

**SECOND EDITION**

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# **Biochemistry and Physiology of Protozoa**

**Volume 1**

Edited by  
**M. LEVANDOWSKY**

**S. H. HUTNER**

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**M. LEVANDOWSKY**

**S. H. HUTNER**

Haskins Laboratories of Pace University  
New York, New York

Consulting Editor

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Volume 1

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A. D. Brown  
Annette W. Coleman  
John E. Dodge  
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## Preface to the Second Edition

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This inaugurates, some 15 years after its predecessor, a multivolume second edition of "Biochemistry and Physiology of Protozoa." In this sense, in retrospect the preceding volumes (three in all) constitute a first edition, but as the intervals between the new volumes will be measured in months and a year or two rather than decades, and the new volumes have been planned as a whole, "second edition" seems fitting, and emphasizes that protozoology has vastly expanded in recent years and, by most evidence, will continue expanding.

The causes of this expansion are easily detected. That the gulf separating prokaryotes and eukaryotes seems evolutionarily the widest among extant organisms is unchallenged. Kluverian unity of biochemistry remains firmly established, but is perceived in a perspective at once deeper and more practical. How easy it was to find drugs against prokaryotes, how cursedly hard and expensive to find them against the eukaryotic parasites—protozoa, fungi, and helminths!

The World Health Organization designates malaria, leishmaniasis, and trypanosomiasis as three of the six infectious diseases posing the most important global challenges. In the developed countries recognition of the grudging pace of progress with chronic diseases and aging is widening the demand for eukaryotic "models" which will be easier to handle than conventional laboratory animals. The more conspicuously animal protozoa are increasingly meeting this hunger for expeditious approaches to eukaryotic fundamentals; they will not be neglected in this new series nor will the pathogens (taking into account that several other volumes on parasitic protozoa have recently been published or are listed in press).

Advances in identifying molecular kinships have attracted biochemists (and other gentry not formally protozoologists) into the enterprise of building abutments for bridges between eukaryotes and prokaryotes. Fittingly, therefore, this edition leads off with an overview of phytoflagellate phylogeny.

The increase in knowledge of metabolic pathways and descriptive biochemistry permits more penetrating analyses of the protozoan equiva-



lents of endocrinology, neurology, especially as manifest in behavior. I therefore am delighted to welcome as senior editor for this edition my colleague Dr. Michael Levandowsky. In doing so I follow the precedent set up by the founder of this enterprise, Andre Lwoff, when he invited me to serve as senior editor with him for Volume II of what was, in retrospect, a three-volume first edition, with long intervals between Volumes II and III. The pace has quickened; the old verities need new kinds of substantiations.

S. H. Hutner

## Preface to Volume 1

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The flux of information has swelled enormously since the first edition of this treatise (Lwoff, 1951; Hutner and Lwoff, 1955; Hutner, 1964) and the later comprehensive survey of Kidder (1967); the time seems ripe again for sifting and synthesis.

Science does not progress predictably; by definition, it advances through trial and error, with long quiet spells punctuated by bursts of activity. Protozoological metaphors come to mind, such as *Amoeba* sending out exploratory pseudopodia, or the biased random-walk progression of a swimming *Paramecium*. Therefore we have not tried to be comprehensive or grimly systematic in this collection, but have followed the story line as we see it, choosing topics of great activity or promise.

Obsessed with the human side of science, we are author-minded; we tried to choose interesting authors and to stay out of their way as much as possible, entering the fray from time to time to referee jurisdictional squabbles, or to rescue the English language.

We dedicate this multivolume second edition to Andre Lwoff, master craftsman, savant, artist, philosopher, and progenitor of this enterprise. We fancy that the very diversity of topics dealt with in these volumes is in keeping with the multifariousness yet scholarly depth of his work. What else is there to say about a man whose protozoological interests extend from marine astomatous ciliates, photosynthetic and colorless flagellates, to trypanosomes? Blame him, not us, for the diversity of topics here!

No great talent as generalist or seer is demanded to conclude that these new volumes reflect not merely the growth of protozoology, but recognition that biological man does not live by *E. coli* alone; that with that groundwork well laid, the time is ripe to confront the realities of our eukaryotic identity. And this too is in keeping with Lwoffian precedents, for he went from protozoology to bacteriology and virology. We dare conclude that, with due respect to the Master, the time is ripe for turn-about, and what would be more strategic at this stage in the development of biology, than to exploit the seeming simplicities of protozoa (perhaps often misleading, but that is for the future to decide), before pursuing

knowledge of the metaphyten and metazoan cell, and the devices leading to multicellularity and to the evolution of consciousness.

We must thank D. P. Petrylak and C. C. Wang for helpful discussions of certain chapters, and the editors at Academic Press for general comments.

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