

Contents

FOREWORD	ix
<i>Frederick Seitz</i>	

PREFACE AND ACKNOWLEDGMENTS	xiii
<i>Theodore H. Geballe and David White</i>	

Part 1 HISTORICAL PERSPECTIVES

ADVANCES IN MATERIALS RESEARCH AND DEVELOPMENT	3
<i>William O. Baker</i>	

MATERIALS RESEARCH LABORATORIES: THE EARLY YEARS	25
<i>Robert L. Sproull</i>	

MATERIALS RESEARCH LABORATORIES: REVIEWING THE FIRST TWENTY-FIVE YEARS	35
<i>Lyle H. Schwartz</i>	

Part 2
**THE STATUS OF SELECTED SCIENTIFIC
AND TECHNICAL AREAS**

PROGRESS AND PROSPECTS IN METALLURGICAL RESEARCH	51
<i>Morris Cohen</i>	
MICROSTRUCTURE AND MECHANICAL PROPERTIES OF METALS	111
<i>John P. Hirth</i>	
CONDENSED-MATTER PHYSICS AND MATERIALS RESEARCH	131
<i>Bertrand I. Halperin</i>	
QUASI-PERIODIC CRYSTALS: A REVOLUTION IN CRYSTALLOGRAPHY	151
<i>John W. Cahn and Denis Gratias</i>	
NEW AND ARTIFICIALLY STRUCTURED ELECTRONIC AND MAGNETIC MATERIALS	161
<i>Francis J. Di Salvo</i>	
MATERIALS RESEARCH IN CATALYSIS	177
<i>John H. Sinfelt</i>	
THE ROLE OF CHEMISTRY IN MATERIALS SCIENCE	203
<i>George M. Whitesides, Mark S. Wrighton, and George Parshall</i>	
ADVANCED CERAMICS	225
<i>Albert R. C. Westwood and Stephen R. Winzer</i>	
ORGANIC POLYMERS	245
<i>John D. Hoffman and Robert L. Miller</i>	
NEW WAYS OF LOOKING AT SURFACES	283
<i>E. Ward Plummer, Torgny Gustafsson, Donald R. Hamann, Ingolf Lindau, Douglas L. Mills, Calvin F. Quate, and Y. Ronald Shen</i>	

MATERIALS SYNTHESIS AND PROCESSING	307
<i>William F. Brinkman</i>	

Part 3

CURRENT TOPICS IN MATERIALS RESEARCH

ENSURING CONTRIBUTIONS TO MATERIALS SCIENCE FROM SMALL-, INTERMEDIATE-, AND LARGE-SCALE SCIENCE	321
<i>Herbert H. Johnson, William D. Nix, Mildred S. Dresselhaus, Albert M. Clogston, and Praveen Chaudhari</i>	
PERSPECTIVES ON FACILITIES AND INSTRUMENTATION FOR MATERIALS RESEARCH	335
<i>Dean E. Eastman, Martin Blume, C. Peter Flynn, and J. David Litster</i>	
MATERIALS RESEARCH AND THE CORPORATE SECTOR	347
<i>Arden L. Bement, Jr., Julius J. Harwood, John K. Hulm, Harold W. Paxton, and Alan G. Chynoweth</i>	
CONTRIBUTORS	369
INDEX	377