BOOK REVIEWS

Darwin Lite

Darwin. A Life in Science. MICHAEL WHITE and JOHN GRIBBIN. Dutton, New York, 1995. xiv, 322 pp., illus. $24.95 or $C34.99.

In recent years Charles Darwin has been the subject of a wave of biographies. Adrian Desmond and James Moore have written one large book, Janet Browne is writing an even larger one, of which one volume has already appeared, and several authors have weighed in with more modest volumes. This book by Michael White and John Gribbin does not attempt to compete with either of the major scholarly biographies. The authors are science writers without significant experience in Darwin research. However, they have made good use of the large body of information now in print to fashion a nicely balanced account of Darwin's personal and professional lives.

To be sure, information alone cannot provide a conclusive answer to such questions as what caused Darwin's chronic, disabling ill-health. Ralph Colp and John Bowlby have argued that Darwin's troubles were largely psychosomatic, the results of his family experience and the stresses of arguing an unpopular cause. While acknowledging the stresses that Darwin faced and his inclination to depression, White and Gribbin largely reject this approach in favor of Fabienne Smith's recent suggestion that Darwin's illness was caused by allergies. The evidence is, of course, ambiguous. However, the authors' preference for a physical, as opposed to a psychological, interpretation reinforces the essentially positive view they take of Darwin's upbringing, education, and family life. They view him as a basically strong-minded individual who overcame his malady to achieve great things.

The great things in Darwin's career include a wide variety of discoveries in geology and biology that the authors pass over rather quickly. They assert, but do not illustrate, his versatility—largely in order to focus on his greatest contribution. In doing so, they again show an independent streak, this time in their treatment of religion. Recent scholarly opinion has been irenic on this subject, pointing more toward scientific as opposed to religious issues in the debate over evolution. White and Gribbin will have none of it; they revert instead to an older emphasis on conflict between enlightened science and religious obscurantism. Their chapter on the subject highlights the Huxley-Wilburforce debate, depicting the debate largely as Huxley wanted us to remember it. To be sure, in the next chapter the authors modify their stand somewhat by explaining Darwin's real difficulty in dealing with Sir William Thomson's extremely short estimate for the age of the Earth. For the most part, though, they look on opposition as an unreasoning failure to accept what they take to be an open-and-shut case.

The authors of this book rightly admire Darwin as a great pioneer of scientific reason, but reason can triumph only through cogent debate. Although Darwin's critics were usually motivated by religious conviction, they had their scientific arguments too, arguments that deserve primary attention if reason is to get its due.

William Montgomery
North Adams State College, North Adams, MA 01247, USA

Chromosomal Structures

Telomeres. ELIZABETH H. BLACKBURN and CAROL W. GREIDER, Eds. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1995. xii, 396 pp., illus. $80. Monograph 29.

Over the past 10 years telomeres have garnered an exponential increase in interest among scientists. This rise to fame reflects both the fast pace of telomere research and the growing number of scientists who are finding that processes they are investigating are influenced by telomere biochemistry. Although Hermann Muller and Barbara McClintock pioneered the field in the 1930s and '40s, their studies were largely overlooked for many years. "Modern" telomere biochemistry started in the late 1970s and early '80s when researchers studying chromosome structure sequenced the telomeres of various ciliates. The discovery of telomerase in the mid-1980s piqued the interest of both enzymologists and the DNA replication community when it became apparent not only that this enzyme had a highly unusual structure but that it offered a mechanism for the replication of the 5′ end of a linear DNA molecule. More recently, discovery of the link between decreasing telomere length and aging and between elevated telomerase activity and cancer has aroused enormous interest among clinicians, and the realization that telomerase inhibitors might provide a way of combating cancer has drawn biotechnology and pharmaceutical companies into the fray.

Given these developments the present book is both timely and much needed. The literature has become increasingly diverse and voluminous, making it difficult for the casual reader or newcomer to the field to gain a balanced perspective. *Telomeres* provides an excellent, easy-to-read introduction for such readers. Moreover, since the book contains a wealth of information on all aspects of telomere biology and biochemistry, it should prove tremendously useful to even the most experienced telomere researcher.

A major strength of the book lies in the breadth of its coverage and the way it links the diverse topics. Each chapter concentrates on a different aspect of telomere research and where necessary describes the experimental system used in performing the research. Thus the book covers topics as diverse as telomere addition in ciliates, gene expression and telomere position effect in yeast, construction of mammalian artificial chromosomes, and telomerase and cancer in humans. Yet the various chapters are not isolated units. The authors frequently refer to other chapters and give short accounts of topics that are discussed in detail elsewhere, providing the reader with a sense of continuity. A further useful and enjoyable feature of the book is its historical perspective, which allows the reader to see how the field developed before being plunged into the intricacies of current knowledge.

The chapters on telomerase, telomeres and aging, and tumor telomeres will be particularly useful to readers who have had their curiosity kindled by journal editorials or articles in *Newsweek* or even local newspapers. The chapter by Greider on telomerase is particularly nice because it leads the reader through the early biochemical studies, explains how to interpret the somewhat complicated telomerase assay, and finishes with an excellent description of what is known about telomerase structure and its mechanism of action. After reading this chapter even a newcomer to the field should be able to interpret the gels shown in a telomerase paper. The chapters by Harley and by de Lange on