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This volume provides a thought-provoking perspective on the empirical and analytic study of body form and composition. The techniques used for measuring body components such as fat, water, lean tissue, bone mass and bone density are evaluated against potential 'gold standards'. The nature of regional differences, developmental changes, pathological abnormalities, and the impact of heredity and environment in shaping body composition are discussed in the context of human evolution. All those concerned with biological anthropology, both clinicians and researchers, will find this book of great interest.

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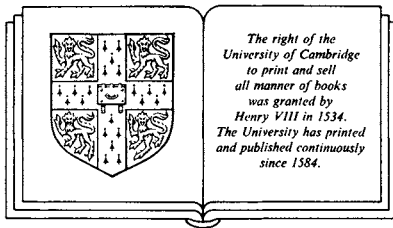
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Preface

A previous contribution to the present series of monographs (Carter & Heath, 1988) has thoroughly explored the issue of somatotyping. The present volume provides a counterpoint to such a 'Gestalt' of body form by focussing upon an empirical and analytic approach to body composition.

A brief introduction compares empirical and intuitive analyses of body form and composition. It considers also the difficult question of proposing 'reference' and 'normal' standards at various stages of life, touching upon such issues as the reasons for data collection, an optimal statistical treatment of the results, concepts of proportionality and the 'unisex phantom'. The next four chapters look at methods for the determination of body fat, body water, lean tissue, bone mass and bone density, available techniques being evaluated against the potential 'gold standards' provided by detailed anthropometry and cadaver dissection.

The book then moves on to examine definitive issues, including regional differences in the relative amounts of fat, muscle and bone, developmental changes in the proportions of these three body components, and the respective influences of heredity and environment in shaping body composition. The implications of inter-individual differences of body composition are considered in the specific contexts of acute and chronic adaptations to a variety of hostile habitats, including situations characterized by extremes of heat and cold, malnutrition, and an over-abundance of food. A subsequent chapter explores pathological abnormalities of body composition, including gross obesity, muscle wasting, and osteoporosis. Finally, information is summarized in the broader context of human evolution; in particular, the text explores how far hostile features of the world (extremes of environmental temperature, starvation, an excessive food supply and disease) have encouraged the emergence of genetic isolates with unusual features of body composition.

In writing the monograph, I have drawn quite extensively upon the research experience of the University of Toronto laboratories. I would like to acknowledge my debt to studies of body composition shared with Drs Joan Harrison and Ken McNeill, field investigations of the Inuit

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conducted in collaboration with Andris Rode and members of the Canadian International Biological Programme team, measurements of fat loss during acute cold exposure shared with Dr W. O'Hara, Stan Murray, and the Defence and Civil Institute of Environmental Medicine, research on anorexia nervosa shared with Drs J. Garfinkel, J. Garner and S. Shinder, and studies of body fat distribution completed with Drs Hugues Lavallée, John Brown, R. Forsyth and P. Kofsky-Singer.

Much still remains for the physical anthropologist to clarify. But if the present book provokes further empirical research upon body composition, allowing more definitive conclusions to be reached, I shall be well-pleased with the outcome of this endeavour.

Toronto

Roy J. Shephard