ence" and the shroud of Turin notwithstanding. Although the authors in this collection devote most of their attention to the problems inherent in science reporting, occasionally they do remark that at its best it is better than anyone has a right to expect. I could not agree more.

DAVID L. HULL
Department of Philosophy, Northwestern University, Evanston, Illinois 53201

Important Fossils

The Burgess Shale. HARRY B. WHITTINGTON. Published in association with the Geological Survey of Canada by Yale University Press, New Haven, CT, 1985. xvi, 151 pp., illus. $25.

The Burgess Shale is a geologic formation in the Rocky Mountains of Canada that has yielded a diverse assemblage of exquisitely preserved marine plants and animals, providing a unique record of the marine organisms that lived during the middle Cambrian Period, about 530 million years ago. This book summarizes the anatomy and natural history of the Burgess biota and the history of its study from its discovery to the designation of the field area as a World Heritage Site in 1981.

The Burgess Shale crops out in a small area on the side of a high ridge in Yoho National Park near Field, British Columbia. The deposit preserves a biota that lived on the seaward edge of a shallow-water, tropical marine algal bank and on the steep bank face and muddy slope below the bank. The fossil assemblage was transported by turbidity currents and other sediment-gravity processes, which rapidly buried the organic remains in deeper-water anoxic sediments on the slope below the bank, thereby protecting them from destruction by scavengers and bacterial action. Few if any of the organisms are considered to be indigenous to the hostile environment in which they were preserved.

The biota of the Burgess Shale was discovered in 1909 by Charles D. Walcott, then secretary of the Smithsonian Institution. Walcott devoted a major part of his research time for the next 18 years to the collection, description, and classification of the Burgess fossils. His results were published from 1911 to 1931 by the Smithsonian Institution in a series of systematic monographs. Recently, several other outcrops have been discovered on nearby ridges by Desmond Collins, of the Royal Ontario Museum, and his associates, but these have far less prolific faunas than the original outcrops.

Harry B. Whittington, now professor emeritus of geology at Cambridge University, began a restudy of the Burgess fossils in 1966, while on the faculty of Harvard University, with the support and collaboration of the Geological Survey of Canada and the National Parks of Canada. New collections were made from Walcott's original quarry and were comprehensively studied by both paleobiologists and sedimentologists. The new collections and Walcott's original collections, over 60,000 specimens housed in the U.S. National Museum of Natural History, became the focus of a nearly 20-year-long research project.

Most of the laboratory studies were conducted at the Sedgwick Museum after Whittington moved to Cambridge. Major studies were made by Derek E. G. Briggs, David L. Bruton, Christopher P. Hughes, and Simon Conway Morris under Whittington's supervision. The result of this collaboration is a series of major monographs that document the anatomy, systematic relations, and paleoecology of many of the soft-bodied marine organisms that make up the Burgess biota. *The Burgess Shale* is an excellent overview and summary of results from these highly detailed studies.

Originally Walcott classified the Burgess fossils into existing phyla and the catch-all group Vermes, which obscured the anatomical and taxonomic uniqueness of the biota. Restudy of the fossils show that the biota contains numerous invertebrate body plans that do not fit within living phyla. Many extant phyla are also represented in the biota, but in proportions different from those encountered in living faunas.

A major part of the book summarizes the anatomy and problems of systematic relations of the fossils. The taxonomic groups recognized to date from the Burgess, and number of species in each, include: Algae, 20 (8 Cyanophyta, 1 Chlorophyta, 7 Rhodophyta, and 4 others); Porifera, 31; Brachiopoda, 7; Lophophorata, 1; Cnidaria, 2; Mollusca, 2; Priapulida, 7; Polychaeta, 6; Trilobita, 22; Crustacea, 21; unassigned Arthropoda, 22; Echinodermata, 6; Hemichordata, 2; Chordata, 1; and other unassigned animals, 17—for a total of 167 species.

Representatives of the biota are illustrated by high-quality photographs and line drawings. Other photographs show the general setting of the field area and the quarry operations. Well-constructed diagrams help explain the geological context of the Burgess Shale and the paleoenvironmental setting of the fossil assemblages. A bibliography of primary literature on the Burgess fossils published through about 1984 is a useful addition. Two important publications that appeared after *The Burgess Shale* went to press are a monograph on the Burgess sponges by J. Keith Rigby (*Palaeontographica Canadiana no. 2*, Canadian Society of Petroleum Geologists and Geological Association of Canada, 1986) and a well-illustrated pamphlet for a general audience by Conway Morris and Whittington ("Fossils of the Burgess shale," *Geol. Surv. Can. Misc. Rep. 43*, 1985).

The Burgess biota is of great importance to studies of the early evolutionary history of complex animal groups. Such analyses are still being made by paleobiologists. However, the success of the Burgess studies is in the meticulous preparation, observation, and description of the fossils by Whittington and his colleagues. The resulting data will serve as reference points for theoretical discussions of the early evolution of life for many years to come. The summary Whittington has provided has broad appeal for teachers, scientists, and general readers interested in the latest information on the Burgess biota and, more generally, the variety of early life on the earth.

MICHAEL E. TAYLOR
U.S. Geological Survey, Denver, CO 80225

Californians at Risk

Waiting for Disaster. Earthquake Watch in California. RALPH H. TURNER, JOANNE M. NIGG, and DENISE HELLER PAZ. University of California Press, Berkeley, 1986. x, 446 pp., illus. $35.

Early in 1977 geologists discovered a bulge or uplift at Palmdale in the desert near Los Angeles. It suggested plate movement that could lead in months or a few years to an earthquake, which was already "overdue" in the general area. A year later a team of sociologists interviewed a large sample of Los Angeles residents and conducted five smaller telephone surveys over the next two years. They also carefully monitored the media and interviewed leaders of all the relevant organizations they could find.

The purpose of the study was to see how people reacted to "the severe threat of earthquake disaster represented by the uplift," and to "refine our understanding" of what people will do when "true earthquake predictions" are released in the future (p. 9). The data, exhaustively analyzed, show that people had little understanding of or reaction to, or even awareness of, the news of the uplift and are doing little to prepare themselves for the receipt of "true earthquake predictions."

The authors seem shocked by what they