

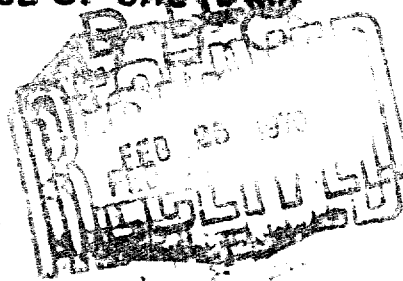
AD701241

# NAVAL MEDICAL RESEARCH

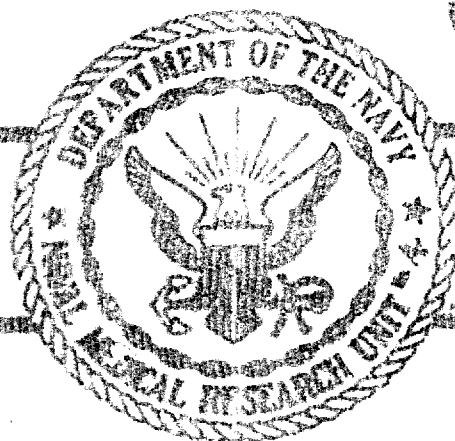
UNIT No. 4

## THE MYCOPLASMATALES AND THE L-PHASE OF BACTERIA

Leonard Hayflick



This document has been approved  
for public release and sale; its  
distribution is unlimited



December 1969

## Wall-less Cells

**The Mycoplasmales and the L-Phase of Bacteria.** LEONARD HAYFICK, Ed. Appleton-Century-Crofts, New York, 1969. xvii + 738 pp., illus. \$30.

That organisms which lack cell walls are under intensive study is evident from the table of contents and the size of this book. The editor has drawn together 26 chapters by 35 contributors, mostly from the Second International Conference on the Biology of the Mycoplasmas held in 1966. Fifteen of the chapters are updated and expanded versions of papers published earlier in the 871-page proceedings of the 1966 conference (*Biology of the Mycoplasmas*, Annals of the New York Academy of Sciences, vol. 143, 1967).

By usual definition, mycoplasmas are found in nature and L-phase organisms, as the editor prefers to call them, are derived from bacteria. Various properties shared by mycoplasmas and L-forms have led to a hypothesis that is difficult to substantiate, that is, that mycoplasmas are descendants of bacteria. The requirement for sterol, a property of animal cells not yet reported for bacteria, and the failure of nucleic acid homology techniques to confirm genetic relatedness are cited in this volume as evidence to the contrary. One may wonder, nevertheless, why other opposing arguments are not included.

Investigators delving into the possible role of L-phase organisms as agents of clinical disease will do well to read the chapter by W. Hijmans and his colleagues from the Netherlands. The thinking in this chapter, supported by 18 pages of references, does not seek to debunk the hypothesis that L organisms have such roles. However, the pitfalls for the researcher investigating this hypothesis are clearly and forcefully pre-

sented. Another chapter, by Z. A. McGee and R. G. Witter, establishes acceptable terminology for the wall-defective variant phases of bacteria and brings together the most recent information on their clinical significance. A discussion of the taxonomic position of the mycoplasmas and the reasoning that led to their present classification was enlightening to this reviewer. *Mycoplasma*, the only genus so far assigned to the family Mycoplasmataceae, has 35 species which are listed by name in the book. Just what will be done with the T-strains of M. C. Shepard is not clear, but the possibility of another genus being assigned to this group appears to be under consideration. Since mycoplasmas are free of cell walls and differ in other important respects from bacteria, they should be aligned into a new class, and the suggested name is Mollicutes (soft skin).

The repetition appearing in the introductory sections of various chapters could have been avoided; however, the articles are well organized, clearly written, thoroughly referenced, and comprehensive. The book is not abundantly illustrated, but does contain sparkling photographs of mycoplasma organisms as viewed under the electron microscope. Photographs shown in the chapter by W. A. Clyde which reveal the diversified morphology resulting from progress of growth are especially striking. The book, covering topics which range from studies of ultrastructure to the epidemiology of *Mycoplasma pneumoniae*, should be a useful addition to the wealth of reference material now available to educators, research workers, and students of microbiology.

YORK E. CRAWFORD  
Mycoplasma Research Division,  
Naval Medical Research Unit No. 4,  
Great Lakes, Illinois