PLANT PHYSIOLOGY:
TRANSPORT PROCESSES IN PLANTS

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by

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PREFACE

The published works contained within this Thesis represent original research conducted during the various phases of my academic development. The first seven papers (1A-7A) represent the research conducted during my Ph.D. period in the laboratory of Dr. F. Andrew Smith, in the Department of Botany, at the University of Adelaide. As a Postdoctoral Fellow in the laboratory of Professor Jack Dainty, Department of Botany, University of Toronto, Ontario, Canada, I extended my research on membrane transport processes in the giant fresh water algal system of Chara corallina. Although much of the work was conducted on my own, I did avail myself of the opportunity to collaborate with other scientists on several research projects; the most profitable association was with Dr. Jack Ferrier, who was also a Postdoctoral Fellow in the same laboratory. During this two year postdoctoral period, my main focus was on the spatial aspects of membrane transport in Chara, and from the research conducted at the University of Toronto papers 8A-13A were published.

In September of 1977 I moved to the University of California, Davis Campus, to take up a junior faculty position in the Department of Botany. In view of the agricultural focus of the UC Davis campus, I established an integrated research program to study the physiology, cytology and biophysics of transport processes in plants. Although we still continued to work on Chara as a model system, we expanded our focus to include ion transport into roots, and sugar transport in terms of phloem physiology. Over the last eighteen months we have further expanded our program to encompass both the role played by plasmodesmata in plant-related transport processes, and the use of molecular biology to further probe the physiology and biophysics of the above-mentioned transport systems.

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