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978-1-107-41584-3 - The Respiratory Function of the Blood: Part I: Lessons from High Altitudes

Joseph Barcroft

Frontmatter

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**THE RESPIRATORY FUNCTION
OF THE BLOOD**

PART I

LESSONS FROM HIGH ALTITUDES

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by

JOSEPH BARCROFT

Fellow of King's College, Cambridge

CAMBRIDGE

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**TO THE MEMBERS OF MY
PARTY IN SOUTH AMERICA**

C. A. BINGER

A. V. BOCK

J. H. DOGGART

H. S. FORBES

G. A. HARROP

J. C. MEAKINS

A. C. REDFIELD

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PREFACE
TO THE FIRST EDITION OF
THE RESPIRATORY FUNCTION OF THE BLOOD

AT one time, which seems too long ago, most of my leisure was spent in boats. In them I learned what little I know of research, not of technique or of physiology, but of the qualities essential to those who would venture beyond the visible horizon.

The story of my physiological “ventures” will be found in the following pages. Sometimes I have sailed single handed, sometimes I have been one of a crew, sometimes I have sent the ship’s boat on some expedition without me. Any merit which attaches to my narrative lies in the fact that it is in some sense at first hand. I have refrained from discussing subjects which I have not actually touched, but which might fittingly have been included in a modern account of the blood as a vehicle for oxygen. Such are the relation of narcosis to oxygen-want and the properties of intracellular oxidative enzymes. The omission of these and other important subjects has made the choice of a title somewhat difficult. I should like to have called the book, what it frankly is—a log; did not such a title involve an air of flippancy quite out of place in the description of the serious work of a man’s life. I have therefore chosen a less exact, though more comprehensive title.

After all, the pleasantest memories of a cruise are those of the men with whom one has sailed. The debt which I owe to my colleagues, whether older or younger than myself, will be evident enough to any reader of the book. It leaves me well-nigh bankrupt—a condition well known to most sailors. But I owe another large debt of gratitude to those who, as teachers, showed me the fascination of physiology, to Dr Kimmins*, and especially to

* Formerly science master at the Leys School, now Chief Inspector of the Educational Department of the London County Council.

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PREFACE

Dr Anderson *. At a later stage I learned much from Dr Gaskell, Professor Langley and Dr Haldane.

There are occasions on which every sailor of the deep sea has to ship a pilot. Mr A. V. Hill has brought me into those harbours which are best approached through the, to me, unknown channels of mathematics.

* Formerly supervisor in physiology to King's College, now Master of Gonville and Caius College.

J. B.

CAMBRIDGE,

December, 1913.

PREFACE
TO
LESSONS FROM HIGH ALTITUDES

THE rapid advance of knowledge rendered impossible the task of revising *The Respiratory Function of the Blood* for a second edition. The book was in three parts with an Appendix on technique: there is now more than enough known about the subject-matter of each part to justify a book on that alone. I have therefore determined to break up the volume into a *series* of manageable units, originally intended to correspond more or less to the "Parts" of the original work. The first volume of this series is now presented.

I have to thank the Royal Society for permission to reproduce Figs. 10, 11, 12, 13, 14, 15, 17, 18, 25, 26, 29, 30, 37, 41, 42, 44, 45, 46, 48 and 50; *Physiological Review*, Figs. 31, 32, 33, 34; *Journal of Physiology*, Figs. 23, 24; *R.A.M.C. Journal*, Figs. 22, 39, 40; *Quarterly Journal of Medicine*, Figs. 20 and 38; the Medical Research Council, Figs. 35 and 36; the Peruvian Corporation, Fig. 3; *Nature*, Fig. 16, and my friends Dr Douglas for the plates of Figs. 1, 7, 8 and 9, Professor Durig for that of Fig. 5, and Professor Aggazzotti for those of Figs. 4 and 6.

J. B.

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