THE HISTORY OF CARTOGRAPHY

VOLUME FOUR

Volume Four
Editorial Advisors

The History of Cartography

J. B. Harley and David Woodward, Founding Editors
Matthew H. Edney, Project Director

1
Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean

2.1
Cartography in the Traditional Islamic and South Asian Societies

2.2
Cartography in the Traditional East and Southeast Asian Societies

2.3
Cartography in the Traditional African, American, Arctic, Australian, and Pacific Societies

3
Cartography in the European Renaissance

4
Cartography in the European Enlightenment

5
Cartography in the Nineteenth Century

6
Cartography in the Twentieth Century

THE HISTORY OF CARTOGRAPHY

VOLUME FOUR

Cartography in the European Enlightenment

Edited by
MATTHEW H. EDNEY
and
MARY SPONBERG PEDLEY

Associate Editors
ROBERT W. KARROW
DENNIS REINHARTZ
SARAH TYACKE

THE UNIVERSITY OF CHICAGO PRESS • CHICAGO AND LONDON

The University of Chicago Press, Chicago 60637
The University of Chicago Press, Ltd., London

Published 2019
Printed in Canada

28 27 26 25 24 23 22 21 20 19 1 2 3 4 5

SET
ISBN-13: 978-0-226-18475-3 (cloth)
ISBN-13: 978-0-226-33922-1 (e-book)

PART 1
ISBN-13: 978-0-226-18476-0

PART 2
ISBN-13: 978-0-226-18477-7

This material is based on editorial work supported in part by the National Science Foundation under Grant Nos. 0322129, 0322200, 0749522, 0749687, 1354100, 8812674, 9320895, 9975699, and 9975705. *The History of Cartography* has also been made possible by major grants from the National Endowment for the Humanities. For a complete list of financial supporters, see pages v–vii of part 1.

DOI: https://doi.org/10.7208/chicago/9780226339221.001.0001

Library of Congress Cataloging-in-Publication Data

Names: Edney, Matthew H., editor. | Pedley, Mary Sponberg, editor. | Karrow, Robert W., editor. | Reinhartz, Dennis, editor. | Tyacke, Sarah, editor.

Title: Cartography in the European Enlightenment / edited by Matthew H. Edney and Mary Sponberg Pedley ; associate editors: Robert W. Karrow, Dennis Reinhartz, Sarah Tyacke.

Other titles: History of cartography ; v. 4.

Description: Chicago : University of Chicago Press, 2020. | Series: History of cartography ; volume 4 | Includes bibliographical references and index.

Identifiers: LCCN 2019049553 | ISBN 9780226184753 (set) | ISBN 9780226184760 (cloth) | ISBN 9780226184777 (cloth) | ISBN 9780226339221 (ebook)

Subjects: LCSH: Cartography—Europe—18th century—History—Encyclopedias.

Classification: LCC GA236 .C39 2020 | DDC 526.094/09033—dc23

LC record available at https://lccn.loc.gov/2019049553

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the editors and authors and do not necessarily reflect or represent the views of the National Science Foundation, the National Endowment for the Humanities, or other sponsors.

♾ This paper meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).

Financial Support

Federal Agencies

Division of Preservation and Access of the National Endowment for the Humanities
Geography and Spatial Sciences Program and Science, Technology, and Society Program of the National Science Foundation

Foundations and Institutions

Caxambas Foundation
The Gladys Krieble Delmas Foundation
T. Lloyd Kelly Foundation
Jay I. Kislak Philanthropic Foundation, in honor of Matthew H. Edney
The Muriel and Norman B. Leventhal Family Foundation, Inc.*
Andrew W. Mellon Foundation
National Geographic Society
Jack Ringer Family Foundation
Salus Mundi Foundation
The Hermon Dunlap Smith Center for the History of Cartography, The Newberry Library
University of Wisconsin–Madison, College of Letters & Science
University of Wisconsin–Madison, Office of the Vice Chancellor for Research and Graduate Education, with funding from the Wisconsin Alumni Research Foundation

Organizations and Corporations

Richard B. Arkway, Inc., and Cohen & Taliaferro, LLC
Chicago Map Society
Martayan, Lan, Augustyn, Inc.
The New York Map Society
Philadelphia Print Shop
The Rocky Mountain Map Society
Snap-on Incorporated
Page Stockwell Old Maps & Prints
Western Association of Map Libraries

Matching gifts from

The Capital Group Companies Charitable Foundation
Cray Research Foundation
ExxonMobil Foundation
General Motors Foundation
Samuel H. Kress Foundation
Lehman Brothers
Norfolk Southern Foundation

Associates

Arthur and Janet Holzheimer*
John Taylor

Sponsors

Roger and Julie Baskes
Richard Brown
William B. Ginsberg
Arthur L. Kelly
Bernard Lisker
Barry L. MacLean
Glen McLaughlin
Mr. and Mrs. Kenneth Nebenzahl*
Mary Sponberg Pedley*
Estate of Walter W. Ristow
David Rumsey
Jeanne K. Snyder, in memory of John P. Snyder
William S. Swinford
Clark L. Taber
Rosalind Woodward*

Founders

W. Graham Arader III
Rand and Patricia Burnette*
Matthew H. Edney
Ralph and Tess Ehrenberg
Joseph H. and Monica G. Fitzgerald
Dr. and Mrs. Robert W. Graebner
Warren Heckrotte
Robert A. Highbarger
Robert A. Holland
Roger J. P. Kain
Andrew J. LeRoy
Duane F. Marble
Douglas W. Marshall
Barbara Backus McCorkle
Thomas McCulloch
Harold Moellering
Joel L. and Beverly S. Morrison
Samir and Suzy Murty
Erhan Oner
Harold L. Osher*
George Parker*
Brian D. Quintenz
William Sherman Reese
Steve Ritchie
Rudy L. Ruggles, Jr.
Thomas F. Sander
Joseph and Françoise Shein
Rodney W. Shirley
Tom and Lee Touchton
Sarah Tyacke*
Albert R. Vogeler
Edward Alex Wiegner
Alberta A. Wood, in memory of Clifford Harlow Wood*
William C. Wooldridge

Benefactors

Cyrus Ala'i
Peter M. Enggass
Mary H. Galneder, in memory of Richard "Dick" Stephenson and Arthur Robinson*
Gail L. Geiger*
Alice C. Hudson
Bert and Mary Lee Johnson*
P. J. Mode
Mark and Margaret Monmonier
Virginia S. Morbeck, in memory of Barbara Bartz Petchenik
Barbara Mundy
Constantine B. Scarvelis, in memory of Kiky Polites
Florence I. and John E. Townsend, in memory of Anthony "Tony" Dolphin
James V. Walker

Patrons

Joseph Aieta III
James R. Akerman
Julie A. Anderson
Stanley K. and Patricia L. Arnett II
Christopher and Barbara Baruth
Sanford H. Bederman, in memory of Louis De Vorsey
Karen Beidel and Greg Carbone, in memory of Susan MacKerer
Waltraud A. Brinkmann
Wesley and Linda Brown
Barbara E. Butler
James R. Carter
Mr. and Mrs. Kenneth A. Chambers*
Barbara M. Christy
Michael P. Conzen
James Cox
Christina Elizabeth Dando
Gerald A. Danzer
Christiaan Debrauw
Dick DePagter
Jordana Dym
Adele C. Edgerton
Constance A. Fairchild
Gail E. and James A. Flatness
John Fondersmith
Richard V. Francaviglia
Joel and Kristie Frieze
Gregory J. Gajda
John W. Galiardo
Bob Gordon
Linda Grable-Curtis
John M. Gubbins, F.R.G.S.
Bob Gurda
Stan and Nancy Morbeck Haack, in memory of Barbara Bartz Petchenik
Susanne A. Haffner
Joan H. and George E. Hall*
Steve Hanon
John H. and Corbin C. Harwood
Guntram Herb and Patricia LeBon-Herb*
Al Herman
Marianne Hinckle
Philip Hoehn
Tracy L. Honn and Mark R. Bernstein
Megan A. Kealy
Josef W. Konvitz
Jon M. Leverenz
G. Malcolm Lewis*
Jane C. Maher, in honor of Professor Louis J. Maher, Jr.
Paul C. Marengo and Joan P. Simmons
Jack and Carmen Miller
Victoria M. Morse and Bill North, in honor of the History of Cartography editorial team
Andre J. and Christine Navez
In memory of Oscar I. Norwich
Mark H. O'Donoghue
Judy M. Olson
Frank T. Padberg, Jr.
Theodore W. Palmer
Christine M. Petto
Jeremy Pool
Peter and Bernice Porrazzo
Thomas Ports
M. Reilly and B. K. Schnee
George and Mary Ritzlin*
Joseph E. Schwartzberg*
Marsha L. Selmer, in memory of Mary E. Fortney
Robert Shilkret
Robert B. Silberman
Albert H. Small
Bruce N. Spring
Julie Sweetkind-Singer
Richard J. A. Talbert
Waldo R. Tobler
Mel and Irene Tremper
Judith Tyner
Richard Umansky
Peter H. Van Demark
Herbert M. Vogler
Larry A. Vos
W. Ken Westray
Thomas B. and Amy Worth

Friends

Joseph A. Abel
Michele Aldrich
Randy Anders
Judith F. Bell
Jeffery A. Bernard
Aníbal A. Biglieri
Steve Bolssen and Margo Kleinfeld
Lindsay Frederick Braun
In memory of Marie Braun
Christian Brun and Jane Fristoe Brun
Charles A. Burroughs
Martin M. Cassidy
Karen Severud Cook
Lesley Cormack
Jeremy Crampton
Donald C. Dahmann
John W. Docktor
Geoffrey Dreher
Jane Drummond
Evelyn Edson, in memory of Dick Stephenson
David Fairbairn
Craig David Flory
James Gifford
Fred J. Goldsmith
Nicole Gotthelf, in honor of Jude Leimer
Pearce S. Grove
Adele J. Haft*
John K. Hall
Linda Halvorson, in memory of Robert and Jane Halvorson
John Hawkins
Erin Healy, in memory of Victor Healy
Paul Herrup
Nikolas H. Huffman
Fuad Issa
Andrew Kapochunas

Anne Knowles
Joel and Deborah Kovarsky
Larry B. Kramer
Valerie Krejcie
George Leonard and Susan Hanes
Wolfgang Lierz
Allen K. and Sara A. Lydick
T. K. McClintock
Darrel L. McDonald
Sherry Wilson McEwen, in memory of Dr. Alec McEwen
Marianne M. McKee
William A. McKinstry
Alberto Montilla
Frederik Muller
R. Michael Peterson
Kirsten A. Seaver
Douglas W. Sims
Dava Sobel*
David and Ingrid Stallé
David and Deirdre Stam, in memory of J. Brian Harley*
Trudy A. Suchan
G. Thomas Tanselle
Stephen C. Thomas
Linda Franklin Tobin
Brian A. Turk
William L. Unger*
Carol Urness
Calvin P. Welch
Cordell D. K. Yee and Ingrid Hsieh-Yee

Additional support from

William R. Adler*
William A. Bauer and Sally M. Rowe
Stephen A. Bromberg
David Buisseret
Vivian C. Carter
In memory of Jan Dixon
Geoffrey H. Dutton, in memory of William Warntz
Bruce Fetter, in memory of J. Brian Harley*
Gregory L. Fullerton
Barbara A. Jenkin*
John T. Juricek
James P. Lacy
Evelyn Lincoln*
Jennifer Martin and Mark Matthias
Carol Medlicott
Dennis L. Merritt*
Harry and Geraldine Montgomery
Susan Morris
Curt Musselman*
John C. Phillips
Penny L. Richards and Peter Turley*
James Henry Romer
Sinclair A. Sheers
Benjamin Spaier
Paul F. Starrs
Scott Steinke
Holly Stevens, in memory of Dr. Noel Stevens
David G. Utley

*A portion or all of this donation was given in memory of David Woodward (1942–2004).

Contents

Entries Listed by Conceptual Cluster endpapers
List of Tables xv
List of Abbreviations xvii

PART 1
Preface, *Matthew H. Edney* and *Mary Sponberg Pedley* xix
Introduction, *Matthew H. Edney* and *Mary Sponberg Pedley* xxiii

A

Académie de marine (Academy of Naval Affairs; France) 1
Academies of Science 3
Académie des sciences (Academy of Sciences; France) 3
Academies of Science in the German States 7
Academies of Science in Great Britain 12
Academies of Science in the Italian States 13
Academies of Science in Portugal 18
Akademiya nauk (Academy of Sciences; Russia) 20
Academies of Science in Spain 23
Adair, John 24
Administrative Cartography 25
Enlightenment 25
Denmark and Norway 31
France 33
New France 38
French West Indies 40
Great Britain 42
British America 47
Italian States 52
Netherlands 60
Ottoman Empire 64
Poland 69
Portugal 71
Portuguese America 73
Russia 75
Spain 78
Spanish America 82
Sweden-Finland 90
Switzerland 92
Allegorical and Satirical Maps 94
Anich, Peter 103
Antiquarianism and Cartography 104
Anville, Jean-Baptiste Bourguignon d' 111
Art and Design of Maps 117
Artaria Family 125
Astronomical Models 127
Atlantic Neptune, The 132
Atlas 133
Atlas in the Enlightenment 133
Geographical Atlas 138
Marine Atlas 140
Composite Atlas 142
School Atlas 144
Historical Atlas 146
Austrian Monarchy 148

B

Balkans 152
Beautemps-Beaupré, Charles-François 153
Bellin, Jacques-Nicolas 154
Bering Expeditions to Northeast Asia 156
Boscovich, Ruggiero Giuseppe 159
Bouguer, Pierre 161
Boundary Disputes and Cartography 162
Boundary Survey Plan 167
Boundary Surveying 174
Enlightenment 174
Austrian Monarchy 179
Denmark and Norway 181
France 182
New France 187
French West Indies 189
British America 191
Italian States 193
Ottoman Empire 199
Portugal 203
Portuguese America 206
Russia 210
Spain 212
Spanish America 213
Sweden-Finland 218
Switzerland 220

British America 222
Buache, Jean-Nicolas 226
Buache, Philippe 228
Bugge, Thomas 230
Büsching, Anton Friedrich 231

C

Cadastral Surveying 232
Calcografia Camerale (Copperplate Printing Administration; Rome) 235
California as an Island 237
Carte de France 239
Cartouche 244
Cassini Family 251
  Cassini (I), Jean-Dominique 251
  Cassini (II), Jacques 254
  Cassini (III) de Thury, César-François 255
  Cassini (IV), Jean-Dominique 257
Cassini, Giovanni Maria 258
Celestial Mapping 259
  Enlightenment 259
  Denmark and Norway 274
  France 276
  Great Britain 278
  Italian States 281
  Portugal 283
  Spain 285
  Sweden-Finland 286
Chabert, Joseph-Bernard, marquis de 287
Cities and Cartography 288
Colbert, Jean-Baptiste 293
Color and Cartography 294
Commission topographique of 1802 302
Compagnie des Indes (Company of the Indies; France) 303
Connoissance des temps 305
Constellations, Representation of 307
Consumption of Maps 309
Cook, James 314
Coronelli, Vincenzo 316
Cosmographical Map 319
Covens & Mortier (Netherlands) 320
Cruquius, Nicolaas Samuelsz. 322
Customs Administration Map 324

D

Dalrymple, Alexander 327
Danish West Indies 329
De Brahm, William Gerard 331
Decoration, Maps as 332
Defoe, Daniel 336
Delisle Family 338
Denmark and Norway 343
Dépôt de la Guerre (Depository of the War Office; France) 346
Dépôt des cartes et plans de la Marine (Depository of Maps and Plans of the Navy; France) 349

E

East India Company (Great Britain) 353
Eclipse Map, Solar 357
Economy, Cartography and the 360
Education and Cartography 367
Encyclopedias 379
Engineers and Topographical Surveys 383
English Pilot, The 393
Enlightenment, Cartography and the 396
Euler, Leonhard 400
Evans, Lewis 401

F

Ferraris Survey of the Austrian Netherlands 403
Flamsteed, John 406
Fleurieu, Charles-Pierre Claret de 408
France 410
Franquelin, Jean Baptiste Louis 414
French East Indies 416
French West Indies 419
Fricx, Eugène Henry 421

G

Games, Cartographic 425
Garden Plan 430
Geodesy and the Size and Shape of the Earth 433
Geodetic Surveying 439
  Enlightenment 439
  Austrian Monarchy 450
  Denmark and Norway 452
  France 454
  Great Britain 458
  Italian States 463
  Portugal 467
  Spain 468
  Sweden-Finland 471
  Switzerland 472
Geographical Mapping 474
  Enlightenment 474
  Denmark and Norway, with Topographical Surveying 489
  France 495
  New France and the French West Indies 501
  German States 505
  Great Britain 509
  British America 513
  Italian States 519
  Netherlands 525

Portugal 529
Portuguese Africa 532
Portuguese America 534
Portuguese East Indies, with Topographical Surveying 538
Russia 541
Spain 546
Spanish America 550
Sweden-Finland 554
Geography and Cartography 557
German States 562
Globe 566
Globes in the Enlightenment 566
Terrestrial Globe 570
Celestial Globe 571
Instructional Texts for the Use of Globes 572
Pocket Globe 573
Lunar Globe 575
Relief Globe 577
Cultural and Social Significance of Globes 578
Great Britain 582
Green, John 586
Greenwich Observatory (Great Britain) 588
Greenwich-Paris Triangulation 589
Guettard, Jean-Étienne 591
Gulf Stream 592

H

Halley, Edmond 596
Hase, Johann Matthias 598
Height Measurement 600
Altimetry 600
Leveling 602
Heights and Depths, Mapping of 604
Relief Depiction 604
Relief Map 610
Isobath 614
Bathymetric Map 615
Heights and Distances, Geometric Determination of 618
Hevelius, Johannes 621
Historical Map 622
History and Cartography 624
History of Cartography 631
Holland, Samuel (Johannes) 634
Homann Family 636
Household Artifacts, Maps on 640
Hudson's Bay Company (Great Britain) 644
Hydrographical Office, Admiralty (Great Britain) 648

I

Iconography, Ornamentation, and Cartography 651
Imaginary Geographies and Apocryphal Voyages 658
Indigenous Peoples and European Cartography 663
Instruments, Astronomical 672
Instruments for Angle Measuring 674
Back Staff 674
Plane Table 675
Marine Compass 677
Circumferentor 678
Precision Devices for Angle Measurement 679
Octant and Sextant 680
Theodolite, Graphomètre, and Similar Instruments 682
Repeating Circle (Repeating Theodolite) 686
Great Theodolite 687
Instruments for Distance Measuring 689
Chain 689
Perambulator 691
Level 692
Irish Plantation Surveys 693
Isoline 695
Italian States 697

J

Jefferys, Thomas 704
Josephinische Landesaufnahme (Josephine Survey; Austrian Monarchy) 705

K

Karlowitz, Treaty of (1699) 709
Kipriyanov, Vasiliy Onufriyevich 710
Kirilov, Ivan Kirilovich 713

L

La Caille, Nicolas-Louis de 716
La Condamine, Charles-Marie de 718
Lambert, Johann Heinrich 719
Landscape, Maps, and Aesthetics 720
Lapland and Peru, Expeditions to 727
League of Augsburg, War of the 731
Liesganig, Joseph 732
Lomonosov, Mikhail Vasil'yevich 734
Longitude and Latitude 735
López de Vargas Machuca, Tomás 750

M

Madrid, Treaty of (1750) 753
Map Collecting 756
Enlightenment 756
Austrian Monarchy 759
Denmark 762
France 763
Great Britain 766
Netherlands 768

Ottoman Empire 769
Portugal 772
Russia 774
Spain 775
Sweden-Finland 777
Switzerland 779
Map Trade 780
Enlightenment 780
Denmark 787
France 788
German States 798
Great Britain 812
British America 826
Italian States 828
Netherlands 834
Poland 842
Portugal 844
Russia 846
Spain 849
Sweden-Finland 851
Switzerland 854
Marine Chart 856
Marine Charting 866
Enlightenment 866
Denmark and Norway 877
France 881
German States 889
Great Britain 891
Netherlands 898
Ottoman Empire 902
Portugal 907
Russia 910
Spain 914
Sweden-Finland 917
Marinoni, Johann Jakob 919
Marsigli, Luigi Ferdinando 920
Mason-Dixon Line 922
Masse Family 924
Mayer, Tobias 925
Measures, Linear 926
Linear Measures in the Enlightenment 926
Itinerary and Geographical Measures 927
Marine Measures 928
Surveying Measures 929
Reform of Linear Measures 930
Medals, Maps on 931
Memoirs, Cartographic 933
Meridians, Local and Prime 936
Metaphor, Map as 942
Meter, Survey for the 945
Mikoviny, Samuel 946
Militär-Ingenieurakademie (Academy for Military Engineers; Austrian Monarchy) 948
Military and Topographical Surveys 949
Military Cartography 954
Enlightenment 954
Austrian Monarchy, with Topographical Surveying 966
Denmark and Norway 973
France 975
German States 980
Great Britain 984
Netherlands, with Topographical Surveying 990
Ottoman Empire 993
Portugal 999
Spain 1002
Sweden-Finland 1004
Switzerland 1009
Military Map 1013
Battle Map 1013
Fortification Plan 1014
Plan-relief 1015
Modes of Cartographic Practice 1017
Müller, Johann Christoph 1019

PART 2

N

Nagayev, Aleksey Ivanovich 1021
Nationalism and Cartography 1022
Naudin Family 1027
Navigation and Cartography 1029
Neptune du Cattegat et de la mer Baltique 1037
Neptune françois and *Hydrographie françoise* 1039
Neptune oriental, Le 1043
Netherlands, Republic of the United 1046
Netherlands, Southern 1049
New France 1055
Niebuhr, Carsten 1060
Nolli, Giovanni Battista 1061
North, Magnetic and True 1064
Northwest Passage 1064

O

Officina Topografica (Topographical Mapping Office; Naples) 1069
Ogilby, John 1071
Ottoman Empire, Geographical Mapping and the Visualization of Space in the 1073

P

Pacific Voyages 1083
Packe, Christopher 1090
Pallas, Peter Simon 1092
Pardies, Ignace-Gaston 1093
Paris Observatory (France) 1093

Picard, Jean 1095
Pilot Book 1097
Poland 1100
Poland-Lithuania, Partitions of 1102
Ponts et Chaussées, Engineers and École des (School of Bridges and Roads; France) 1105
Portugal 1109
Portuguese Africa 1110
Portuguese America 1112
Portuguese East Indies 1114
Privilege and Copyright 1115
Projections 1119
  Geographical Maps 1119
  Marine Charts 1126
  Topographical Survey Plans 1128
Property Map 1129
  Cadastral Map 1129
  Estate Plan 1133
Property Mapping 1138
  Enlightenment 1138
  Austrian Monarchy 1149
  Denmark and Norway 1152
  France 1156
  New France and the French West Indies 1161
  German States 1166
  Great Britain 1171
  British America 1175
  Italian States 1181
  Netherlands 1185
  Ottoman Empire 1190
  Poland 1192
  Portugal 1194
  Portuguese America 1196
  Russia 1200
  Spain 1203
  Spanish America 1208
  Sweden-Finland 1214
  Switzerland 1216
Public Sphere, Cartography and the 1219

R

Reilly, Franz Johann Joseph von 1227
Religion and Cartography 1227
Rennell, James 1236
Reproduction of Maps 1238
  Manuscript Reproduction 1238
  Engraving and Printing 1248
  Color Printing 1260
  Typographic Printing 1263
Revolution, American 1265
Revolution, French 1270
Rizzi Zannoni, Giovanni Antonio 1275
Robert de Vaugondy Family 1277
Roy, William 1279
Russia 1281

S

Samplers, Map 1285
Sanson Family 1286
Sarychev, Gavriil Andreyevich 1289
Science and Cartography 1291
Scotland, Military Survey of (Great Britain) 1297
Sea of the West 1299
Seutter, Probst, and Lotter Families 1301
Sibbald, Robert 1304
Signs, Cartographic 1304
Society of Jesus (Rome) 1311
Sørensen, Jens 1319
Sounding of Depths and Marine Triangulation 1320
Southern Continent 1325
Soymonov, Fëdor Ivanovich 1327
Spain 1328
Spanish America 1330
Statistics and Cartography 1334
Sveriges Lantmäteriet (Swedish Land Survey) 1340
Sweden-Finland 1342
Switzerland 1343

T

Tatishchev, Vasiliy Nikitich 1347
Taxation and Cartography 1348
Thematic Map 1354
  Climate Map 1354
  Geological Map 1355
Thematic Mapping 1359
  Enlightenment 1359
  Austrian Monarchy 1365
  France 1369
  German States 1373
  Great Britain 1377
  Italian States 1382
  Netherlands 1387
  Poland 1390
  Russia 1392
  Spain 1395
  Sweden-Finland 1397
  Switzerland 1401
Tofiño de San Miguel y Vandewalle, Vicente 1402
Topographical Mapping and the State 1404
Topographical Survey Map 1410
Topographical Surveying 1417
  Enlightenment 1417
  France 1428
  New France 1435
  French West Indies 1437
  German States, with Geodetic Surveying 1439

Great Britain 1447
British America 1451
Italian States 1455
Ottoman Empire 1464
Poland 1469
Portugal 1472
Portuguese Africa, with Urban Mapping 1475
Portuguese America 1478
Spain 1482
Spanish America 1488
Sweden-Finland 1490
Switzerland 1493
Trade and Plantations, Board of (Great Britain) 1495
Transportation and Cartography 1497
Transportation Map 1497
Canal Map 1497
Canal Survey 1500
Post-Route Map 1502
Road Map 1504
Route Map 1504
Travel and Cartography 1507
Traverse 1517
Surveying Traverse 1517
Itinerary Traverse 1519
Marine Traverse 1521
Triangulation Surveying 1522

U

Ulloa, Antonio de, and Jorge Juan 1525
United States of America 1527
Urban Map 1529
Urban Map in the Enlightenment 1529
Urban Plan 1530
Urban View 1537
Urban Mapping 1540
Enlightenment 1540
Austrian Monarchy 1547
Denmark and Norway 1551
France 1553
New France 1559
French West Indies 1562
German States 1566
Great Britain 1569
British America 1572
Italian States 1575
Netherlands 1579
Ottoman Empire 1586
Poland 1591
Portugal 1595
Portuguese America 1599
Portuguese East Indies 1600
Russia 1602
Spain 1604
Spanish America 1608
Sweden-Finland 1613
Switzerland 1616
Urban Planning and Cartography 1618
Utrecht, Treaty of (1713) 1624

V

Verenigde Oost-Indische Compagnie (VOC; United East India Company; Netherlands) 1627
Videnskabernes Selskabs kort (Academy of Sciences and Letters map series; Denmark) 1632
Vischer, Georg Matthäus 1633

W

Wall Map 1636
West-Indische Compagnie (WIC; West India Company; Netherlands) 1638
Wiebeking, Carl Friedrich von 1639
Women and Cartography 1641
World Map 1644

Z

Zach, Franz Xaver von 1647
Zürner, Adam Friedrich 1648

Editors and Contributors 1653
Entries Listed by Conceptual Cluster 1665
Index, *Do Mi Stauber* 1673

Tables

1 Summary of major differences between the two main categories of mapping undertaken in the European Enlightenment xxxi
2 James Horsburgh's observations of Jupiter's satellites to determine the longitude of the Bombay esplanade from Greenwich, 1803 739
3 Costs of engraving, *Geographischer Entwvrf der Hochfürstlich Brandenbvrg-, Cvlm- und Onolzbachischen rings*, 1764 806
4 The cartographic modes pursued in modern Europe as applied in this volume 1018
5 Modern European cartographic endeavors, or institutional groupings, within which multiple cartographic modes are pursued, as applied in this volume 1018
6 Development over time of large multisheet urban wall maps in the Netherlands 1582

Abbreviations

HC 1 *The History of Cartography*, vol. 1, *Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean*, ed. J. B. Harley and David Woodward (Chicago: University of Chicago Press, 1987)

HC 2.1 *The History of Cartography*, vol. 2, bk. 1, *Cartography in the Traditional Islamic and South Asian Societies*, ed. J. B. Harley and David Woodward (Chicago: University of Chicago Press, 1992)

HC 2.2 *The History of Cartography*, vol. 2, bk. 2, *Cartography in the Traditional East and Southeast Asian Societies*, ed. J. B. Harley and David Woodward (Chicago: University of Chicago Press, 1994)

HC 2.3 *The History of Cartography*, vol. 2, bk. 3, *Cartography in the Traditional African, American, Arctic, Australian, and Pacific Societies*, ed. David Woodward and G. Malcolm Lewis (Chicago: University of Chicago Press, 1998)

HC 3 *The History of Cartography*, vol. 3, *Cartography in the European Renaissance*, ed. David Woodward (Chicago: University of Chicago Press, 2007)

HC 6 *The History of Cartography*, vol. 6, *Cartography in the Twentieth Century*, ed. Mark Monmonier (Chicago: University of Chicago Press, 2015)

Geographical Mapping in the Italian States. Throughout the seventeenth and eighteenth centuries, geographical mapping of Italy remained largely restricted to printed images, generally included in large atlases such as Giovanni Antonio Magini's, published in Italy or by printers elsewhere in Europe (initially Flemish and Dutch and subsequently French). Magini's map of Italy (1609) was followed by his atlas of regional maps, *Italia*, published posthumously in 1620 (Sereno 2007, 843; Woodward 2007, 791–92); thereafter, Italian cartographers did not construct any more innovative depictions of the peninsula. Only in the early decades of the eighteenth century were astronomical observations and geodetic measurements made by French and Italian scientists used to update existing cartography. Surprisingly, this task did not fall to the most prolific Italian cartographer of the day, the Venetian Vincenzo Coronelli, nor to Giacomo Cantelli da Vignola (*L'Italia con le sue poste e strade principali,* 1695). Rather, French geographers used the scant documentary sources and newly available geodetic and astronomic data to construct images that achieved a level of accuracy immediately hailed as innovative. In 1720 Guillaume Delisle produced *L'Italie dressée sur les observations de M^rs^ : de l'Académie royale des sciences*. Then Jean-Baptiste Bourguignon d'Anville produced an even more influential work: *L'Italie publiée sous les auspices de Monseigneur le duc d'Orleans prémier prince du Sang* (1743), which established the model for the remaining century (see fig. 64). More precise in measurement and content with increasingly accurate depiction of borders and other topographical features, these French images of the peninsula and its regions enjoyed great commercial success. Even in Italy, enterprising printers and booksellers in Venice and Bassano, such as Paolo Santini and Francesco Santini, Antonio Zatta, and the Remondini family, published editions of these maps.

The slow development of small-scale cartography in Italy may be easily explained: prior to unification, the various individual states made no public investment in commissioning a comprehensive geographical image of the peninsula based on geodetic surveying and celestial observations. In fact, there were hardly any astronomical observatories that could be put to such use; the observatory in Pisa was founded in 1739, followed by establishments in Florence (1750 and 1775), Milan (1760–64), and Padua (ca. 1777). In each case it took years for the observatory to become fully operational. Thus cartographers compiling medium- to small-scale maps faced insurmountable difficulties. Practices in the seventeenth century had changed little from the sixteenth: "the cartographer was fortunate, of course, if he could get access to more refined and detailed information, to restricted government documents such as those that [at the end of the sixteenth or beginning of the seventeenth century] the dukes of Mantua probably made available to Italy's greatest cartographer, Giovanni Antonio Magini, when he was working on his atlas of Italy." Furthermore, such "state maps—intended for military or political/administrative use—were primarily geographical in nature and had been compiled from partial surveys carried out without the systematic application of criteria. This meant that any attempt to combine them to form a small-scale cartographic image of more extensive areas of territory ran the risk of falling into substantial approximations" (Mangani 2001, 364–65). In effect, the numerous cartographic depictions of the regions of Italy that appeared in the map collections printed in Italy and abroad during the course of the seventeenth and eighteenth centuries continued to rely on works produced in the sixteenth century or slightly later, explaining their mediocre achievement in topographical detail and metric accuracy.

To the middle of the eighteenth century, in all the small states of preunification Italy, "even the most expert and skilled cartographers [produced] an account of geographical reality in which there are clear, macroscopic geometrical distortions that are the result of the ad hoc methods adopted when taking on-site surveys of terrain; surveys of the countryside were based on direct or reported observations that, however careful or painstaking, totally failed to meet the necessary methodological criteria" (Arca 2004, 103). Only at the height of the Enlightenment would these criteria be applied with the necessary mathematical rigor.

Defects and distortions are clear even in those regional cartographic products considered the best of their day, such as the *Carta generale de stati di sva altezza reale*, commissioned in the early 1670s by Carlo Emanuele II of Savoy, which provided an exceptional account of Savoyard Piedmont for the seventeenth century. Constructed by the military engineer Giovanni Tommaso Borgonio, engraved by Giovanni Maria Belgrano, and published in Amsterdam in 1680 by the heirs of the printer Joan Blaeu, it is sometimes referred to as the "Carta di Madama Reale" because it was published at the behest of the duke's widow, Maria Giovanna Battista (Sereno 2007, 851–52) (see fig. 108). Significantly, the original manuscript is preserved in the classified portion of the state archive of Savoy (Turin, Archivio di Stato, Carte topografiche segrete, 18 A III rosso). Drawing on many large-scale official cartographic images available within the state administration, the map was also the fruit of actual on-site surveying carried out from 1675 onward using compass and *traguardo* (sighting vane), though not from the application of trigonometric measuring techniques. The scale (ca. 1:192,000) is large enough to allow substantial topographical detail, while

the mountains are rendered in perspective view with lateral shading.

While Borgonio's map was immediately adopted as an instrument of state administration, it also expressed the prestige of the ruling dynasty. It was reengraved as late as 1772 by Giacomo Stagnone and published, with some necessary updates, under the title *Carta corografica degli Stati di S. M. il Re di Sardegna data in luce dall'ingegnere Borgonio in 1683* [sic] *corretta ed accresciuta nell'anno 1772* (Sereno 2007, 852, fig 33.11). This revised version, recognized as the best available account of the chorography of Piedmont, functioned as an instrument of political administration throughout the revolutionary and Napoleonic periods until the first years of the Restoration; it played a role in the large *Carte générale du théatre de la guerre en Italie* prepared by Louis Albert Guislain Bacler d'Albe in two parts, 1798–1802 (Pelletier 2001, 89, 114; Massabò Ricci and Carassi 1987, 277n15).

Two other contemporary regional geographies also reflect Borgonio's work in certain ways, being based on the original (though partial) on-site surveying and using strikingly modern systems of representation. Produced by José Chafrion, a Catalan military engineer employed by the Milanese government, these maps were published in Milan as *Mappa geografica esattissima delle Provincie del Tortonese, Pauese, Allessandrino* (ca. 1680) and *Carta de la Rivera de Genova con sus verdaderos confines y caminos* (1685) (Quaini 2007, 859–65, fig. 34.7). Compared to contemporary cartographic depictions, the maps display a greater degree of accuracy and unusually modern techniques for rendering topographical features, such as the quasi-realistic depiction of the orography (Barozzi 1981; Quaini 2007, 863–64).

It could be argued that until the second half of the eighteenth century, Borgonio and Chafrion were the only mapmakers who gave a sufficiently detailed account of the areas they mapped (Piedmont and Liguria respectively), doing some justice to the complex array of numerous river basins and valleys of both regions. "Due to the stimulus to further knowledge exerted by the needs of war, the language of cartography was becoming not only more precise but also was adopting more complex symbolism: each inhabited center is classified according to size and military role; the navigability and fords of each watercourse are identified; woodlands as well as 'main roads' are indicated" (Quaini 1994b, unpaginated [4]).

The *Stati del serenissimo signor duca di Modena in Italia* (1746, ca. 1:200,000), prepared by Domenico Vandelli and engraved by Andrea Bolzoni, "both in terms of completeness of information and technical skill, [is] the best and most detailed account of the Este duchy . . . produced since Marco Antonio Pasi's manuscript map of 1571" (Federzoni 2006, 186). The *Corso del Po per la Lombardia* (1703), prepared by Agostino Cerruti, a sergeant major in the papal guard, has been described as "the first modern chorographical map of the Po valley identified as both a geographical and human entity, . . . [a river] navigable from Piedmont to the sea, it constitutes the axis of political and economic life" (Milanesi 1990, 102).

Southern Italy was described in the less innovative *Carte de' Regni di Napoli e di Sicilia* (1692), an atlas by Antonio Bulifon (republished by his grandson, Luigi, in 1734). The atlas included a general map, *Accuratissima e nuova delineazione del Regno di Napoli,* and various regional maps prepared and engraved by the Milan-born Francesco Cassiano de Silva (Valerio 1993, 67–71, 73n2). Agatino Daidone printed a map of Sicily in 1714–18 based on some partial on-site measurements and original data; Antonio Bova drew upon Daidone's map for his own, published in Palermo in 1745, which included clear improvements and an inset map of the city of Palermo. In Bova's work "there is a detailed and full depiction of the hydrographical networks [while] the account of the orography is rather imprecise, being rendered with groups of hills that do not reflect the real distribution of the mountains. . . . However, the characteristics of the coastline are well rendered, with the mouths of rivers, peninsulas, and islands off the coast, though with just a simple indication of archipelagoes. Great care and attention are paid to the depiction of inhabited centers" (Ioli Gigante 2001, 275–77, quote on 276).

The manuscript depiction of Sicily produced initially at a scale of 1:40,000 by the Austrian baron Samuel von Schmettau, military engineer, has attracted some close study (Dufour 1995, 1999). Schmettau was sent by Prince Eugene of Savoy as quartermaster general to Sicily when the Habsburgs replaced the House of Savoy as rulers of the island. There from 1719 to 1720 he led a group of six topographical engineers to survey the island at a scale of ca. 1:40,000, using triangulation techniques and astronomical observations to establish latitudes of particular places (Dufour 1995, 25–29). Upon returning to Vienna in 1721, Schmettau supervised Lieutenant Michel (Miguel) Angelo de Blasco in the reduction of the original survey drawings to a large manuscript map, ca. 1:80,000, titled "Nova et accurata Siciliæ. Regionum, Urbium, Castellorum, Pagorum, Montium, Sylvarum, Planitierum, Viarum, Situum . . . Descriptio universalis," in two copies. One copy was prepared on twenty-eight sheets for the emperor (Vienna, Österreichische Nationalbibliothek, a.B.141, reproduced in Dufour 1995) and the other on thirty sheets for the council of war (Vienna, Kriegsarchiv) (Valerio 1993, 316–18; 2014, 68–70; Valerio and Spagnolo 2014, 2:409–13,

no. 201). Clearly reflecting its military origins but also displaying economic interests, the map shows fortresses, coastal landing points and anchorages, the entire network of roads and inhabited settlements, and strategic woodlands (Ioli Gigante 1999, 20–22; Dufour 1995, 30–43; 1999, 83–85, pl. on 123–28, 131–36). Shortly after its preparation in 1722, the large manuscript map was reduced to ca. 1:312,000 and printed on two large sheets (fig. 305). It displayed the iconography of conquest with the inclusion of images of the fleet of the Austrian alliance, whose attacks seized the island from Spanish control. The plates were reprinted without the battle scenes around 1735; a later version, with additions, was printed on four sheets by Gian Giuseppe Orcel in about 1778 as *Descrizione geografica del Regno di Sicilia e sue isole adiacenti* (Valerio and Spagnolo 2014, 2:435–37, no. 219; 2:483–85, no. 250).

"The eighteenth century marked a clear turning point in the history of Italian cartography, with a move from pregeodetic to geodetic cartography. This shift resulted in a radical change not only in the operative procedures employed in drawing up a map, but also in the theoretical bases for the science of cartography itself." During the second half of the Enlightenment, "Italy would see the rapid establishment of cartographic procedures based upon application of geometrical frameworks for high-precision surveying. This marked the triumph of the procedure of triangulation, which henceforward would become the principal method for the geometricization of territory within Italy" (Arca 2004, 103).

Aside from Schmettau's survey in Sicily, the first examples of geodetic cartography are the printed map of the Papal States (*Nuova carta geografica dello Stato Ecclesiastico,* 1755) by the Jesuit Christopher Maire, based on the survey and observations by Maire and Ruggiero Giuseppe Boscovich (see fig. 90), and the body of cartographic depictions drawn up and printed by the Padua scientist Giovanni Antonio Rizzi Zannoni from ca. 1770 onward. Working on his own, Maire also prepared the detailed map of the Legazione di Urbino (1757), a treatment noteworthy for its accurate delineation of internal and external boundaries and its detailed depiction of the road network (Mangani and Mariano 1998, 194–95).

During his long career, Rizzi Zannoni produced many important medium- to small-scale geographical works. The five-sheet *Carta geografica della Sicilia prima o sia Regno di Napoli* (finished by Rizzi Zannoni in 1769, ca. 1:400,000) was a project resolutely promoted by Ferdinando Galiani, an influential figure in the Neapolitan Enlightenment. Compiling a wide range of published and manuscript material, Rizzi Zannoni drew the map in Paris. Engraving began in 1767 and final publication brought great success, due not only to its elegance, legibility, and convenient multisheet format, but also to its wealth of information and relative precision. Twenty-five years after d'Anville's *Italie*, "the cartography of southern Italy now took a decisive step forward. It would not have been possible to do better without undertaking direct measurements on the ground" (Valerio 1993, 78–98, quote on 97).

Rizzi Zannoni's second achievement comprised *La gran carta del Padovano* (see fig. 422) and its companion, the precise *Pianta della città di Padova* (see fig. 908), both prepared between 1778 and 1781. Though the large-scale *Gran carta* (ca. 1:20,000) remained unfinished (in 1780–81, only four of the envisaged twelve sheets were published in Padua, engraved by Antonio Buttafoco [Buttafogo] and Giovanni Valerio Pasquali), it nevertheless exemplifies "truly modern topographical surveying" and must be considered "the first example in Italy of a large-scale topographical operation based on trigonometric procedures" (Valerio 1993, 112–16, quote on 116).

In April 1781 Rizzi Zannoni moved to Naples in the service of the Bourbon monarch Ferdinand IV. There, with the help of a few assistants (including Antonio Moretti and Giovanni Ottone di Berger), he began the demanding project of mapping the entire kingdom at a scale of 1:114,545. The most impressive cartographic undertaking in eighteenth-century Italy, the *Atlante geografico del Regno di Napoli*, necessarily involved astronomical observations and trigonometric measurements. Between 1781 and 1786, Rizzi Zannoni set up an entire triangulation network, which may not have exemplified high-precision criteria but did provide the geometrical basis for the atlas, whose thirty-one plates were published in Naples from 1788 to 1812 (Arca 2004, 104; Cantile 2004, 106) (see fig. 270). Beginning with Calabria, the first plates were engraved primarily by the artist Giuseppe Guerra in 1787–89. However, because the work dragged on with necessary corrections to the original drawings, the publication was only completed in 1812. Nevertheless, the result was especially innovative in the representation of mountains, rendered with hatching and shading (Valerio 1993, 124–211). Thus, in the last two decades of the eighteenth century the Kingdom of Naples produced Italy's most innovative cartography thanks to Rizzi Zannoni (Manzi 1987, 534).

Although it was the first region in Italy equipped with geometrically based cadastral maps, Lombardy did not benefit from a similarly based geographical map until the end of the eighteenth century. Because the depiction of peripheral areas and especially borders in cadastral maps of Lombardy was so disproportioned, various projects advocating a new geometrical map based on triangulation were proposed to the Austrian


Nova et accurata
SICILIÆ
Regionum Urbium Castellorum Pagorum
Montium, Sylvarum Planitierum Viarum
Situum
ac singularium quorumque locorum et rerum ad Geographiam
Pertinentium
Descriptio Universalis
juxta regulas Astronomicas, et Topographicas diligentissimo labore
et inchoata
Anno 1719
dum CAROLI VI. Semper invicti
exercitus
Regnum Aug.mo Imperatori Iure quæsitum
armis Vindicaret
Perfecta Demum Annis 1720 et 1721
Miglia Italiane
Lieues de France
Canne Siciliane
Iussu Augustissimi Imperatoris
S. Bar. de Schmettau
INSULÆ
LIPARÆ olim ÆOLIÆ
MARE TYRRHENUM
MARE IONIUM
MARE AFRICANUM
VAL DI MAZZARA
VAL DEMONE
VAL DI NOTO
ISOLA di MALTA
MESSINA
SIRACUSA
CATANIA
PALERMO

government by Rizzi Zannoni and the astronomers of the Brera Observatory, among others. The project was finally adopted and refined in 1783–86 by the astronomer Barnaba Oriani using the large scale (ca. 1:86,400) of the Cassini *Carte de France*. Geodetic surveys provided results that were combined with astronomical observations by Giovanni Angelo de Cesaris and Francesco Reggio. From these data, the draftsman Giacomo Pinchetti and engraver Benedetto Bordiga began creating the final image in 1792–93. However, the ten-sheet *Carta topografica del Milanese e Mantovano* was not published until 1804–7 by Benedetto Bordiga and his brother Gaudenzio. Complete with refined ornamental scrolls and figures, this map celebrated the state's power with a description of territory more detailed than that of the *Carte de France*; it distinguished four categories of roads and five categories of settlements, as well as land use: rice fields, bare and tree-lined fields of arable land, vineyards, heathland, pastureland, woods, vegetable gardens, the layout of farmland, and systems of terracing. The orography is rendered with shading from an overhead light source (Signori 1990, 43–45) (fig. 306; see also fig. 269).

In 1797, the Habsburg rulers of the Republic of Venice "invested great effort in the regular surveying and cartographic depiction of the Veneto and Friuli territories it had recently acquired. The complex operation was . . . entrusted to a colonel (later general) of the Austrian General Staff, Anton von Zach. . . . The *Topographisch-geometrisch[e] Kriegskarte von dem Herzogthum Venedig* was the product of a survey based on a regular geometrical division of territory calculated by Vincenzo Chiminello, a scientist at the Padua astronomical observatory, . . . and comprises 120 small plates (*Sectionen*) each at 1:28,800" (Cantile 2007, 36). For obvious political and military reasons, this large map was a highly classified document but served as the basis for *Il Ducato di Venezia astronomicamente e trigonometricamente delineato* (1806; 1:234,000) (Rossi 2005, 2007).

Maps of Italy that altered the image established by d'Anville did not appear until the last decade of the eighteenth century and the early years of the nineteenth. Primary credit for this is due to Rizzi Zannoni for his skills in compilation and use of more recent observations and measurements. For this he may justifiably be ranked with Delisle and d'Anville. However, credit should also go to the head of Napoleon's office of cartography, Bacler d'Albe, and to the Bordiga brothers, who worked as engravers and cartographers in the French military mapping service.

In 1795 Rizzi Zannoni published his *Nuova carta della Lombardia* (ca. 1:240,000), an important account of the entire Po River basin, incorporating Liguria and the northern Apennines. The French appreciated the work enough to requisition the copperplates in January 1799 and the extant printed copies in Rizzi Zannoni's Naples workshop. A reduced-scale version (ca. 1:458,000) was reprinted as *Nuova carta dell'Italia Settentrionale* (1799–1800). Finally, in 1802, Rizzi Zannoni chose the Florentine Giuseppe Molini to publish his two-sheet map of Italy, intended to promote his more demanding project of a map of the peninsula in fifteen sheets at ca. 1:380,000. Ultimately, only sheet 11 (Naples) and sheet 14 (Sicily) were published (Valerio 1993, 179–81, 187–88, 200).

The French Armée d'Italie established a topography department (or Deposito) in Milan in 1797–98 that required *ingénieurs géographes* (initially from France) to survey the whole Italian territory. The most wide-ranging project was for a map covering the entire theater of the Napoleonic Wars in Italy: the *Carte générale du theatre de la guerre en Italie* (1798, ca. 1:259,000) was coordinated by Bacler d'Albe and engraved by the Bordiga brothers. Given the limited time allowed, "the work had to be put together by reworking the already available maps"—for example, the French maps of Delisle and d'Anville, and various other mutually incommensurate cartographical images—"with previously acquired geodetic measurements being used for certain areas" (Signori 1987, 499). The draftsman Pinchetti coordinated the entire scheme, which initially covered only northern Italy in thirty sheets. But in 1802 Bacler d'Albe added a further twenty-two sheets, the *Carte générale des Royaumes de Naples, Sicile & Sardaigne*, to cover the rest of the peninsula, a work largely based on the maps of Rizzi Zannoni. Despite the lack of homogeneity within the final product, this map was long used for military, political, and administrative purposes, thanks primarily to the wealth of its topographical information: settlements, roads, watercourses, state and departmental

(*facing page*)

FIG. 305. BARON SAMUEL VON SCHMETTAU, *NOVA ET ACCURATA SICILIÆ . . . DESCRIPTIO UNIVERSALIS*, PRESUMED VIENNA, CA. 1722–23. A reduction of the multisheet manuscript map of the island presented to the Holy Roman Emperor based on the strategic survey supervised by Schmettau from 1719 to 1720. The two vignettes show the Austrian-allied British fleet commanded by Admiral George Byng at the landing at Tindari (1719) (top right) and the Spanish fleet in retreat in the Battle of Capo Passero (1718) (bottom right), actions that both confirmed Austrian control of the island, further emphasized by the Imperial double-headed eagle in the cartouche.

Size of the original: 90.5 × 122.0 cm (neat line; on 2 sheets). Image courtesy of the Newberry Library, Chicago (Novacco 6F 34).

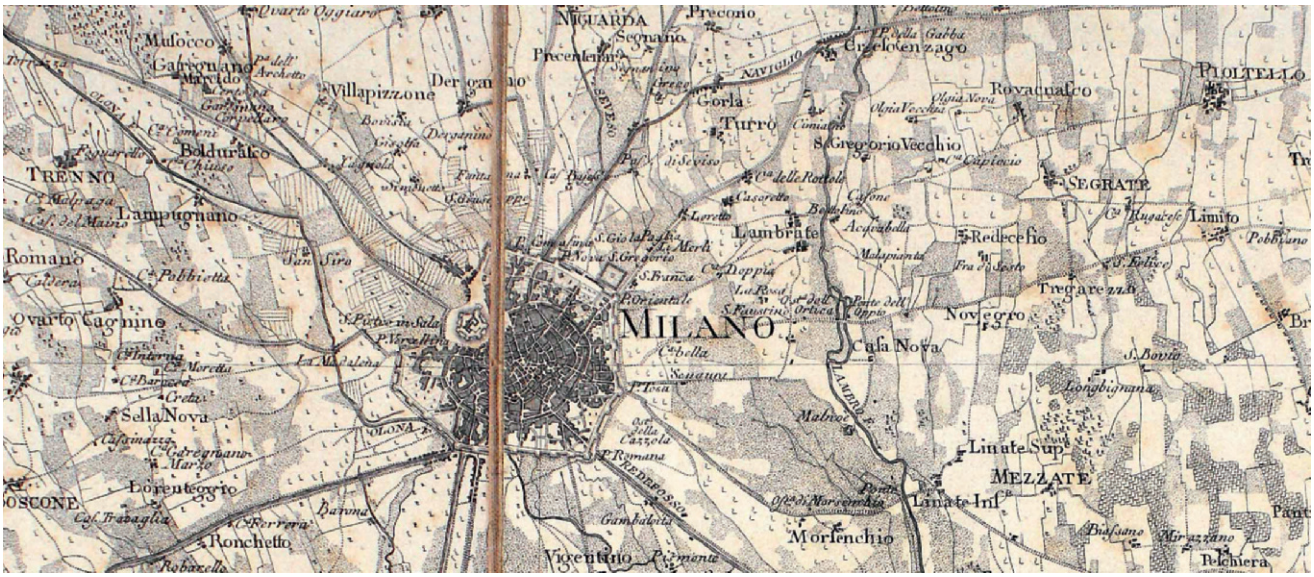

FIG. 306. DETAIL OF THE AREA AROUND MILAN FROM THE *CARTA TOPOGRAFICA DEL MILANESE E MANTOVANO ESEGUITA DIETRO LE PIÙ ESATTE DIMENSIONI GEOGRAFICHE ED OSSERVAZIONI ASTRONOMICHE*. By the astronomers of Brera Observatory in Milan, engraved (1792–93), printed (1804–7), *foglio* 3. The first large-scale geometrically based map of Lombardy was modeled on the Cassini *Carte de France* but employs more detail in its display of different types of roads, settlements, and land use. Printed map, engraved in copper in ten *fogli* (nine map sheets plus title sheet); scale 1:86,400. (For a different sheet from this map, see fig. 269.)
Size of the entire sheet: 88 × 87 cm. Su concessione del Ministero dei Beni e delle Attività Culturali e del Turismo, Biblioteca Nazionale Centrale di Firenze, Divieto di Riproduzione/ By courtesy of the Ministry of Cultural Heritage and Activities and Tourism (MiBACT), Central National Library of Florence, Ban of Reproduction (PALAT.Cart.geog.357).

boundaries, and orography (the latter obliquely lit and rendered using hatching) (Signori 1987, 500–501n13).

LEONARDO ROMBAI

SEE ALSO: Italian States; Rizzi Zannoni, Giovanni Antonio

BIBLIOGRAPHY

Arca, Salvatore. 2004. "L'inquadramento geometrico del territorio nazionale." In *Il territorio nella società dell'informazione: Dalla cartografia ai sistemi digitali,* ed. Andrea Cantile, 103–5. Florence: Istituto Geografico Militare.

Barozzi, Pietro. 1981. "La 'Carta de la Rivera di Genova' di Joseph Chafrion (1685)." In *La Sardegna nel mondo mediterraneo*, 2 vols., 1:143–65. Sassari: Gallizzi.

Cantile, Andrea. 2004. "Italia cognita: Dall'eredità cartografica preunitaria ai nuovi strumenti per la conoscenza scientifica del territorio realizzati dall'IGM." In *Il territorio nella società dell'informazione: Dalla cartografia ai sistemi digitali,* ed. Andrea Cantile, 106–13. Florence: Istituto Geografico Militare.

———. 2007. "Sulla nascita della cartografia ufficiale italiana: Gesuiti, scolopi, laici e militari, tra le esigenze della polemologia, le occorrenze dell'amministrazione e le necessità della scienza." In *La cartografia in Italia: Nuovi metodi e nuovi strumenti dal Settecento ad oggi*, ed. Andrea Cantile, 31–57. Florence: Istituto Geografico Militare.

De Felice, Pierluigi. 2006. "'Terra di Lavoro' nella cartografia napoletana dei secoli XVII–XIX." In *Atti del convegno di studi "La cartografia come strumento di conoscenza e di gestione del territorio," Messina, 29–30 marzo 2006,* ed. Corradina Polto, 351–62. Messina: Edizioni Dr. Antonio Sfameni.

Dufour, Liliane, ed. 1995. *La Sicilia disegnata: La carta di Samuel von Schmettau, 1720–1721*. Palermo: Società Siciliana per la Storia Patria.

———. 1999. "Dalle piazzeforti al territorio; gli ingegneri militari e la cartografia in Sicilia tra '500 e '700." In *Effigies Siciliae: La rappresentazione della Sicilia tra Rinascimento e Illuminismo nella cartografia militare manoscritta*, ed. Amelia Ioli Gigante, Liliane Dufour, and Corradina Polto, 69–88. Rome: Società Geografica Italiana.

Federzoni, Laura. 2006. "Vandelli, Domenico." In *Geo-Grafie di un territorio: Studi e ricerche per un dizionario storico dei cartografi in Emilia-Romagna*, ed. Marco Petrella, Chiara Santini, and Stefano Torresani, 184–87. Bologna: Pàtron.

Ioli Gigante, Amelia. 1999. "La cartografia militare nel processo di conoscenza del territorio siciliano." In *Effigies Siciliae: La rappresentazione della Sicilia tra Rinascimento e Illuminismo nella cartografia militare manoscritta*, ed. Amelia Ioli Gigante, Liliane Dufour, and Corradina Polto, 13–24. Rome: Società Geografica Italiana.

———. 2001. "L'attività cartografica di Antonio Bova, incisore palermitano del secolo XVIII." In *La cartografia degli autori minori italiani,* ed. Claudio Cerreti and Annalena Taberini, 275–83. Rome: Società Geografica Italiana.

Mangani, Giorgio. 2001. "La questione della raccolta delle fonti cartografiche (secoli XVI–XVIII)." In *La cartografia degli autori minori italiani,* ed. Claudio Cerreti and Annalena Taberini, 361–69. Rome: Società Geografica Italiana.

Mangani, Giorgio, and Fabio Mariano. 1998. *Il disegno del territorio: Storia della cartografia delle Marche*. Ancona: Il Lavoro Editoriale.

Manzi, Elio. 1987. "Aree 'trascurate' e aree 'centrali' nella cartografia ufficiale pre-unitaria del Mezzogiorno." In *Cartografia e istituzioni in età moderna,* 2 vols., 2:527–41. Genoa: Società Ligure di Storia Patria.

Massabò Ricci, Isabella, and Marco Carassi. 1987. "Amministrazione

dello spazio statale e cartografia nello stato sabaudo." In *Cartografia e istituzioni in età moderna,* 2 vols., 1:271–314. Genoa: Società Ligure di Storia Patria.
Milanesi, Marica, ed. 1990. *L'Europa delle carte: Dal XV al XIX secolo, autoritratti di un continente.* Milan: Mazzotta.
Pelletier, Monique. 2001. "Carte e potere." In *Segni e sogni della Terra: Il disegno del mondo dal mito di Atlante alla geografia delle reti,* 80–129. Novara: Istituto Geografico De Agostini.
Quaini, Massimo. 1994a. "La Liguria invisibile." In *La Liguria,* ed. Antonio Gibelli and Paride Rugafiori, 41–102. Turin: Einaudi.
———. 1994b. "Ligurie di carta." In *La Liguria,* ed. Antonio Gibelli and Paride Rugafiori, following 157 (unpaginated). Turin: Einaudi.
———. 2007. "Cartographic Activities in the Republic of Genoa, Corsica, and Sardinia in the Renaissance." In *HC* 3:854–73.
Rossi, Massimo, ed. 2005. *Kriegskarte, 1798–1805: Il Ducato di Venezia nella carta di Anton von Zach*. 3 vols. Treviso: Fondazione Benetton Studi Ricerche; Pieve di Soligo: Grafiche V. Bernardi.
———. 2007. *L'officina della Kriegskarte: Anton von Zach e la cartografie degli stati veneti, 1796–1805*. Treviso: Fondazione Benetton Studi Ricerche; Pieve di Soligo: Grafiche V. Bernardi.
Sereno, Paola. 2007. "Cartography in the Duchy of Savoy during the Renaissance." In *HC* 3:831–53.
Signori, Mario. 1987. "L'attività cartografica del Deposito della Guerra e del Corpo degli ingegneri topografi nella Repubblica e nel Regno d'Italia." In *Cartografia e istituzioni in età moderna,* 2 vols., 2:493–525. Genoa: Società Ligure di Storia Patria.
———. 1990. "La carta della Lombardia austriaca realizzata dagli astronomi dell'Osservatorio milanese di Brera." In *L'Europa delle carte: Dal XV al XIX secolo, autoritratti di un continente,* ed. Marica Milanesi, 42–45. Milan: Mazzotta.
Valerio, Vladimiro. 1993. *Società uomini e istituzioni cartografiche nel Mezzogiorno d'Italia.* Florence: Istituto Geografico Militare.
———. 2014. "Tre momenti di conquista nella cartografia siciliana." In *Sicilia 1477–1861: La collezione Spagnolo-Patermo in quattro secoli di cartografia*, 2 vols., ed. Vladimiro Valerio and Santo Spagnolo, 1:67–75. [Naples]: Paparo Edizioni.
———, and Santo Spagnolo, eds. 2014. *Sicilia 1477–1861: La collezione Spagnolo-Patermo in quattro secoli di cartografia*. 2 vols. [Naples]: Paparo Edizioni.
Woodward, David. 2007. "The Italian Map Trade, 1480–1650." In *HC* 3:773–803.

Geographical Mapping in the Netherlands. Given that the Netherlands was a major center of commercial map production throughout the long eighteenth century, it will not be surprising that most of the general purpose, small- to medium-scale maps of the Netherlands and its provinces were commercial ventures. Indeed, the emphasis of Dutch mapsellers on supplying the European market with affordable atlases meant that none engaged in the costly intellectual effort of compiling new critical regional maps; it was easier to copy the work of French geographers. However, the local Dutch market did sustain an interest in new maps of the Netherlands and of its constituent regions. For general maps of the Republic of the Netherlands as a whole, H. A. M. van der Heijden and Dirk Blonk (2005) provide a comprehensive survey. The following summary of provincial geographical maps available during the period ignores, for the most part, derivative single-sheet maps. Of particular note are the maps engendered by boundary disputes or initiated by local surveyors who petitioned local governments for support; these maps are detailed elsewhere in this volume.

The most important province of the Republic was Holland. The States of Holland never undertook to map their province, possibly because there were sufficient *waterschappen* (water management board) maps and commercial maps to satisfy any need. The main large overview wall map is the *Nova et accvrata totivs Hollandiæ Westfrisiæq topographia* by Balthasar Florisz. van Berckenrode, based on *waterschappen* maps, and published by Willem Jansz. Blaeu in 1621 (22 sheets, ca. 1:110,000). The Blaeu/Van Berckenrode map was reissued four times from the same plates, with changes, before 1682 (Schilder 1986–2013, 5:291–332, with full-size reproduction; Blonk and Blonk-van der Wijst 2000, 36–48, 221–28). An enlarged and improved version, *'t Graefschap Holland* by Jacob Aertsz. Colom, was published in 1639 (40 sheets, ca. 1:60,000) and reprinted, with some changes, by Frederick de Wit about 1720 and by Covens & Mortier at least as late as 1737 (Donkersloot-de Vrij 1981, 139, no. 704; Blonk and Blonk-van der Wijst 2000, 276–83, which describes over 100 maps of the province between 1542 and 1815).

Friesland had (and retains) a highly developed sense of independence from the nation as a whole that is reflected in the mapping of the province. On the initiative of Christiaan Schotanus à Sterringa, all rural municipalities (*grietenijen*) were surveyed and mapped in the period 1658–62. These maps were issued from 1664 by Christiaan's son Bernardus Schotanus à Sterringa in Christiaan's book *Beschryvinge van de heerlyckheydt van Frieslandt*. The scales of the maps vary from 1:50,000 to 1:100,000 depending on the size of the respective *grietenij*. The states of the province were not very happy with the maps and in 1682 gave Bernardus a new commission to survey the *grietenijen*. After many years of work the maps were finally published in 1698 in the *Friesche atlas*, of which only 125 copies were printed. The atlas contains maps of the twenty-seven *grietenijen* (scales 1:25,000 to 1:43,000), maps of the three *goën* (districts), and information on occupation and land use and an extensive toponymy. In the well-known edition of 1718, *Uitbeelding der heerlijkheit Friesland*, the original thirty maps were revised and an overview and eight historical maps were added (reproduced at full size in Schotanus à Sterringa 1970) (fig. 307). The most important single-sheet map of Friesland in the eighteenth century was probably Abraham Allard's *Frisiæ dominium vernacule Friesland* (ca. 1702, ca. 1:130,000) (De Rijke 2006, 279–83, which describes more than 100 maps of the province between 1545 and 1850).

No official maps of the province of Groningen are known from the period. A commercial wall map was