



PREFACE

Many beginning students find some aspects of genetics much more difficult to grasp than others. Not very surprisingly, this is especially true of the problem solving and calculations involved in Mendelian genetics, pedigree analysis, linkage and mapping, quantitative analysis, and population genetics. We have found that many texts provide little if any feedback to students in these areas of possible weakness. Even if the correct answer is readily available, a student who arrives at the wrong answer may not necessarily know whether the incorrect answer resulted from a minor mathematical error or a more fundamental misunderstanding of the material. This primer of genetic analysis is designed to address some of these difficulties.

In order to help you build confidence in your grasp of the subject and in your ability to apply that knowledge to novel problems, we start with an array of problems that test simple, basic ideas. More challenging problems then follow naturally. In addition, we have supplied questions with detailed explanations of how to work them. You can then work at your own pace through the logical analysis of different types of problems. With this practice and some guidance on how to avoid common pitfalls, you will gain experience and confidence in your ability to solve problems in the major areas of genetics.

Each chapter begins with Study Hints in which we suggest ways of organizing your studies of a topic or take you step-by-step through a problem-solving approach. Practice Tests are provided at the end of the book. Some areas, such as linkage and mapping, are given especially extensive coverage, since they are particularly well suited to practicing data analysis and interpretation. It is important to remember, however, that these hints are not comprehensive. They are intended to complement the material in a general textbook. The hints and problems should also be useful in reviewing for examinations like the Medical Candidacy Aptitude Test (MCAT) or Graduate Record Examination (GRE). Important Terms lists appear at the end of each Study Hints section as a convenient guide for review. Definitions of these and other basic terms are given in the Glossary at the end of the book.

In preparing this and the first edition, we have benefited from the helpful suggestions made by students in our courses. In addition, Fred B. Schnee, William E. Spivey, and Robert R. Tucker made many constructive recommendations during the writing of the first edition. Eric M. Weaver helped us see the material again from the eyes of a dedicated student while we prepared this second edition, and the suggestions by Stanton B. Gray and K. April Sholl are also greatly appreciated. Their suggestions have led to the addition of several "overview" chapters, additional problems, and a significant expansion in the area of molecular biology. We also thank Coral McCallister for her talented help with many of the figures.

We hope that you find this excursion into genetic analysis an enjoyable and profitable one. Good luck!