

Preface

Giant algal cells have provided experimental material for the physiologist for a little more than half a century: the interaction of physics with biology is several hundred years old. Both physicists, we have written of those parts of the physiology of giant algal cells that interested us, omitting many things of interest to biochemists or geneticists. In this chosen, restricted field, we have kept in mind that we were summarising the latest work, for our colleagues, and introducing the field to others. At times the conflict between these imaginary readers will be apparent to the real one.

When this book was mooted, the field of biophysical physiology of giant algal cells was full of active workers again, and full of unresolved problems. We thought, as time passed, that the book would be able to report more and more of them to have been successfully solved. Nine years later, many an old dilemma stands, less threatening than before, its familiar horns worn by the passing summers and winters. New problems claim attention: as we write, an interesting clash of paradigms is in progress. For many years, the models in use in plant electrophysiology came from animal physiology; now that Mitchell has turned so much of biochemistry into a branch of membrane biophysics, the models are beginning to be Mitchelian. Here, as elsewhere, we can only urge the reader who wants clear-cut decisions to wait-and-see.

We thank our colleagues who helped us during the preparation of the book: especially G. P. Findlay, who read the manuscript, and whose criticism was of great use to us; and also those who without reading the manuscript delicately hinted that it had better be good. Many gave us access to their unpublished work, for which we are grateful – C. E. Barr, P. H. Barry, H. G. L. Coster, W. J. Cram, G. P. Findlay, G. E. Fogg, P. B. Green, A. W. D. Larkum, R. McC. Lilley, L. J. Mullins, J. D. Pickett-Heaps, M. G. Pitman, F. A. Smith, W. J. Vredenberg, E. J. Williams, and U. Zimmermann.

For the photographs of algae that grace the volume we thank B. T. Lester and J. P. Fairburn of Sydney University; for the electron micrographs we thank T. E. Bostrom, A. W. D. Larkum, J. D. Pickett-Heaps and M. Vesik. For many of the line drawings, our thanks to D. J. Stanley of Sydney University.

Finally we are happy to acknowledge the following for permission to reproduce published journal figures:

Botanical Society of Japan [*Botanical Magazine, Tokyo*: Fig. 12.2 (a)].

CSIRO [*The Australian Journal of Biological Sciences*: Figs 5.9, 7.4 (a), (b), 7.5 (c), 7.6, 7.8, 8.3].

Elsevier Publishing Company [*Biochimica et biophysica Acta*: Figs 6.8 (a), (c), 10.5, 10.6].

Japanese Society of Plant Physiologists [*Plant and Cell Physiology*: Fig. 12.5 (b)].

Macmillan Journals Ltd [*Nature, Lond.*: Fig. 2.4].

New Phytologist [Figs 10.2, 10.3].

Oxford University Press [*Journal of experimental Botany*: Figs 6.4 (b), 11.1].

Physiologia Plantarum [Fig. 4.1].

Rockefeller University Press [*Journal of general Physiology*: Figs 2.1, 2.5, 6.4 (a), 7.4 (c), 12.5 (a)].

Springer-Verlag [*Protoplasma, Handbuch der Pflanzenphysiologie*: Figs 2.2, 2.3, 3.1, 3.4, 12.2 (b), 12.3, 12.4].

A.B.H.

N.A.W.

November 1973