

37 "prosporus" occurs for "prosurus." Color photographs throughout the book are too small, and opposite page 302 a caption for a lichen illustration directs the reader to "note the black apothecia" which are not visible.

The content satisfies the objectives described in the preface. This textbook would support a course between an introductory principles course and the advanced morphology courses ordinarily offered at the graduate level. The laboratory aspect of any such course would, of course, need to be strongly emphasized. For curricula designed as Haynes envisions, the subjects in this book would be useful content for secondary teachers and botanists.

Daniel F. Burton
Mankato State College
Mankato, Minn.

Cell and Molecular Biology

THE LIVES OF A CELL: NOTES OF A BIOLOGY WATCHER, by Lewis Thomas. 1974. Viking Press (625 Madison Ave., New York 10022). 148 p. \$6.95.

Thomas Jefferson may be alive and well and frequenting the New Haven-New York area. Only a DNA-print would reveal whether Lewis Thomas is an alias or an intellectual look-alike. The "brainpower" tribute of JFK to our third president could well be made for the author of this work. Thomas' book reflects the genius of one man, who, like Jefferson is as broad as he is deep.

The book, a collection of short essays which first appeared in the *New England Journal of Medicine*, can be read in several hours, but the reader will want to return again and again to savor the subtle imagery of Thomas' thought. It is destined to become a classic for the biological generalist, the evolutionist, the ecologist. Thomas has organized and synthesized much of the contemporary material from several disciplines including anthropology, microbiology, cytology, ethology, and genetics. The result is a story of freshness and simplicity that is as unique as one of its leading characters, the termite symbiote, *Myxotricha paradoxa*.

Thomas' writing style projects an image of a warm, compassionate, optimistic human being—one awed by the complexity that is man and the countless thousands of other species that make up the "membrane" of life which covers this planet. Thomas is humbled by the realization that his identity may not be what he supposes it to be, for his cells are "occupied" by possible endosymbionts, the mitochondria, centrioles and perhaps others. "I had never bargained on descent from single cells without nuclei . . . There is additional humiliation that I have not, in a real

sense, descended at all. I have brought them all along with me, or perhaps they have brought me."

Thomas feels that basic biomedical research will provide the foundation for advances in those areas where "effective" and efficient medical technology is not present. He very cleverly distinguishes between applied and basic science and points out that the former is only possible after a thorough understanding of the latter. Thus, basic biological research appears to be the first step in the elimination of incurable diseases and "halfway technology."

Biofeedback, the recent "break-through" in experimental psychology, is met with much reservation by Thomas. He feels it is not in keeping with a "return to nature," and implies that such control may lead to serious problems of the fumbling type associated with practiced skills. Jokingly, he suggests the exact opposite—a complete let go. This, he contends, would be in accord with becoming part of our ecosphere rather than manager of it.

Thomas' etymology is superb. He sees syntax as an innate elaboration of our linguistic genome—something which separates us from other animal species. Ambiguity is seen as desirable, even necessary, since it provides us with the straying power to drift away—up, up, and away. Thomas views language as endowed with a life of its own and as any life form, always changing.

It has been about 200 years since Jefferson penned our Declaration of Independence. Lewis Thomas' essays may represent an equally eloquent Declaration of Interdependence for our ecosphere. The pieces of Nature's jigsaw puzzle, past and present, have been increasingly joined so that a picture is emerging—that of a ecological-evolutionary unity among all life on earth.

Curt Harper
Preble High School
Green Bay, Wis.

Ecology and Environmental Biology

ON DEFUSING THE POPULATION BOMB, by Michael Endres. 1975. Halsted Press (605 Third Ave., New York 10016). 191 p. \$10.00 hardback, \$5.00 softback.

The author of this volume has attacked a problem of heroic proportions. While the presentation is adequate, it fails to come up to the expectations generated by the title. It lacks, for example, the flair and grace of Paul Ehrlich's *The Population Bomb*—its logical antecedent. For this reason, it seems unlikely to produce an enthusiastic readership despite the several important insights brought to bear.

The book seems most appropriate as supplementary reading for college level

social science courses. The first three chapters outline various aspects of the problem of population growth and continue with an historical review of population theory. The piece on Malthus is excellent, probing his writings in depth and going far beyond the popularized notion of this man as doomsayer prophet. In addition, the organization into natural theories of population vs. socio-cultural approaches and the accompanying discussion is illuminating in that it opens the field to a much wider array of social commentary. The section "Karl Marx on Population" is a good example.

Chapters 4-10 lay the groundwork and present the author's main thesis: that massive increments in life expectancy will make an emphasis on fertility control less than adequate in dealing with population-related problems. The author is not a biologist and draws primarily from known authorities in medical research for support. Unfortunately, the Buckminster Fuller-like musings frequently cited are poor substitutes for documented research results.

The basic fault with this book lies in the author's style. Redundancies are abundant—notably where arguments from previous chapters are cited and rephrased without adding to the discussion. The reader is forced into a pattern of skimming and then rereading for significant ideas. Along with heavy and convoluted wording and frequent digressions, this tends to disrupt the smooth flow of ideas throughout the book.

Stanley L. Cummings
Yosemite (National Park) Institute
Yosemite, Calif.

Educational and Professional Concerns

SCIENCE FOR THE ELEMENTARY SCHOOL, by Edward Victor. 3rd ed., 1975. Macmillan Co. (866 Third Ave., New York 10022). 744 p. \$12.95 hardback.

This is a book of methods and materials designed especially for the elementary school science teacher. It strikes a nice balance between the biological, chemical, and physical sciences, at times separating them but also interrelating where appropriate. The initial chapters seem more suited for the beginner or less experienced teacher who is concerned with planning, sample teaching units, and objectives relating to teaching science in the elementary school. Some areas, such as the topics relating to various psychological theories including Piaget's, are applicable for more experienced teachers. The overall strength of the text relates to the basic science information section, which provides a mixture of ac-