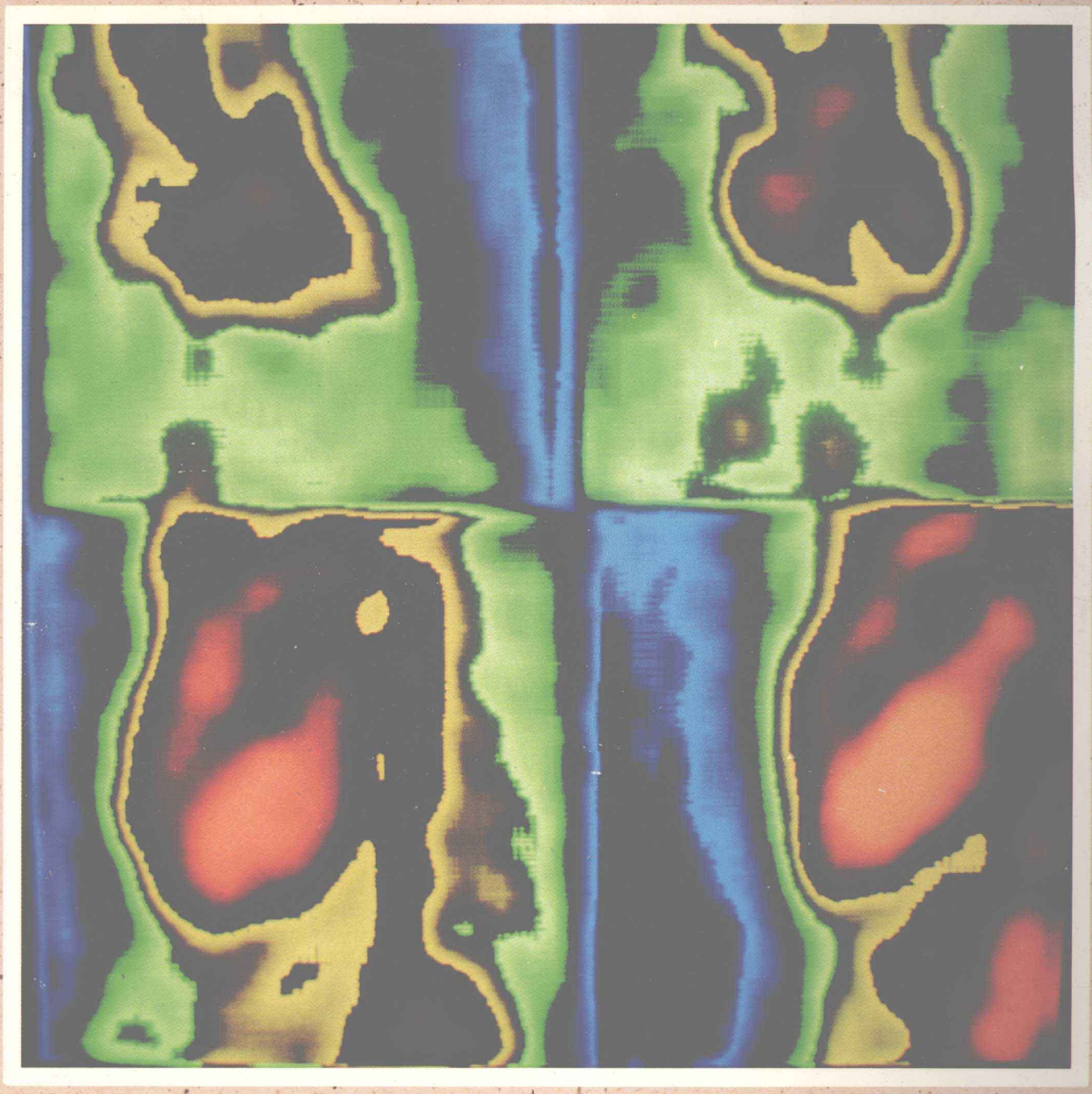

Perspectives on

Human Biology

Stuart I. Fox

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Pierce College

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To my daughter Laura and others of her generation, in whose care spaceship earth will be entrusted at the dawn of the second millennium

Preface

Human biology is an extraordinarily interesting subject to study and a challenging one to teach. Its interest to the student is derived from its root in personal concerns: "This is *my* body, *my* sex life, and *my* environment." The challenge of teaching human biology derives from its seemingly all-encompassing nature; instructors must choose which topics to include and emphasize, and which to exclude or de-emphasize. This unusual flexibility provides a unique opportunity for instructors to tailor their human biology courses to the specific desires and needs of their students.

Most human biology courses share certain common features. Basic concepts in biology and other sciences are introduced and explained succinctly so that students can advance to the more interesting applications of these concepts. Some knowledge of systematics, evolutionary mechanisms, and ecology is needed, for example, to understand man's place in the natural world. Similarly, a basic understanding of cells, tissues, organs, systems, and the principle of homeostasis is required before biomedical advances can be appreciated. Ideally, all of these basic concepts are explained clearly but relatively quickly; they serve as a necessary preamble to the topics of major interest to the students.

This text presents all of the background information needed to understand the subjects most often emphasized in a human biology course, and presents these subjects in the most current and interesting fashion possible. Human reproduction, development, and aging, for example, are emphasized by two separate chapters following a chapter on the endocrine system, which provides the basic background information. Genetic engineering is a common thread throughout the text, and is directly addressed following a thorough and modern introduction to gene action. Basic concepts and exciting discoveries about the immune system, as another example, precede a separate and current chapter on cancer. An entire chapter on human nutrition logically follows separate chapters on metabolism and the digestive system.

The ability of students to use this text and understand the concepts presented is aided by the logical organization of topics and by extensive use of beautifully rendered, full-color figures. In addition, there are numerous pedagogical devices that can help students to better understand the fascinating subject of human biology.

Student Aids

The following information about the organization and pedagogical devices in the text will help you to derive maximum benefit from this book.

Chapter Openers

Each chapter begins with three aids to learning: (1) an *Outline,* which lists the headings within the chapter and their page numbers for easy reference; (2) a list of *Objectives,* which tells you what you can expect to learn from the chapter; and (3) *Keys to Pronunciation,* which helps you to pronounce many new words in the chapter. These materials should be quickly read for familiarity before beginning the chapter, and then should be used for reference as you proceed through the chapter.

Perspectives

These are the paragraphs at the beginning of each major heading that are set off in different type and color from the main body of the text. They are summaries of the major concepts to be presented in that section, and provide a bird's-eye view of that section. Read these carefully, because they will help you to identify the organizing concepts of the section and prevent you from becoming distracted by the details. The details provided later breathe life into these concepts, but should not be allowed to obscure the major themes covered in the section.

Boxed Information

Following a discussion of a basic concept in the text, you may find a colored box of text. These contain short discussions of clinical or practical applications of the information preceding the boxes. You will find it enjoyable, as well as instructive, to see how your newly acquired basic knowledge can be applied to practical problems.

Social Issues

Within most of the chapters of this book are larger boxed essays labeled *Social Issues.* These are devoted to current ethical and political concerns raised by a topic in human biology covered in that chapter. These issues

are hotly debated by many segments of society, and should be familiar to all educated citizens. The points of view expressed are those of the author, and are written in such a way as to stimulate debate in the classroom. If you do not agree with some aspect of the essay, speak up! These important issues can be resolved only when each person voices their opinion and is honestly open to the opinion of others.

Footnotes

The derivations of many of the new words introduced in the chapter are provided in footnotes. These can help you to understand why a particular word is used, and this understanding makes it easier for you to remember the word.

Study Activities

Each major heading in the chapters ends with a list of study activities: pictures and flowcharts to draw, essays to answer, and other activities. The purpose of these activities is to help you to interact with the information presented, and provide a "reality check" to see if you really did understand the information. These activities will be more useful to you if you actually write them out, rather than just think about them.

Chapter Summaries

At the end of each chapter, the material is summarized for you in outline form. This summary is organized by major headings followed by the major points of information. Read the summary after studying the chapter to be sure that you have not missed any points, and use the summaries to help you review for examinations.

Review Activities

The Review Activities follow each chapter summary, and include objective and essay questions. The answers to the objective questions are provided in the Appendix at the back of the book. The first essay question in each chapter is answered in the Student Study Guide. Be sure to take these self-quizzes in a "closed-book" fashion before looking up the answers.

Appendix

The Appendix contains the answers to the objective questions in the Review Activities at the end of each chapter.

Glossary

The Glossary provides definitions of the more important terms used in the text. Whenever you encounter an unfamiliar term or would like additional information about a term, look it up in the Glossary.

Supplementary Materials

Student Study Guide

Written by Dr. Lawrence G. Thouin, Jr., this is an optional book that can help you to derive more benefit from the text. The answer to the first question in the Review Activities at the end of each chapter is provided here, together with helpful hints about how to answer essay questions on human biology. The study guide also provides additional objective questions (with answers), fill-in-the-blank questions, crossword puzzles, and other learning devices.

Instructor's Manual-Test Item File

The Instructor's Manual-Test Item File was written by the author to assist instructors in preparing for their classes. Each chapter includes a chapter outline and objectives, a list of suggested discussion topics, objective

questions with answers, essay questions with answers, and a list of suggested films relating to the chapter. Addresses of film suppliers are provided in appendix I, and a list of transparencies that accompany the text is provided in appendix II. The Test Item File contains additional objective questions with answers for each textbook chapter. These can be used to construct examinations.

wcb TestPak

A computerized testing service, provides instructors with either a mail-in/call-in testing program or the complete test item file on diskette for use with the Apple and IBM PC computers. wcb TestPak requires no programming experience.

Transparencies

This text is accompanied by 100 transparencies in two and full color. The transparencies feature text illustrations with oversized labels, facilitating their use in large lecture rooms. The transparencies are free to adopters.

Acknowledgments

I am indebted to the entire book staff at Wm. C. Brown Publishers, but would particularly like to thank Bea Sussman, Jess Schaal, Michelle M. Campbell, and Carol Mills, for their contributions. Their skill and perseverance are evident throughout this book. I am in awe at the talents of the many artists who were able to take my chicken scratchings and convert them into respectable, even beautiful, figures. *Perspectives in Human Biology* could not have been written without the aid of dedicated reviewers, who provided expert suggestions and needed encouragement. These reviewers are:

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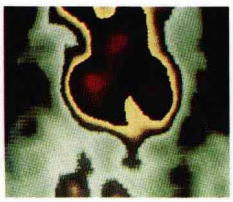
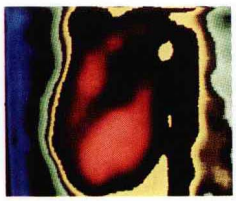


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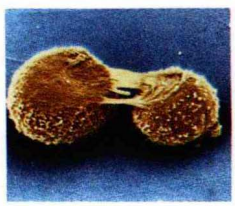
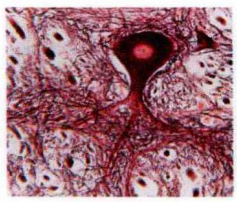
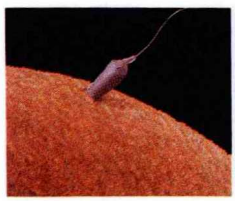
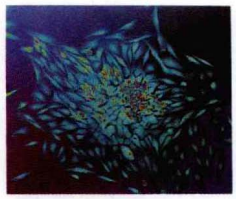
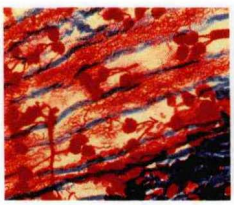


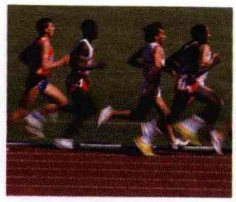






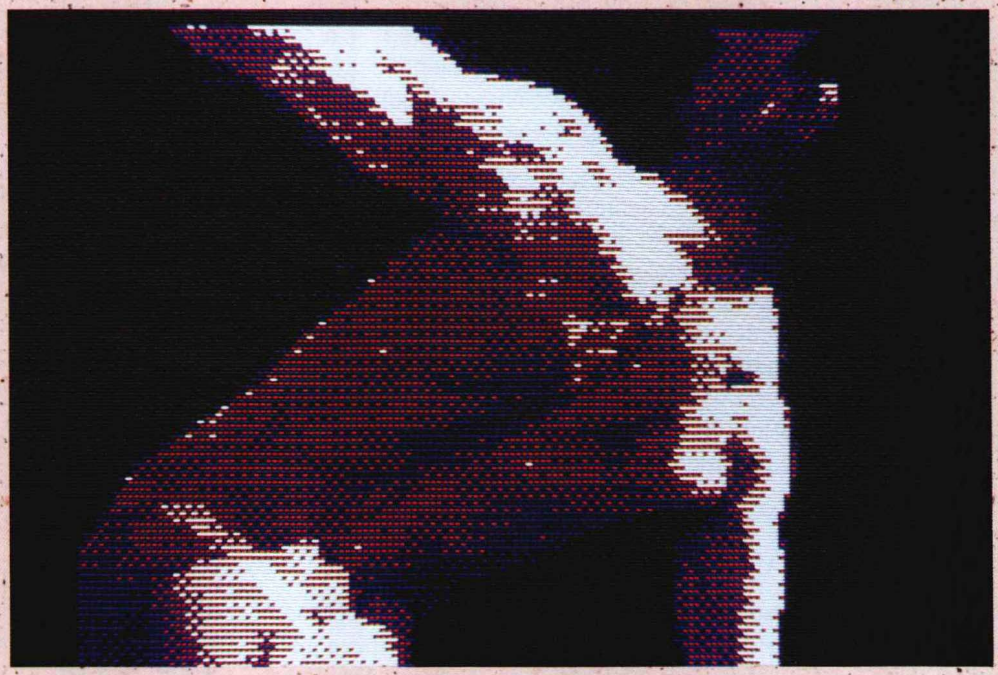




Perspectives on

Human Biology

1

Introduction to Human Biology



Outline

Objectives

By studying this chapter, you should be able to

1. list the specialties of general biology that pertain to the study of human biology
2. explain the characteristics of the scientific method
3. list the five kingdoms, and the characteristics of chordates, mammals, and primates
4. define the term *species*, and explain why all living humans are considered to be members of the same species
5. list the different genera and species included in the hominid family
6. describe the anatomical characteristics of humans

Keys to Pronunciation

Hominidae: *ho-min'i-de*
pharyngeal: *fah-rin'je-al*
pharynx: *far'inks*
phylum: *fi'lum*
physiology: *fiz''e-ol'o-je*

Photo: The human body. Modern medical imaging techniques allow us to see ourselves in new ways.