as in birds. This is a topic of considerable dispute, and much remains to be done before a synthesis is possible. Two chapters deal with physiological aspects, one by Rankin *et al.* on the oogenesis-flight syndrome and one by Goldsworthy and Wheeler on the control of flight metabolism. The former is of particular interest, for, like the chapter by Dixon and Howard, it illustrates how the interaction between several life history components can result from a common physiological control mechanism.

Danthanarayana has done a commendable job in bringing together a diverse collection of chapters that will be a useful addition to the library of anyone even tangentially interested in the subject.

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Astronomical Influences

The Galaxy and the Solar System. ROMAN SMOLUCHOWSKI, JOHN N. BAHCALL, and MILDRED S. MATTHEWS, Eds. University of Arizona Press, Tucson, 1986. xii, 483 pp., illus. $29.95. Space Science Series. Based on a conference, Tucson, AZ, Jan. 1985.

This volume, the latest in the very successful Space Science Series, is the result of a 1985 conference of the same title. The editors emphasize that it is intended to be a text and source book, rather than the proceedings of a conference, but the published chapters are nonetheless based on papers given at the meeting. Although it is disappointing that the book took so long to produce, the extra time was put to good use, and the final product compares well with others from the same stable.

The common thread throughout is the question of whether processes formerly considered purely galactic might significantly influence the solar system and thus affect events on the earth. This theme unites an impressive array of topics, including comets, mass extinction, Planet X, cosmic rays, molecular clouds, and the sun's local stellar environment. The initial stimulus for such a wide-ranging meeting came from reports of an apparently regular 30-million-year periodicity in the geological and mass-extinction records. This, it was argued, could only be understood if the earth was periodically perturbed by external astronomical processes, and a leading suggestion at the time was that environmental catastrophes might be caused by collisions of comets with the earth.

Readers may remember the excitement that these ideas first generated, in both the popular and the scientific press, especially the suggestion (only one of several) that the sun might have a faint, low-mass companion star named Nemesis. According to this proposal, the solar companion would periodically sweep in from the outer Oort cloud and scatter large numbers of comets into the inner solar system from a hypothetical dense inner core of the comet cloud.

Under such circumstances, the decision to organize a conference and publish a book before the subject had fully consolidated was a brave one. But the gamble paid off: not only was the meeting of astronomers from a wide range of backgrounds successful at stimulating discussion and new ideas (even if no immediate agreement was reached), but the book that emerged is undoubtedly an important work that will make a valuable and long-lasting impression on our understanding of how galactic processes affect the solar system.

The reader should be warned, however, that the topics included give a somewhat distorted picture of the galaxy and the solar system. Neither astronomical system is comprehensively reviewed, because the points of contact between the two are few and rather far between. This leaves the book with an uneven distribution of principal topics, but those that are included are treated well and in some depth.

Another sort of unevenness is apparent from the fact that whereas some papers have been written from a balanced perspective and incorporate recent references, others still bear the hallmarks of debate at the meeting and omit more recent work, even relevant material that appears elsewhere in the book. Realistically, however, the attainment of a consensus and a uniform approach to the problem was never a possibility, and the occasional internal inconsistencies often add to the book's interest. In comparing and assessing the various papers, it would have been helpful (especially in such a rapidly changing field) to have known when the typescripts were received and accepted. Generally, however, the editors have done an excellent job in providing internal cross-references and maintaining a uniform level of presentation. This was surely no mean task, considering that the book contains 22 chapters written by an even larger number of collaborating authors. A minor flaw, in my view, is the merging of references from each paper into a single, common bibliography.

These reservations notwithstanding, I recommend the book highly. Because of its technical content, it should (and will) be read by all those interested in the possible galactic connection between mass extinctions and other terrestrial processes. In addition, individual papers provide excellent surveys of areas of astronomy that are often not well covered elsewhere. Thus the book will serve both as a reference and as an introduction to its subject.

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Deep Sea Data

North Atlantic Palaeoceanography. C. P. SUMMERHAYES and N. J. SHACKLETON, Eds. Blackwell Scientific, Palo Alto, CA, 1986. vi, 473 pp., illus. $95. Geological Society Special Publication, no. 21. Based on a meeting, London, Nov. 1984.

Paleoceanography is a relatively new discipline within the earth sciences, having had its catalyst, if not origin, in a 1967 symposium in Cambridge, England, entitled "Micropaleontology of Marine Bottom Sediments." Those were heady days: the Deep Sea Drilling Project was about to be launched, plate tectonics and sea floor spreading awaited the test of the drill bit and the benediction of the micropaleontologist, advances in instrumentation (electron microscopy) and its use in micropaleontological studies opened new avenues toward refinements in taxonomy—the sine qua non of a reliable stratigraphy—and evolutionary studies and the use of microfossils in stratigraphic and paleoceanographic studies were developing apace.

Nearly 20 years of drilling in the world oceans by the *Glomar Challenger* under the Deep Sea Drilling Project and its successor program, the International Program of Ocean Drilling, has led to a quantum jump in our understanding of the dynamic history of the global ocean system over the past 150 million years in the form of almost 100 published volumes reporting the results of these voyages.

The North Atlantic, surrounded on three sides by land, with major input of terrigenous clastics from marginal land areas and with access to the global ocean circulation via conduits to the Arctic (Labrador and Norwegian-Greenland Seas) and the South Atlantic, is a natural laboratory for studying the interaction of various processes in the evolution of the oceans. This splendid, if somewhat expensive, volume represents the combined talent of a large number of workers currently active in this laboratory and involves a database of over 150 drilling sites in the North Atlantic.