

CONTENTS

	PAGE
The National Role of Materials Research and Development—W. O. Baker.....	1
Symposium on Recent Progress in Materials Sciences	
Accomplishments and Limitations of Solid State Theory—Harvey Brooks.....	11
The Influence of Surfaces on the Properties of Materials—M. J. Sinnott.....	28
Mechanical Properties of Semiconductors—John N. Hobstetter.....	40
Status of Ductile Ceramic Research—Earl R. Parker.....	52
Symposium on Nature and Origin of Strength of Materials	
Dislocation Motions and the Yield Strength of Solids—John J. Gilman.....	69
Discussion.....	81
Resistance to Creep Deformation and Fracture in Metals and Alloys—F. Garofalo..	82
Discussion.....	98
Brittle Fracture Strength of Metals—E. T. Wessel.....	99
Discussion.....	116
Effects of Size and Shape on Fracture of Solids—G. R. Irwin.....	118
Discussion.....	128
Fatigue Strength of Crystalline Solids—G. M. Sinclair and C. E. Feltner.....	129
Discussion.....	141
<hr style="width: 10%; margin-left: 0;"/>	
Appendix: Editor's Notes on Crystal Physics Terminology.....	143