



Society of Antiquaries  
of **Scotland**

# Bearsden

A Roman Fort on the Antonine Wall

David J Breeze

ISBN: 978-1-908332-08-0 (hardback) • 978-1-908332-18-9 (PDF)

The text in this work is published under a [Creative Commons Attribution-NonCommercial 4.0 International](#) licence (CC BY-NC 4.0). This licence allows you to share, copy, distribute and transmit the work and to adapt the work for non-commercial purposes, providing attribution is made to the authors (but not in any way that suggests that they endorse you or your use of the work). Attribution should include the following information:

Breeze, D J 2016 *Bearsden: A Fort on the Antonine Wall*. Edinburgh: Society of Antiquaries of Scotland. <https://doi.org/10.9750/9781908332189>

**Important:** The illustrations and figures in this work are not covered by the terms of the Creative Commons licence. Permissions must be obtained from third-party copyright holders to reproduce any of the illustrations.



Every effort has been made to obtain permissions from the copyright holders of third-party material reproduced in this work. The Society of Antiquaries of Scotland would be grateful to hear of any errors or omissions.

Society of Antiquaries of Scotland is a registered Scottish charity number SC 010440. Visit our website at [www.socantscot.org](http://www.socantscot.org) or find us on Twitter [@socantscot](https://twitter.com/socantscot).

BEARSDEN  
A ROMAN FORT ON THE ANTONINE WALL



# BEARSDEN

## A ROMAN FORT ON THE ANTONINE WALL

DAVID J BREEZE

*With contributions by*

Lindsay Allason-Jones, Donald Bailey,<sup>†</sup> Mike Baillie, Iain Banks, Paul Bidwell, Sjoerd Bohncke, Susan Chalmers, G H Collins,<sup>†</sup> Anne Crone, Alex Croom, Brenda Dickinson, Camilla Dickson,<sup>†</sup> James H Dickson, Andrew Fitzpatrick, Dennis Gallagher, Geoff Gaunt, Rikke D Giles, Mark Gillings, Katharine Hartley, Martin Henig, Andrew Jones, Lawrence Keppie, John Locke, Euan MacKie, Frances McLaren, Ian Máté, Jef Maytom, Michael J Moore, G C Morgan, Jennifer Price, Sian Rees, Anne S Robertson,<sup>†</sup> Jackaline Robertson, Adam T Welfare and David F Williams



Jacket image: an artist's impression of the bath-house at Bearsden undergoing roof repairs (Michael Moore)

Published in 2016 in Great Britain by the Society of Antiquaries of Scotland

Society of Antiquaries of Scotland  
National Museum of Scotland  
Chambers Street  
Edinburgh EH1 1JF  
Tel: 0131 247 4115  
Fax: 0131 247 4163  
Email: [administration@socantscot.org](mailto:administration@socantscot.org)  
Website: [www.socantscot.org](http://www.socantscot.org)

The Society of Antiquaries of Scotland is a registered Scottish charity No SC010440.

ISBN 978 1 90833 208 0

*British Library Cataloguing-in-Publication Data*

A catalogue record for this book is available from the British Library.

Copyright © Society of Antiquaries of Scotland and Contributors, 2016

All rights reserved. No part of this publication may be reproduced, stored in or introduced into a retrieval system, or transmitted, in any form, or by any means (electronic, mechanical, photocopying, recording or otherwise) without the prior written permission of the publisher. Any person who does any unauthorised act in relation to this publication may be liable to criminal prosecution and civil claims for damages.



United Nations  
Educational, Scientific and  
Cultural Organization



**Frontiers of the  
Roman Empire**  
inscribed on the World  
Heritage List in 2005

Design and production by Lawrie Law and Alison Rae  
Typesetting by Waverley Typesetters, Warham, Norfolk  
Manufactured in Serbia by Štamparija Grafostil

*For the people of Bearsden and the archaeologists and archaeo-scientists of Bearsden*



# CONTENTS

<i>List of illustrations</i>	xiii
<i>List of tables</i>	xix
<i>Preface</i>	xxi
<i>Acknowledgements</i>	xxv
<i>List of contributors</i>	xxvii
<i>Abstract</i>	xxix
<i>Summary</i>	xxx
1 THE STRUCTURE OF THE REPORT	1
2 PREVIOUS ACCOUNTS	3
3 THE EXCAVATIONS	7
3.1 The topography of the site	9
3.2 The fort	10
3.2.1 The defences	10
3.2.2 The ditches	10
3.2.3 The rampart	17
3.2.4 Internal roads	20
3.2.5 Drains and gulleys	23
3.2.6 Open spaces	23
3.2.7 Internal buildings	26
3.3 The annexe	42
3.3.1 The bath-house	42
3.3.2 The latrine	70
3.3.3 The annexe south of the bath-house	72
3.4 Extra mural activity	74
3.5 Resistivity survey <i>Iain Banks</i>	75
4 SOILS	77
4.1 The west rampart <i>Ian D Máté</i>	77
4.2 Soil samples from buildings <i>Ian D Máté and Sjoerd Bohncke</i>	78
5 STONE	81
5.1 Analysis <i>Geoff Collins<sup>†</sup></i>	81
5.2 The stone objects <i>Lawrence Keppie</i>	81
5.2.1 Inscribed and sculptured stones	81
5.2.2 Voussoir stones	89

5.2.3	Bath-house furniture	90
5.2.4	Worked building stones	91
5.2.5	Slabbing, flooring and paving	93
5.2.6	Miscellaneous	94
5.3	The milling stones <i>Adam T Welfare</i>	94
5.3.1	Introduction	94
5.3.2	Catalogue	95
5.3.3	Discussion	97
5.4	The flint flake <i>Euan W MacKie</i>	98
6	BRICK AND TILE <i>Dennis B Gallagher</i>	99
6.1	Introduction	99
6.2	Types	101
6.3	Signature marks	102
7	POTTERY	103
7.1	Samian ware <i>Brenda Dickinson</i>	103
7.1.1	Introduction	103
7.1.2	Catalogue	103
7.2	The coarse ware <i>Paul Bidwell and Alex Croom</i>	108
7.2.1	Introduction	108
7.2.2	Fabrics	109
7.2.3	Catalogue	111
7.3	Mortaria <i>Katharine F Hartley</i>	129
7.3.1	Summary	129
7.3.2	Methodology	129
7.3.3	Quantification	130
7.3.4	Mortarium fabrics	131
7.3.5	Catalogue of stamped mortaria	135
7.3.6	Final comments	143
7.3.7	Catalogue of mortaria found at Bearsden arranged in fabrics	145
7.4	Scientific analysis of the pottery	158
7.4.1	Heavy mineral analysis of black-burnished ware <i>David Williams</i>	158
7.4.2	Petrological examination of pottery <i>Geoff Collins<sup>†</sup></i>	159
7.4.3	Geological report on trituration 'grit' in mortaria fragments <i>Geoff Gaunt</i>	160
7.4.4	Chemical and petrological analysis of local oxidised wares <i>Mark Gillings</i>	165
7.5	'Native' pot <i>Euan W Mackie</i>	171
7.6	Lamp <i>Donald Bailey</i>	171
7.7	Amphorae <i>Andrew P Fitzpatrick</i>	171
7.7.1	Introduction	171
7.7.2	Amphorae types	171
7.7.3	Composition of the assemblage	173
7.8	Discussion of pottery <i>Paul Bidwell and Alex Croom</i>	176
7.8.1	Vessel types and character of the assemblage	176
7.8.2	Local production	178
7.8.3	Distribution	178
7.8.4	Pottery supply systems	178
7.8.5	Origin of the British potters working at Bearsden	179
7.8.6	Pottery of North-African style	180
8	MORTAR ANALYSIS <i>Graham Morgan</i>	183

9	GLASS	<i>Jennifer Price</i>	184
	9.1	Introduction	184
	9.2	Catalogue	189
		9.2.1 Vessels	189
		9.2.2 Window glass	193
		9.2.3 Object	193
10	INTAGLIOS	<i>Martin Henig</i>	195
	10.1	Catalogue	195
	10.2	The 'shrimp' <i>Susan Chambers</i>	196
11	METALWORK	<i>Lawrence Keppie</i>	197
	11.1	Copper alloy	197
	11.2	Lead	199
	11.3	Iron	199
		11.3.1 Weapons	199
		11.3.2 Tools and implements with a note on the iron hoe by Sian Rees	205
		11.3.3 Structural items	207
		11.3.4 Strappings and sheeting	213
		11.3.5 Transport	214
		11.3.6 Footwear	214
		11.3.7 Nails	215
		11.3.8 Miscellaneous	219
12	COINS	<i>Anne S Robertson<sup>‡</sup></i>	221
13	PLANT REMAINS	<i>Camilla Dickson<sup>‡</sup> and James H Dickson</i>	223
	13.1	Introduction	223
	13.2	Outer east annexe ditch	223
		13.2.1 Macroscopic plant remains	223
		13.2.2 Macroscopic plant remains from pollen samples	234
		13.2.3 Outer east annexe ditch: pollen analyses	235
		13.2.4 Origin of cultivated plants and the evidence for hay	239
		13.2.5 Processing the crops	240
	13.3	Depression south of building 7	242
		13.3.1 Macroscopic plant remains	242
		13.3.2 Pollen analysis	245
	13.4	Inner west ditch	249
		13.4.1 Macroscopic plant remains	249
		13.4.2 Pollen analysis	251
	13.5	Middle west ditch	251
		13.5.1 Macroscopic plant remains	251
		13.5.2 Pollen analysis	257
	13.6	Outer west ditch	257
		13.6.1 Macroscopic plant remains	257
		13.6.2 Pollen analysis	257
	13.7	South ditch	259
		13.7.1 Macroscopic plant remains	259
		13.7.2 Pollen analysis	261
	13.8	Rampart turves	263
		13.8.1 East annexe rampart	263
		13.8.2 East fort rampart	263
		13.8.3 Macroscopic plant remains	265
		13.8.4 Pollen analysis	265

13.9	Wood, charcoal and other burnt plant remains	265
13.9.1	Outer east annexe ditch	265
13.9.2	Inner west ditch	265
13.9.3	Middle west ditch	265
13.9.4	Ramparts	265
13.9.5	Charcoal associated with buildings in the northern part of the fort	265
13.9.6	Charcoal associated with buildings in the southern part of the fort	266
13.9.7	Bath-house	267
13.9.8	Latrine	267
13.9.9	Conclusion	267
13.10	Interpretation of pollen analyses	268
13.11	The woodland around Bearsden	268
13.12	The plant communities	269
13.13	Comparison with other sites	270
13.13.1	Pollen analysis	270
13.13.2	Macroscopic plant remains	271
13.14	Summary of the plant remains	272
13.15	Future work	272
	<i>Appendix 1</i> Notes on the identifications	274
	<i>Appendix 2</i> Determining the thermal history of the bran with electron spin resonance spectroscopy	279
	<i>Addendum</i> James H Dickson	279
14	INFRARED ANALYSIS OF CHARRED MATERIAL ADHERING TO POTSHERDS <i>Frances McLaren</i>	281
14.1	The use of infrared analysis	281
14.2	What is the character of archaeological char?	281
14.3	Chemical analysis of the Bearsden char	282
14.4	How can we interpret the Bearsden wheats?	284
15	DENDOCHRONOLOGY <i>Mike Baillie and Anne Crone</i>	285
16	BONES <i>Jackaline Robertson</i>	287
17	INSECT REMAINS <i>John Locke</i>	289
17.1	Introduction	289
17.2	Analysis	289
17.2.1	East annexe ditch	289
17.2.2	Inner west ditch	297
17.2.3	Middle west ditch	298
17.2.4	Outer west ditch	298
17.2.5	South ditch	298
17.2.6	Depression in fort	298
17.2.7	Building 7	298
17.3	General implications of the grain-beetles	299
17.4	Climatological implications of the fauna	299
18	PARASITOLOGICAL INVESTIGATION OF THE EAST ANNEXE DITCH <i>Andrew K G Jones and Jef Maytom</i>	301
18.1	Introduction	301
18.2	Analysis	301
18.3	Discussion	303
19	LEATHER <i>Dennis B Gallagher</i>	305
19.1	Introduction	305
19.2	Catalogue	307

20	RECONSTRUCTION DRAWINGS	<i>Michael J Moore</i>	309
21	DISCUSSION		311
21.1	The site before the Romans		311
21.2	The Antonine Wall		311
21.3	The fort		311
21.3.1	The fort platform		311
21.3.2	Measurements and builders		311
21.3.3	The defences		312
21.3.4	The roads		314
21.3.5	The stone buildings		314
21.3.6	The timber buildings		314
21.3.7	The identification of the buildings		316
21.4	The annexe		320
21.4.1	The bath-house		323
21.4.2	The latrine		327
21.5	The planning of the fort and annexe		330
21.6	The unit based at Bearden		335
21.7	The building of the fort and annexe		344
21.8	The date of occupation		346
21.9	The history of the site		348
21.10	The civil settlement		348
21.11	Life in the fort		348
21.11.1	Introduction to the distribution of artefacts		348
21.11.2	The small finds assemblage	<i>Lindsay Allason-Jones</i>	349
21.11.3	Weapons and clothing		350
21.11.4	Tools		350
21.11.5	Cooking, eating and drinking		350
21.11.6	Comments on the distribution of artefacts	<i>Rikke D Giles</i>	360
21.11.7	Diet		369
21.11.8	Hygiene and relaxation		371
21.12	Supply		371
21.13	The end of the fort		375
21.14	Summary of the history of the fort		375
21.15	Some wider implications		376
22	CONCLUSIONS		381
	<i>Bibliography</i>		385
	<i>Index</i>		399



# LIST OF ILLUSTRATIONS

i	The bath-house at the end of the 1973 being prepared for an influx of visitors	xxi
ii	The opening of the bath-house in 1982	xxii
iii	The Roman fort and annexe at Bearsden	xxiii
1.1	The Antonine Wall	1
1.2	Key to excavated areas, detailed plans and sections in the report	2
2.1	Roy's plan of Bearsden, 1755	3
2.2	Roy's map of the Bearsden area, 1755	4
2.3	The 1862 OS map	5
2.4	The 1896 OS map	5
2.5	The grounds of 35 Roman Road before excavation	6
3.0.1	The excavated areas in relation to the existing features	8
3.0.2	Excavating the north granary	9
3.0.3	Excavating the bath-house in 1982	9
3.1.1	Map of the contours and drains	10
3.2.1	Plan of the fort and excavated areas	11
3.2.2	The north ditch	12
3.2.3	The outer west ditch	12
3.2.4	The outer annexe ditch	12
3.2.5	The west ditches in plan	13
3.2.6	The south ditch	14
3.2.7	Sections of the north, east and south ditches	15
3.2.8	Sections of the west ditches	16
3.2.9	Plan of the west rampart of the fort, the surviving turves, and the intervallum	17
3.2.10	The west rampart of the fort, water tank and intervallum road	17
3.2.11	The turves of the west fort rampart	17
3.2.12	Plan of the rampart between the fort and the annexe and adjacent areas	18
3.2.13	The rampart base and turf south of Roman Road	19
3.2.14	The rampart base south of Roman Road after removal of the turf	19
3.2.15	The rampart base north of Roman Road with the area of burning	19
3.2.16	The cobbling under the burning north of Roman Road	19
3.2.17	Turves and wood of the fort/annexe rampart	20
3.2.18	The outfall of the drain through the east annexe rampart	20
3.2.19	The west intervallum looking north	21
3.2.20	The water tank looking west	21
3.2.21	The east intervallum with the path between buildings 6 and 7	21
3.2.22	The junction of the <i>via praetoria</i> and the <i>via principalis</i>	21
3.2.23	The <i>via decumana</i> looking east	22
3.2.24	The metalling south of building 12 looking north	22
3.2.25	The path between buildings 6 and 7 looking south	22

3.2.26	Section across the depression between building 7 and the <i>via principalis</i>	24
3.2.27	General view of building 1 looking south-east	24
3.2.28	Plan of buildings 1 and 2	25
3.2.29	The west end of building 1 looking east	26
3.2.30	Plan of buildings 3 and 4	27
3.2.31	A post-hole in building 3	28
3.2.32	A hearth in the base of an amphora	28
3.2.33	The north-west corner of building 3	28
3.2.34	The north wall of the north granary looking west	29
3.2.35	The north wall of the north granary looking south	29
3.2.36	The western end of the north granary looking south	30
3.2.37	The east end of the north granary	30
3.2.38	Plan of buildings 5, 6, 7 and 8	31
3.2.39	A hearth in building 5	32
3.2.40	Part of building 7 looking south-east	32
3.2.41	The south granary	33
3.2.42	Plan of buildings 9, 13 and 14	34
3.2.43	Building 10	35
3.2.44	Plan of buildings 10, 11, 12 and 15	36
3.2.45	General view of the building 11 looking west	37
3.2.46	North-west corner of building 11 looking west	38
3.2.47	The <i>via decumana</i> with building 14	39
3.2.48	Plan of 'building' 16 and the south intervallum	40
3.2.49	Section of pits in 'building' 16	41
3.3.1	The bath-house in 1973 looking south-east	43
3.3.2	The bath-house in 1973 looking north-west	43
3.3.3	Plan of the bath-house at floor level	44
3.3.4	Plan of the bath-house at basement level	45
3.3.5	The primary bath-house	46
3.3.6	The north-east corner of the primary bath-house	46
3.3.7	The stoke-hole in the primary bath-house looking south	47
3.3.8	The stoke-hole of the primary bath-house looking west	47
3.3.9	The stoke-hole of the primary bath-house looking east	47
3.3.10	The primary bath-house looking south showing the burning around the hearth	48
3.3.11	The hearth in the primary bath-house	48
3.3.12	The changing room in 1973	49
3.3.13	Post-holes in the changing room	50
3.3.14	The south wall of the changing room of the bath-house	51
3.3.15	The west end of the bath-house in 1973	51
3.3.16	The door between the cold room and the first warm room	52
3.3.17	The drain below the cold room looking north	52
3.3.18	The drain below the cold room looking south	52
3.3.19	The cold bath in 1973 looking east	53
3.3.20	The cold bath in 1973 looking north	53
3.3.21	The cold bath in 1980 looking north with the plaster visible	54
3.3.22	The cold bath in 1980 looking south with the outlet visible to the left	54
3.3.23	The cold bath in 1980, detail of the outlet	54
3.3.24	The heated range in 1973	55
3.3.25	The heated range in 1980	55
3.3.26	The north wall of the heated range	56
3.3.27	Section across the south wall of the primary bath-house	56
3.3.28	The north face of the north wall of the heated range	57
3.3.29	The niche in the first warm room	57
3.3.30	The first warm room following lifting of the flags looking west	57
3.3.31	The first warm room following lifting of the flags looking south	58

3.3.32	The first warm room following removal of the clay fill looking south	58
3.3.33	The channel between the second and first warm rooms	59
3.3.34	The threshold of the door between the first and second warm rooms	59
3.3.35	The second warm room looking north	60
3.3.36	The threshold of the door between the second warm room and the hot room	61
3.3.37	The second warm room looking west with the bench end and seat	61
3.3.38	The second and first warm rooms looking west following removal of the bench	61
3.3.39	Detail of the floor of the second warm	61
3.3.40	The hot room and the second warm room looking west	62
3.3.41	The second warm room looking south	62
3.3.42	The hot room looking north showing the wall jacketing in position	63
3.3.43	A sketch showing the arrangement of the heating in the hot room	63
3.3.44	The hot room looking north	63
3.3.45	The hot bath and the hot room in 1973	64
3.3.46	The furnace chamber	64
3.3.47	The furnace chamber after excavation	65
3.3.48	The hot dry room in 1973 looking south-east	65
3.3.49	The hot dry room looking west in 1973	66
3.3.50	The hot dry room looking north during consolidation	66
3.3.51	The hot dry room looking south during consolidation	66
3.3.52	The southern row of dwarf walls in the hot dry room	67
3.3.53	The blocked drain under the east wall of the hot dry room	67
3.3.54	The area to the south of the cold bath looking east	68
3.3.55	The area south of the heated range with the gully from the cold bath to the latrine	68
3.3.56	The drain leading south from the bath-house to the latrine	68
3.3.57	The path to the latrine	69
3.3.58	The latrine looking west from above	70
3.3.59	The latrine looking west	70
3.3.60	The latrine looking east	70
3.3.61	The drain through the rampart	71
3.3.62	Section along the north wall of the latrine	71
3.3.63	The area between the fort/annexe rampart and the bath-house looking east	72
3.3.64	The drain between the bath-house and the fort/annexe rampart	72
3.3.65	The cobbling south-west of the bath-house	73
3.3.66	The cobble foundation to the west of the latrine	73
3.4.1	Plan of the area west of the fort	73
3.4.2	The clay and cobble foundation west of the fort looking south	74
3.4.3	The pivot stone in the clay and cobble foundation	74
3.5.1	The geophysical survey	75
4.1	Diagram of section below west rampart	77
5.1	Stone 1, the inscription of the Twentieth Legion	81
5.2	Stone 1, photograph of the inscription of the Twentieth Legion	82
5.3	Stones 2 and 3	82
5.4	Stone 4, the unscribed altar	83
5.5	Stone 4, photograph of the unscribed altar	84
5.6	Stone 5	84
5.7	Stone 6, the head of a goddess	85
5.8	Stone 6, photograph of the head of a goddess	85
5.9	Stone 7, the fountain head	86
5.10	Stone 7, photograph of the fountain head	87
5.11	Stone 8	87
5.12	Stone 9	87
5.13	Stones 10 and 11	88
5.14	Stone 22	89

5.15	Photograph of a voussoir	90
5.16	Stones 50 and 51	91
5.17	Stones 52–4	92
5.18	Stones 53–4, photograph of bench supports	93
5.19	Stones 63, 64 and 69	93
5.20	Stones 76 and 82, a worked stone and the gaming board	94
5.21	Stone 82, photograph of the gaming board	94
5.22	The counterweight	95
5.23	Querns	96
6.1	Photograph of box tiles	99
6.2	The curved bricks	100
6.3	Photograph of the curved bricks	100
6.4	Marks on tiles	101
7.1	Samian	105
7.2	Coarse pottery 1–44	112
7.3	Coarse pottery 45–66	114
7.4	Coarse pottery 67–88	116
7.5	Coarse pottery 89–128	119
7.6	Coarse pottery 129–64	121
7.7	Coarse pottery 165–90	124
7.8	Coarse pottery 191–238	126
7.9	Coarse pottery 239–59	128
7.10	Bearsden mortaria from all sources by weight	131
7.11	Bearsden mortaria from all sources by number of sherds	132
7.12	Bearsden mortaria from all sources by rim percentages	132
7.13	Bearsden mortaria from sources inside and outside Scotland by weight	133
7.14	Bearsden mortaria from all sources using the maximum figure of 57 vessels for Fabric 5 (Sarrius)	133
7.15	Bearsden mortaria from different sources using the minimum figures of 37 vessels for Fabric 5 (Sarrius)	134
7.16	Stamps of potters other than Sarrius recorded at Bearsden	136
7.17	Stamps of Sarrius found at Bearsden	137
7.18	Mortaria 1–11	146
7.19	Mortaria 12–26	147
7.20	Mortaria 28–37	150
7.21	Mortaria 38–45	153
7.22	Mortaria 46–61	154
7.23	‘Native’ pot	171
7.24	The lamp	172
7.25	Amphorae 1–16	175
9.1	Base of a rectangular bottle with C ASINI MARTIAL	187
9.2	Glass 1–6, 11–13, 15, 16	189
9.3	Glass 10	190
9.4	Body and base of a square bottle	191
9.5	Base of a square bottle	191
9.6	Melted bottle base	192
9.7	Fragments of window pane	193
10.1	Intaglio of Minerva	195
10.2	Ring and intaglio of a shrimp	196
10.3	Intaglio of a shrimp	196
11.1	Metalwork 1–10	197
11.2	Lead	197
11.3	Ironwork 1, 2, 7–10, 11–14	198
11.4	Ironwork from the middle west ditch	199

11.5	Ironwork from the middle west ditch	200
11.6	A spearhead	200
11.7	Ironwork 15–22, arrowheads	201
11.8	Arrowheads from the middle west ditch	201
11.9	Ironwork, 62, shield boss	202
11.10	The exterior face of the shield boss	203
11.11	The interior face of the shield boss	203
11.12	Ironwork 63–5	204
11.13	Ironwork 88, hoe	205
11.14	Ironwork 89, 90, 92, 93, 94, 96, 97	206
11.15	The anvil	207
11.16	Ironwork 98, 99	208
11.17	Ironwork 100–9, 112–15, 119	209
11.18	Ironwork 120–7	210
11.19	Ironwork 132, 134, 136, 137, 144, 152–4	211
11.20	Ironwork 161–3	212
11.21	Ironwork 222, 223	213
11.22	The hub lining	214
11.23	Ironwork 235–46, nails	215
11.24	Ironwork 247–56, 277, 286–8	216
11.25	Ironwork 298, 300, 302, 304, 305, 310, 312, 315–17, 319–24, 328, 329	217
11.26	Ironwork 330, 331	219
11.27	The ?pivot-block	219
13.1	Cereal bran	229
13.2	Leguminosae, testa fragments	230
13.3	Miscellaneous plant remains	233
13.4	Pollen diagram	238
13.5	Experimental grain processing of emmer and spelt wheats to compare with bran from Roman sewage	243
13.6	Traditional Scottish processing of hulled six-row barley for pearl (pot) barley	243
13.7	Cereal processing	244
13.8	Macroscopic plant remains: summary diagram	263
13.9	<i>Sitophilus granarius</i> and emmer wheat groats after grinding in a rotary quern	274
17.1	Fragments of grain skins from the sewage in the east annexe ditch	294
18.1	The distribution of <i>ascaris</i> and <i>trichuris</i> in the east annexe ditch	302
19.1	A leather shoe	305
19.2	Leather shoes	306
21.1	Trajan's Column in Rome shows the construction of a Roman fort	313
21.2	Plan and restored elevation of the wall of a timber building	315
21.3	Plans of granaries	316
21.4	Headquarters buildings on the Antonine Wall	318
21.5	A reconstruction of the headquarters building without a forehall and a basilica	319
21.6	A reconstruction of the headquarters building with a forehall	321
21.7	The development of the bath-house	322
21.8	A cut-away reconstruction of the bath-house	324
21.9	A reconstruction of the bath-house	325
21.10	Reconstruction plan and section of the latrine	326
21.11	A reconstruction of the interior of the latrine	328
21.12	Plan with the <i>actus</i> grid superimposed	329
21.13	Plans of forts on the Antonine Wall	331
21.14	(a) Plan of Bearsden 1 and (b) Bearsden 2	333
21.15	A possible reconstruction of building 7	335
21.16	A restored section through a barrack-block	336

21.17	The food logistics of a cavalry pony	338
21.18	The mucking-out logistics	339
21.19	A reconstruction of the buildings in the north-west area of the fort	340
21.20	A reconstruction of the buildings in the north-east area of the fort	341
21.21	Plans of barrack-blocks	342
21.22	A reconstruction of the fort and annexe	345
21.23	The distribution of mortaria	351
21.24	The distribution of cooking pots	352
21.25	The distribution of jars, beakers and plates	353
21.26	The distribution of bowls and dishes	354
21.27	The distribution of samian	355
21.28	The distributions of flagons, lids and Cologne ware	356
21.29	The distribution of glass	357
21.30	The distribution of amphorae	358
21.31	The sources of supply	370
21.32	The distribution of Sarrius' mortaria at Bearsden	372
21.33	A mortarium bearing the name of Sarrius	373
21.34	Pottery vessels found at Bearsden	373
21.35	Figs	374
21.36	Burnt wattle and daub from building 3	375
21.37	Coin of Antoninus Pius	376
21.38	View shed analysis from the fort at Bearsden	378
22.1	The bath-house following consolidation	381
22.2	The bath-house following consolidation from the west	382
22.3	The latrine and bath-house following consolidation	383

# LIST OF TABLES

3.1	Building 3: the size of the rooms	28
3.2	Building 7: the size of the rooms	33
4.1	Colouration of soil samples	78
7.1	Breakdown of pottery from the whole site	108
7.2	Quantification of all the mortaria from Bearsden	130
7.3	Mortaria from sources inside Scotland	131
7.4	Mortaria from sources outside Scotland	131
7.5	Summary of mortaria stamped by Sarrius	139
7.6	Raetian mortaria in Scotland	142
7.7	Vessels sampled for heavy mineral analysis	158
7.8	Percentages of non-opaque minerals of samples	159
7.9	Analysis of grits in mortaria fragments	161
7.10	Catalogue of mortaria fragments	163
7.11	Combined analytical results of local oxidised wares samples	166
7.12	Chemical data relating to oxidised wares and clay daub	167
7.13	Sampled sherd information	168
7.14	Pottery and daub: Np vs Hf	170
7.15	Pottery and daub: Ta vs Np	170
7.16	Quantification of amphorae fabrics and types present in the assemblage	173
7.17	Quantification of commodities represented by the amphorae	173
7.18	Pottery (excluding amphorae and samian) shown as percentages	176
7.19	Vessel types from the whole site, shown as percentages of their EVES (excluding samian)	177
7.20	Comparison of vessel types with other second-century assemblages, shown as a percentage	177
7.21	Vessel types in local fabrics by EVEs, shown as a percentage	178
8.1	Analysis of mortars	183
13.1	East annexe ditch, macroscopic plant remains	224
13.2	East annexe ditch, macroscopic plant remains from c 1ccm samples	236
13.3	Macroscopic plant remains in the depression within the fort	246
13.4	Inner west ditch, macroscopic plant remains	252
13.5	Middle west ditch, macroscopic plant remains	258
13.6	Outer west ditch, macroscopic plant remains	260
13.7	South ditch, macroscopic plant remains	262
13.8	Turf ramparts, macroscopic plant remains	264
13.9	Selected useful plants from other Roman military sites in Britain and Germany	273
13.10	Measurements of cereal and large grass pollen	275
16.1	The animal bone	288
17.1	Coleoptera in the east annexe ditch	290
17.2	Coleoptera in the inner west ditch	295
17.3	Coleoptera in the middle west ditch	296

17.4	Coleoptera in the outer west ditch	297
17.5	Coleoptera in the south ditch	297
17.6	Coleoptera in the depression south of building 7	298
17.7	Coleoptera in building 7	299
18.1	Dimensions of <i>Trichuris ova</i>	301
21.1	Forts on the Antonine Wall	312
21.2	Headquarters buildings on the Antonine Wall	320
21.3	Antonine barrack-blocks	337
21.4	Functional groups of artefacts	360
21.5	Relative ranking of functional groups of artefacts	361
21.6	Functional groups in barracks and granaries	362
21.7	Functional groups in ditches, ramparts and roads	363
21.8	Functional groups in the intervallum and unknown contexts	363
21.9	Functional groups in the annexe	364
21.10	Health care body sub-group	365
21.11	Kitchen/food sub-group	366
21.12	Rough Castle, kitchen/food sub-group	367
21.13	Crawford, kitchen/food sub-group	368
21.14	Bearsden, functional group percentages from selected buildings	368
21.15	The building of the Antonine Wall	377

# PREFACE

The excavations at Bearsden lasted from 1973 to 1982 with the post-excavation work continuing thereafter until 1992; there was then a hiatus which largely coincided with my period as Chief Inspector of Ancient Monuments and while the specialist reports were being prepared. All work was undertaken as part of my official duties as an inspector of ancient monuments and funded by Historic Scotland and its predecessor departments. During the years from 1973 the structure of archaeology changed considerably, with most excavations now undertaken

by archaeologists employed full-time as excavators. The work at Bearsden had to be fitted round other duties and the pressure of those undoubtedly delayed the publication of this final report, though interim and advance reports and discussions had appeared elsewhere (eg Breeze 1974a; Breeze 1977a; Dickson, J H 1979b; Dickson et al 1979; Breeze 1982; Breeze 1983; Knights et al 1983; Breeze 1984a; Keppie & Arnold 1984; Breeze 1986; Collins 1986; Dickson, C & Dickson, J H 1988; Dickson, C 1989; Dickson, C 1991).



*Illustration i*

The bath-house at the end of the 1973 being prepared for an influx of visitors.



Illustration ii  
The opening of the bath-house in 1982.

Many of the above references relate to the detailed work and subsequent publications by Camilla Dickson and her husband Jim Dickson on the botanical remains discovered at Bearsden. This has been amongst the most important aspect of all the post-excavation analysis and even led to a series of letters in *The Times* on feeding Roman troops (20, 27 and 29 June 1983). There were special exhibitions of the objects from the excavations at the Hunterian Museum, University of Glasgow, and the Lillie Art Gallery, Milngavie, in 1977.

This long delay has also allowed for discussion and reassessment of the structural evidence, not least by Geoff Bailey (Bailey 1994 and forthcoming), and of the artefactual material. Of particular importance has been the work on the pottery. At an early stage Louise Hird appreciated that the pottery did not form a normal Antonine Wall assemblage. The unusual forms, which appeared to me to be early second century, suggested to her local production, and this was confirmed by Geoff Collins; this in turn

led to detailed chemical and petrological analysis of the local oxydised wares (Breeze 1986: 186; Collins 1986; Gillings 1991). This important observation attracted the attention of Vivien Swan and led her to undertake a wide-ranging survey of the pottery from the Antonine Wall with important ramifications (Swan 1999). Vivien died before she could complete her report on the pottery from Bearsden but this was subsequently undertaken by Paul Bidwell and Alex Croom. The significance of the local manufacture is reflected in their report and that on the mortaria by Katharine Hartley. The fact that there was only one period of occupation at Bearsden was also amongst the new material that led Nick Hodgson to review the evidence for two periods of occupation on the Antonine Wall (Hodgson 1995: 31). The undertaking of an excavation project on a seasonal basis retains certain advantages in that time is allowed for consideration between each season, yet the problem with this project was that it was never certain that a further season would be possible, so each year had to be planned as if it was the last. Nevertheless, work was carried out within a strategic framework prepared before the excavation began. This determined that the main aims of the excavation would be to discover the state of any remains, obtain a complete plan of the fort in all periods of occupation, determine the history of the site and investigate the possibility of the existence of an annexe or a civil settlement (internal memo dated 21 March 1972 on AMG/A40/2/1, lodged in the SRO). When it became clear that the botanical material survived so well, tracing the vegetational history of the site was added to the list. It is fair to state that these aims were largely achieved.

The extension of a single four-week trial excavation into a ten-year excavation project resulted in the production of annual plans. The continuing emendation of the plan as a result of new information becoming available is a salutary lesson in trying to interpret too much from limited information: *Britannia* 5 (1974) – 10 (1979).

The excavation, in particular at its beginning and end, provoked much public interest. At the end of the first season, a television report on the discoveries led to an enormous influx of visitors. The erection of a fence prevented visitors from inadvertently falling into the excavation, and, together with a nightwatchman, helped to protect the visible remains from unwanted attention (illus i). The public interest was focused on the bath-house, which was presented by the then owners, Miller Homes, to the state. This was protected by a timber cover and reopened in 1979 for the visit of the Congress of Roman Frontier Studies and then consolidation. The bath-house was opened to the public by Allan Stewart, MP, Minister for Home Affairs and the Environment in the Scottish Office on 17 May 1982 (illus ii), the first such event in Scotland and soon repeated as new monuments were acquired and new displays created (Breeze 1984a: 64–7).

The artefactual material from the excavation has been allocated to the Hunterian Museum, University of Glasgow, while the archive lies in Historic Environment Scotland, Edinburgh.

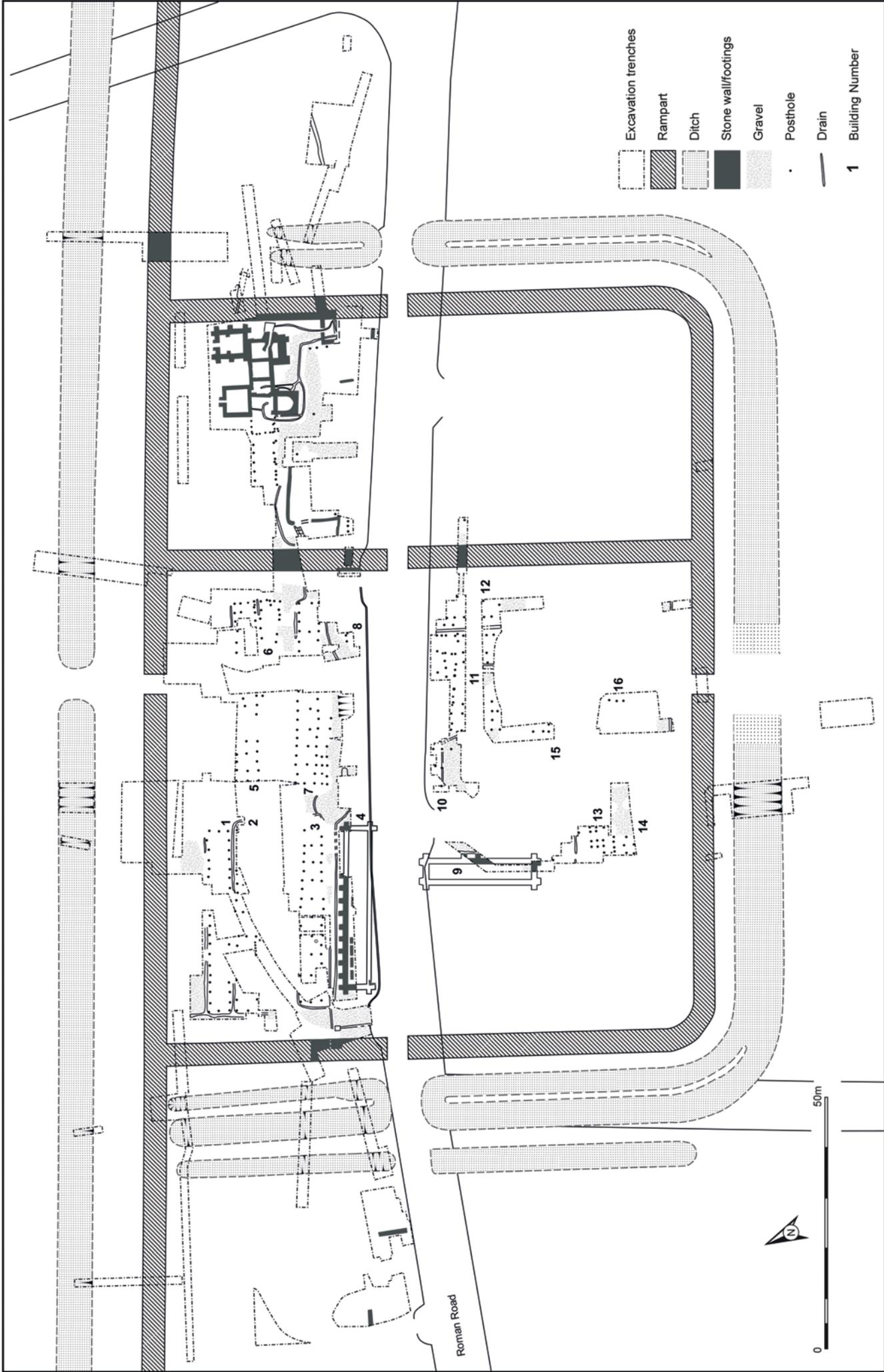


Illustration iii  
The Roman fort and annexe at Bearsden.



# ACKNOWLEDGEMENTS

Most grateful thanks are due to Professor Valerie Maxfield, assistant director through every season of work on site, for her encouragement, advice, support and for reading and commenting on this report, to Dennis Gallagher for his tireless work throughout the post-excavation process, and to Gemma Hudson of AOC Archaeology Ltd for her skill and patience in preparing the illustrations for publication; this report would not have achieved publication without their labours. I am also particularly grateful to Michael J Moore for his suite of 'reconstruction drawings' which not only bring the buildings to life but also help clarify issues which are otherwise difficult to explain.

Over two hundred people worked on the excavation, many returning year after year. Sincere thanks are offered to all, but in particular to the site supervisors: Merlyn Vyner, senior supervisor, Paul Austen, Alison Caldwell, Vicky Crosby, the late Brian Dobson, the late Tom Robertson, Judith Stones, David Thornborrow, Ceri Vyner (now Lamb), Avril Whittle (now Sinclair) who prepared many of the site drawings, and to the finds recorders, Susan Ritchie (now McLarty) and Pamela Breeze. I am grateful to all the specialists for their reports, which have been revised for publication, and in particular to the late Mrs Camilla Dickson for her labours, advice, encouragement and patience, as well as a most important report. I am also grateful to Geoff Bailey, Paul Bidwell, Paul Buckland, Rikke Giles, Adrian Goldsworthy, Bill Hanson, Ian Haynes, Peter Hill, Lawrence Keppie, Michael J Moore and Tony Rook for advice and discussion.

Permission to excavate was kindly granted by Miller Homes (Northern) Ltd, Woodblane Developments (Scotland) Ltd, Bearsden and Milngavie District Council, who also provided much help and support, and Mr and Mrs M MacMahon. The project has been funded by Historic Scotland and its predecessor departments. I am grateful to Historic Scotland for funding research visits to UK museums and archaeological sites in search

of comparative material, and in particular to Lisa Brown, Rebecca Jones and Rod McCullagh for their assistance in the final stages of the preparation of this report.

The drawings of the excavations were produced by Dennis Gallagher while those of the stonework, metalwork and leather were prepared by Tom Borthwick. Vivien Jones kindly prepared the rubbings and scans of the samian. Michael J Moore drew the artist's impressions of the fort and its buildings.

Lawrence Keppie would like to thank Dennis Gallagher for preparing lists of material, from which the metalwork report was written, Abigail Tebbs for seeking parallels in the published literature, and Dr M C Bishop, Professor E A Moignard, Dr R S O Tomlin, Professor R J A Wilson and The Hair Studio, Cumbernauld, for advice and help. Malcolm Chapman arranged access to the material in stores at the Hunterian Museum. Kay Hartley acknowledges the help received by the National Museum of Scotland, the Hunterian Museum, University of Glasgow, and Dumfries Museum in making their collections available for study.

Frances McLaren would like to acknowledge that part of her research was carried out under a two-year NERC grant No GR3/957; Professor Martin Jones, Alan Fairweather, Peter Murphy, Leonor Peña Chocarro and George Willcox for providing the other ancient material cited in the text; Gordon Hillman for providing the modern wheat standards from his reference collection at The Institute of Archaeology; Dr Ann Butler and Eamonn Keaveney for reading drafts of the script; with particular thanks to Professor Daniel Zohary for discussing and explaining various parts of the wheat story.

The German translation of the abstract is by Sonja Jilek and the French by Richard Fawcett: I am grateful to both.

Illustrations 2.1 and 2.2 are reproduced by kind permission of the Society of Antiquaries of London with the images supplied by RCAHMS, and 21.37 by kind permission of the Hunterian Museum, Glasgow University.



# LIST OF CONTRIBUTORS

Lindsay Allason-Jones  
11 Castle Terrace, Berwick-upon-Tweed TD15 1NR

Dr Donald Bailey<sup>‡</sup>  
formerly of the Department of Greek and Roman Antiquities, The British Museum, London WC1B 3DG

Professor Mike Baillie  
Palaeoecology Centre, Queen's University, Belfast BT7 1NN

Paul Bidwell  
formerly of Tyne and Wear Archives and Museums, Arbeia Roman Fort and Museum, Baring Street, South Shields NE33 2BB

Dr Sjoerd Bohncke  
Faculty of Earth and Life Sciences, Vrije Universiteit, De Boelelaan 1085, 1081 HV Amsterdam, The Netherlands

Professor David Breeze  
formerly of Historic Scotland, Longmore House, Salisbury Place, Edinburgh EH9 1SH  
36 Granby Road, Edinburgh EH16 5NL

Susan Chambers  
formerly of the National Museums of Scotland, Edinburgh EH1 1JF

G H Collins<sup>‡</sup>  
late of the British Geological Survey, West Mains Road, Edinburgh EH9 3LA

Dr Anne Crone  
AOC Archaeology, Edgefield Road Industrial Estate, Loanhead EH20 0SY

Alex Croom  
Tyne and Wear Archives and Museums, Arbeia Roman Fort and Museum, Baring Street, South Shields NE33 2BB

Brenda Dickinson  
28–30 Main Street, Woodnewton, Peterborough PE8 5EB

Mrs Camilla Dickson<sup>‡</sup>  
per Department of Botany, University of Glasgow, Glasgow G12 8QQ

Professor James H Dickson  
Northlight Heritage Dickson Laboratory for Bioarchaeology, Kelvin Campus, 2317 Maryhill Road, Glasgow G20 0SP

Professor Andrew Fitzpatrick  
School of Archaeology and Ancient History, University of Leicester, University Road, Leicester LE1 7RH

Dennis B Gallagher  
4 Sylvan Place, Edinburgh EH9 1LH

Dr Geoff D Gaunt  
formerly of the Department of Archaeological Sciences, University of Bradford, Bradford BD7 1DP

Dr Rikke D Giles  
FoxDog Farm, PO Box 1330, Kingston WA 98346 USA

Dr Mark Gillings  
School of Archaeology and Ancient History, University of Leicester, University Road, Leicester LE1 7RH

Katharine F Hartley  
Flat 2, 27 Hanover Square, Leeds LS3 1AW

Dr Martin Henig  
Institute of Archaeology, 36 Beaumont Street, Oxford OX1 2PG

Dr Andrew K G Jones  
Department of Archaeology, King's Manor, University of York, York YO1 7EP

Professor Lawrence J F Keppie  
the Hunterian Museum, University of Glasgow, Glasgow G12 8QQ

John Locke  
formerly Environmental Archaeology Unit, University of York, York YO1 5DD

Dr Euan MacKie  
former Senior Curator of Archaeology and Anthropology at the Hunterian Museum, University of Glasgow, Glasgow, G12 8QQ;  
Fairhills, Station Road, Old Kilpatrick G60 5LT

Frances S McLaren  
formerly of the Department of Environmental Sciences, University of East London, Romford Road, London E15 4LZ

Ian D Máté  
Chantstoun, South Mains, Bathgate EH48 4NP

Jef Maytom  
formerly Department of Archaeology, University of York, York YO1 7EP

Graham C Morgan  
formerly of the School of Archaeological Studies, University of Leicester, 113 Coleridge Drive, Narborough LE9 5QH

Michael J Moore  
15/4 North Avenue, Leicester LE2 1TL

Professor Jennifer Price  
formerly of the Department of Archaeology, University of Durham, Durham DH1 3LE  
Garth End, Well Garth, Heslington, York YO10 5JT

Dr Sian Rees  
Datchet, Station Road, Raglan, Gwent NP5 2EP

Professor Anne S Robertson<sup>†</sup>  
formerly of the Hunterian Museum, University of Glasgow G12 8QQ

Jackaline Robertson  
AOC Archaeology, Edgefield Road Industrial Estate, Loanhead EH20 9SY

Adam T Welfare  
Historic Environment Scotland, John Sinclair House, 16 Bernard Terrace, Edinburgh EH8 9NX

Dr David F Williams  
Department of Archaeology, University of Southampton, Southampton SO17 1BJ

# ABSTRACT

The Roman fort at Bearsden (NS 545 721) was occupied within the period 142 to 165. It was placed within a landscape already at least partly cleared of woodland and supporting a diversity of pasture, heath, bog and aquatic vegetation. The original plan for a fort (Bearsden 1), covering 1.72ha and laid out to a grid measuring  $5 \times 4$  *actus*, was amended after work on the headquarters building, a granary and bath-house, being divided into a fort (Bearsden 2) and an annexe roughly on a ratio of 2:1. The headquarters building and granary were retained, resulting in an eccentric plan for the fort; the bath-house was demolished and rebuilt. The granaries were of stone, other buildings of timber including, uniquely on the Antonine Wall, the headquarters, which, again uniquely, appears to have included a forehall. Its construction, and the plan of the barrack-blocks, suggests that cavalry were based at both Bearsden 1 and 2. There were an irregular number of ditches; the turf rampart appears to have been surmounted by a timber breastwork.

The annexe contained a bath-house and a latrine. Analysis of the sewage revealed that the soldiers ate both emmer and spelt wheat, barley, pulses, local fruit and nuts, figs, coriander, celery and dill, and opium poppy; they had a mainly plant-based diet; they suffered from worms; they appear to have used moss to clean themselves.

Supplies such as food and pottery came from southern Britain, Gaul and Spain. Much pottery was made locally.

Occupation ended with the buildings demolished and burnt, the rampart partially slighted and its timber breastwork burnt.

The bath-house and latrine were placed in state care in 1982.

## ZUSAMMENFASSUNG

Das römische Kastell von Bearsden (NS 545 721) war in der Zeit von 142 bis 165 belegt. Es wurde in einem zumindest schon teilweise gerodeten Naturraum angelegt, der auch Weiden, Heide, Sumpf und teilweise unter Wasser stehende Vegetation aufwies. Der ursprüngliche Kastellplan (Bearsden 1), der sich auf 1.72ha erstreckte und ein Raster von  $5 \times 4$  *actus* aufwies, wurde nach Umbauten am Kommandogebäude, dem Speicher und dem Bad geteilt, wodurch das Kastell (Bearsden 2) und ein Annex im Verhältnis 2:1 entstanden. Das Kommandogebäude und der Speicher wurden beibehalten, woraus sich ein ungewöhnlicher Kastellplan ergab; das Badegebäude wurde geschliffen und neu gebaut. Einmalig am Antoninuswall war, dass die Speicherbauten

in Stein, andere Bauten, wie auch das Kommandogebäude, das ebenfalls einzigartig am Antoninuswall eine Vorhalle aufwies, in Holz ausgeführt waren. Diese Konstruktionsmerkmale und der Grundriss der Kasernenblöcke lassen vermuten, dass in Bearsden 1 und Bearsden 2 Kavallerie stationiert war. Es gab eine uneinheitliche Anzahl von Gräben; der Rasensodenwall scheint von einer hölzernen Brustwehr bekrönt gewesen zu sein. Der Annex wies ein Badegebäude und eine Latrine auf. Analysen der Abwässer erbrachten den Nachweis, dass die Soldaten sowohl Emmer als auch Spaltweizen, Gerste, Hülsenfrüchte, einheimische Früchte, Feigen, Koriander, Sellerie und Dill, und Schlafmohn aßen; sie ernährten sich hauptsächlich von pflanzlicher Nahrung, litten an Wurmbefall; um sich selbst zu reinigen scheinen sie Moos verwendet zu haben.

Nachschub an Lebensmitteln und Keramikgefäße kam vom Süden Britanniens, von Gallien und Spanien. Viel Keramik wurde aber auch lokal hergestellt. Die Besiedlungsgeschichte endet mit dem Brand und Abriss der Bauten, einem teilweise geschliffenen Wall und der niedergebrannten hölzernen Palisade. Das Badegebäude und die Latrine wurden 1982 in staatliche Obhut übergeben.

## RÉSUMÉ

La forteresse Romaine de Bearsden était occupée pendant l'époque 142 à 165. Elle était localisée dans un paysage qui a été déjà au moins partiellement débarrassé de bois, et qui soutène diversité de pasturage, bruyère, marécage et végétation aquatique. Le plan primitif de la forteresse (Bearsden 1), qui occupe 1.72ha, et qui a été disposé sur une grille mesurant  $5 \times 4$  *actus*, a été modifié après le commencement de construction du quartier général, du grenier et de la maison de bains; par la suite elle était se divisée en une forteresse (Bearsden 2) et une annexe, en rapport de 2:1. Le quartier général et le grenier étaient tous les deux conservées, et en conséquence la forteresse avait un plan irrégulière; la maison de bains était démolit et reconstruit. Le grenier était construit de pierre, mais des autres bâtiments de bois; uniquement sur le mur Antonin, le quartier général était de bois, et aussi uniquement il semble qu'il en avait eu une avant-salle. Sa construction de bois et le plan des casernes suggèrent que Bearsden1 et aussi Bearsden 2 étaient tous les deux pour la cavalerie. Il y'avait un nombre irrégulier de fosses autour de la forteresse; il semble que le rampart tourbeaux était surmonté

par un parapet de bois. L'annexe a contenu une maison de bains et une latrine. L'analyse d'égouts a démontré que les soldats ont mangé de l'émmer et du spelt blé, de l'orge, des légumineuses, fruits et noix locaux, du coriandre, du céleri, et de l'aneth, et du pavot d'opium. Ils ont mangé un régime principalement herbivore. Ils étaient affligés de vers intestinaux. Il semble qu'ils nettoyaient eux-mêmes avec de la mousse. L'approvisionnement en nourriture et en poterie, par

exemple, était envoyé par le sud Bretagne, Gaul et Espagne. Mais beaucoup de poterie était fabriquée localement.

L'occupation de la forteresse était terminée lorsque les bâtiments étaient détruits et brûlés. Le rempart était partiellement démolit, et son parapet brûlé.

La maison de bains et la latrine ont été mises en charge de l'état en 1982.

# SUMMARY

Rescue and research excavations from 1973 to 1982, funded by Historic Scotland and its predecessor departments, on and around the site of the Roman fort at Bearsden on the Antonine Wall (NS 545 721) revealed evidence for the vegetation history of the area, elucidated the plan of the fort and annexe, and the history and occupation of both, and provided important information on the diet of the soldiers (illus iii).

Pollen analysis suggests that when the army arrived the vegetation in the area was mainly of established pasture with some partly cleared woodland. Trees were mainly of alder and hazel with some willow while grasses, heather and rushes grew in cleared areas. The climate may have been a little cooler than today.

The fort, built on uneven ground, was planned to be an enclosure (Bearsden 1) measuring 152m east-west × 113m north-south across the ramparts thereby covering 1.72ha, and 143m × 104m within the ramparts, 1.48ha. During building work this large enclosure was divided into a western fort (Bearsden 2), 102m east-west over the ramparts, 93m within (1.15ha/0.95ha), and an annexe 54m east-west over the ramparts, 45m within (0.61ha/0.47ha). Bearsden 1 was laid out within the framework of a grid measuring 5 × 4 *actus*. Five buildings in Bearsden 2 were about one *actus* long while the distance across the width of one pair of buildings was half an *actus*, and across another pair only a little less. This suggests that the soldiers who built the first fort also planned and possibly built the second, which in turn suggests that one activity followed closely on the other. The changes at Bearsden may have had wider implications for military deployment on the Antonine Wall; perhaps it was at this point, rather than when the secondary forts were added to the Wall, that some units were moved.

The fort and annexe were attached to the rear of the Antonine Wall, the north defences of both being the Wall itself. The Military Way passed through the centre of the fort; the line is now occupied by Roman Road. There were three ditches to the west of the fort, one wide ditch to the south and two to the east of the annexe: there were no ditches between fort and annexe. No ditch showed any evidence for recutting.

The stone rampart base surrounding Bearsden 1 was 4.5m (15½ Roman feet) wide with the overlying turves averaging 400mm × 320mm (the regulation size was 430mm × 300mm). The rampart between the fort and annexe was 4.35m wide. To its east burnt debris about 1.5m wide and containing thin branches of

willow, alder and hazel is best interpreted as the remains of the rampart's timber breast-work.

The buildings started or completed in Bearsden 1 included the headquarters, a granary, the bath-house and latrine. The first two buildings were retained in Bearsden 2, creating an eccentric plan for the fort, but the bath-house was demolished and rebuilt on a different alignment. Identified buildings of Bearsden 2 include part of the headquarters building together with a possible forehall; two barrack-blocks, each apparently containing officer's quarters and eight rooms; two stone granaries; a possible storehouse, and three long-narrow buildings; there were also open areas, some owing to the steep slope in the north half of the fort; other areas contained depressions, perhaps for the collection of water, and small pits. Most of the buildings were of timber with wattle and daub walls and probably thatched roofs. The exceptions were the granaries which were stone, one at least probably with a tile roof. A forehall suggests the presence of cavalry in Bearsden 1, while barrack-blocks with eight rooms also implies cavalry. The small size of the fort and the apparent lack of accommodation for a complete unit suggests that Bearsden was linked to another fort, possibly Castlehill, 2.5km to the west, which appears to have been too small to hold all of the Fourth Cohort of Gauls attested there.

The annexe contained a bath-house and a latrine. An earlier heated room, presumably part of a bath-house, was abandoned before completion and replaced by a new building on a different alignment. The new bath-house contained a timber changing room and cold room, a stone heated range (two warm rooms, a hot room and a hot bath) and a cold bath, with a hot dry room apparently added later. The latrine was built against the inside face of the east annexe rampart. The sewage de-bouched into the east annexe ditches. The contents of the outer ditch included fragments of moss which may have been used for cleaning purposes.

Analysis of the sewage indicated that the soldiers had a mainly plant-based diet. Different species of wheat were found: emmer may have been used for porridge and spelt for bread while durum may have been used to make pasta and/or porridge. Barley may have been used for thickening broth. Figs and the spices coriander, celery and dill, with the oily seeds of linseed and opium poppy together with pulses were consumed, as were local fruit and nuts. The soldiers suffered from worms.

The soldiers were supplied with food and pottery from southern Britain and from Gaul and Spain. Considerable quantities of pottery were made in the area of Bearsden. These

include the wares of Sarrius, a potter established in the English Midlands, who appears to have established a workshop in the area, almost certainly at Bearsden.

Occupation outside the fort was sought to west, east and south, but with little success. Two short cobble foundations were found to the west of the fort, one containing a pivot-hole at one end. Only a gulley was located to the east of the annexe.

Hints at minor modifications in the fort were recorded; as many as three amendments occurred in the second bath-house, excluding its predecessor. Pottery reveals that the fort was

occupied in the Antonine period, that is from 142/3 to no later than 170. Burnt debris demonstrates that the fort was destroyed, probably by the Roman army itself. By this time the outer east annexe ditch appeared to have silted to about half its original depth with sewage from the latrine. Two almost unworn coins dating to 153–5 suggest that the fort was abandoned soon after that date.

The bath-house and latrine were placed into state care in 1982 having been consolidated, landscaped and laid open for public viewing (Breeze 1984: 64–7).