Darwin and the Prurient Biographer

Charles Darwin. "A Man of Enlarged Curiosity." PETER BRENT. Harper and Row, New York, 1981. viii, 536 pp., illus., + plates. $20.75.

Peter Brent—the author of novels, thrillers, a study of the Hindu guru, and biographies of Captain Robert Scott, Mungo Park, and Lawrence of Arabia—has written the most recent, and perhaps longest, biography of Charles Darwin in the English language. Any book about Darwin that purports to be "definitive" will receive notice; and in view of its size and timeliness—it following in the wake of Irving Stone's best-seller *The Origin*, and 1982 being the centenary of Darwin's death—Brent's book is bound to attract considerable attention.

The raison d'être for a biography of a scientist is, in almost all instances, the scientific work of the individual. Thus a good biography of a scientist must be a good intellectual biography before anything else. This is certainly the case with Darwin. Brent does recognize this on the very first page: "This book emphasiz[es] Darwin's crucial role in the intellectual history of the West" (see also p. 269). But I believe that those looking for an original, scholarly study of Darwin's scientific life and work will be disappointed by this biography. The biography is replete with entertaining anecdotes—many from unpublished sources—about Darwin, concerning for example his shooting and beetle-collecting manias before the voyage of the *Beagle*. But, although many pages are devoted to Darwin's science, Brent has very little new to say about Darwin's intellectual life; and on a number of important questions he says little, if anything at all.

Brent perpetuates, without any real documentation, several standard but questionable views about Darwin's intellectual development. These include the supposedly significant influence on Darwin of his interaction with Captain Fitzroy, supposedly a fundamentalist during the voyage of the *Beagle* (see especially p. 160), and Darwin's supposed retreat from natural selection into Lamarckianism in response to his many critics (pp. 430, 446, 468).

Brent's discussion of Darwin's Galápagos experience is confusing and mistaken on a number of points. Contrary to Brent's statement (p. 195), Darwin while in the Galápagos was completely unaware of differences between the plants of different islands (see Darwin's own statement in the "Appendix," p. 629, to the first edition, 1839, of his *Journal of Researches*). Darwin never stated that there was a "direct correlation between beak shape and diet" (p. 199) in the finches of the Galápagos, nor did he know about the habit of *Camarhynchus pallidus* of using a cactus spine to poke in holes to find insects. (For an exposé of the many "myths" about Darwin and the finches, see F. J. Sulloway, "Darwin and his finches: the evolution of a legend," *J. Hist. Biol.*, in press.) The well-known passage on the beaks of the finches—"Seeing this gradation . . ."—quoted by Brent comes from the second edition (1845), not the first edition, of Darwin's *Journal*.

Brent omits almost entirely the fascinating and informative story of the interaction between Darwin and Alfred R. Wallace. In the 1860's and early 1870's these two engaged in truly awe-inspiring debates over the nature and scope of natural selection. This is hardly mentioned. Over the past decade several writers have insinuated that Darwin lifted from Wallace, without acknowledgement, the so-called principle of divergence. Brent never even refers to this matter. (For a refutation, see David Kohn, "On the origin of the principle of diversity," *Science* **213**, 1105 [1981].)

Furthermore he states, erroneously, that Darwin addressed this problem "in a late addition to the essay [of 1844]." The principle of divergence is not contained in the essay (Darwin hit upon it in the 1850's), and the passage Brent quotes (p. 373) is from the first edition of the *Origin of Species* (1859, p. 112), not the essay at all. It is certainly not true (p. 429) that Darwin's views did not change between 1842 and 1859. (See for example Dov Ospovat's *The Development of Darwin's Theory*, reviewed above.)

There are a large number of other, lesser errors. A few examples follow. Darwin became an evolutionist in March 1837, that is, after the voyage, not in March 1836, during the voyage (p. 279). The Waterhouse who visited Darwin in the 1850's was surely the naturalist George, rather than the architect Arthur (p. 363). The *Punch* cartoon on p. 461 accompanied a poem satirizing the dispute between Huxley and Owen over man's place in nature; it was not about the "abolitionist Wedgwoods." The word, as used by Darwin and by biologists today, is "systematist," not Brent's "systemist" (pp. 335, 375, 377, 416). Haldane, Wright, and Fisher did not "create modern genetics" (p. 511), although one could argue they did create theoretical (or mathematical) population genetics.

Lastly Brent is confused about the current state of evolutionary theory. He lumps together the controversy among evolutionists over mechanisms of evolution and the totally distinct controversy between Biblical fundamentalists and evolutionists (pp. 3 and 512). He swallows whole the extremely controversial claims by Steele concerning the inheritance of acquired immune responses (p. 511). Brent appears to have a low opinion of Darwin's theory of sexual selection (p. 478). This comes at a time when there is more interest among evolutionists in "sexual selection" than at any other since 1871 when the first edition of *The Descent of Man* was published.

Although Brent contributes little new to our understanding of Darwin as a scientist, he does have a good deal new to offer in the way of speculation about Darwin's sex life, in thought and in deed. Hence the title for this review. A few examples will illustrate the point. After quoting Darwin's description of the women of Lima, Peru, Brent comments:

> Is the erotic warmth of these observations a clue to deeper turmoils long repressed? Locked away for five years with a bunch of seamen . . . high-spirited, healthy and obviously aware of the attractions of women, calling from time to time at some of the wildest of South American cities, Darwin must surely have been at least tempted when his fellows set off—as some of them undoubtedly will have—on their dubious shoreward excursions [p. 193].

Brent sees a paradox in Darwin's situation upon his return to England from the voyage of the *Beagle*:

> Although he had spent these five years in almost constant motion, in a very real sense his life had stood still; . . . although he had undergone an intellectual revolution . . . , his progress towards a full emotional and sexual adulthood had received no assistance [p. 220].

In part 1 of the book (Housemaid and Postillion), Brent devotes about 20 pages to Darwin's first (pre-*Beagle*) romance; and then in part 3 (Marry—Marry—Marry) another 20 to Darwin's decision to marry. These numbers should be compared to the two paragraphs (p. 429) given to the contents of the *Origin of Species*.

When Darwin writes to his fiancée, Emma Wedgwood, about Captain Fitzroy's remark that "we shall not know what real happiness there is in man and woman living together, till we have tried it for at least six months," Brent wonders: "Was this a word of warning about Darwin's sexual expectations?" (p. 255).

There are a number of references to

sexual behavior in Darwin's private notebooks dating from 1837–39. Brent cannot resist the observation:

> The sexual instinct, its manifestations and attendant organs interested him more than they had before, and it need not be a prurient point to see in this a sublimated reflection of his own sharpened sexuality [p. 298].

And Brent also speculates on the Darwins' sex life as husband and wife:

> Unspoken in the humility and gratitude with which he [Charles] received her [Emma] accepting him as husband, implied in the recurring description of himself as "brute," one senses the sexual "demand," that physical transaction in which the wife gives in, as graciously as she can and the husband, almost despite himself, struggles briefly for his own satisfaction. Convulsed by guilt, he afterwards thanks her for permitting such a violation, and lives out his sexual life in a mixture of resentment and contrition [p. 320].

But the most revealing of all concerns the Health Diary that Darwin kept from 1849 to 1855.

> In 1850, too, there appear occasional little ticks in the record, four or five a month, and it is possible that these marked the occasions of sexual intercourse. It seems unlikely that he would have neglected this factor, yet impossible that he would have mentioned it directly. There is no indication, however, that such a conclusion is correct, rather than based on the wishful prurience of a biographer [p. 384].

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Vibrations of the Earth

Free Oscillations of the Earth. E. R. LAPWOOD and T. USAMI. Cambridge University Press, New York, 1981. xii, 244 pp., illus. $49.95. Cambridge Monographs on Mechanics and Applied Mathematics.

It is more than 20 years since the free oscillations of the earth were first observed. Yet the book under review is the first one devoted exclusively to the subject. Lapwood and Usami have written a thorough monograph emphasizing the mathematical and theoretical aspects of this active subject of research.

The book begins with a survey of work from the second half of the 19th century and the first half of the 20th. Both observational and theoretical studies are presented. Without good instrumentation and recording systems, and without computers, progress during this period was modest. Nevertheless, considerable insight into the subject was achieved.

In 1960 perhaps the largest earthquake in a century occurred in Chile. By then, theoretical and computational developments were well advanced and data acquisition systems were improved. The Fourier spectra of the seismograms clearly showed the resonance peaks of the free oscillations of the earth, and a new branch of observational geophysics was firmly established, albeit without the benefit of the fast Fourier transform algorithm.

The authors approach the formulation of free oscillation theory pedagogically, making their book well suited as a basis for a series of lectures. Chapters 2, 3, and 4 are devoted to the oscillations of a homogeneous sphere, a shell, and a two-layered sphere. These are two-point boundary value problems, and the authors discuss in detail the interpretation of the eigenvalues (squared frequencies of oscillation) and eigenfunctions. The authors, as is usual, treat the outer core as a fluid, but they also include a discussion of small, finite rigidity of the outer core. As the rigidity vanishes the spheroidal equations drop from sixth to fourth order and the toroidal from second to zero. This is an example of a singular perturbation problem where one class of eigenvalues collapses onto the origin. A discussion of singular perturbation theory (such as is found, for example, in *Perturbation Methods in Applied Mathematics* by J. D. Cole) could have been included without loss of clarity or style.

The effects of self-gravitation and methods of computation for stratified models are treated in chapters 5 and 6. Experience has shown that the most stable and efficient numerical methods for computing eigenfrequencies and eigenfunctions are the Rayleigh-Ritz method and the finite difference method. The former is made more tractable by using Hermite cubic splines as the basis, as has been done by both Buland and Wiggens. The latter is rendered numerically very stable by using the method of minors in the formulation of the equations, as has been done by Woodhouse.

After a brief discussion of rotational splitting in chapter 7, chapter 8 is devoted to the solotone effect. The usual theory of the asymptotic distribution of eigenvalues in a Sturm-Liouville problem requires that the relevant parameters be twice differentiable. When they are not there are internal resonances and the simple asymptotic distribution breaks down, leading to the solotone effect. Sturm-Liouville theory has made numerous contributions to geophysics in the past. In the matter of the solotone effect geophysics has returned the favor.

The formulation of the excitation of free oscillations in terms of the source moment tensor is presented in chapter 9. This is followed by a discussion of array processing techniques for identifying spectral peaks and measuring their frequencies. The use of free oscillation spectra to determine source mechanisms is a subject of current research and is an approach that can be applied to all events of magnitude 6.5 or larger.

A survey of current research concludes the book. The book provides a firm foundation for anyone who would engage in research in the free oscillations of the earth. In fact, in this reviewer's opinion, astronomers could benefit from reading it. It is a fitting companion to the recent volume *Nonradial Oscillations of Stars* (W. Unno, Y. Osaki, H. Ando, and H. Shibahashi, University of Tokyo Press, 1979).

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Flatworms

The Biology of the Turbellaria. Proceedings of a symposium, Diepenbeek, Belgium, Aug. 1980. ERNEST R. SCHOCKAERT and IAN R. BALL, Eds. Junk, The Hague, 1981 (U.S. distributor, Kluwer Boston, Hingham, Mass.). xiv, 302 pp., illus. $69.50. Reprinted from *Hydrobiologia*, vol. 84. Developments in Hydrobiology 6.

This book consists of papers presented at the Third International Symposium on the Biology of the Turbellaria. The first two symposia of this series convened under different names: the Libbie H. Hyman Memorial Symposium (Chicago, 1970), and the Alex Luther Centennial Symposium on Turbellaria (Tvärminne, Finland, 1977).

The 36 papers included in the book are grouped in five sections. In the first section, Systematics and Zoogeography, I. R. Ball discusses the phyletic status of the Paludicola and points out that this taxon may not be monophyletic and may have evolved from two marine ancestors. Several papers deal with the karyology of polyclads and triclads. W. Teshirogi and S. Ishida study the electrophoretic band patterns of proteins of a species of *Polycelis*, and R. Biersma and H. G. W. Wijsman analyze enzyme variations in two closely related species.

The section Ecology and Faunistics contains papers on various aspects of the ecology of freshwater and marine Turbellaria. P. M. Martens and E. R. Schockaert discuss sand-dwelling micro-