

Experimental Ciliatology: An Introduction to Genetic and Developmental Analysis in Ciliates, by D. L. Nanney. John Wiley & Sons, New York, 1980, 304 p., illus., \$22.50 (79-21918).

This book is a presentation of the major ideas, findings, and challenges that have arisen during the first century of experimental work on the genetics and development of ciliates. These organisms are a large and diverse group of eukaryotes evolutionarily far removed from the lines that gave rise to higher plants or animals. They have given rise to no multicellular forms, but have rather "elected" to explore the biological potential of the elaboration of relatively large, complex, and active organisms based on the compounding of fundamental eukaryotic organellar structures. Consequently, much of their potential as subjects or, as Nanney suggests, tools for biological research lies in what they can tell us concerning the organizational and functional aspects of the machinery of eukaryote structure, genetics, and development.

The work surveyed in this brief, thoughtful, and highly readable book provides both a basis for understanding the biological problems that have been analyzed with the help of these organisms and the relationships between some of the less orthodox biological problems (e.g., the different types of non-Mendelian heredity) and the main lines of current biological thought and research. Throughout the book, the peculiarities of ciliates and their developmental genetics are placed within the context of their "ecogenetic" milieu, an approach both helpful to the novice and thought-provoking for the experienced investigator.

The book focuses on the experimental analysis of heredity and development in the two most thoroughly domesticated ciliates, *Tetrahymena* and *Paramecium*. But studies of other ciliates, particularly *Stentor* and various hypotrichs, are used when the concepts being presented cannot be shown or shown as well with the two best known organisms. The first half of the book introduces the organisms, their evolutionary background, the characteristic peculiarities of their nuclear system, and their life histories. The concepts of mating types, species complexes, and breeding systems and the features of the life histories of the organisms, including their evolution of aging and mortality, are considered in the context of the combination of ecological, genetic, and evolutionary parameters that mold both the life style and the life history of the organism.

The second half of the book is discussion of the developmental genetics of ciliates, which begins with a consideration of "structural in-

Tropical Foods: Chemistry and Nutrition, Vol. 2, edited by George E. Inglett and George Charalambous. Academic Press, New York, 1979, 701 p., illus., \$21.00.

This second volume of a two-volume proceedings (vol. 1 was reviewed in *BioScience* November 1979) deals more with vegetable production and consumption patterns and description of the physical properties and processing techniques of tropical foods than with their chemical and nutritional aspects. The result is a general review of selected fruit and vegetable foods regularly consumed in the tropics.

There are five chapters devoted to production and consumption patterns in Asia and the Far East (3), Central America, and Africa. Two chapters deal with general nutritional aspects, and the remainder with specific foods or food groups. Typically for a proceedings, the chapters are of uneven quality.

The fifth chapter is an interesting analysis of the nutritional role of vegetables in the Asian diet, with an emphasis on Taiwan. A method for analyzing the nutritional role of a food commodity is presented. The following chapter describes the potential contribution that small gardens can make toward improving the nutritional status in rural areas.

There is an especially useful chapter on tropical grain legumes, which describes production, uses, processing methods and nutritional properties, and another on the expanding role

of wheat in the tropics. Remaining chapters deal with the functional properties and chemical and nutritional composition of peanut flours and their proteins; soy protein foods, with particular attention given to soy beverages and processed soy fractions; coconut products (oil, flour, protein, and dried coconut); merlitos and eggplants; avocados; new processed banana products; maize foods of Colombian origin; fermented African foods; and the nutritional quality of typical Nigerian diets. Two chapters deal with special foods: one with Philippine food supplements used in emergency feeding of malnourished children, and the other with leaf protein concentrates, their nutritional composition, and possible large-scale production methods.

With its heavier emphasis on vegetables and their nutritional contribution to tropical diets, volume 2 supplements volume 1 very well. Volume 2 in fact gives a much more rounded picture and deals more with truly tropical products. Still missing, however, is thorough treatment of important protein foods such as meat, seafood, eggs, and milk. Fermented foods are also covered only lightly.

The book is recommended for those working specifically on the products covered and for libraries. It is an important supplement to the literature expanding our understanding of the nutritional status of tropical regions.

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ertia" in the development and positioning of cortical organelles—a consequence of the fact that the pattern of preexisting organelles influences the way that new organellar assemblies are positioned, and the remarkable ability which ciliates share with metazoan embryos for the relational placement of structures within a positional or developmental field. The discussion then shifts to consideration of gene expression, beginning with the "functional inertia" of patterns of gene expression, which, although evoked by specific environmental factors, remain in force long after the stimulus is removed. It continues with an extensive analysis of macronuclear differentiation as an epigenetic phenomenon in which various cellular or environmental factors permanently influence the pattern of gene expression in competent developing macronuclei. This is followed by a brief description of hereditary symbiosis and organellar heredity and an all-too-brief final chapter presenting examples of genetic dissection of the development and function of cell systems, including the electrophysiological properties of plasma membrane, nuclear division and cytokinesis,

food vacuole formation, and the development and function of trichocysts. This final section has far greater significance than its brevity suggests, for much of the future scientific utility of ciliates as an organismic technology will undoubtedly be concerned with the genetic dissection and analysis of various fundamental aspects of the cellular biology of eukaryotes.

Throughout the book, the discussion is presented in a relatively nontechnical way with emphasis on ideas rather than on technical details. This is undoubtedly helpful to the general reader or the student who is trying to get an overview of the field, but may somewhat limit the work's utility as a text. The author's goal is to present a survey of the field, which can engage the interest of nonprotozoologists in the problems of heredity and development in ciliates.

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