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This book is composed of a set of chapters contributed by past and present collaborators of the Nobel Laureate Sir Andrew Huxley covering the areas of muscle research to which he has made major contributions. The purpose of the book is to discuss the way that muscle works, asking questions at a functional level about the molecular basis of muscle tone production and muscle contraction. The majority of the chapters are concerned with muscle physiology and the relation between structure and function. The process of activation of muscle is examined, together with the mechanism of contraction itself. Although most of the book is concerned with vertebrate skeletal muscle, several of the chapters deal with cardiac muscle. The book also features two introductory chapters discussing Sir Andrew's achievements in both nerve and muscle physiology.

All those interested in the structure and function of muscle, or cell motility in general, will wish to read this book.

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Edited by
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Division of Biomolecular Sciences
King's College London



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Preface

Andrew Fielding Huxley was awarded the Nobel Prize for Physiology or Medicine in 1963, together with A. L. Hodgkin and J. C. Eccles, for his contribution to understanding the process of nerve conduction. But by this time his research efforts had been redirected towards muscle contraction for some twelve years, and he had already played a major role in formulating the sliding-filament theory and in elucidating the first steps in the activation process. During these years and subsequently, he worked with a number of visitors to his laboratory, chiefly postdoctoral fellows from abroad. The opportunity for these collaborators to pay tribute to his influence on their work came at a conference associated with the meeting of the Physiological Society in Cambridge in June 1989. This marked no particular anniversary, though it preceded his retirement from his post as Master of Trinity College by a year. I asked him what kind of a meeting he would like, and he replied without hesitation, "On muscle." So while this book does relatively little to celebrate his contributions to research on nerve, many of his past and present collaborators in muscle research were able to attend the conference and all of those contributed to this volume.

Robert Stämpfli's contribution (Chapter 1) does, however, recall the days in Cambridge and Plymouth when he witnessed the great work of Hodgkin, Huxley, and Katz on the squid giant axon, and collaborated with Huxley in demonstrating saltatory conduction in myelinated nerve. This contribution arose by a curious circumstance. I asked Professor Stämpfli at short notice whether he would be prepared to make a speech at the dinner after the meeting. To my relief he accepted with alacrity, and to my surprise he told me he knew exactly what he would say. It turned out that he had written an article about Andrew Huxley in the early 1970s, though this had not been published. He gave the speech as

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promised, on an idyllic summer's evening in the garden of the Master's Lodge at Trinity.

In my own account of Andrew Huxley's research on muscle (Chapter 2), I soon abandoned the attempt to write a straightforward account of his work, as so much of it is covered in his own book *Reflections on Muscle*, and in his other review articles, and it became pointless to try to compete. I have tried to adopt a style that is midway between Robert Stämpfli's reminiscences and an account of his research, drawing extensively on conversations with his collaborators and with Andrew Huxley himself. I hope that this account will serve as a background to the various contributions in the body of the book and also entertain the reader.

Because of other commitments I was unable to work on this book much until the summer of 1990, and authors have brought their contributions up to date as of August 1990.

Stanford
May 1991

R. M. Simmons