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FEATURES IN THE ARCHITECTURE OF PHYSIOLOGICAL FUNCTION

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To

MY WIFE

CONTENTS

PREFACE

It must have been about the time of the Harvey Centenary that Sir John Rose Bradford delivered an address to the Cambridge Medical Society; in it he said, so nearly as I can remember, "The difference between physiology as taught now and in my youth is that now the student is given principles: then he was only given facts". I commenced to wonder what these principles were, and the list, as it occurred to me, was much the same as the headings of the chapters of this book.

Having been privileged to give the Dunham Lectures at Harvard in 1929, some of the titles became expanded into lectures, the publication of which could scarcely be refused when the request was made by the revered Founder of that Benefaction. The whole grew, supplying material for other lectures, and then a curious thing happened. At the outset I had regarded the body as a noble building on the principles which it exhibits as unconnected features in its architecture. It became clear that the features were far from being independent. The highest functions of the nervous system demand a quite special constancy in the composition of its intimate environment. The stability of the internal *milieu* almost compels the principle of the storage of materials and of integration in adaptation. Again an easy stepping stone to integration in the practice of the body to have more than one way of doing many things. But parallel mechanisms may express themselves not only in integrative but in antagonistic processes. Moreover, increased function actively may be achieved either by heightening the efforts of units already functioning or by marshalling a greater number of units: and so we arrive at the "all-or-none" relation.

It seemed almost as though there had emerged an approach

to physiology from an unusual angle: not from that of mere structure, whether the structure of organs or of chemical formulae, but from the principles of function.

It is doubtful whether the book would ever have seen the light but for the sympathetic encouragement of some of my friends, notably Sir Charles Sherrington and Prof. S. P. Cathcart. The help which I have received from Prof. Adrian, Mr Matthews, Dr Winton, Dr Keys and a host of other workers in the Cambridge Laboratory will be evident to all readers, and Mr Thacker has done much on the editing side. For the use of diagrams I am indebted to: Messrs Baillière, Tindall & Cox (*Veterinary Journal*); the Editors of the *Journal of Physiology*; the Council of the Royal Society, London (*Proceedings*); the Editor of the *Journal of Pathology and Bacteriology*; Messrs Walter de Gruyter & Co. (*Archiv für Anatomie u. Physiologie*).

J. B.

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