

Precambrian Ore Deposits of the East European and Siberian Cratons

Edited by

D.V. Rundqvist

Russian Academy of Sciences,

Institute of Precambrian Geology, St. Petersburg, Russia

and

C. Gillen

*The University of Edinburgh, Centre for Continuing Education,
Edinburgh, United Kingdom*



1997

ELSEVIER

Amsterdam – Lausanne – New York – Oxford – Shannon – Singapore – Tokyo

Contents

<i>Foreword</i> (D.V. Rundqvist)	V
<i>Introduction</i> (D.V. Rundqvist)	1
Part I. Mineral deposits of the East European Craton	
Section 1. Eastern Baltic Shield	
<i>General geological features</i>	11
<i>Chapter 1. The Kola Terrain</i>	
<i>V.A. Gorelov & S.I. Turchenko</i>	15
1 Ore deposits and occurrences	16
1.1 Iron	16
1.2 Titanium, iron, phosphorus	20
1.3 Aluminium (kyanite schists)	27
1.4 Nickel, copper, cobalt	29
1.5 Lead, zinc	41
1.6 Molybdenum	43
1.7 Rare metals	46
1.8 Graphite	50
<i>Chapter 2. Karelia Terrain</i>	
<i>V.A. Gorelov, A.M. Larin & S.I. Turchenko</i>	51
1 Ore deposits and occurrences	53
1.1 Iron	53
1.2 Titanium	57
1.3 Nickel, copper, PGE	58
1.4 Molybdenum	67
1.5 Gold	70
1.6 Massive sulphide	71
1.7 Shungite	74
<i>Chapter 3. Belomorian Belt</i>	
<i>V.A. Gorelov</i>	77
1 Ore deposits and occurrences	77
1.1 Muscovite	77
1.2 Ceramic pegmatites	83

VIII

Chapter 4. Ladoga Belt

<i>V.A. Gorelov & A.M. Larin</i>	87
1 Ore deposits and occurrences	88
1.1 Tungsten	88
1.2 Tin	89
1.3 Ceramic pegmatites	100
1.4 Graphite	102
2 Conclusions	103

Section 2. Ukrainian Shield and Voronezh crystalline massif

Chapter 5. The Ukrainian Shield

<i>V.B. Dagelaysky</i>	107
1 Geological structure and metallogeny	107
2 Ore deposits and occurrences	115
2.1 Iron	115
2.2 Chromium	123
2.3 Titanium and phosphorus	123
2.4 Nickel, copper, cobalt	127
2.5 Molybdenum	130
2.6 Rare metals and rare earths	132
2.7 Graphite	141
2.8 Topaz and morion in pegmatites	145
2.9 Abrasive garnet	149
2.10 Talc and magnesite	150
2.11 Pyrophyllite	151
3 Conclusions	152

Chapter 6. The Voronezh crystalline massif

<i>V.B. Dagelaysky</i>	155
1 Geological structure and metallogeny	155
2 Ore-bearing tectonic structures	160
3 Ore deposits and occurrences	160
3.1 Iron	160
3.2 Nickel, copper, cobalt	165
4 Conclusions	170

Chapter 7. Platform cover of the East European Craton

<i>A.K. Zapolnov</i>	173
1 General features of tectonic evolution and ore content	173

Part II. Mineral deposits of the Siberian Craton

Section 1. Anabar Shield

Chapter 8. Major features of geological structure and metallogeny

<i>S.I. Turchenko</i>	185
-----------------------------	-----

Section 2. Aldan Shield

Chapter 9. Aldan Terrain

<i>D.A. Mikhailov</i>	195
-----------------------------	-----

1.1 Iron	198
1.2 Phlogopite	202
1.3 Apatite	206
1.4 Rock crystal in quartz veins	209

Chapter 10. Olyokma Terrain

<i>A.M. Larin & D.A. Mikhailov</i>	211
--	-----

1 Ore deposits and occurrences	212
1.1 Iron	212
1.2 Copper	215
1.3 Rare metals	222
1.4 Apatite	224

Chapter 11. Batomga Terrain

<i>A.M. Larin</i>	227
-------------------------	-----

Chapter 12. Dzhugdzhur–Stanovoy Terrain

<i>V.A. Gorelov</i>	231
---------------------------	-----

1 Ore deposits and occurrences	232
1.1 Iron	232
1.2 Nickel, copper, cobalt	232
1.3 Molybdenum	235
1.4 Gold	236
1.5 Phosphorus, iron, titanium	238
2 Conclusions (D.A. Mikhailov)	242

Section 3. Basement inliers around craton margins and fold belts

Chapter 13. Pre-Sayan inlier

<i>V.Ya. Khiltova & G.P. Pleskach</i>	249
---	-----

1 General geological features(V.Ya. Khiltova)	249
2 Ore deposits and occurrences (V.Ya. Khiltova & G.P. Pleskach)	250
2.1 Iron	250
2.2 Titanium	255

2.3	Aluminium (sillimanite schists)	257
2.4	Rare metals	258
2.5	Talc and magnesite	260
2.6	Muscovite	265
2.7	Apatite	265
2.8	Fluorite	269
 <i>Chapter 14. Angara-Kan inlier</i>		
	<i>V.Ya. Khiltova & G.P. Pleskach</i>	271
1	Ore deposits and occurrences	271
1.1	Titanium	271
1.2	Gold	273
1.3	Muscovite	274
 <i>Chapter 15. Khamar-Daban and Pre-Olkhon inliers, SW Pre-Baikal</i>		
	<i>D.A. Mikhailov & V.Ya. Khiltova</i>	279
1	Pre-Olkhon inlier	279
1.1	Manganese	280
2	Western Khamar-Daban	281
2.1	Phlogopite	282
2.2	Lazurite	284
 <i>Chapter 16. Yenisey fold belt</i>		
	<i>V.Ya. Khiltova & G.P. Pleskach</i>	289
1	Ore deposits and occurrences	289
1.1	Iron	291
1.2	Manganese	294
1.3	Lead, zinc	298
1.4	Gold	302
1.5	Talc and magnesite	310
1.6	Rare metals	313
2	Conclusions	314
 <i>Chapter 17. Baikal-Patom fold belt</i>		
	<i>A.M. Larin, Ye.Yu. Rytsk & Yu.M. Sokolov</i>	317
1	Geological structure and metallogeny	317
2	Ore deposits and occurrences	323
2.1	Iron	323
2.2	Nickel, copper, cobalt	326
2.3	Lead, zinc	329
2.4	Tin	336
2.5	Rare metals	337
2.6	Gold	341
2.7	Muscovite	349
2.8	Ceramic pegmatites	356

2.9	Chrysotile-asbestos	356
2.10	Ornamental stones	358
3	Conclusions	360

Section 4. Platform cover of the Siberian craton

<i>Chapter 18. Tectonic evolution and metallogeny</i>		
	<i>A.K. Zapolnov</i>	365

1	Mineral deposits and occurrences	370
1.1	Manganese	370
1.2	Lead, zinc	371

Part III. Patterns of mineral deposit evolution in Precambrian structures

<i>Chapter 19. Evolutionary patterns of mineral deposits in Precambrian terrains</i>		
	<i>A.M. Larin, S.I. Turchenko & D.V. Rundqvist</i>	383

1.1	Archaean metallogenic epochs	384
1.2	Proterozoic metallogenic epochs	391
1.3	Phanerozoic metallogenic epochs	402
2	Conclusions	402

<i>Chapter 20. A classification of Precambrian mineral deposit types</i>		
	<i>D.V. Rundqvist, V.A. Gorelov, S.I. Turchenko & A.M. Larin</i>	409

References	425
Index of mineral deposits and occurrences	445
Subject Index	451