Human Genetics

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Cover photo

Human chromosomes stained with Acridine orange (.01%). After treating slides at 85°C in a phosphate buffer, the reverse banding pattern is observed and photographed in color. Magnification: 100× 10.25× 10

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Preface

Human Genetics is based on a course I have taught at the State University of New York at Stony Brook since 1968. It is intended primarily for use in a one-term course in human genetics, human heredity, or heredity and society. This text, like my course, emphasizes the underlying biology of the human condition. By relating genetic principles to the human condition, this text will prepare students to consider some controversial issues involving the science of genetics in contemporary society.

Coverage of genetic principles includes a balanced treatment of cells and chromosomes, classical genetics, analysis of complex traits, developmental genetics, molecular genetics, and population genetics. In each of these six topic sections, I have made an effort to include applications to the individual and society. When identifying societal and ethical problems, I have emphasized options to which students can apply their new knowledge of genetics. In a society of diverse peoples, there is no way to avoid controversies, and I have deliberately used several as a way of introducing biological principles. Among the controversies covered are questions of embryo transfer, recombinant DNA technology, and environmental mutagens. When discussing current subjects such as IQ testing, eugenics, genetic counseling, genetic engineering, fertility, and cancer, I have also attempted to place these issues in their historical perspective.

No prior science course work is necessary for this text and thus it can be used by a variety of nonscience majors. I have included a number of pedagogical aids to complement the topic discussions and to help the student study the material. Included are an abundance of photographs and illustrations, many clinical in nature; end-of-chapter aids, including questions for review and discussion and a list of key words; a glossary; and a bibliography of related books and readings in human genetics.

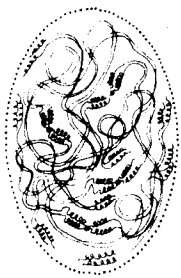
I acknowledge with deep appreciation the many helpful suggestions and criticisms offered by those who have reviewed the manuscript for this book. They include: Harvey A. Bender, University of Notre Dame; Claire M. Berg, University of Connecticut; Peter S. Dawson, Oregon State University; Wendell H. McKenzie, North Carolina State University; Muriel N. Nesbitt, University of California, San Diego; Robert M. Petters, Pennsylvania State University; Frank J. Ratty, San Diego State University; and Joan K. Stadler, Iowa State University.

I thank the Dight Institute of Genetics at the University of Minnesota where I began the first draft of the book. I especially appreciate the stimulation provided by Robert Desnick, Gregory Grabowski, Robert Gorlin, Richard King, Carl Witkop, Sheldon Reed, and Elving Anderson.

I am grateful to Bentley Glass and Frank Erk who recruited me to Stony Brook and to Vera King Farris who shared many discussions on the design of the course from which this book was developed. I sincerely appreciate the superb editorial advice of Harvey Pantzis, and the detailed criticisms and encouragement of Cedric Davern. Many of the original sketches for the illustrations for this text were prepared by Christina, Claudia, and Erica Carlson; the balance of the sketches and all the illustrations were attractively rendered by Carmela Ciampa. Cathy Cantin was immensely helpful and talented in producing the book and I thank Janice Wheeler, Eve Mendelsohn, and Kate Bramer for the care and skill they put in the design and photo research for this book.

Most of all I have benefited from the continued interest and criticisms offered by Stony Brook students about the content, emphasis, and issues dealt with in this text. I hope that students who read this text will develop an enriched view of the life sciences and appreciate the central role of heredity in relating all of life, past and present.

Elof Axel Carlson



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