

There is, then, a real need for an incisive book which would provide a lucid introduction to the subject. *Insect Photoperiodism*, however, does not meet this need; in my opinion, it will be only confusing to the student and annoying to the specialist.

A primary difficulty lies in Beck's delineation of his subject matter: "photoperiod" is defined as any light-dark cycle, and photoperiodism is considered to include all aspects of biological rhythmicity affected by light cycles (rather than only adaptation to season, mediated by day-length). This leads, inevitably, to semantic confusion: "In nearly all cases, photoperiodic responses of insects and other animals have been shown to be based on the effects of the environmental photoperiodic rhythm on internal biological rhythmic processes" (p. 1). If "photoperiodic responses" are taken to include the entrainment of circadian rhythms of eclosion and activity, this statement is partially valid; but to the reader who thinks of photoperiodism in terms of day-length responses (the traditional usage), the statement is patently misleading, since the available evidence for an internal rhythmic substrate underlying the seasonal responses of insects is either inconclusive or, in some cases, apparently negative (as Beck also recognizes, p. 177 ff). Throughout the book, wherever I came upon "photoperiodism" and "photoperiodic," I found it necessary to ask myself precisely which meaning was intended. My initial annoyance rapidly degenerated into despair.

The book provides an extensive treatment of insect circadian rhythms (eclosion, locomotor activity, and so on) and their phase-shifting and entrainment by light cycles, but never any clear indication of the relevance of these studies to seasonal adaptation. And relevance aside, the portions of the text on circadian rhythms are still probably the weakest component of the book. Bünning, who has so strongly emphasized the contributions to the study of leaf movement rhythms made by early workers such as Pfeffer (1875) and Darwin (1881), is nevertheless credited with the "pioneer studies of daily rhythms in plants" (p. 62). It is asserted that no systematic studies of "Aschoff's rule" have been made with insects (p. 67), although references to Lohmann's work with *Tenebrio* (for instance, by Hoffmann, in *Circadian Clocks*, 1965) must have passed through Beck's hands. There is an ex-

tensive discussion of *Drosophila* phase-shifting experiments from Pittendrigh's laboratory, but the proposed interpretation (p. 77), separating phase-shifts due to light-on and those due to light-off, clearly exceeds anything warranted by the data or proposed by Pittendrigh.

Beck is hesitant to use the term "biological clock," and I concur; but the logic of his reservations escapes me:

The existence of a biological clock could be deduced only if a degree of temporal freedom could be demonstrated. That is, if a given response to a stimulus were capable of expression at any time following stimulation, but could be held in abeyance until the passage of some arbitrary length of time, the response could then be said to be governed by a biological clock. This is not known to occur in any biological system; all responses are determined (p. 58).

The last sentence seems to imply that a biological clock would, by definition, violate strict determinism (and hence invoke vitalism?); but the preceding statements suggest that a biological clock is simply synonymous with a temporal "gating" mechanism, such as has already been demonstrated for development and eclosion of *Drosophila*—or have I misunderstood?

Other dogmatic statements in the text must be considered wrong on several counts: "There is general agreement that the insect responds to the light-on and light-off signals and to the time elapsing between these signals, rather than to the presence, absence or duration of light energy, per se" (p. 103). Not only is there no general agreement on this issue, but the entrainability of circadian rhythms, in the presence of natural twilights and even sinusoidal light cycles, clearly demonstrates that discrete on-off "signals" are not essential to synchronize a circadian rhythm. And Beck himself discusses in detail the many cases in which continuous light or continuous darkness—without on and off "signals"—can evoke the same growth or reproductive response as an appropriate light cycle.

I would like to find some aspect of this book about which I could wax enthusiastic; my reaction, however, was consistently negative. Even the 16-page bibliography, which I had thought might prove useful to entomologists, is apparently unreliable. A spot-check of the German-language references (without a check of original sources for pagination and so on) revealed four typographic errors (spelling and the

like) on page 244, and others on pages 248, 252, 254, 256, 257, 264, and 265. The much-needed incisive introductory text on photoperiodism has yet to be written.

J. T. ENRIGHT

*Scripps Institution of Oceanography,  
University of California, La Jolla*

## Origins of an Institution

**The Royal Society.** Concept and Creation. MARGERY PURVER. M.I.T. Press, Cambridge, Mass., 1967. xviii + 246 pp., illus. \$7.

Because of the central role which the Royal Society, founded in 1660, played in the scientific revolution, there have been a number of attempts to isolate just those elements which led to its formation.

Scholars have looked among the welter of utopian ideas and programs, ephemeral movements and organizations which flourished in the confused period of the Civil War and Commonwealth for likely candidates to which they can attribute parentage. Joining these scholars in their search, Margery Purver has challenged their usual methods and assumptions. Instead of concentrating on the mechanics and locations of the various organizations and movements that have been suggested as "precursors" of the society, she insists that only a study of the aims and philosophical inspirations of these precursors will enable us to know which one led to its formation and wherein its "unique character" lies. She has been able to enlighten us on some important though isolated points, but in general her book is naive, based on spotty research, and marred by an artless construction which all too frequently merely strings together overly long and often unnecessary quotations.

There are two major parts to Purver's thesis. First, she claims that the first historian of the Royal Society, Thomas Sprat, is correct in his assertion that the society's origins were at Oxford, rather than in London, as most subsequent accounts have maintained. Her case, however, rests in large measure on a misreading of the evidence. In trying to prove Sprat's reliability on the issue of the society's origins and its philosophical leanings, for example, she rests her case on the close supervision given Sprat by the members of the society; her evidence, however, indicates merely close supervision of the examples of the society's

research that Sprat was to include in his history and of the way he would describe the structure of the society. Nothing she cites indicates that the society's supervision extended beyond these limited parts of his history. She takes most of Sprat's claims as gospel and lauds his objectivity, ignoring the role of his history as propaganda for the society. At least in part, Sprat's history was clearly an attempt to ingratiate the young society with Charles II on the grounds that it would help preserve order and stability; in fact, Sprat went so far as to claim that the presence of natural philosophers at Oxford after the Civil War had saved the university from ruin. Purver's suggestion that, had the society wished to obscure its origins, it would undoubtedly have hidden its Parliamentary associations at Oxford during the 1640's ignores the fact (alluded to in H. R. Trevor-Roper's introduction to this book) that Oxford had been an important center of Royalist sentiment; in addition she overlooks the possibility that the society, under heavy attack from the universities, might well have wanted to claim a fictitious university parentage.

The second part of her thesis is an interpretation of Baconian philosophy, in connection with which she lays great stress on Bacon's influence on the Royal Society. Here she rightly stresses that Bacon's insistence on the applicability of theories was for him primarily a means of insuring that there would be some connection between scientific theories and the real world, rather than the more common view that he was interested primarily in utilitarian ends. She provides a valuable illustration of the way the Oxford Experimental Science Club tried to follow Baconian principles in gathering accounts of natural phenomena from various books. But most of her rather polemical discussion of Bacon is puzzling. Against whom is it aimed? Her discussion of his philosophy is apparently an attack on certain accepted views, but her failure to cite any scholar later than the 19th-century historian Macaulay leaves us little way of knowing whether she is attacking real or straw men; in most instances, the latter seems to be the case. And her lengthy attempt to show the society's debt to Bacon is an exercise in the obvious.

A series of chapters discussing each of the suggested "precursors" forms the second half (or appendix) of the book. Here Purver is much better, and only here does she employ the scholarship of

this century. She has interesting things to say about inconsistencies in the accounts of the society's origins by Wallis which are used to support the claim that the society began in London; she makes clear the complete lack of proof that the society had its origin at Gresham College. There is also a valuable discussion of the Invisible College of Boyle.

These high points in the second half cannot, however, overshadow the deficiencies of most of the book. Purporting to be a discussion of the philosophical context of the Royal Society and its work, the book virtually ignores the crucial role played in this philosophical context by the atomists, the Cartesians, the anti-Cartesians, and the Cambridge Platonists. We are expected to believe that Baconianism was virtually the only engine propelling the scientific revolution. With such an engine it is doubtful that the scientific revolution could have gone very far.

DAVID KUBRIN

*Department of History, Dartmouth College, Hanover, New Hampshire*

## A Culture Area

**The Philadelphia Anthropological Society.** Papers presented on its Golden Anniversary. JACOB W. GRUBER, Ed. Temple University Publications, Philadelphia, 1967 (distributed by Columbia University Press, New York). xiv + 162 pp. \$7.50.

These papers commemorating the 50th anniversary of the Philadelphia Anthropological Society represent something of an unfulfilled hope. I say unfulfilled, because the seemingly ambiguous charge given to the individual contributors results in a very uneven volume. The steering committee's plan was to invite specialists to deliver papers on selected topics viewed in historical perspective in the hope that, by choice of topics and resourcefulness of authors, Philadelphia's significance in the development of American anthropology would be duly reflected. Some authors stress Philadelphia at the cost of balanced coverage of their topical subject; others successfully interweave appropriate Philadelphia scholars and institutions into their presentations; still others manage either to avoid urbi-culture entirely or to resolve the difficulty by perfunctory bows in the direction of the City of Brotherly Love. The result of these compromise formations is neither a balanced set of arti-

cles dealing with historical dimensions of specific anthropological domains nor an integrated picture of Philadelphia's position in the development of anthropology.

Now let us count blessings. A. Irving Hallowell's excellent baseline essay discovers and brings together much new material on 18th- and 19th-century anthropology in Philadelphia. It is to be hoped that Hallowell will one day enlarge the perspective by treating the later history of Philadelphia anthropology, particularly as localized in the University of Pennsylvania. No one is better qualified to undertake the task. The late John Freeman's article on the American Philosophical Society complements Hallowell's contribution, but again stops short of the 20th century. Chester Chard provides a most useful survey of problems and accomplishments in the ever-changing field of Arctic anthropology. As a synthetic overview, this article should prove rewarding to Arctic specialists and non-specialists alike. Equally valuable is Fred Eggan's concise summary of Northern Woodland Ethnology. Eggan's discerning eye catches many problems in the Northern Algonkian area deserving primary research or reinvestigation.

Less of a blessing are the articles by Shapiro (on physical anthropology), Wormington (on the paleo-Indian), and Ekholm (on Mesoamerican archeology). The immensity of their subjects or the constraint of a Philadelphia perspective leads to a certain superficiality.

The last two essays, by Chafe and Dockstader, are essentially impassioned pleas for help. Chafe notes the steady incremental shrinking of linguistic diversity in North America and urges increased effort in the recording and description of these languages before they pass beyond recall. While this call to arms has a familiar ring, echoing at least back to 19th-century linguists, Chafe argues persuasively that the rate of linguistic loss is increasing not only in an absolute sense as more and more Indians accommodate to our society but in the relative sense that Indian children use their native languages with less facility and competence than their fathers and grandfathers. Dockstader bemoans the eclipse of museums by universities as centers of anthropological research and training. Although it is true that study of material culture is badly neglected in contemporary anthropology and that the museum is the appropriate laboratory for such study,