

Preface

This seventh edition of *Biology Laboratory Manual* has been completely revised to reflect the newer trends in biology, but at the same time every effort has been made to preserve the features that have made it so popular with both students and instructors through the many years that it has been in print. These features include such things as:

1. Directions are thorough and specific so that students can carry out the exercises with a minimum of help
2. A listing of needed materials for each exercise to avoid lost time while a search is made for items that may not have been anticipated.
3. Preparation directions for solutions and other needed materials are given at the end of each chapter to avoid searching for formulas and other preparation information.
4. The exercises call for materials and apparatuses that are readily available locally or can be obtained from biological supply companies at a reasonable cost.
5. A liberal use of photographs and drawings, nearly all of which have been made by the author for this manual, aid the understanding of directions.
6. Spaces are provided at the end of each exercise to record the results obtained and conclusions that can be drawn therefrom. Questions are also asked that involve deductive reasoning from the results.

New chapters have been added on topics such as behavior, enzymes, population genetics, etymology, taxonomy, and solving a biological problem. Also, a glossary is introduced so students will have a quick reference to words they may not know. Each chapter is a complete unit and can be studied in any order to accommodate the sequence of lectures or the availability of specimens locally. For instance, the final chapter on solving a biological

problem is given at the end of the manual, but should be introduced whenever the instructor feels that the students have a sufficient background to undertake a project. Likewise, the chapter on etymology should be introduced early in the course so students will have a better understanding of the way compound words are formed and can more easily recall those that are used. Since no materials are required, it can be used on those days when materials fail to arrive or other plans for the laboratory go awry.

More introductory remarks are given at the beginning of each exercise to give the student a better understanding of why the exercise is being done and what should be gained from it. As an additional aid, a list of objectives are given at the beginning of each chapter. The manual can be used with most modern textbooks of biology. Specific listings are given showing which chapters of the manual are correlated with chapters of some of the most widely used textbooks. Some teachers may prefer to use the manual as a basic source of information and, instead of a textbook, make assignments in journals and books that are available in the library.

The author is indebted to many biology teachers that have given critical reading to the original manuscript and made constructive suggestions for improvement. The following are due particular gratitude:

Dr. Neal Buffaloe
University of Central Arkansas

Professor Charles Detwiler
Houghton College

Professor Bernard Bostick
Beckley College

Dr. John Gapter
University of Northern Colorado

A. M. Winchester