

Acknowledgments

THIS PROJECT began when, more than a decade ago, I began to look into the history of Caltech's chemistry department. It has subsequently assumed the form of a seminar paper, a dissertation, several articles, and now a book. At every stage I have benefited from the sound advice, warm encouragement, and unfailing tact of my former teachers, especially Owen Hannaway and Robert Kargon.

Others have also made this a better book and me a better historian. Robert E. Kohler helped sustain my interest in this project both through his writings and his timely comments on drafts of several chapters. I do not share all of his views on the history of disciplines, but I have found no one whose work is as consistently stimulating. Gerald L. Geison, Michael S. Mahoney, Thomas S. Kuhn, and Charles C. Gillispie gave me friendship and generous support during the years I was privileged to work in Princeton's Program in the History of Science. They taught me more about writing, scholarship, and the history of science than they can possibly know. Jeffrey Sturchio and Walter Kauzmann, readers for Princeton University Press, gave generously of their time and thought and saved me from several errors and omissions.

Readers of the first chapter will recognize my debts to Robert Scott Root-Bernstein. While I ostensibly directed his doctoral dissertation on the Ionists, in truth he was my teacher. Larry Owens, through his unique gift for cultural history, has led me to see new dimensions in my subjects and their institutions. He proved equally resourceful in tracking down obscure books during the year he served as my research assistant. I also wish to thank JoAnn Morse, Geoff Sutton, Ted Porter, Peter and Pauline Dear, and John Carson, former students who did not share my interest in physical chemistry but whose lively intelligence, good conversation, and exciting work have consistently sparked my imagination.

The late R. E. Gibson generously shared his knowledge of the Geophysical Laboratory of the Carnegie Institution of Washington and vetted sections of this book that deal with the history of petrology. I am also indebted to David Cahan and Wolfgang Girmus for reading and commenting on an earlier draft of the first chapter. The late Robert S. Mulliken shared with me drafts of his autobiography, *The Life of a Scientist*, and gave me the pleasure of several hours of telephone conversation about his rich work and experience. Paul H. Emmet, Don M. Yost, Duncan MacRae, Ernest H. Swift, and Oliver R. Wulf graciously responded to queries about the early years of their careers as physical chemists. Farooq Hussein, Leon Gortler, Jeffrey Sturchio, P. Thomas

Carroll, Ron Doel, and John Heilbron have shared with me the results of their archival research and transcripts of interviews. Judy Goodstein and Deborah Cozort helped me navigate through the Caltech and MIT archives. Faye Angelozzi and Rhea Cabin have been superb secretaries and good friends. Laura Kang Ward, the manuscript's copyeditor, watched not only my commas and semicolons but also my German syntax and algebra. I was fortunate to have her help.

In addition to these personal debts, I owe thanks to several institutions. Sigma Xi generously afforded me travel funds that made my first trip to the Caltech archives possible. The Smithsonian Institution and my hosts at the National Museum of American History, especially Jon Eklund, gave me ideal conditions in which to write the dissertation upon which this book is based. The American Council of Learned Societies, the National Science Foundation, and the Princeton History Department provided grants that helped underwrite a year of uninterrupted research and writing. More recently, the Trustees of Amherst College awarded me a fellowship that made it possible to complete this book.

Portions of this book are taken, with adaptations, from articles that appeared in *Isis*, *Historical Studies in the Physical Sciences*, and the *Journal of Chemical Education*. They appear here by permission. Chapter 5 contains material that appeared, in different form, in *Chemistry and Modern Society: Essays in Honor of Aaron J. Ihde*, ed. John Parascandola and James C. Whorton (Washington, D.C.: American Chemical Society, 1983), and is reprinted with permission from the American Chemical Society, copyright 1983 American Chemical Society.

I am grateful, above all, to the members of my family, especially my wife, Virginia, who has listened patiently to several versions of this book.