PREFACE

THE PRESENT GENERATION has witnessed an explosive increase in biological knowledge, especially in the fields of molecular and cell biology. New techniques of study, such as the use of the electron microscope and of radioactive tracers, have made discoveries possible which have surpassed even the most optimistic expectations of a few years ago. At the same time the ever expanding curriculum of the colleges and universities has brought about a contraction in the amount of time allowed for biology courses in the general curriculum. Courses of one quarter, one semester, or abbreviated year courses have become more and more common.

This book has been written to satisfy the need for a text covering the great principles of biology in the light of modern discoveries, yet with sufficient descriptive biology to make these principles meaningful. The material to be included has been carefully selected so that the size of the book is such that it can serve for shortened courses, although it can easily be adapted to longer courses by supplemental library assignments.

Introductory chapters at the beginning of the book orient the student in the field of biology. These are followed by chapters on the molecular basis of life presented in conjunction with the theoretical origin of life on the earth. This topic leads logically into the cellular, then the organismic, and finally the ecological organization of living matter, with the principle of homeostasis as a unifying theme throughout. Considerable emphasis is placed on radiation biology and genetics in each of these topics. Chapters on the plant and animal kingdoms are included in the introductory section. These chapters can be omitted without interrupting the continuity of the study by teachers who would prefer that their students not take the time to study them in detail. Nevertheless, this section of the book can serve as a valuable reference when the students run across the names of unfamiliar organisms or taxonomic groups in other sections of their study.

The extensive use of photographs and diagrams as illustrations serves both to stimulate student interest and to aid in the understanding of the subject matter. Most of these illustrations have been made by the author; those which are the work of others are acknowledged in the captions. A laboratory manual to accompany this text is available from the William C. Brown Company, Publishers, of Dubuque, Iowa.

The author is deeply grateful to all of those who have assisted in the prepara-

tion of this book. In particular, the author wishes to acknowledge the invaluable assistance given by the critic readers who carefully read and made detailed suggestions for revision of the original manuscript. These are Dr. Gerald Nisbet, of Ball State College, Muncie, Indiana, and Dr. Herbert Treuting, of Trenton State College, Trenton, New Jersey. Some others who have been very helpful in specific sections of the book are Dr. Daniel Arnon, of the University of California, for his suggestions on the process of photosynthesis; Dr. William Shull, of the University of Michigan, for suggestions and illustrations on human genetics; Dr. C. M. Pomerat of the Pasadena Foundation for Medical Research, for valuable suggestions and photographs on cell biology. In addition, my colleagues at Colorado State College have always been helpful in answering questions and making suggestions on topics in their specialties. These include Dr. John Gapter, Dr. Arthur Moinat, Dr. Gerald Schmidt, Dr. Maynard Stamper, Dr. Robert Sund, and Dr. Bert Thomas. The author would appreciate criticisms, comments, and suggestions for improvement of the book by those who use it as a text.

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