

Preface

The cyanobacteria can be defined as "microorganisms that harbor, within a typically prokaryotic cell, a photosynthetic apparatus similar in structure and function to that located in the chloroplast of phototrophic eukaryotes."¹ The origins of cyanobacteria date back almost to the beginning of life on earth. Fossils of the progenitors of these organisms are found in strata over three billion years old.² The genetic, metabolic, and morphological diversity of the cyanobacteria rivals that seen among the totality of other eubacteria. As simple bacteria, the cyanobacteria would seem to be the obvious organisms of choice for the study of such fundamental processes as oxygen-evolving photosynthesis and nitrogen fixation. Indeed, in recent years this group of organisms has become the focus of intense study. This development resulted from a fundamental change in perspective and from the availability of large collections of pure cultures of cyanobacteria, collections which include representatives of each of the major groups of these organisms.

The rapid growth of this field owes much to the leadership of Roger Stanier and his associates. On September 28, 1976, Roger Stanier delivered the Emil Chr. Hansen lecture on the occasion of the centennial of the Carlsberg Laboratory in Copenhagen. He said: "Fifteen years ago, when we began work on the cyanobacteria, these organisms were still construed as algae, and their study was largely conducted, as it always had been, by phycologists, with a heavy emphasis on descriptive taxonomy and ecology. It was commonly believed that the isolation of pure cultures is exceptionally difficult, even though M. B. Allen had made a promising start on this technical problem about 1950; indeed most of the pure strains then in existence had been isolated by her. Accordingly, much of our initial work was directed to the isolation and purification of additional members of this group, an essential prerequisite for comparative experimental studies. The news that these organisms are really bacteria has spread, thus encouraging other microbiologists to take up work on cyanobacteria. More significant information about their biological properties has emerged in the past decade than in the preceding century."¹

We hope the contributions in this volume will prove useful to investigators with little previous experience with cyanobacteria as well as to those who wish to change the emphasis of their research. This volume, with its stress on methodology, does not provide a detailed survey of the

¹ R. Y. Stanier, *Carlsberg Res. Commun.* **42**, 77 (1977).

² J. W. Schopf, Ed. "Earth's Earliest Biosphere. Its Origin and Evolution." Princeton University Press, Princeton, New Jersey, 1983.

literature on cyanobacteria, but extensive bibliographies are available in two recent monographs.^{3,4}

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LESTER PACKER

ALEXANDER N. GLAZER

³ N. G. Carr and B. A. Whitton, Eds. "The Biology of Cyanobacteria." University of California Press, Berkeley and Los Angeles, 1982.

⁴ P. Fay and C. Van Baalen, Eds. "The Cyanobacteria." Elsevier Science Publishers. Amsterdam, The Netherlands, 1987.