PREFACE

This new edition has been revised from the ground up. That is largely due to the addition of two new authors to the team. Julio de Paula has stepped aside, but his contribution to earlier editions will still be evident. In his place are George Ratcliffe and Mark Wormald, both highly experienced biochemists with years of teaching the subject. One of us (PWA) has certainly learned a great deal about how biochemists regard physical chemistry and its role in elucidating the complex systems characteristic of life. We hope the appropriate and resulting mixture of precision and pragmatism will be apparent throughout the text.

The text has been thoroughly revised throughout. We have adopted the Focus/Topic structure that has proved popular in our family of texts. The short, selectable Topics provide great flexibility (and are less daunting to the student than a lengthy chapter), and each Focus collects them into a series of intellectually homogeneous groups. The Topics have been written without presupposing a sequence (although some possible sequences would be curious, to say the least), so are readily adaptable to an instructor's choice. Each Focus is preceded by a preamble which emphasizes the conceptual development that the Topics represent. Each Topic begins with a series of questions that students typically ask: why should I learn this material, what is the core idea, and what should I know already? Each Topic ends with a summary of the key concepts and the key equations.

Mathematics is widely regarded as a problem wherever physical chemistry is taught. We tackle the problem at several levels, drawing on our experience with our other texts. First, we encourage the reader to use mathematics. That is accomplished by bringing the reader to a point where progress can be made only by deploying mathematics. The *How is that done?* sections then open the door to progress. (They also neatly package a derivation for later easy reference.) Then, at a more fine-grained level, the equations in the text have annotations to help to explain how to travel across the next equal sign. Underlying and supporting this approach are *The chemist's toolkits*, which are succinct summaries of the mathematics or physics needed at the point of use.

There are numerous *Case studies*. These typically take the material introduced and developed in a Topic and show how it is applied in biochemistry. The tables of data throughout the text are augmented by additional support material in the *Resource section*, which includes an *Atlas of structures*, a ready-reference compilation of molecular structures of the substances referred to in the text.

There are worked *Examples* throughout the text, which encourage readers to collect their thoughts before embarking on a solution, and fuss-free *Brief illustrations*, which are there simply to show how to use an equation or concept that has just been introduced. We have devised many new end-of-Topic *Exercises*, which are divided into thought-provoking discussion questions, straight-forward instructional exercises, and more elaborate projects.

It is appropriate that a biochemistry text undergo a root-and-branch revision, with changes at all levels of its structure, scope, and presentation. That revision could not have been done without the contribution of many colleagues, and we thank them in the following section.