

Preface

The bacterial spore is a complex structure. The sequences of events occurring during the process of sporulation and during those stages (germination and outgrowth) leading to vegetative cell development have long held the attention of biochemists and microbiologists. A considerable amount of time and effort has been devoted, at the cellular, biochemical and molecular levels, in order to achieve a better understanding of the spore and of sporogenesis, sometimes with a view to harnessing the findings to achieve more efficient use of sterilization and sporicidal treatments.

Generally, spores possess an above-average resistance to inimical processes. Following a brief initial account of spore structure and sporogenesis, the effects of chemical and physical agents are discussed, with emphasis placed on factors influencing destruction, mathematical aspects, applications and the mechanism(s) responsible for spore inactivation or resistance. The most important processes are undoubtedly thermal (moist heat, dry heat), radiation (ionizing, ultra-violet), chemical (liquid phase, vapour phase) and hydrostatic pressure. In recent years, there has been renewed interest in the possible use of combined sporicidal treatments, and these are described and discussed in a separate chapter. Finally, sufficient data have now accumulated for some preliminary conclusions to be reached about the recovery and revival of sublethally injured spores.

It is inevitable in a work of this type, which deals with the effects of chemical and physical agents upon a single type of organism, that some overlapping occurs between chapters. In the author's opinion, this is not necessarily a disadvantage, since studies in one field frequently impinge into investigations in another area.

It is hoped that the book will be of value to microbiologists in the food, dairy and pharmaceutical industries and to those who undertake academic and applied research into spore destruction.