

# CONTENTS

[Twenty-seven plates]

	PAGE
<b>PREFACE</b>	[V]
<b>SIR KINGSLEY DUNHAM, FOR.SEC.R.S.</b> Progress in mineralogy (summary only)	1
MARINE MINERALOGY	
<b>S. E. CALVERT</b> Mineralogy of silica phases in deep-sea cherts and porcelanites	[5]
<b>Discussion:</b> R. G. BURNS, J. V. SMITH AND D. R. C. KEMPE	[18]
<b>A. J. EASTON, D. HAMILTON, D. R. C. KEMPE AND S. M. F. SHEPPARD</b> Low temperature metasomatic garnets in marine sediments	19
<b>Discussion:</b> S. O. AGRELL AND D. R. C. KEMPE	36
<b>H. ELDERFIELD</b> Authigenic silicate minerals and the magnesium budget in the oceans	[39]
<b>Discussion:</b> D. R. C. KEMPE	47
<b>R. G. BURNS AND VIRGINIA M. BURNS</b> The mineralogy and crystal chemistry of deep-sea manganese nodules, a poly-metallic resource of the twenty-first century	49
<b>Discussion:</b> A. J. EASTON	67
EXPERIMENTAL PETROLOGY	
<b>F. A. SEIFERT</b> Reconstruction of rock cooling paths from kinetic data on the Fe <sup>2+</sup> -Mg exchange reaction in anthophyllite	69
<b>Discussion:</b> A. D. LAW AND J. V. SMITH	77
<b>M. J. O'HARA AND D. J. HUMPHRIES</b> Problems of iron gain and loss during experimentation on natural rocks: the experimental crystallization of five lunar basalts at low pressures	79
<b>Discussion:</b> G. M. BROWN, F.R.S., D. K. BAILEY AND J. V. SMITH	95
<b>B. J. WOOD</b> The activities of components in clinopyroxene and garnet solid solutions and their application to rocks	97
<b>Discussion:</b> M. J. O'HARA	1-1061
<b>J. NOLAN</b> Determination of specific component activities in tholeiitic melts: principles and technique	109

## CONTENTS

### GEOCHEMISTRY

	<b>PAGE</b>
<b>C. D. CURTIS</b> Sedimentary geochemistry : environments and processes dominated by involvement of an aqueous phase	119 136
<i><b>Discussion:</b> R. G. BURNS AND J. V. SMITH</i>	
<b>I. S. E. CARMICHAEL, J. NICHOLLS, F. J. SPERA, B. J. WOOD AND S. A. NELSON</b> High-temperature properties of silicate liquids : applications to the equilibration and ascent of basic magma	139 195
<i><b>Discussion:</b> D. K. BAILEY, J. V. SMITH AND M. J. O'HARA</i>	
<b>J. V. SMITH</b> Mineralogy of the planets : a voyage in space and time (summary of the Centenary Hallimond Lecture)	199

### EXTRATERRESTRIAL MINERALOGY

<b>G. M. BROWN, F.R.S.</b> Two major igneous events in the evolution of the Moon	205 217
<i><b>Discussion:</b> M. J. O'HARA</i>	
<b>V. F. BUCHWALD</b> The mineralogy of iron meteorites	219
<b>J. R. ASHWORTH AND D.J. BARBER</b> Electron microscopy of some stony meteorites	259 272
<i><b>Discussion:</b> G. M. BROWN, F.R.S. AND J. V. SMITH</i>	

### MINERALOGICAL ASPECTS OF ORES

<b>E. F. STUMPF</b> Sediments, ores and metamorphism: new aspects	273
<b>P. R. SIMPSON AND J. F. W. BOWLES</b> Uranium mineralization of the Witwatersrand and Dominion Reef systems (With a preface by S. H. U. BOWIE, F.R.S.)	293
<b>T.J. SHEPHERD</b> Fluid inclusion study of the Witwatersrand gold-uranium ores	315
<b>C. C. RUNDLE AND N.J. SNELLING</b> The geochronology of uraniferous minerals in the Witwatersrand Triad; an interpretation of new and existing U/Pb age data on rocks and minerals from the Dominion Reef, Witwatersrand and Ventersdorp supergroups	333

## CONTENTS

ENVIRONMENTAL MINERALOGY		PAGE
J. C. <b>GILSON</b>		
Medicine and mineralogy		351
<b>Discussion:</b> NANCY TATE, J. ZUSSMAN AND R. G. BURNS		<b>358</b>
D. R. <b>BOWES</b> , A. M. <b>LANGER</b> AND A. N. <b>ROHL</b>		
Nature and range of mineral dusts in the environment		359
<b>Discussion:</b> J. ZUSSMAN		[376]
A.A. <b>HODGSON</b>		
Nature and paragenesis of asbestos minerals		377
<b>Discussion:</b> J. V. SMITH, E. J. W. WHITTAKER AND R. G. BURNS		<b>389</b>
F.D. <b>POOLEY</b>		
The use of an analytical electron microscope in the analysis of mineral dusts		391
<b>Discussion:</b> J.V. SMITH AND R. C. MACKENZIE		<b>404</b>