

CONTENTS

INTRODUCTION 13

HISTORICAL CONTEXTS 15

The history of the Vitkovice Ironworks 15

The plans to establish an ironworks 15

The foundation of the Rudolf Ironworks and the works' development in the Lower Vitkovice area 15

The puddling plant at the Rudolf Ironworks and the first production 16

The first blast furnace 18

Production of rails 19

Changes in ownership 19

Transport and the new railway network 20

The first steel production in Bessemer converters 23

The introduction of Scottish-type furnaces and their new location 25

The establishment of the Vitkovice Mining and Iron Corporation 25

The arrival of Paul Kupelwieser and the modernization of production 27

The introduction of Siemens-Martin furnaces and the Thomas converter 27

The introduction of the Vitkovice duplex process 28

The purchase of the Schüller Ironworks and its conversion into a puddling plant 28

The lease and subsequent purchase of the Sophienhütte 31

The development of the company and the growing focus on armaments production 31

A new concept for the blast furnace – construction of modern furnaces 32

The establishment of the New Steelworks and rolling mill in Zábřeh, the First World War 34

Between the world wars – the construction of the cold rolling mill and the Fryštát Ironworks 36

The introduction of electric furnaces 36

Changes in ownership 37

The Second World War and the establishment of the Südbau 37

The post-war period 38

After 1948: the communist takeover 39

Reconstruction of the blast furnace plant, construction of high-volume blast furnaces 41

The introduction of secondary metallurgy 43

The atomic programme and the modernization of the electric arc furnaces 44

Production of steel in OXYVIT converters 44

Modernization of the rolling mills 44

Four-high thick plate rolling mill 3.5 45

The final phase of the blast furnace up to its closure: 1972–1998 46

The transformation of political and economic life after 1989 46

The end of production at the blast furnaces 47

Modernization and changes at the steelworks and rolling mills in the free market economy 48

The general, cultural and social history of Vítkovice	52
The population during the early boom years	52
The influence of the ironworks on local government	52
Vítkovice becomes a town	53
The creation of “Greater Ostrava” and the decline of Vítkovice as a municipality	53
Urban and architectural development in the context of the needs and interests of the Vítkovice Ironworks	54
The establishment of the ironworks – a stimulus for growth	57
The arrival of Paul Kupelwieser: the dawn of a new era	59
New Vítkovice – a modern satellite development	59
Phase 1: The beginnings of work on New Vítkovice	60
Phase 2: The concept becomes a reality	65
<i>Residential buildings</i>	67
<i>The waterworks and water supply</i>	67
<i>The Catholic church</i>	67
Phase 3: Company vs. town	68
<i>Health care, education, sport and leisure facilities</i>	68
<i>Later additions to New Vítkovice</i>	76
<i>The southern part of Vítkovice</i>	78
The First World War and the inter-war period: decades of gradual decline	82
<i>Churches, social amenities and sports facilities</i>	82
<i>Jirí of Poděbrady Square (Náměstí Jirího z Poděbrad)</i>	83
Vítkovice after the Second World War: A period of visible decline	83
New hopes	84
Heritage conservation and new uses for historic buildings	84
The first systematic research of industrial heritage	84
The role of museums	85
Student projects – an important phase in finding new uses for heritage sites	86
Systematic research by the National Heritage Institute	86
Heritage conservation of selected sites and machinery	89
Application for UNESCO status	90
Steps towards restoration	90
The conversion of the site for new use	92
Differing conceptions of heritage management and architecture	93
THE HISTORY OF IRON AND STEEL PRODUCTION	95
The technological flow of the iron production process	95
Coal mining	95
Extraction and processing of iron ore	95
Coke production	98
<i>Coke</i>	98
<i>Coking plants</i>	98
The coking process (carbonization)	99

<i>Coking ovens</i>	99
<i>The heap system</i>	100
<i>Schaumburg kilns (half-open ovens)</i>	100
<i>Beehive ovens</i>	100
Flame ovens, use of coking by-products	103
<i>Dulait type ovens</i>	103
<i>Francois-Gobiet-type ovens</i>	103
<i>Coppée-type ovens</i>	103
<i>Ringel ovens</i>	103
The use of by-products and heat regeneration	104
<i>Otto-Hoffmann ovens</i>	106
<i>Koppers ovens</i>	106
Chemical processing of coking by-products	106
<i>Coking gas</i>	106
<i>Separation of coal tar</i>	110
<i>Separation of ammonia (NH₃)</i>	110
<i>Separation of benzene</i>	110
Production of pig iron	110
<i>Pig iron</i>	110
<i>Blast furnace gas</i>	113
<i>Slag</i>	113
Pig iron production	113
<i>Basic types of iron</i>	115
Blast furnaces	115
<i>The furnace vessel</i>	115
<i>The charging system and the furnace top</i>	116
Blast furnaces at the Vitkovice Ironworks	116
<i>Belgian-type furnaces</i>	116
<i>Scottish-type furnaces</i>	118
<i>Scottish-type furnaces – the Lürmann system</i>	119
<i>More modern types – the Büttgenbach system</i>	119
<i>Soviet designs</i>	119
Blast stoves and bellows	122
<i>Bellows</i>	122
<i>Blast stoves</i>	122
Cleaning of blast furnace gas, pipeways	123
<i>Dust catchers</i>	125
<i>The LURGI gas cleaning system</i>	125
Refining of pig iron, steel production	125
Steelworks	125
The refining process	125
<i>Acidic and basic processes</i>	127

- The duplex process* 127
- Wrought iron and carbon steel production 127
 - Puddling furnaces* 128
 - Puddling* 128
 - Double puddling furnaces (patented Küper system)* 128
 - Double rotary puddling furnaces (patented Pietzka system)* 128
- Converters 128
 - Converters* 128
 - Bessemer converters* 131
 - Thomas converters* 131
 - OXYVIT oxygen converters* 131
- Regenerative reverberatory furnaces 135
 - The open hearth process* 135
 - Siemens-Martin furnaces* 135
 - Wellman furnaces* 137
 - Talbot furnaces* 137
 - Tandem furnaces* 139
 - Crucible furnaces* 139
- Electric furnaces 139
 - Electric arc furnaces* 141
- Secondary metallurgy 141
 - Scandinavian lance (SL)* 141
 - Ladle furnace (LF)* 143
 - The ISSM system (Integrated System for Secondary Metallurgy)* 143
- Casting 143
 - Steel casting (casting ladles, coquilles, ingots)* 143
 - Continuous casting* 143
- Forming 144
 - Rolling 144
 - Longitudinal rolling 147
 - Two-high rolling mills (one-way, reversible)* 147
 - Three-high rolling mills* 147
 - Four-high rolling mills* 147
 - Cluster rolling mills* 148
 - Universal rolling mills* 148
 - Diagonal rolling, tube rolling 148
 - Mannesmann-type "pilger" mill* 148
 - Stiefel automated rolling mill* 150
- Forging 153
- Forging machines 153
 - Hammers* 153
 - Presses* 153

CATALOGUE OF ENTREPRENEURS AND COMPANIES 163

- Archdiocese of Olomouc (Olmütz) 163
- First Austro-Hungarian Blast Furnace Company 163
- Geymüller, Johann Heinrich 164
- Gutmann, Wilhelm / David / Max 164
- Klement Gottwald Vítkovice Ironworks (Vítkovické železářny
Klementa Gottwalda / VŽKG), VÍTKOVICE Group 166
- Kupelwieser, Paul 167
- Reichswerke AG für Erzbergbau und Eisenhütten "Hermann Göring"
(AG Reichswerke "Hermann Göring") 168
- Rothschild, Salomon Mayer / Anselm Salomon / Albert Salomon / Louis 169
- Rudolf, Archbishop Rudolf von Habsburg, Archbishop of Olomouc (Olmütz) 171
- Rudolf Ironworks (Rudolfshütte) 172
- Vítkovice Holding 172
- Vítkovice Ironworks 173
- Vítkovice Mining and Iron Corporation 173

CATALOGUE OF CULTURAL MONUMENTS
AND SITES OF HERITAGE INTEREST 175

- Cadastral district Hrabůvka 175
- Jubilee colony (Jubilejní kolonie), Edisonova, Heritesova, Jubilejní, Letecká, Slezská, Velfikova
and Závodní St. 175
- Cadastral district Moravská Ostrava 177
- Power plant of the Karolina coking plant 177
- Sophienhütte (Žofinská huť), Power Station no. III 179
- Cadastral district Vítkovice 181
- Bridge works and boiler works, plant 6, 1. máje St. 181
- Cast Steel Works / plant 3 / VÍTKOVICE HEAVY MACHINERY, a. s. 182
- Old Steelworks / Steelworks II, Ruská and Halasova St. 182*
- Forge, known as the "steam division", armour plating mill 184*
- Heavy machinery works 184*
- Gas-holder, Halasova st. 185*
- Chateau (Zentralhaus), Directors' villa, Výstavní St. 186
- Church of St Paul, Mírové náměstí 188
- Health care facilities and social amenities 189
- Company hospital 189*
- Company orphanage, Sirotčí St. 191*
- Municipal poorhouse / nursing home, Lidická St. 191*
- Leisure and sports facilities 192
- Company bathhouse, Ruská St. 192*
- Gymnasium, 1. máje St. 192*
- Municipal bathhouse, corner of Lidická and Zengrova St. 192*
- Outdoor swimming pool, Ruská St. 195*
- Sports stadium, Závodní St. 195*

Lower Vítkovice area, technological flow – coal mining, coke production, iron production / plant 1 – blast furnaces 195

Rudolf Ironworks 197

Hlubina Colliery (Důl Hlubina) / Laušman Colliery (Důl Laušman), (cadastral district Moravská Ostrava) 197

Coal sorting plant, batch preparation plant 198

Coking plant 198

Blast furnaces 200

Power Station no. II 205

Power Station / Bellows Centre no. VI / Small World of Technology 205

Gas-holder / "Gong" multifunctional hall 207

MAN gas-holder (cadastral district Moravská Ostrava), 1. máje St. 207

Power plant / plant 8 / ČEZ 207

Rectory, Věžní St. 209

Residential buildings – "New Vítkovice" 210

Bunkhouses, Kotkova, Nerudova, Jeremenkova St. 210

Cairo colony, Kotěrova and Šalounova St. 210

Clerks' double villa, Ruská and Vystavní St. 210

The English colony and Westend, Mírové náměstí 213

Gable colony, Lidická, Nerudova and Tržní St. 213

I-blocks, Ruská St. no. 44 213

The Joseph colony, Erbenova, Floriánova, Kovářská, Meziuliční, Obránců míru, Ocelářská, Okružní, Ryskova, Sirotčí and Tavičská St. 215

Orphanage colony, Sirotčí St. 215

Steelworks colony, Ocelářská St. 215

U-blocks, Mírová, Jeremenkova and Věžní St. 216

Schools 216

Apprentices' hostel, 1. máje St. 216

Company girls' school / 1st German Girls' General School, corner of Ruská and Jeremenkova St. 216

Creche / nursery school, Prokopa Velikého St. 216

Czech Girls' College / College for Female Professions / Secondary Health Care School, Jeremenkova and 1. máje St. 219

Franz Joseph Czech General School, Zengrova and Ocelářská St. 219

German Girls' General and Municipal School, nursery school and household school, Halasova St. 219

German Municipal School / Secondary Health Care School, between Mírová and Jeremenkova St. 221

2nd German Boys' General School and 2nd German Girls' General School / 1st Czech Boys' General School and 1st Czech Girls' General School / primary school, corner of Ocelářská and Šalounova St. 221

Shops and dining facilities 221

Company canteen, Kotkova St. 221

Company hotel, Mírové náměstí, Ruská St. 221

Market, Mírová, Sirotčí, Jeremenkova and Halasova St. 223

Steam crane, 1. máje St.	224
Town hall, Mírové náměstí	224
Tube rolling mill, plant 4, Tube rolling mill of the Třinec Ironworks (Třinecké železářny, a. s.), Výstavní St.	224
<i>The Large Mannesmann mill</i>	226
<i>The Small Mannesmann mill</i>	228
Cadastral district Zábřeh nad Odrou	238
New Steelworks and Rolling Mill / plant 2 / VÍTKOVICE STEEL, a. s., Pohraniční St.	238
New Steelworks / Steelworks I	238
Rolling mill	238
REGISTER OF COKING PLANTS	243
REGISTER OF BLAST FURNACES	246
REGISTER OF STEEL FURNACES AND PUDDLING FURNACES	251
REGISTER OF ROLLING TRAINS	256
LITERATURE AND SOURCES	265