Book Reviews

The Atoms Within Us. Ernest Borek. Columbia University Press, New York, 1961. xv + 272 pp. Illus. $5.
The Coil of Life. The story of the great discoveries in the life sciences. Ruth Moore. Knopf, New York, 1961. xxvii + 418 pp. Illus. $5.95.

Who should explain science to laymen? Should it be scientists, converted or diverted from their usual work, or should it be journalists, who specialize in science writing? Whether or not there is a general answer, these volumes present an interesting case study of this question. The author of the first is a biochemist, of the second, a journalist. Comparison and contrast have some meaning because both authors are experienced and skillful.

The subject is molecular biology, and both book jackets are ornamented with DNA helices, indicating fairly what lies within. Both authors wisely (I think) approach present problems by the historical route. Ernest Borek traces a path through enzymes, vitamins, intermediary metabolism, isotope techniques, and the architecture of proteins, reaching (after side trips through the blood system and cellular defenses) deoxyribonucleic acid (DNA), with a third of the book to go. Ruth Moore begins with a brief eulogy of DNA and then presents a flashback to Lavoisier and the early days of cell theory and Mendelian genetics. Before she begins the extended discussion of DNA she, too, has used up two-thirds of her book; but unlike Borek, she devotes most of the remaining third to DNA and its ramifications, discussing in considerable detail problems of duplication, of the synthesis of ribonucleic acid (RNA), of coding, and of protein structure. Her book is the larger of the two by some 50 percent.

Although there are many differences in detail, each book deserves high praise for admirably doing the job it sets out to do, namely exhibiting the beauties of molecular biology, including the exciting developments of the last decade, to the man in the street. Whether John Doe will get the message is, of course, another problem. Probably he won't; after his day of quiet desperation, he will probably flee, via television, to "77 Sunset Strip." But Doe's yet unfrustrated son or daughter may pick up one of these books in the high school library, and be rewarded.

Of adverse criticism there is little to offer, but here significant contrasts between the two books are discernible. The faults of the authors spring, I think, from a sort of overcompensation. It is a common complaint that journalists know too little of what they write about. Such a criticism cannot be made about Moore, who had done her homework well. But, aware (I suspect) of this type of critical comment, she has retailed rather too much information, particularly about the early history of biology. There are too many highlights and side lights for the reader easily to see the big picture.

The balance is better in Borek's volume, and his writing also conveys more of a feeling of authority, as one would expect. (Does the layman notice this? One wonders.) But the biochemist commits his own characteristic errors of compensation. Aware, no doubt, of laymen's allergy to diagrams and symbols, Borek announces at the outset: "I use no chemical formulas in this book." This is surely a severe restriction for a book about biochemistry, but he adheres to it for more than a hundred pages, until he takes up the story of the synthesis of insulin by Sanger and his co-workers. Borek tells this detective story very well, but only by using structural formulas. He could hardly do otherwise. Unfortunately, he then apparently remembers his original promise and returns to formula-free exposition. Skilled as Borek's writing is, it is difficult to believe that the reader can get as clear an idea of the hereditary mechanism from words alone as he can get from Moore's diagram-rich text.

So we have the curious contrast of the journalist freely and effectively employing formulas and diagrams, while the scientist avoids them. Borek's motivation and intention are clear and praiseworthy—to avoid parochial cant. But has he not thrown out the baby with the bath? Paraphrasing Willard Gibbs, Borek says (page 114): "Gentlemen, the sciences *are* humanities." But do these humanities not have their own characteristic art forms—namely formulas, diagrams, and graphs? To eschew the appropriate forms is to risk losing the art. In writing his *Essai Philosophique sur les Probabilités*, Laplace achieved the tour de force of describing probability theory without using algebra, but the result has proved useful to neither scientists nor laymen. Laplace's essay is longer, more difficult, and less artistic than the equivalent algebraic exposition would have been. Every artist, and that includes the scientist, must insist on the appropriateness of his tools and media if the audience is to understand what he is trying to say.

One more contrast deserves mention. Borek's book, *The Atoms Within Us*, has no literature citations, whereas *The Coil of Life* closes with a carefully chosen and well-annotated bibliography. For the terminal reader who will pursue the topic no farther (and who admittedly is in the majority), a bibliography is a useless luxury. But for the small fraction of young readers who are fired by an introduction to delve deeper into a subject, such an aid is almost as important as the text itself. If science is, as we think, an endless frontier, we should leave open the paths that lead to it.

GARRETT HARDIN
Department of Biological Sciences, University of California, Santa Barbara

The Geology of the U.S.S.R. A short outline. D. V. Nalivkin. Translated from the Russian by S. I. Tomkeieff. J. E. Richey, Translation Editor. Pergamon, New York, 1960. ix + 170 pp. 2 maps. $15.

A book that summarizes the geology and mineral resources of one-sixth of the land surface of the earth is of paramount interest to geologists and economists, especially when the area involved is one so little known beyond its boundaries as the Soviet Union. Indeed, we could not have read such a book