

Contents

1	Introduction	1
1.1	Setting the Scene: Analytical Data and Connoisseurship for Attribution in Art	2
1.2	Application to Ceramics and Porcelains	10
1.3	The Growth of English and European Porcelains in the Eighteenth Century	16
1.4	Body Compositions of Early Porcelains	25
1.5	Key Analytical Markers for Porcelain Identification	33
1.6	Raw Material Composition	47
1.7	The Requirement for an Analytical Protocol for Porcelain Attribution	52
1.8	Is There a Need for Analytical Data Input for the Definitive Porcelain Attribution for Unknown Specimens?	57
	References	60
2	Chinese Porcelains and their Early European Competitors	65
2.1	Early Porcelain Manufacture in China	66
2.2	The European Challenge to Imported Chinese Porcelains	71
2.2.1	Straits Chinese Porcelain	75
2.3	The Export of Chinese Porcelain to Europe Through Canton and Nanking	76
2.4	Portuguese Shipments of Chinese Porcelain	87
2.5	The Early European Response	89
2.6	Aristocratic Financial Support for European Manufactories	92
2.7	Early French Soft Paste Porcelain Compositions	94
	References	95

3	Establishing the Historical Baseline Chronology for European Porcelains	99
3.1	The Earliest European Porcelain Manufactory: The Medici Manufactory at Florence	99
3.2	The First English Porcelain Manufactory at Fulham?	109
3.3	The First French Porcelain Manufactory at Rouen	120
3.4	St Cloud Porcelain	125
3.5	Meissen Porcelain	128
3.6	Pomona, Chelsea, Limehouse and Bow	133
3.6.1	Pomona, Newcastle-Under Lyme	133
3.6.2	Bow, Stratford, London	134
3.6.3	Chelsea Porcelain	137
3.6.4	Limehouse	141
3.7	Other Selected Porcelain Manufactories	144
3.7.1	Austria	145
3.7.2	Italy	146
3.7.3	Spain	148
3.7.4	Bohemia	150
3.7.5	Russia, St Petersburg	151
3.7.6	The Netherlands	152
3.7.7	Switzerland	153
3.7.8	Other Porcelain Manufactories	153
3.8	Summary and Conclusions from a Background Comparison of Early Porcelain Manufactories	154
	References	158
4	Types of Porcelain and Their Elemental Oxide Compositions	165
4.1	Types of Porcelain	166
4.2	Compositional Differentiation of Porcelains	175
4.3	The Role of the External Decorating Workshop	183
4.4	An Analytical Mantra	185
4.5	The Concept of Accuracy, Error, Detection Limits and Precision in Analytical Measurements and Their Importance for Porcelain Studies	188
4.6	The Concept of Ratios of Analytical Data	191
	References	195
5	Analytical Science and Case Studies of Porcelains	197
5.1	The Groundwork for Debate in a Holistic Study	198
	References	205

6	Case Studies I. Analytical Data Which Have Materially Contributed Towards the Factory Attribution of Porcelain Specimens	207
6.1	The <i>Burghley House Jars</i> : The Earliest English Porcelain Survivors?	208
6.1.1	The Burghley House Scenario	208
6.1.2	Background to the Analyses	214
6.1.3	The <i>Burghley House Jars</i> : The Analyses	217
6.1.4	The Arnhold Teabowl	231
6.1.5	Conclusions	231
6.2	A Unique Rockingham Porcelain Table	233
6.2.1	Wentworth Castle and Wentworth Woodhouse	233
6.2.2	Conclusions	239
6.3	A Rare Nantgarw Porcelain Trumpet Spill Vase?	240
	References	246
	References for Section 6.1	246
	References for Section 6.2	248
	References for Section 6.3	249
7	Case Studies II: Analytical Data Which Have Revealed that Significant Revision Is Required to the Perceived Historical Knowledge of Porcelain Factories (Part A)	251
7.1	Nantgarw Porcelain: An Exclusively Soft Paste Phosphatic Body?	252
7.1.1	Soft Paste Nantgarw China: The Historical Belief	253
7.1.2	The Curious Case of Hard Paste Nantgarw China	256
7.1.3	Conclusions	261
7.2	An Analytical Conundrum: Anatase in Ming Porcelain Shards. What Surprises Lie in Wait for an Unsuspecting Analyst?	267
7.2.1	Conclusions	271
7.3	The Strange Case and Ongoing Saga of <i>Bow</i> and <i>Factory-A</i> Marked Porcelains: Can these Actually be One and the Same Manufactory?	272
7.3.1	The “Factory A” Marked Porcelains	273
	References	278
	References for Section 7.1	278
	References for Section 7.2	279
	References for Section 7.3	280

8	Case Studies III: Analytical Data Which Have Revealed That a Significant Revision Is Required to the Historical Knowledge of Porcelain Manufactories (Part B)	283
8.1	Analysis of a Rare <i>Pendock-Barry, Barry- Barry Derby</i> Porcelain Plate	284
8.1.1	Genealogy of the Pendock Family	291
8.1.2	Estimated Date of Manufacture of the <i>Barry Barry</i> Service from Genealogical and Heraldic Evidence	292
8.1.3	Analytical Studies of the <i>Barry-Barry</i> Service Porcelain	295
8.2	Ballerina on Porcelain: A <i>Rara Avis</i> , But Where Did It Come From?	297
8.2.1	Setting the Scene	297
8.2.2	A History of Ballet	299
8.2.3	Dancers Depicted on Porcelain	303
8.2.4	Porcelain Spill Vase: Potential Factories	307
8.2.5	Analytical Information from Raman Spectroscopic Analysis	310
8.2.6	Conclusions	313
8.3	Meissen Hard Paste Porcelain: A Similar Composition <i>Vis-a-Vis</i> the Vienna Du Paquier Factory and Can Analytical Science Differentiate Between Them?	315
	References	318
	References for Section 8.1.4	318
	References for Section 8.2.6	318
	References for Section 8.3.1	319
9	Challenges for Analytical Science (Case Studies IV)	321
9.1	The <i>Amarna Princess</i> : An Authenticity Problem?	322
9.1.1	The <i>Amarna Princess</i> Scenario	324
9.1.2	Conclusion	327
9.2	A Swansea Porcelain Mug with an Unusual Handle: A Rare Specimen Which Only Partially Satisfies the Standard Exemplars?	327
9.3	Rockingham Porcelain: Is It Bone China or Phosphatic Soft Paste Porcelain?	330
9.3.1	Rockingham Porcelain Exemplars	331
9.3.2	Analytical Raman Spectroscopic Analysis of Rockingham Porcelains	333
9.3.3	Conclusions	336
9.4	Is All Blue Cobalt Blue? Hidden Gems in Porcelain Decoration Revealed by Combinatorial Analytical Techniques	336
9.4.1	Glass Frit and Cullet	337
9.4.2	Smalt, Cobalt Blue, Egyptian Blue, Han Blue and Bristol Blue	338

9.4.3	The Presence of Arsenic in Blue Glass Colourants for Porcelain Decoration	341
9.4.4	Smalt or Lapis Lazuli?	344
9.4.5	Analyses of Pigments on Porcelains and Their Input to the Attribution Process	346
9.4.6	Conclusions	349
9.5	Did They or Did They Not Manufacture Nantgarw Porcelain at the Swansea China Works in 1815?	350
9.5.1	The Scenario	350
9.5.2	Can Analytical Science Differentiate Between Nantgarw Porcelain Made in the Nantgarw China Works and a Nantgarw-Bodied China Made in the Swansea China Works?	353
	References	358
	References for Section 9.1	358
	References for Section 9.2	358
	References for Section 9.3	358
	References for Section 9.4	359
	References for Section 9.5	361
10	A Forensic Holistic Conundrum – An Ongoing Controversy	363
10.1	The King George II Porcelain Busts	364
10.2	Chronology and Life of King George II	365
10.3	Candidates for the Manufactory of the King George II Busts	367
10.4	Description of the King George II Bust and Its Purpose	371
10.5	Analysis of the King George II Porcelain Busts	373
10.5.1	The Surviving King George II Busts	374
10.5.2	A Summary of the Analytical Data and Its Interpretation	377
	References	379
11	The Answer Lies in the Glaze!	381
11.1	The Nantgarw Glaze Recipes	382
11.2	Analysis of Nantgarw Porcelain Glazed Shards	384
11.3	Glaze Analyses Undertaken on Finished Nantgarw Porcelains	388
11.4	The Use of Analytical Raman Spectroscopy to Estimate the Kiln Firing Temperatures from Glaze Analyses	391
11.4.1	An Estimation of Glaze Firing Temperatures from Raman Band Intensities	392
11.5	The Parallel Manufacture of Glass	393
11.5.1	The Composition of Early Glass	395
11.6	Conclusions	396
	References	397

12 Assessment of the Role of Chemical Analysis in the Holistic Attribution of Porcelains to Factory Sources, Their Characterisation and the Evaluation of Their Chronology	399
12.1 The Assessment of a Porcelain Type and the Need for Compositional Analysis	400
12.2 Analytical Achievements and Failures: Early <i>Versus</i> Modern Analyses	403
12.3 The Strength of Analytical Data	407
12.4 Holistic Attributions Made With or Without the Inclusion of Analytical Evidence or Another Component	409
References	412
Appendices	415
Appendix I: Lady Charlotte Guest/Schreiber (1812–1895)	415
References	422
Appendix II: The “Bearded Tulip”: Who Was “ <i>De Junic</i> ” and Can Analysis Help to Unravel the Mystery Surrounding this Artist?	423
What Is Known About “ <i>de Junic</i> ”?	425
References	433
Appendix III: Retailers of Porcelain: A Source of Uncertainty for Analytical Attribution?	434
Did the Swansea China Works Ever Produce Nantgarw Porcelain?	441
References	441
Appendix IV: The Importance of Establishing the Correct Chronology for Factory Operations in a Holistic Forensic Analytical Approach. Example: The Swansea and Nantgarw Manufactories, 1814–1820	443
Transcript of an Interview given by Henry Morris, formerly of the Swansea China Works, to Colonel Grant Francis on the 14th August 1850. Reproduced in the <i>Cambrian</i> newspaper on the 3rd January, 1896 and then quoted by William Turner in his book <i>The Ceramics of Swansea and Nantgarw</i> , published in 1897	443
Chronology of Activities and Landmark Dates at the Swansea and Nantgarw China Works	447
Details of the Auction Sales of Swansea and Nantgarw Porcelains	454
Conclusions	458
References	460
Appendix V: Angela Georgina Burdett-Coutts, 1st Baroness Burdett – Coutts of Highgate, 1814–1906	461

Appendix VI: American Porcelain Manufacture	463
John Bartlam's Cain Hoy China Manufactory, Charleston, 1765–1770; The Bonnin & Morris Manufactory, the American China Manufactory, Philadelphia, 1770–1773	463
Nineteenth Century Porcelains in the United States of America: The Role of the Presidency	469
References	472
Appendix VII: Curiosities in Ceramics Composition Exposed by Chemical Analysis	473
Ancient Ceramics that Contain Asbestos	474
Analysis of Corsican Ceramics	475
References	476
Coade Stone – An Eighteenth Century Architectural Ceramic	476
References	481
White Earthenwares	482
References	487
Appendix VIII: Knowledge Transfer in the Age of Enlightenment	488
The Rise of the Coffee Shop in European Culture	491
References	495
Appendix IX: Ancient Pigments Nomenclature Confusion: An Analytical Challenge	496
Pigments	498
References	503
Appendix X: The <i>Tek Sing</i> Treasure	506
Analysis of Porcelains Related to the <i>Tek Sing</i> Treasure	510
References	513
Appendix XI: The Ehrenfriede von Tschirnhaus (1651–1708) and Johann Bottger (1682–1717) Controversy	513
References	518
Appendix XII: The Re-Creation of Nantgarw Porcelain	519
Joseph William Mellor	520
Summary of the First Attempt to Re-Create the Nantgarw Porcelain Body by Ernest Morton Nance and Joseph Mellor in the 1930s	522
The Nantgarw Glazes	525
The Modern Re-Creation of Nantgarw Porcelain	528
References	532
Appendix XIII: Armorial Services in English and Welsh Porcelains	533
Heraldic Achievements	534
English Porcelain Armorial Services of the Eighteenth and Nineteenth Centuries	535
Welsh Porcelain Armorial Services	538

The Scientific Study of Armorial Porcelain Services	544
Conclusions	546
References	546
Glossary	549
Selected Bibliography	561
Index	565