particular interest are the subchapters describing the effects of the size-dependent residence time distribution and the dynamics and control of continuous crystallizers. A short paragraph deals with the plug-flow crystallizer and, again, there is a paragraph on agglomeration. Chapter 9 describes the effect of growth-rate dispersion and methods of analyzing that phenomenon. Chapter 10, on mixing, is very important as, in many cases, mixing has an enormous effect on crystallization. This chapter also includes remarks on fluid-bed crystallizers and series of agitated vessels.

Chapter 11 deals with crystallizer design and operation. It is relatively brief and, besides some general remarks, contains just a few design illustrations using published examples from the literature. The concluding Chapter 12 briefly describes other crystallization techniques, such as adductive and extractive crystallization, the use of hydrotropic additives, and freeze and emulsion crystallization. A few comments are also made on encrustations and modification of crystal habit.

The book contains a number of experimental results and numerous solved examples. In addition, it provides a good literature survey, though in many cases providing only references without detailed descriptions of the respective methods. This is understandable, however, as a more detailed treatment would have enormously expanded the book's size. The book can be recommended as an extremely useful tool for process engineers, technologists and researchers in the field, and to advanced-level students of chemical engineering.

JAROSLAV NÝVLT

Institute of Inorganic Chemistry
Academy of Sciences of the Czech Republic
Pelléova 24
16000 Prague 6
Czech Republic

Acta Cryst. (1997). **A53**, 528

Atomic and ion collisions in solids and at surfaces. Edited by ROGER SMITH. Pp. ix + 309. Cambridge: Cambridge University Press, 1997. Price £45.00 (US $69.95). ISBN 0-521-44022-X.

This book provides a comprehensive survey of various theoretical/computational models available for simulating energetic collisions of atoms with surfaces. Although the book does not address traditional crystallographic methods, it provides the framework for understanding how experimental techniques such as ion scattering spectroscopy (ISS) are sensitive to surface structure. The nine chapters are well organized, and smooth transitions between the various topics demonstrate the editor's skillful coordination of contributions from seven co-authors. While citing many experimental studies along the way, the book focuses on treating the dynamics of atom/surface collisions through non-experimental methods. The text begins with a review of classical scattering theory and the origins of binary collision theory. Throughout, the authors show with clarity and rigor how various standard equations are derived from first principles. It is not assumed that the reader has an advanced degree in physics or mathematics. The authors survey four basic approaches to modeling dynamics: binary collision theory, transport theory, Monte Carlo techniques, and molecular dynamics simulations. Because an accurate atom/surface potential is required in all computational treatments, a chapter is devoted to the most common semi-empirical methods used for calculating these potentials.

A major theme to the book is understanding the inelastic processes involved when an energetic ion penetrates a lattice. The authors review many models which describe both the excitation of electrons in the solid and the recoil of substrate nuclei brought about by a swift atomic projectile. Discussion focuses on predicting the final rest distribution of the projectiles within the lattice, the corresponding atom displacements induced in the substrate, and sputtering phenomena. Along the way, the authors evaluate many of the popular algorithms and computational packages used in the field, such as *TRIM*, *TRIDYN*, *PRAL*, *KORAL*, *VEGAS*, *MARLOWE* and *SUSPRE*. The authors demonstrate how numerical simulations of ISS, secondary ion mass spectrometry (SIMS), depth profiling, radiation damage, and ion implantation can lead to a greater understanding of the fundamental dynamics. A chapter is also devoted to simulations of the surface topographical changes induced by ion bombardment and deposition. The Editor succeeds in providing a valuable resource for researchers in academia and industry, in fields of surface science, semiconductor engineering, thin-film deposition, and particle-surface interactions, who desire a deeper understanding of the non-experimental ways to study energetic atom/surface collisions. Although the book does not include problems for students, it would make an excellent supporting text for a special topics graduate course. Those interested in structural information will find a description of forward simulations whereby computations accurately reproduce ISS data; however, the inverse problem, *i.e.* extracting a unique surface structure directly from ISS data, has yet to be solved.

DENNIS JACOBS

Department of Chemistry and Biochemistry
University of Notre Dame
Notre Dame
IN 46556
USA

Acta Cryst. (1997). **A53**, 528–530

Collected works of Dorothy Crowfoot Hodgkin. Vol. I. **Insulin.** Vol. II. **Cholesterol, penicillin and other antibiotics.** Vol. III. **General crystallography and essays.** Edited by G. G. DODSON, J. P. GLUSKER, S. RAMASESHAN and K. VENKATESAN. Pp. cxliii + 2230. Bangalore: Indian Academy of Sciences, 1996. Price US $120 (Individual vols. US $40). ISBN 81-7296-020-4.

Dorothy Crowfoot Hodgkin was arguably one of the greatest scientists of this century, and certainly one of the most influential figures in the development of crystallography. What motivates such people, and what is it that causes them to inspire