BOOK REVIEWS

Molecular Errata

Correcting the Blueprint of Life. An Historical Account of the Discovery of DNA Repair Mechanisms. ERROL C. FRIEDBERG. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1997. xiv, 210 pp., illus. $49. ISBN 0-87969-507-2.

What a catchy title to introduce the history of DNA repair! Until *Science* christened DNA repair "the molecule of the year" this field had escaped the ravages of the competition that has plagued the mainstreams of molecular biology. Errol Friedberg's book tells how this fortress was protected, first by confusing observations and later by exemplary collegiality. The book is a personal interpretative essay that melds science and historical scholarship. Friedberg has made significant contributions to the study of DNA repair. He now demonstrates other facets of his scholarship: interest in preserving scientific history and love of writing.

It is uplifting, indeed, to be treated to repetitive examples of scientific collegiality: postponing publication so that others might receive equal and well-deserved credit; acknowledging contributions of competitors; and even ferreting out past contributions from Japanese and Russian scientists. In addition, the book is studded with inspiring quotations. Consider the beauty of Evelyn Witkin's statement, "Every generation of biologists lives through thrilling discoveries that instantly transform their view of life, like sudden shifts in the pattern of a kaleidoscope." Research on DNA repair was not dominated by the contribution of single individuals or groups of scientists working together. Instead, as Dulbecco observed, it reflects a wonderfully innocent period in the history of biology, where insights in small labs could determine future directions in science. *Correcting the Blueprint of Life* contrasts with recent books on the history of molecular biology and cancer research that portray scientific battlefields, excessive competition, extreme secretiveness, and even fraudulent claims.

Friedberg hints at how pervasive misconceptions may have both sheltered and hindered progress in understanding DNA repair. First, DNA was considered an undamageable molecule. Even Delbrück stated that genes were composed of extraordinarily stable molecules, perhaps constituting some hitherto unrecognized state of matter. Second, DNA—even in somatic tissues—was protected against damage by reactive cellular metabolites. Third, DNA synthesis was assumed to be error-free. Finally, once DNA repair was recognized as an enzymatic process, it was believed that the same mechanisms were operative in cells from all species. Friedberg demonstrates how each of these misconceptions was negated by decisive experiments. He opens the book with the history of photoreactivation, a powerful mechanism for reversal of DNA damage but one that apparently has been ignored during the evolution of mammalian species. Radiation damage to DNA provided an exacting approach for the quantitation of DNA damage. However, as Cairns concluded, the survival curves employed by countless scientists were castles built in the air. These curves did not lead to mechanistic insights. T4 endonuclease provided the first evidence for enzymatic removal of ultraviolet-dimers, an area of investigation that was Friedberg's own major entrée into DNA repair. Again, this mechanism was not utilized by mammals. In fact, the early experiments demonstrating specialized mechanisms for DNA repair may have delayed the discoveries of more universal mechanisms, including base excision repair by DNA glycosylases, nucleotide excision repair, and mismatch repair.

While this book is a delight for the "repairologist," it is not for the novice. It requires a general knowledge of molecular biology as well as an interest in documenting the history of science. If more of the scientific explanations in the book were bolstered by the use of diagrams and illustrations, similar to those that Friedberg has used so effectively in his textbook on DNA repair, it could have appeal to a wider scientific readership. Friedberg documented his views on the history of DNA repair by solicitation of documents, letters, and recollections. This approach has an inherent bias in that it emphasizes the accomplishments of the contributors. There are areas of investigation that had great impact on the understanding of DNA repair yet are omitted: for example, studies of mutagenesis, oxygen free radicals, and cancer. These are minor complaints that do not detract from the fact that Friedberg has written an informative and authoritative book, providing a personal glimpse into the history of DNA repair before it became a scientific discipline. Since only the epilog considers how deficits in DNA repair contribute to the cause of many human diseases, Friedberg leaves room for a sequel, a book documenting the impact of DNA repair on cancer and associated diseases.

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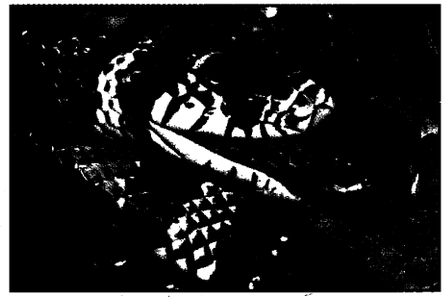
The Serpent World

Snakes. The Evolution of Mystery in Nature. HARRY W. GREENE. Photographs by Michael and Patricia Fogden. University of California Press, Berkeley, 1997. xiv, 351 pp., illus. $45 or £35. ISBN 0-520-20014-4.

Few animals engender passion to the same degree as the snake. That passion has traditionally involved aversion rather than affection, but the minority view has been gaining ground. Recent years have seen a dramatic shift in public attitudes toward these animals, with the older biblical image (the evil, cunning, loathsome serpent) being superseded by a far more realistic view of snakes as animals. Indeed, they probably qualify (albeit on a fairly low rung) as charismatic megafauna. One cause—and consequence—of the changing public perception has been an extraordinary explosion in scientific research directed toward these mysterious creatures. The increasing miniaturization of radio transmitters through the 1970s was the key event, because field studies of these cryptic animals suddenly became feasible. Harry Greene was among the pioneers in this work, and he has now produced a remarkable volume to celebrate his lifelong love affair with snakes.

The book covers the same topics as sev-



"Double-banded Coralsnake Mimic (*Erythrolamprus bizonus*), Costa Rica, swallowing a Northern Cat-eyed Snake (*Leptodeira septentrionalis*) tail-first." [From *Snakes*]