## **CONTENTS**

Preface to the Fourth Edition	v
Foreword	vii
Preface to the First Edition	ix
Part I-Topographical Surveying for Geological Work	
Introduction	3
Preparation for Survey Work	4
Chain Survey	. 4
Compass and Tape (or Chain) Survey	7
Distribution of Closing Error in a Compass Traverse	8
Compass Survey in the Presence of Rocks Containing Magnetic	
Minerals	9
Brunton Compass	11
Tunnel Survey with Brunton Compass	12
Some Hints on Traversing	15
Plane Table Survey	19
Theodolite and Miner's Dial Surveys	23
Verniers	24
Fixing of Stations and Traversing	26
Stadia or Tacheometer Survey	30
Levelling and Contouring	40
Triangulation Surveys	48
Determining True North	53
Plotting of Surveys	54
Survey Equipment with Reference to the Problem	<b>5</b> 9
Appendices	62
Bore Hole Survey Methods	68
Miscellaneous Calculations and Adjustments	75
Notes on Instruments and Accessories	79
Part II—Photogrammetry	
Introduction	89
Air Photography	90
Types of Air Photographs and Scales	93

xiv CONTENTS

Drilling

Uses of Air Surveys	94
Vertical Photos: Characteristics	94
Principles of Stereoscopic Perception	97
Parallax in Stereoscopy	99
Conditions for Stereoscopic Vision and Stereoscopic Equipment	99
Simple Methods of Making Planimetric Maps	108
Contouring	114
Map-making with Stereoscope Instruments	116
Part III—Photogeology	
Vertical Exaggeration	123
Distortion	125
Preliminary Steps and Features Identified on Photos	126
Uses of Air Photos	134
Part IV—Geochemical Prospecting	
Geochemical Prospecting for Metallic Mineral Deposits	1,45
Dispersion	145
Pathfinder Elements	147
Secondary Cycle	153
Geochemical Field Techniques	1,57
Geochemical Analytical Methods	161
Techniques Used in Geobotanical Survey	167
Geochemical Methods for Petroleum and Natural Gases Exploration	170
Part V-Geophysical Methods in Mineral Explorations	
Introduction	181
Electrical Methods	182
Electromagnetic Method	203
Induced Polarisation Methods	212
Gravity Methods.	216
Magnetic Methods	220
Seismic Methods	229
Radioactive Method	252
Electric Well Logging	255
Part VI—Drilling	

267

CONTENTS	xv
Percussion Drills	268
Rotary Drills	273
Miscellaneous Drilling Methods	286
Drill Sampling	289
Accuracy of Sole Hole Sampling	293
Bore Hole Problems	298
Bore Hole Logging	309
Preservation and Sampling of Cares	312
Part VII—Ancilliary Operation in Prospecting	
Ancilliary Operations in Prospecting	317
ANFO Explosives	320
Equipment and Material Required for Blasting	322
Method of Changing Explosives	325
Drainage (Annexure)	332
Part VIII—Mining Methods	
Mining Methods	337
Classification of Mining Methods	343
Altuvial Mining	344
Open Cast Mining or Quarrying	352
Underground Mining	360
Opencast Mining—(notes) Additional (Annexure)	
Part IX—Coal Mining Methods	
Coal Mining Methods	395
Longwall Advancing	402
Longwall Retreating	406
Horizon Mining	409
Miscellaneous	411
Strip Mining	412
Part X	
(A) Management Economics—(Book Keeping Excluded notes)	415
(B) Elementary Techniques in Planning/Programming	415
1. PERT and CPM	415
2. Use of the Computer	415
(A) Management Economics	417

xvi CONTENTS

(B) PERT and CPM Techniques	443	
The Computer—Its Use (Annexure)	451	
Part XI—Examination of Mineral Properties		
Sampling and Statistical Computations, Geostatistics	465	
Mine Economics	488	
(a) Economic Organisation of Industry	488	
(b) Sampling	490	
(c) Calculation of Reserves etc.	500	
(d) Procedure for the Estimation of Reserves	52?	
(e) Evaluation of Assets	530	
(f) Mineral Economics	532	
Part XII—Ore Dressing or Beneficiation	ı	
Crushing	542	
Grinding	551	
Sizing	561	
Classification	.568	
Air Sizing	576	
Electrical Precipitation of Dust	578	
Concentration	579	
(A) Washing and Scrubbing	579	
(B) Gigging	580	
(C) Tabling	582	
(D) Vanners	585	
(E) Miscellaneous	586	
(F) Flotation	390	
General Observations on Flotation	602	
(G) Magnetic Separation	606	
(H) Electrostatic Separation	609	
Miscellaneous Processes	612	
Flow Sheets: Chromite	624	
Gold	625	
Copper	626	
Lead-zinc	626	
Manganese	<b>627</b> .	
Barite	628	
Gypsum	629	
Steatite	630	
Clay	631	

CONTENTS	xvii
Coal	632
Tin	633
Part XIII—Indian Examples of (A) Geochemical (B) Geophysical Exploration (C) Mining and Ore Dressing Practice	
Geophysical Exploration	637
Geochemical Exploration	639
Iron Ore	641
Gold	645
Lead-zinc	651
Copper	655
Mica	659
Coal	660
Manganese	661
Lignite	664
Phosphate	660
Black Granite	667
Part XIV—Collection of Field Data and Writing of Reports	
Introduction	671
Observations	671
Economic Bias in Sampling	672
Mapping	673
Laboratory Work	674
Exploration Methods	674
Broad Frame Work and Guidelines for Report	,676
Economic Aspects	,680
Addendums	686
Annexure I	718
Index to the Addendums	725
Subject Index	727