# Preface

This eighth edition of *Microbiological Applications* differs from the previous edition in that it has acquired four new exercises and dropped three experiments. It retains essentially the same format throughout, however. In response to requests for more emphasis on laboratory safety, three new features have been incorporated into the text. In addition, several experiments have been altered to improve simplicity and reliability.

The three exercises that were dropped pertain to flagellar staining, bacterial conjugation, and nitrification in soil. All of these exercises were either difficult to perform, unreliable, or of minimal pedagogical value.

To provide greater safety awareness in the laboratory, the following three features were added: (1) an introductory laboratory protocol, (2) many cautionary boxes dispersed throughout the text, and (3) a new exercise pertaining to aseptic technique.

The three-page laboratory protocol, which follows this preface, replaces the former introduction. It provides terminology, safety measures, an introduction to aseptic technique, and other rules that apply to laboratory safety.

To alert students to potential hazards in performing certain experiments, caution boxes have been incorporated wherever they are needed. Although most of these cautionary statements existed in previous editions, they were not emphasized as much as they are in this edition.

Exercise 8 (Aseptic Technique) has been structured to provide further emphasis on culture tube handling. In previous editions it was assumed that students would learn these important skills as experiments were performed. With the risk of being redundant, six pages have been devoted to the proper handling of culture tubes when making inoculation transfers.

Although most experiments remain unchanged, there are a few that have been considerably altered. Exercise 27 (Isolation of Anaerobic Phototrophic Bacteria), in particular, is completely new. By using the Winogradsky column for isolating and identifying the phototrophic sulfur bacteria, it has been possible to greatly enrich the scope of this experiment. Another exercise that has been altered somewhat is Exercise 48, which pertains to oxidation and fermentation tests that are used for identifying unknown bacteria.

The section that has undergone the greatest reorganization is Part 10 (Microbiology of Soil). In the previous edition it consisted of five exercises. In this edition it has been expanded to seven exercises. A more complete presentation of the nitrogen cycle is offered in Exercise 58, and two new exercises (Exercises 61 and 62) are included that pertain to the isolation of denitrifiers.

In addition to the above changes there has been considerable upgrading of graphics throughout the book. Approximately thirty-five illustrations have been replaced. Several critical color photographs pertaining to molds and physiological tests were also replaced to bring about more faithful color representation.

I am greatly indebted to my editors, Jean Fornango and Jim Smith, who made the necessary contacts for critical reviews. As a result of their efforts the following individuals have provided me with excellent suggestions for improvement of this manual: Barbara Collins at California Lutheran University, Thousand Oaks, CA; Alfred Brown of Auburn University, Auburn, AL; Lester A. Scharlin at El Camino College, Torrance, CA; and Hershell Hanks at Collin County Community College, Plano, TX.