ory might constitute the telomeric end-protection mechanism. Several of the repeat sequences have been demonstrated to form specific protein-DNA complexes in vitro and in vivo, which also in theory might perform the functions required uniquely for telomere behavior. In addition to protecting chromosomal ends from initiating deleterious recombination events, telomeres must also overcome the "end replication problem" inherent in the observation that all known DNA replication enzymes require a primer. Thus, the argument goes, in each generation some number of nucleotides will be lost from the 5′ end of the lagging strand at each chromosomal end. The discovery of telomerase activity (carried out by a ribonucleoprotein complex that adds additional repeat sequences to the guanine-rich strand of termini) conserved in such widely divergent organisms as ciliates, mammals, and now (since the publication of the book) fungi has provided a satisfying prospective resolution. However, there is intriguing experimental evidence that one or more recombinational mechanisms may also play a significant role in maintaining telomere length. Although it is clear that characteristic telomeric repeat lengths are observed in different species (or even tissues for mammals), the mechanism for maintenance of a characteristic average length is not yet apparent. Later chapters in the book provide in-depth discussion of a variety of topics including new telomere formation in genome rearrangements, the relationship of human telomere loss to carcinogenesis and aging, variegating position effects on transcriptional activity near telomeres, and natural (evolutionary) alterations in primate chromosome architecture. *Drosophila* telomeres, which lack terminal tandem repeats, are given consideration in an independent chapter that evaluates the current best hypotheses put forward for telomere function in this organism.

Despite the breadth of information included (papers cited range from 1885 to 1994) many recent important experimental advances are not covered in the book; all presumably were published after it went to press. Clearly, the study of telomeres and their biology is a rapidly moving, robust field of research. Thus, with no fault implied, the book will not substitute for a good literature search for relevant papers from 1994 and beyond.

In *The Telomere* Kipling has certainly met, and possibly exceeded, his modest goal of compiling "an accessible introduction to a field full of fascinating and unique phenomena"; he has produced an incisive and captivating account with material of interest to a broad spectrum of telophiles, from spectators to central players in research. Each chapter includes a copious, well-organized reference list with full titles, and reviews are listed separately from the longer list of primary papers. At the end of the book, a helpful index facilitates the revisiting of favorite data bits or ideas. There are very few figures, but each is well chosen to enhance the text. In fact, the dearth of figures may simply represent the degree to which current knowledge is insufficient for accurate depiction of the spatial arrangement of objects, and additional drawings would have only provided distraction.

The Telomere is rigorous in summary, bold in speculation, and near comprehensive in scope. Contained concisely within 208 pages, the rapid succession of facts and ideas is adequate to satisfy even the immediate-gratification habit of TV generations. For a work of nonfiction, I found *The Telomere* to be a gripping read.

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Vignette: New Quarry

The hunting metaphor introduced by Paul de Kruif in his *Microbe Hunters* aptly describes the succession of movements in medical science in this century. Those hunters, who in the first two decades found the microbes responsible for many of the scourges of mankind, were replaced in the next two decades by the *vitamin hunters*, who discovered that deficiencies of vitamins could cause other epidemic diseases—pellagra, rickets, and scurvy. The vitamin hunters were superseded by the *enzyme hunters*, who showed how enzymes were assisted by vitamins in the metabolic operations responsible for cell growth and energy metabolism.

In recent decades the *gene hunters* have dominated. . . . A cadre of gene hunters is busy looking for the genes for human traits and the defects in these genes that cause inborn errors of metabolism. But the searches by these disease hunters are not basically different from those established for bacteria, fungi, plants, flies, and other animals. The greatest mystery now resides in brain processes—mood, memory, mental illness—which, when probed successfully with novel technologies, will turn the spotlight on a new breed of hunters (to whom we might refer as *head hunters*).

—*Arthur Kornberg*, in *The Golden Helix: Inside Biotech Ventures* (University Science Books)

Books Received

AIDS Clinical Trials. Dianne M. Finkelstein and David A. Schoenfeld, Eds. Wiley-Liss, New York, 1995. xiv, 458 pp., illus. $49.95.

Blastogenesis. Normal and Abnormal. John M. Opitz and Natalie W. Paul, Eds. Wiley-Liss, New York, 1994. xx, 403 pp., illus. $159. March of Dimes Birth Defects Foundation Birth Defects Original Article, vol. 29, no. 1 (1993). From a workshop, Big Sky, MT, Oct. 1991.

Changing Large Technical Systems. Jane Summerton, Ed. Westview, Boulder, CO, 1994. xii, 348 pp., illus. $49.85. From a conference, Vadstena, Sweden, Aug. 1992.

Diverse Topics in Theoretical and Mathematical Physics. Roman Jackiw. World Scientific, River Edge, NJ, 1995. viii, 514 pp., illus. $106; paper, $61.

Element of Risk. The Politics of Radon. Leonard A. Cole. Oxford University Press, New York, 1994. x, 246 pp., illus. Paper, $11.95. Reprint, 1993 ed.

The Fragile Contract. University Science and the Federal Government. David H. Guston and Kenneth Keniston, Eds. MIT Press, Cambridge, MA, 1994. xiv, 244 pp. $37.50; paper, $17.95.

Genetically Modified Organisms. A Guide to Biosafety. George T. Tzotzos, Ed. CAB International, Oxford, UK, 1995 (U.S. distributor, University of Arizona Press). x, 213 pp. $55.

How to Think about Weird Things. Critical Thinking for a New Age. Theodore Schick, Jr., and Lewis Vaughan. Mayfield, Mountain View, CA, 1994. xvi, 299 pp., illus. Paper, $18.95.

In Other Words. The Science and Psychology of Second-Language Acquisition. Ellen Bialystok and Kenji Hakuta. BasicBooks, New York, 1994. x, 246 pp. $27.

Mushrooms. Poisons and Panaceas. Denis R. Benjamin. Freeman, New York, 1995. xxvi, 422 pp., illus., + plates. $59.95; paper, $34.95.

Nanoscale Probes of the Solid/Liquid Interface. Andrew A. Gewirth and Hans Siegenthaler, Eds. Kluwer, Norwell, MA, 1995. xvi, 334 pp., illus. $177 or £112 or Dfl. 260. NATO ASI Series E, vol. 288. From an institute, Sophia Antipolis, France, July 1993.

Publishers' Addresses

Below is information about how to direct orders for books reviewed in this issue. A fuller list of addresses of publishers represented in *Science* appears in the issue of 26 May 1995, page 1220.

Cambridge University Press, 110 Midland Ave., Port Chester, NY 10573–4930. Phone: 800-872-7423; 914-937-9600. Fax: 914-937-4712.

Oxford University Press, Inc., Order Dept., 2001 Evans Rd., Cary, NC 27513. Phone: 800-451-7556; 919-677-0977. Fax: 919-677-1303.