

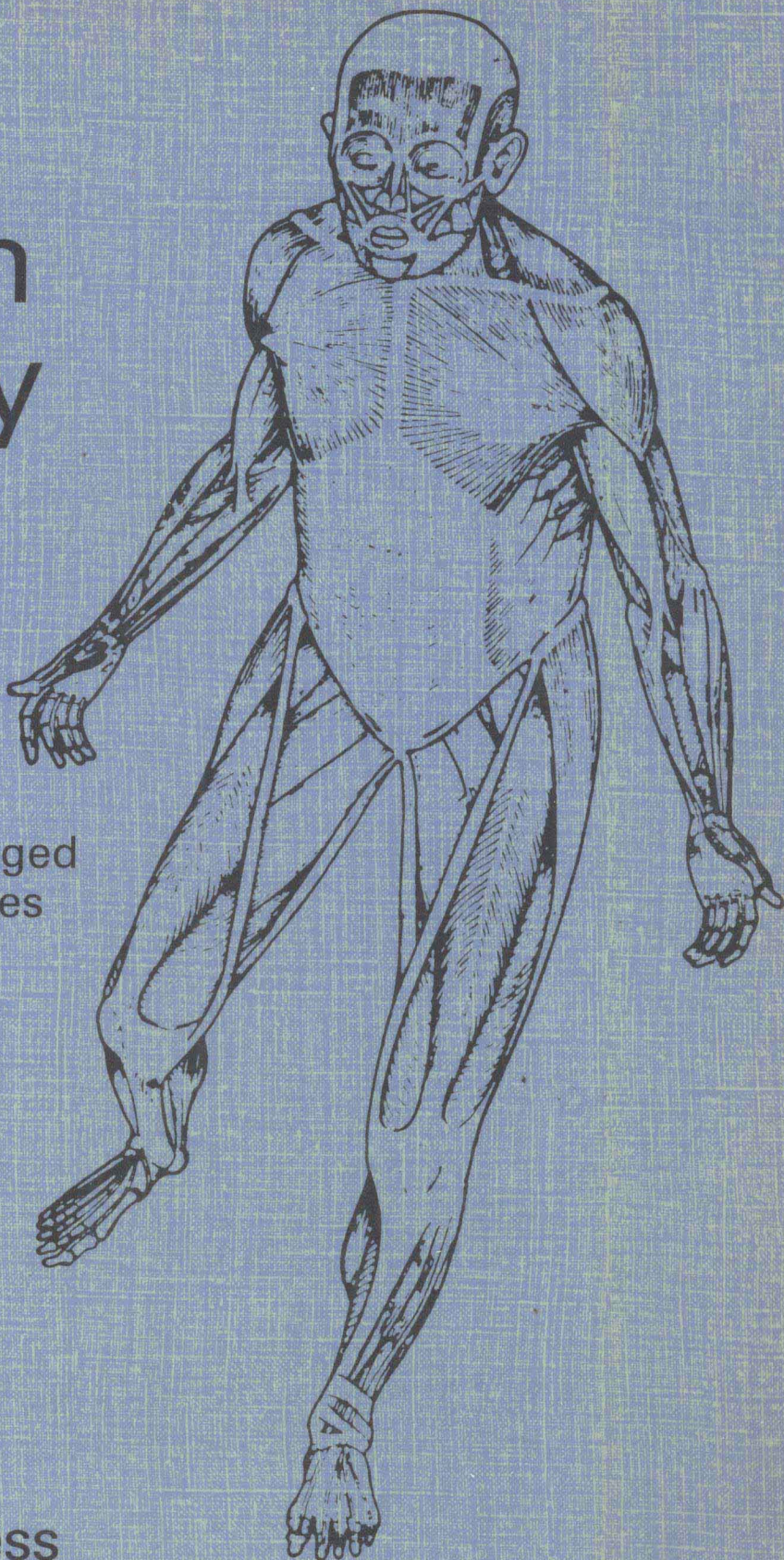
A Textbook of
**Human
Biology**

Third edition

Revised and enlarged
for all basic courses

John K. Inglis

Pergamon Press



A TEXTBOOK OF HUMAN BIOLOGY

THIRD EDITION

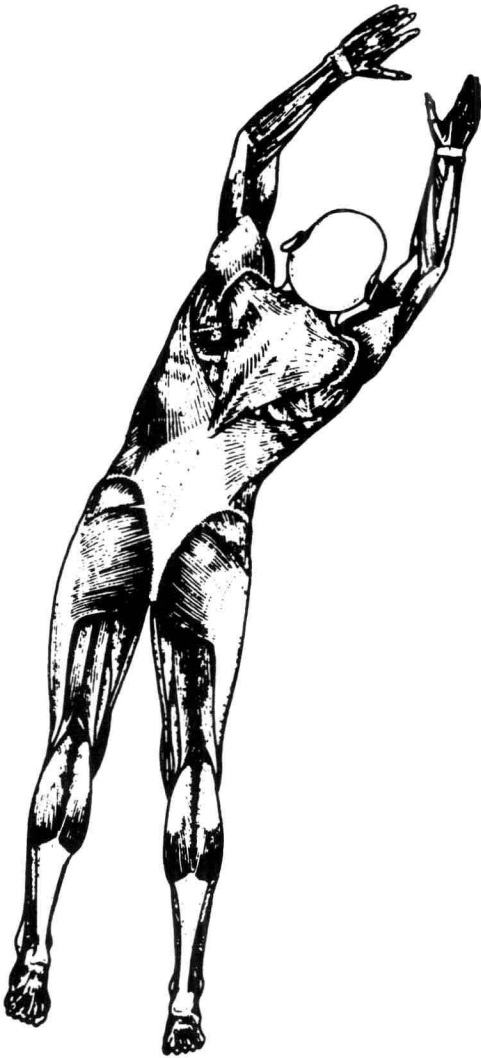
REVISED AND ENLARGED
FOR ALL BASIC COURSES

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PREFACE TO THE THIRD EDITION

This is more than a third edition: it is a new book. The first two editions bear little resemblance to this book, except in title. This new book is designed to cater for a wider market than the first two editions. It is hoped that the book will serve the following educational programmes:

- Human Biology (GCSE-O and A level, UK and Commonwealth)
- Human and Social Biology (GCSE-O and A level)
- Health Science certificates and diplomas (UK and USA)
- Registered and Enrolled Nursing diplomas (UK and USA)
- Medical and Dental Hygienists and Receptionists
- High School Diplomas—grades 11, 12, 13 (USA and Canada)
- Laboratory Technician qualifications in biology and medical laboratory science (B/TEC)

The topics of food and nutrition have been more fully covered in this edition to serve the needs of basic courses in catering and nutrition.

An experienced teacher may see this widespread cover as inflated ambition, but it is really saying that the book is aimed at the later school-years and early college years. There is enormous overlap in many of the courses mentioned and this book is concerned with that area of overlap within the specialisms of anatomy, physiology and health.

One major objective in this new book is to provide source material for “open-learning” courses which are becoming more popular in the UK. Each chapter becomes a unit of study which must be read and then tested. If teachers or students want to use this book for flexistudy courses the author will be pleased to answer any enquiries. A system of objective tests with self-marking devices can be used for continuous assessment and student grading (pp. 381–407), and further study materials are referred to in a final reading list (pp. 413–14).

ACKNOWLEDGEMENTS

This book was inspired by the students of further education in Oxford, England, in Illinois, USA and in Ontario, Canada. It is the enthusiasm and the interest of students that makes a teacher continue his task in up-dating and improving his methods of communication.

This book was written in the USA and in Canada and I must offer my thanks to the college authorities who permitted me the opportunity to teach in their faculties of natural and health sciences.

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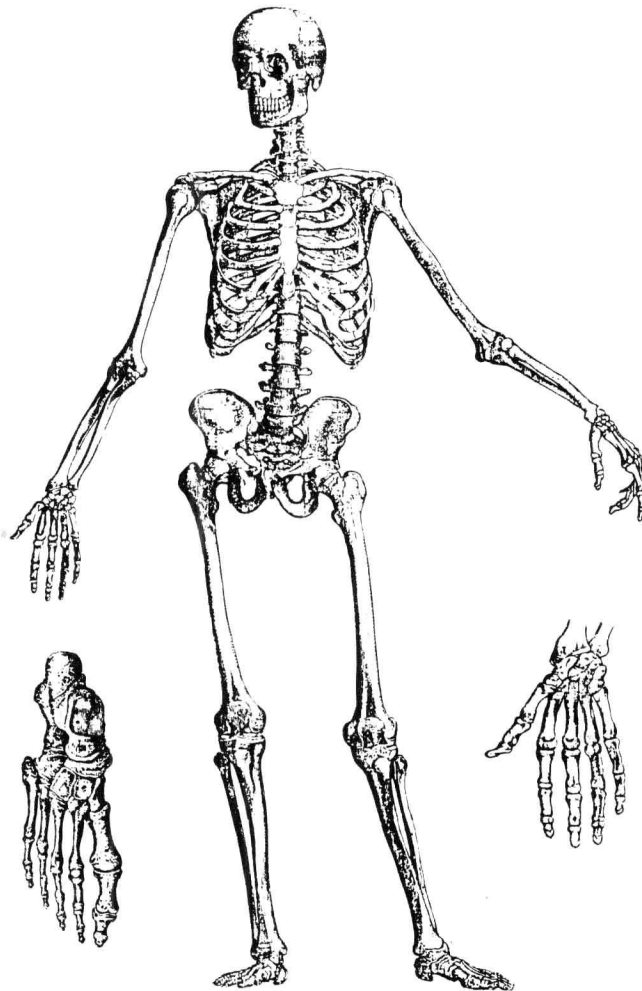
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UNIT A

Anatomy and Physiology of Man



CHAPTER 1

INTRODUCING THE HUMAN SPECIES

CHAPTER OBJECTIVES

This chapter should enable the student to:

1. Describe the similarities between man and ape
2. Describe the differences between man and ape
3. Outline man's ancestors in his family tree
4. Review the meaning and classification of race
5. Describe the organization levels of the human body
6. Understand the meaning of homeostasis
7. Describe the directional terms used when describing parts of the body
8. Know the body cavities and the types of membranes that line them.

1.1 MAN AND THE APES—THEIR SIMILARITIES

Man shares many similarities with his nearest relatives, the apes. These shared features can be listed as below (some of them cannot be seen merely by observation):

1. Hairy skin
2. Eyes face forwards giving stereoscopic vision
3. Five-fingered hand with opposable thumb
4. Breeding pairs with complicated mothering behaviour
5. Mammary glands present in thoracic region
6. A single uterus (womb) with one or two babies only born at a time
7. Menstrual cycle (monthly "period")

Apes also have blood which is similar to that of man and get the same types of illnesses as us. The chimpanzee and the gorilla show so many similarities to man that it is suggested they are similar

to the group from which early man arose. This does not mean that man evolved from the chimpanzee, but that our ancestral ape-like relatives may have been of that sort.

Another most obvious similarity between man and ape is that they are both mammals. Mammals are characterized by the presence of a hairy skin and the possession of mammary glands.

1.2 MAN AND THE APES—THEIR DIFFERENCES

Man also has many obvious differences from the apes, a few of which are shown below.

	Man	Apes
Growth rate	Quite slow	Faster
Sexual maturity	14 years	8 years
Full growth (male)	20 years	12 years
Dependency of young	6-8 years (approx.)	2 years
Lower limb bones	Longer than upper limbs	Shorter than upper limbs
Toe bones	Rather short	Rather long
Leg	Straight	Curved
Skull-backbone joint	Centre base of skull	At back of skull
Canine teeth	Smallish	Large fangs
Jaws	Short	Large and long
Face	Short, steep	Long, protruding
Brain	Large	One third size of man's

Man is also unlike the ape in that he walks erect on two feet (is bipedal). He therefore has longer and stronger legs, and hands that are free to develop tool-handling skills. This learning how to use tools necessitated a more complex and larger brain. The shape of the skull is another difference, as man's cranium has an upright forehead and the