references to recent observational results and as a review of research on high latitude particles.

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Optical Mineralogy

Microscopic Identification of Minerals (McGraw-Hill, New York, 1965. 427 pp., $10.50), by E. Wm. Heinrich, is intended as an elementary introduction to optical mineralogy, but the scope is more limited than is implied by the title. A brief introduction to the methods of studying minerals by the microscope (12 pp.) precedes a brief description of optical properties of minerals (15 pp.). The bulk of the book (337 pp.) is devoted to the description of 180 minerals, in detail, under the headings composition, indices, color, form, orientation, and diagnostic features; partial descriptions or tabulated data are included for 116 additional mineral species. The book differs from many textbooks in optical mineralogy in that special emphasis is placed on the characteristics of crushed fragments in immersion mediums; additional brief reference is made to the characteristics of selected minerals in thin section, or their appearance as detrital grains. Separate tables (27 pp.) give ranges of indices of refraction, colors of minerals by optical groups, twinning of minerals, birefringence, and relief in thin section. The tables are limited in the number of minerals for which data are given, and most of the tabulated data are organized to indicate rather broad ranges:

for anthophyllite, α = 1.598–1.674, β = 1.605–1.685, γ = 1.615–1.697, γ-α = 0.013–0.025; γ versus composition in chart form; for fayalite, α = 1.731–1.824, β = 1.760–1.864, γ = 1.773–1.875; α, β, γ, γ-α, and 2V versus composition in chart form. The collection and presentation of a large number of charts make this an excellent textbook for the student of the common rock-forming minerals. Charts and tables that relate variations in optical properties to compositional variation in a mineral series, such as garnets, the rhombohedral carbonates, the lazulites, olivines, staurolites, cordierites, epidotes, pyroxenes, amphiboles, mica minerals, and feldspars, have been obtained from the detailed researches of many scientists (177 references), but the coverage of the various mineral groups is specific in some places and general in others.

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Biological Research in Antarctica

Biogeography and Ecology in Antarctica (Junk, The Hague, 1965. 800 pp., $31.95), edited by J. van Mieghem and P. van Oye, is offered by the editors as ". . . a general survey of what has been done thus far in the way of biogeographical and ecological research . . ." in Antarctica. It comprises the third volume in the series "Monographiae Biologicae" concerned with the continents of the Southern Hemisphere, since in the editors' opinion, it was "thought essential to include Antarctica." It is one of six major reports on Antarctic biological research published since the International Geophysical Year of 1957 and 1958. The others are *Discussion on the Biology of the Southern Cold Temperate Zone* (Royal Society, London, 1960); *The Life Sciences in Antarctica* (National Academy of Sciences, Washington, D.C., 1961); *Proceedings, 1st Symposium on Antarctic Biology* (Hermann, Paris, 1964); *Discussion on Physical and Biological Changes Across the Antarctic Convergence* (Royal Society, London, 1964); and *Antarctica* (Royal Society of New Zealand, 1965).

The short preface contains general explanations, two of which bear noting. One, a statement that little has appeared in biogeographical and ecological research about Antarctica, is not in accord with the existing record of the Antarctic biological literature published since 1957. Moreover, several contributors to this volume also had papers in earlier publications. Then, although the editors speak out warmly on behalf of international collaboration, a basic tenet that has done much to facilitate research in Antarctica, what appears to be lacking for efficient coordination in closing the many gaps in our knowledge of Antarctic biology is international coordination and communication, preferably through the Scientific Committee on Antarctic Research and the appropriate Permanent Working Group. The introductory remarks are, in a measure, an unbalanced review of the history of the Antarctic and an unnecessary digest of the 18 chapters that constitute the sole basis for this volume.

The first three chapters provide the physical setting: Harrington on geology and morphology; Rubin on climatology; and Ostapoff on the ocean surrounding Antarctica. The materials in these papers are well organized and clearly presented; the data are effective because they are derived largely from significant and current findings.

A second set of papers treats the vegetation of Antarctica. Hirano's report on freshwater algae is a painstaking review of all the earlier literature, with many detailed tables and an extended appendix concerned with the taxa of Antarctic and sub-Antarctic freshwater algae. The treatment is largely systematic, with emphasis on geographic distribution; but the usefulness of the latter information rests entirely on the correctness of the taxonomy, and Hirano admits that some of the determinations may be questionable. His bibliography, 116 references, falls just short of recent ecological work by Goldman, Angino, and a number of other recent limnological field workers; his bibliographic citations lack references to pages and sometimes to volume. Dodge's six-page exposition on the distribution and origin of the lichen vegetation of Antarctica also lacks references. A serious and unexplainable gap in the overall presentation of Antarctic botany is the absence of information on Antarctic mosses and hepatics; these are extremely important elements of the cryptogamous Antarctic flora and visible constituents of the land vegetation and a veritable cosmos of terrestrial invertebrate life. These shortcomings suggest hasty preparation, but in view of the long delay between the receipt of the manuscripts and their final publication, they also indicate a lack of editorial coordination. Wace's discussion on the vascular flora is a generous 65-page contribution, notwithstanding the fact that Antarctica can boast of only two flowering plants. The author brings in much that is relevant in terms of world vegetation by summarizing the fossil floras, the existing and highly pertinent distributions of present-day genera of vascular plants in the Southern Hemisphere, and recent views on the theories of zonal distribution of Antarctic and sub-Antarctic vegetation. Sieburth, who draws largely on his own experiences and observations, provides a competent and knowledgeable review of microbiological research in Antarctica. Wace and Sieburth somehow managed to include addenda and thus bring their references up to 1964.

Chapters 8 through 12 deal with the marine invertebrates. The first of these, David's paper on Chaetognatha, is a concise, informative, and well-diagrammed paper that provides a systematic, geographical, and ecological treatment. Yaldwin's paper on decapod Crustacea, the second shortest paper in the volume, represents a fairly well done survey of the surprisingly sparse Antarctic decapod Crustacea fauna which, it appears, is distinct from the sub-Antarctic fauna. However, within the brief span of this paper, there are a number of editorial variants and a series of unnecessary abbreviations which are inconsistent with the brevity of the paper and the style in the rest of the volume. Powell, an acknowledged authority of the mollusks of New Zealand and the sub-Antarctic region, has contributed a useful and important summary of this large group of invertebrates and a number of maps that show various distributions. This 47-page report includes four and a half pages of references up to 1958. It omits Rehder's brief but pertinent summary of malacological research in *The Life Sciences in Antarctica* (1961), and leaves out references to various biogeographical provinces discussed by his countrymen, Dell (1962) and Pawson (1961). Vervoort gives a concise summary on the biology of epiplankton in the Antarctic Ocean in relation to the hydrology of the Southern