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# FROM AN ANCIENT EDEN TO A NEW FRONTIER:

AN ARCHAEOLOGICAL JOURNEY ALONG THE CARLISLE  
NORTHERN DEVELOPMENT ROUTE

# FROM AN ANCIENT EDEN TO A NEW FRONTIER: AN ARCHAEOLOGICAL JOURNEY ALONG THE CARLISLE NORTHERN DEVELOPMENT ROUTE

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Front cover: *The CNDR under construction, looking south across Stainton West and the River Eden floodplain; Neolithic leaf-shaped arrowhead from Stainton West*  
Rear Cover: *The palaeochannel at Stainton West under excavation (top); Hadrian's Wall (Stone Wall) at Knockupworth (middle); a possible Bronze Age sauna at Stainton West (bottom)*

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# Contents

List of Illustrations .....	vi
Abbreviations.....	xxxvii
Contributors .....	xxxix
Summary.....	xlii
Acknowledgements.....	xliv
 1 INTRODUCTION.....	 1
The Carlisle Northern Development Route.....	1
Archaeological Investigations along the CNDR Scheme.....	2
Methodologies .....	11
Post-excavation Assessment, and Revised Research Aims and Objectives .....	24
Methodologies for Post-excavation Analysis .....	25
Project Chronology.....	31
Structure of the Volume and the Character of the Archaeology .....	32
Project Database/Website .....	35
Archive.....	35
 2 GEOLOGY, GEOMORPHOLOGY, AND LITHOLOGY .....	 37
Geology and the Glacial Landscape .....	37
Sea-level Change.....	39
The Lower Eden Terraces and Floodplain on the CNDR.....	40
Lithology and Stratigraphy at Stainton West.....	45
 3 THE MESOLITHIC BACKGROUND AND THE EARLIEST MESOLITHIC ENCAMPMENTS ON THE CNDR.....	 53
Background .....	53
Mesolithic Activity on the CNDR: Ninth to Early Fifth Millennia cal BC .....	63
 4 A LATE MESOLITHIC ENCAMPMENT: STAINTON WEST IN THE FIFTH MILLENNIUM CAL BC....	103
The <i>Principal Palaeochannel</i> .....	103
The Late Mesolithic Encampment (Mesolithic Phase III).....	103
 5 AN ISLAND BETWEEN TWO CHANNELS: INTERPRETING THE MESOLITHIC ENCAMPMENTS AT STAINTON WEST.....	 149
Layout and Zonation of the Mesolithic Encampments.....	150
A Residential Camp? .....	154
Modelling Late Mesolithic Settlement and Mobility.....	161
Stainton West and the Eden Valley Settlement Model.....	173
Comparator Sites .....	177
Legacy .....	184
 6 THE MESOLITHIC/NEOLITHIC TRANSITION AND THE MARGINALISATION OF STAINTON WEST ..	185
The Mesolithic/Neolithic Transition .....	185
The Hiatus Phase.....	187
The Marginalisation of Stainton West .....	203
 7 THE NEOLITHIC BACKGROUND .....	207
Defining the 'Neolithic' .....	207
The Emergence of the 'Neolithic' (c 3950-3500 cal BC) .....	208
The Later Neolithic Period (c 3500-2450 cal BC) .....	228
 8 DEPOSITION AND TREE FELLING: THE EARLY NEOLITHIC PERIOD AT STAINTON WEST .....	233
The <i>Principal Palaeochannel</i> : Natural Deposits .....	233
The First 'Neolithic' Activity in the Channel.....	236
'Early Neolithic I' Activity in the Channel.....	238



	<i>'Early Neolithic II' Activity in the Channel</i> .....	271
	The Character of Early Neolithic Deposition .....	275
	Earlier Neolithic Activity in the Grid-square Area.....	279
	The Local Environment: the Palaeoenvironmental Evidence.....	284
	The Earlier Neolithic Chronology at Stainton West .....	291
9	AN ANCESTRAL GLADE? INTERPRETING THE EARLY NEOLITHIC ACTIVITY AT STAINTON WEST.....	303
	A Drier Channel.....	303
	Activity in the Channel.....	303
	An Ancestral Geography .....	308
	Sacred Groves: A Khanty Analogy .....	309
	Tree Felling and Wood Procurement .....	311
	Timber Houses and Monuments.....	314
	Woodland Clearance.....	315
	An Ancestral Future.....	316
	A Regional Comparator: Ehenside Tarn .....	318
	Becoming 'Neolithic' on the Solway Firth .....	318
10	IN THE SHADOW OF THE HENGE: THE LATER NEOLITHIC PERIOD AT STAINTON WEST .....	323
	Monuments on the Terrace .....	323
	The Later Neolithic Period at Stainton West .....	328
	A Liminal Landscape? Interpreting the Later Neolithic Activity.....	358
11	THE CHALCOLITHIC AND BRONZE AGE LANDSCAPE.....	363
	Chalcolithic and Bronze Age Chronologies.....	363
	The Chalcolithic and Earlier Bronze Age of the Inner Solway Firth ( <i>c</i> 2450-1150 cal BC).....	365
	Chalcolithic and Earlier Bronze Age Activity on the CNDR .....	382
	The Later Bronze Age of the Inner Solway Firth ( <i>c</i> 1150-750 cal BC) .....	418
12	THE CHALCOLITHIC AND BRONZE AGE: BURNT MOUNDS AND SETTLEMENT .....	427
	Burnt Mounds and Associated Features .....	427
	Settlement .....	437
13	THE 'MISSING' IRON AGE AND THE ROMAN FRONTIER.....	447
	The 'Missing' Iron Age on the CNDR .....	447
	The Roman Frontier .....	448
	The Roman Environment .....	481
	Other Romano-British Activity.....	482
14	SETTLEMENT AND ENCLOSURE: THE POST-ROMAN LANDSCAPE .....	485
	The Environment.....	485
	Archaeological and Historical Background.....	487
	Archaeological Sites on the CNDR .....	496
	Discussion: Early Medieval Settlement .....	510
	The Post-medieval Period .....	516
	Post-medieval Archaeology along the CNDR.....	521
15	ANCIENT EDEN AND BEYOND: LANDSCAPE DEVELOPMENT AT THE HEAD OF THE SOLWAY FIRTH .	531
	The Mesolithic Period: Enculturing the Eden Valley .....	532
	A Deluge and an Hiatus .....	542
	The Neolithic Transition: Channelling the Ancestors .....	543
	The Neolithic Period: A Monumental Landscape .....	551
	CNDR: A Model for Chalcolithic and Bronze Age Settlement? .....	553
	Pre-Roman and Roman Iron Age Settlement? .....	557
	The Impact of the Roman Frontier.....	560
	Early and Later Medieval Settlement and Landscape in Stainton Township .....	564
	The Creation of the Modern Rural Landscape.....	567
	The CNDR and the Development of the Cultural Landscape .....	567

BIBLIOGRAPHY .....	569
INDEX.....	623

## ONLINE

APPENDIX 1: THE WORKED STONE FROM STAINTON WEST: THE ASSEMBLAGE	
APPENDIX 2: THE WORKED STONE FROM STAINTON WEST: COARSE-STONE TOOLS, STONE IMPLEMENTS, AND OCHRE	
APPENDIX 3: THE WORKED STONE FROM STAINTON WEST, FLAKED LITHICS 1: METHODOLOGIES, RAW-MATERIAL TYPES, AND KNAPPING GROUPS	
APPENDIX 4: THE WORKED STONE FROM STAINTON WEST, FLAKED LITHICS 2: PRIMARY TECHNOLOGY	
APPENDIX 5: THE WORKED STONE FROM STAINTON WEST, FLAKED LITHICS 3: SECONDARY TECHNOLOGY	
APPENDIX 6: THE WORKED STONE FROM STAINTON WEST: RAW-MATERIAL SOURCING ANALYSES	
APPENDIX 7: THE WORKED STONE FROM STAINTON WEST: MICROWEAR ANALYSES	
APPENDIX 8: THE WORKED STONE FROM STAINTON WEST: HAFTING RESIDUES AND RESIDUE ANALYSES	
APPENDIX 9: THE WORKED STONE FROM STAINTON WEST: SPATIAL ANALYSIS	
APPENDIX 10: THE WORKED STONE FROM STAINTON WEST: INTERPRETATION AND CONCLUSIONS	
APPENDIX 11: CERAMICS	
APPENDIX 12: BEADS, OTHER LITHICS, AND OTHER OBJECTS	
APPENDIX 13: THE WOOD	
APPENDIX 14: INSECT REMAINS	
APPENDIX 15: FORAMINIFERA, OSTRACODS, AND DIATOMS	
APPENDIX 16: POLLEN AND NON-POLLEN PALYNOMORPHS	
APPENDIX 17: WATERLOGGED PLANT REMAINS	
APPENDIX 18: CHARRED PLANT REMAINS AND CHARCOAL	
APPENDIX 19: SOIL ANALYSES	
APPENDIX 20: SCIENTIFIC DATING	

# List of Illustrations

## Figures

1	Location of the Carlisle Northern Development Route .....	xlvi
2	The evaluation trenches along the northern half of the CNDR .....	4
3	The evaluation trenches along the southern half of the CNDR .....	6
4	The CFA evaluation trenches at Knockupworth, revealing elements of Hadrian's Wall and the Vallum .....	7
5	The open-area excavations and strip-and-record exercises along the northern half of the CNDR .....	8
6	The open-area excavations and strip-and-record exercises along the southern half of the CNDR .....	10
7	Parcel 27 North, Stainton West .....	16
8	The upper areas of archaeological investigation at Stainton West .....	18
9	The lower areas of archaeological investigation in the <i>Principal palaeochannel</i> at Stainton West .....	23
10	The definition of a Lithic Entity .....	26
11	A probability distribution, showing the simple calibrated radiocarbon date and the posterior density estimate .....	28
12	A probability distribution plot, showing the use of 'Sequences' and 'Phases' within the Stainton West Bayesian model .....	29
13	The bedrock geology of the southern Solway area .....	36
14	Glacial ice flows in the Solway area .....	37
15	The superficial geology of the southern Solway area .....	38
16	Relative mean sea levels (MSL) for the south and north of the Solway Firth .....	40
17	LiDAR topography of the River Eden terraces and palaeochannels where traversed by the CNDR .....	41
18	LiDAR topography of the River Eden terraces and palaeochannels, with an interpretive cross-section .....	42
19	Stainton West after topsoil stripping, showing the <i>Basal sands and gravels</i> .....	48
20	The palaeochannels at Stainton West .....	49
21	The lithological/stratigraphic units at Stainton West .....	50
22	The extent of the <i>Stabilised land surface</i> , the <i>Mesolithic overbank alluvium</i> , and the <i>Backwater channel</i> in the <i>Grid-square area</i> .....	51
23	Vertical displacement of lithic finds of knapping groups within the sediment profile .....	52
24	Mesolithic archaeological and palaeoenvironmental sites mentioned in the text .....	55
25	Mesolithic archaeological and palaeoenvironmental sites in Cumbria and south-west Scotland mentioned in the text .....	58
26	Earliest Mesolithic evidence from Terrace 1 .....	63
27	The setting for the earliest Mesolithic encampment at Stainton West .....	65
28	Structures 1 and 2, as indicated by archaeological features and distinctive Lithic Entities .....	66
29	Structure 1, as indicated by archaeological features and distinctive lithic distributions .....	67
30	Representative sections of the <i>Principal palaeochannel</i> , showing the <i>Mesolithic organic deposit</i> and its main constituents .....	71
31	The morphology of the <i>Principal palaeochannel</i> when the <i>Mesolithic organic deposit</i> formed .....	73
32	Reconstruction, showing the progressive sedimentation of the <i>Mesolithic organic deposit</i> in the <i>Principal palaeochannel</i> and the suggested arrangement of the beaver dam and lodge .....	75
33	Radiocarbon and dendrochronological wiggle-matched dates for the <i>Mesolithic organic deposit</i> and associated activity in the <i>Grid-square area</i> .....	77
34	The composition of the waterlogged wood from the <i>Mesolithic organic deposit</i> .....	84
35	Relative proportions of waterlogged plant remains in the Mesolithic deposits in the <i>Principal palaeochannel</i> .....	85
36	Percentage diagram of the pollen and non-pollen palynomorphs within the Mesolithic deposits in Bays V and B of the <i>Principal palaeochannel</i> .....	86
37	Distribution of charred and worked wood, and lithic artefacts in the <i>Mesolithic organic deposit</i> .....	89
38	The distribution of lithic artefacts on the eastern bank of the <i>Principal palaeochannel</i> and the features, in the <i>Grid-square area</i> , associated with the <i>Mesolithic organic deposit</i> .....	95
39	East-facing section of tree-throw <b>90208</b> .....	97
40	Distribution of lithic material in the grid squares surrounding tree-throw <b>90208</b> .....	99
41	The Stainton West site in the later Mesolithic period .....	102
42	Radiocarbon dating of ' <i>Mesolithic/Neolithic alluvium I</i> ' .....	104
43	The microlith forms associated with the later Mesolithic encampment .....	105
44	Non-microlithic retouched tools and debitage associated with the later Mesolithic encampment .....	105
45	Cores and core-dressing pieces associated with the later Mesolithic encampment .....	106
46	Sources of raw materials at Stainton West .....	106
47	Axe blades/fragments associated with the later Mesolithic encampment .....	109

48	The tuff axe/adze from Holbeck Park .....	111
49	Mesolithic activity areas, lithic distribution, and relevant archaeological features in the <i>Grid-square area</i> ..	114
50	The lithic distribution and archaeological features associated with the Habitation Area .....	115
51	North-west-facing section of pit <b>90392</b> .....	116
52	North-west-facing section of pit <b>90434</b> .....	116
53	Pits and stakeholes comprising Structures 3-5, Lithic Entities, and grid squares, and coarse-stone tools ...	117
54	South-east-facing section of pit <b>90258</b> .....	118
55	The ochre blade .....	119
56	The lithic distribution and archaeological features associated with the Midden Area .....	120
57	The lithic distribution and archaeological features associated with the Tool-production Area .....	122
58	South-west-facing section of hearth <b>90263</b> .....	123
59	The lithic distribution and archaeological features associated with the Hide-working Area .....	124
60	South-west-facing and south-east-facing sections through the south-west quadrant of pit <b>90245</b> containing hearth <b>90507</b> .....	126
61	The lithic distribution and archaeological features associated with the Butchery Area .....	128
62	The relative lack of lithics, indicating the Lithic-free Activity Area .....	130
63	The lithic distribution and archaeological features associated with the Axe-working Area .....	131
64	South-west-facing section of pit <b>90115</b> .....	132
65	The distribution of tuff cores and debitage within the Axe-working Area .....	134
66	The lithic distribution and archaeological features associated with the Habitation Area ( <i>'Mesolithic encampment II'</i> phase) .....	135
67	The distribution of the microliths associated with Structure 6 .....	137
68	The lithic distribution and archaeological features associated with the Tool-production Area ( <i>'Mesolithic encampment II'</i> phase) .....	138
69	Tool-production Area ( <i>'Mesolithic encampment II'</i> phase): distribution of chert and brown/grey-flint.	140
70	Radiocarbon dating of the later Mesolithic encampment .....	144
71	Radiocarbon dating of <i>'Last Mesolithic encampment II'</i> and the earliest age of death of a tree in Cluster 2 ( <i>'Mesolithic/Neolithic alluvium II'</i> ) .....	145
72	The relationship between the shifting structures and the lithics in the <i>Grid-square area</i> .....	146
73	Palaeochannels and islands on the Stainton West floodplain .....	149
74	The lithic distribution, archaeological features, and Mesolithic activity areas in the <i>Grid-square area</i> .....	151
75	Hafted microliths forming composite tools .....	152
76	The complete reduction sequence based on chert, pebble-flint, and brown-flint lithics .....	155
77	The range of tool forms from the Mesolithic encampments .....	156
78	The source areas of the lithic materials found at Stainton West .....	161
79	The lithic site at the Eden/Eamont confluence .....	168
80	The potential habitual range of the Stainton West hunter-gatherers .....	174
81	Possible comparator sites .....	175
82	A model of late Mesolithic seasonal settlement and mobility for the Solway Firth and Eden Valley .....	179
83	The potential social range of the Stainton West hunter-gatherers .....	182
84	The Hiatus Phase deposits at Stainton West .....	187
85	Sections across Bays B, D, and F, showing the position of the <i>Mesolithic alluvium</i> .....	189
86	Evolving Mesolithic stream flow within the <i>Principal palaeochannel</i> .....	190
87	Sections across Bays B, D, and F, showing the position of the <i>Mesolithic/Neolithic alluvium</i> .....	193
88	Distribution of the oaks in dendrochronological Cluster 2 within the <i>Mesolithic/Neolithic alluvium</i> .....	194
89	Knapping groups within the <i>Mesolithic overbank alluvium</i> , and the radiocarbon-dated features relevant to the chronology of the Hiatus Phase .....	199
90	Monolith samples used to date the <i>Mesolithic/Neolithic alluvium</i> .....	201
91	Radiocarbon dating of the Hiatus Phase ( <i>'Mesolithic/Neolithic alluvium II'</i> ) .....	202
92	Earlier Neolithic sites mentioned in the text .....	208
93	The Neolithic house/hall at Lockerbie Academy .....	209
94	Modelled radiocarbon dates from the Neolithic house/hall at Lockerbie Academy .....	210
95	Early Neolithic sites on the Furness Peninsula .....	211
96	The Early Neolithic tree-throw at Holbeck Park, which produced Carinated Bowl pottery and a rod microlith .....	212
97	Modelled radiocarbon dates from Holbeck Park .....	213
98	Modelled radiocarbon dates from Stainton Quarry .....	215
99	Modelled radiocarbon dates from Holbeck Park and Stainton Quarry .....	215



100	Modelled radiocarbon dates from the early enclosure beneath Long Meg .....	218
101	Modelled radiocarbon dates from Site 98, Langdale .....	224
102	Palaeoenvironmental sites containing evidence for the Neolithic period .....	225
103	Later Neolithic sites mentioned in the text .....	228
104	The Stainton West site .....	232
105	The extent of the <i>Earlier Neolithic organic deposit</i> in the <i>Principal palaeochannel</i> .....	234
106	The <i>Earlier Neolithic organic deposit</i> and the <i>Earlier Neolithic alluvium</i> in the <i>Principal palaeochannel</i> .....	234
107	The extent of the <i>Earlier Neolithic alluvium</i> in the <i>Principal palaeochannel</i> .....	236
108	Wooden structures and <i>in-situ</i> stakes in the <i>Earlier Neolithic organic deposit</i> , and the underlying boughs from the <i>Mesolithic/Neolithic alluvium</i> .....	237
109	Possible fish-trap <b>75935</b> .....	238
110	Composite image of wood preserved within the <i>Earlier Neolithic organic deposit</i> .....	239
111	Wooden Structures 1-3 .....	242
112	Radiocarbon and dendrochronological wiggle-matched dates for the wooden structures .....	246
113	Wooden artefacts and non-structural worked wood in the <i>Earlier Neolithic organic deposit</i> .....	247
114	Unworked coarse stone in the <i>Principal palaeochannel</i> , associated with 'Early Neolithic I' activity .....	259
115	The distribution of worked coarse-stone artefacts in the <i>Principal palaeochannel</i> .....	263
116	The distribution of polished-stone axeheads, flaked lithics, and pottery in the <i>Principal palaeochannel</i> .....	264
117	Rim from an Early Neolithic traditional Carinated Bowl vessel .....	271
118	Artefacts in the <i>Principal palaeochannel</i> , possibly associated with 'Early Neolithic II' activity .....	272
119	Suggested zones of Early Neolithic deposition within the <i>Principal palaeochannel</i> .....	276
120	The burnt lithic distribution in the vicinity of tree-throw <b>90262</b> .....	280
121	The formation of a tree-throw, with deposited material .....	281
122	Earlier Neolithic activity in the <i>Grid-square area</i> .....	282
123	The composition of waterlogged wood from the <i>Earlier Neolithic organic deposit</i> .....	285
124	The relative increase of dung beetles in the Neolithic deposits, as compared to the Mesolithic deposits, within the <i>Principal palaeochannel</i> .....	286
125	Pollen monoliths from the <i>Principal palaeochannel</i> and <i>Grid-square area</i> .....	288
126	Pollen percentage diagram for the Neolithic and Chalcolithic deposits in Bay B of the <i>Principal palaeochannel</i> , showing the Elm Decline and the Elm Decline Demise .....	289
127	Pollen percentage diagram for the Neolithic deposits in Bay D of the <i>Principal palaeochannel</i> , showing the Elm Decline Demise .....	290
128	Radiocarbon modelling of key earlier Neolithic parameters .....	299
129	The radiocarbon dating of the Elm Decline and the appearance of cereal-type pollen and ribwort plantain, compared with other key Early Neolithic parameters .....	301
130	Earlier Neolithic wooden structures in the <i>Principal palaeochannel</i> .....	302
131	Possible foundational acts of deposition in the <i>Principal palaeochannel</i> .....	304
132	The deposition of Trident 2 in the <i>Principal palaeochannel</i> .....	305
133	The deposition of stone tools and unworked cobbles in the <i>Principal palaeochannel</i> .....	306
134	The deposition of the <i>polissoir</i> fragments and earlier Neolithic pottery in the <i>Principal palaeochannel</i> .....	307
135	The location of the Siberian Khanty .....	309
136	The site of the large tree-throw indicating the position of a felled ancient tree .....	312
137	Mesolithic/Neolithic sites mentioned in the text .....	313
138	The possible form of the earlier Neolithic landscape at Stainton West .....	319
139	Monuments seen as cropmarks on Terrace 1 .....	322
140	The trench exposing the ditch of the henge monument .....	324
141	Henges/stone circles mentioned in the text .....	326
142	Sections through the <i>Later Neolithic organic deposit</i> within the <i>Principal palaeochannel</i> .....	328
143	The <i>Later Neolithic organic deposit</i> in the <i>Principal palaeochannel</i> , and Burnt Mounds 1 and 5 .....	329
144	Radiocarbon and dendrochronological wiggle-match dates for the <i>Later Neolithic organic deposit</i> .....	332
145	The composition of waterlogged wood from the <i>Later Neolithic organic deposit</i> .....	333
146	Relative proportions of waterlogged plant remains in the Neolithic deposits in the <i>Principal palaeochannel</i> .....	333
147	Pollen percentage diagrams for the Neolithic deposits in Bays O and D .....	335
148	Deposits of wood, worked wood, and artefacts in the <i>Later Neolithic organic deposit</i> .....	336
149	Section through tree-throw <b>70129</b> .....	340
150	Later Neolithic activity in the <i>Grid-square area</i> .....	341
151	North-east-facing section showing the relationship between tree-throws <b>90531</b> and <b>90522</b> , and <i>Backwater</i>	

	<i>channel sediment 90181</i> .....	342
152	Radiocarbon dates for the <i>Later Neolithic organic deposit</i> and tree-throw <b>90522</b> .....	344
153	Burnt Mound 1, before and after the excavation of stone spread <b>90191</b> .....	345
154	Sections through Burnt Mound 1 .....	347
155	Radiocarbon dates for Burnt Mounds 1 and 5.....	350
156	Burnt Mound 5, with the south-east-facing section through pit <b>70350</b> .....	351
157	Later Neolithic burnt mounds mentioned in the text.....	353
158	Radiocarbon dating of the Kirkhill burnt mound.....	354
159	Later Neolithic Grooved Ware pottery, large driven stakes, and <i>polissoir</i> fragments in the <i>Principal palaeochannel</i> .....	355
160	Radiocarbon dates for the burnt mounds, Grooved Ware, and driven stakes at Stainton West.....	357
161	Chalcolithic and Bronze Age sites on the CNDR .....	364
162	Terraces 3 and 4 at Stainton West, with Chalcolithic and Bronze Age deposits, and earlier features which may have been visible .....	366
163	Cross-section through Bay B, showing the Chalcolithic and Bronze Age deposits .....	367
164	Cross-section of Bay F, showing the Bronze Age reactivation channels .....	371
165	The extent of the <i>Bronze Age alluvium</i> and a section across Bay O.....	372
166	Chalcolithic-period findspots around the inner Solway Firth .....	374
167	Earlier Bronze Age burial sites around the inner Solway Firth .....	376
168	Chalcolithic and Bronze Age archaeological and pollen sites mentioned in the text.....	378
169	Earlier Bronze Age settlements and burnt mounds, and potential circular ceremonial sites, within the inner Solway Firth.....	379
170	Earlier Bronze Age stone and bronze artefacts around the inner Solway Firth .....	381
171	Chalcolithic and earlier Bronze Age burnt mounds at Stainton West .....	383
172	Posterior density estimates for the Chalcolithic and Bronze Age burnt mounds .....	386
173	Burnt Mound 6 and contemporary burnt-out tree-throws and hearth.....	387
174	Burnt Mound 2 .....	388
175	Burnt Mound 4 .....	390
176	Burnt Mound 3 .....	393
177	Other features associated with burnt mound activity.....	394
178	Ring-gully <b>100031</b> .....	394
179	Features surrounding ring-gully <b>100031</b> , and the pottery vessel from pit <b>100026</b> .....	397
180	Features to the west of Burnt Mounds 3 and 4.....	399
181	Hearth <b>90434</b> , diagnostic Bronze Age lithics, and the extent of the Late Mesolithic midden in the <i>Grid-square area</i> .....	400
182	Chalcolithic/earlier Bronze Age settlements and agriculture.....	402
183	Earlier Bronze Age features in Parcel 9.....	404
184	Chalcolithic and earlier Bronze Age features in Parcel 21 North, and the Vallum area of Hadrian's Wall .....	406
185	House 3.....	407
186	Sections across ditches <b>21378</b> and <b>21096</b> .....	408
187	Section across pit <b>21099</b> .....	409
188	Structure <b>21476</b> .....	409
189	Earlier Bronze Age features in Parcel 41.....	410
190	Earlier Bronze Age settlement in Parcel 42 .....	411
191	House 5.....	412
192	House 4.....	414
193	House 6.....	415
194	Other pits and postholes associated with the Parcel 42 Bronze Age settlement .....	417
195	Later Bronze Age artefacts and possible settlements around the inner Solway Firth .....	419
196	Features at Stainton West containing later Bronze Age charred material .....	421
197	Later Bronze Age settlement in Parcel 32 .....	423
198	Sections across pits <b>32095</b> and <b>32004</b> , and posthole <b>32042</b> .....	424
199	Structure <b>32084</b> .....	425
200	Probability distributions of calibrated radiocarbon assays and posterior-density estimates from the Chalcolithic and earlier Bronze Age remains from the CNDR .....	426
201	Burnt mounds mentioned in the text .....	428
202	The lined troughs at Stainton West .....	430
203	The Stainton West and Beckton Farm ring-gully structures.....	434

204	Probability distributions of the calibrated radiocarbon dates associated with Chalcolithic and earlier Bronze Age settlements on the CNDR.....	438
205	Chalcolithic and Bronze Age settlements mentioned in the text .....	439
206	Chalcolithic structures from Parcel 21 North, Tatton Park, and New Cowper Quarry, and late third/early second millennium BC structures at Manchester Airport .....	440
207	The earlier Bronze Age houses on the CNDR.....	441
208	The earlier Bronze Age houses, and comparable structures from Blairhall Burn, Dumfries .....	442
209	Iron Age sites mentioned in the text .....	446
210	Features pre-dating the construction of the Roman frontier at Knockupworth.....	449
211	Hadrian's Wall in the vicinity of Knockupworth.....	450
212	Schematic reconstruction of 'idealised' cross-sections of the Turf and Stone Walls.....	451
213	Schematic reconstruction of an 'idealised' cross-section through the Vallum.....	452
214	The route of the CNDR at Knockupworth, with the CFA and CAU evaluation trenches .....	454
215	The Turf and Stone Walls, and associated features.....	455
216	The Turf and Stone Walls, and a section through ditch/drain <b>50081</b> .....	458
217	The excavations across the Vallum.....	462
218	West-facing section through the Vallum ditch and mounds in the drainage trench .....	465
219	North-west-facing section through the north mound of the Vallum in the underpass trench .....	469
220	South-east-facing section through the north mound of the Vallum in the road-footprint trench .....	471
221	West-facing section through the south mound, or perhaps the marginal mound, of the Vallum in the drainage trench .....	472
222	The western section of Hadrian's Wall, showing the CNDR and other sites mentioned in the text.....	473
223	Ditches <b>32179</b> and <b>200023</b> .....	482
224	Gravel deposits <b>200098</b> , cut by palaeochannel <b>200102</b> .....	483
225	Areas along the CNDR containing early medieval, medieval, and post-medieval archaeology .....	484
226	Early medieval and medieval palaeoenvironmental sites mentioned in the text .....	486
227	Early medieval sites in the vicinity of the CNDR .....	488
228	Early medieval sites and finds in Carlisle .....	489
229	The kingdom of Northumbria during the seventh/ eighth century .....	491
230	Later medieval Carlisle .....	494
231	Later medieval sites in the vicinity of Carlisle.....	495
232	Parcel 42 and its environs .....	497
233	The early medieval settlement in Parcel 42 .....	498
234	Building 1 .....	499
235	Building 2 .....	500
236	Modelled radiocarbon dates from the early medieval settlement.....	502
237	Building 3 .....	503
238	Building 5 .....	503
239	Building 4 .....	504
240	Possible early medieval fencelines .....	504
241	The possible early routeway serving the Parcel 42 early medieval settlement.....	505
242	Parcel 32, and a transcription of the cropmarks close to Stainton, possibly relating to a later medieval settlement.....	507
243	Sections across ditches <b>32154</b> and <b>32014</b> .....	508
244	The henge ditch containing medieval-period deposits.....	510
245	Different building techniques used in early medieval buildings .....	512
246	Early medieval sites mentioned in the text .....	514
247	Early medieval buildings in the wider environs of the CNDR.....	515
248	Extract from Smith's map of 1746, showing the landscape and settlement to the north and west of Carlisle.....	517
249	Extract from Donald's map of 1770-1, showing the landscape and settlement to the north and west of Carlisle.....	518
250	Extract from an 1823 enclosure map of Kingmoor, showing Kingmoor House and its formal garden....	519
251	The nineteenth-century canal and railway network.....	520
252	Post-medieval remains in Parcel 5, with a section across ditch <b>5105</b> .....	521
253	Parcel 5 features superimposed on the 1770 enclosure award map .....	522
254	Post-medieval remains in Parcels 9 and 20 .....	523
255	Post-medieval remains in Parcel 21, superimposed on the First Edition Ordnance Survey map .....	524

256	Post-medieval remains at Stainton West .....	525
257	Post-medieval remains in Parcel 42.....	526
258	Post-medieval remains in Parcel 21 North.....	527
259	Evaluation trenches with post-medieval features in Parcels 46 and 47 .....	528
260	Canal and railway features cutting through the Vallum at Knockupworth .....	529
261	The first camp and midden at Stainton West, dating to the end of the seventh millennium/beginning of the sixth millennium cal BC .....	533
262	The beaver lodge, dam, and midden, at Stainton West, during the middle and late sixth millennium cal BC ...	535
263	The possible extent of the fifth millennium cal BC encampment at Stainton West .....	537
264	The layout of the fifth millennium cal BC encampment at Stainton West .....	538
265	Habitual and social ranges of the Stainton West hunter-gatherers, and the source areas for the worked stone from the site.....	539
266	Stainton West in the earlier Neolithic period.....	544
267	Stainton West in the later Neolithic period .....	551
268	The <i>Principal palaeochannel</i> , Burnt Mounds 1 and 5 at Stainton West, with the henge monument on the upper river terrace .....	553
269	Chalcolithic and Bronze Age settlements along the CNDR .....	555
270	Possible pre-Roman Iron Age sites adjacent to the CNDR.....	558
271	Sites with evidence of the pre-Roman Iron Age and Roman-period landscape in the western section of Hadrian's Wall.....	559
272	Idealised sections through the Turf and Stone Walls in the western sector of Hadrian's Wall.....	561
273	Idealised section across the Vallum, with the section at Knockupworth .....	561
274	Medieval settlement in Stainton township.....	565
275	The flaked-lithic sample areas, Stainton West .....	Appx 1
276	Cores and core tools from earlier Neolithic deposits in the <i>Principal palaeochannel</i> .....	Appx 2
277	The dimensions of the core tools .....	Appx 2
278	The dimensions of the cores.....	Appx 2
279	Probable thinning flakes and a flake with a denticulated edge .....	Appx 2
280	Faceted hammerstone, facially pecked cobbles, and a multi-hollowed cobble .....	Appx 2
281	The pounder/grinder from <i>Earlier Neolithic organic deposit 70346</i> .....	Appx 2
282	Dimensions of the facially pecked hammerstones.....	Appx 2
283	Dimensions of the plain hammerstones .....	Appx 2
284	<i>Polissoirs</i> .....	Appx 2
285	Ground stones and an anvil .....	Appx 2
286	Anvils and elongated ground stone .....	Appx 2
287	Hollowed stones.....	Appx 2
288	The notched pebble.....	Appx 2
289	The incised cobble.....	Appx 2
290	Axe 70326.4 .....	Appx 2
291	Axe 70353.30 .....	Appx 2
292	Axe 70403.14 .....	Appx 2
293	Axe 70325.41 .....	Appx 2
294	Axe 88102.2000 .....	Appx 2
295	Reworked axe 89853.2000 .....	Appx 2
296	Used and worked ochre.....	Appx 2
297	Partially flaked chert nodule from the <i>Stabilised land surface</i> and <i>Basal sands and gravels</i> , and a partially flaked pebble-flint pebble from the <i>Mesolithic overbank alluvium</i> .....	Appx 4
298	Chert core from the <i>Basal sands and gravels</i> .....	Appx 4
299	The potential reasons for the discard of the analysed cores which exhibited a reduction stage, from the <i>Basal sands and gravels</i> .....	Appx 4
300	Refitting brown-flint scalar core from the <i>Basal sands and gravels</i> and <i>Stabilised land surface</i> .....	Appx 4
301	The extent of the platform edge worked on the analysed single-platform cores from the <i>Stabilised land surface</i> .....	Appx 4
302	Pebble-flint and chert cores from the <i>Stabilised land surface</i> .....	Appx 4
303	Shapes of the analysed cores exhibiting a reduction stage from the <i>Stabilised land surface</i> .....	Appx 4
304	The potential reasons for the discard of the analysed cores exhibiting a reduction stage from the <i>Stabilised land surface</i> .....	Appx 4
305	Chalcedony/agate, chert, and pebble-flint cores from the <i>Mesolithic overbank alluvium</i> .....	Appx 4



306	The extent of platform edge worked on the analysed single-platform cores from the <i>Mesolithic overbank alluvium</i> .....	Appx 4
307	Shapes of the analysed cores exhibiting a reduction stage from the <i>Mesolithic overbank alluvium</i> .....	Appx 4
308	The potential reasons for the discard of the analysed cores exhibiting a reduction stage from the <i>Mesolithic overbank alluvium</i> .....	Appx 4
309	Shapes of the analysed cores exhibiting a reduction stage from hollow <b>90314</b> (Structure 2) and stone spread <b>90396</b> .....	Appx 4
310	The extent of platform edge worked on the analysed single-platform cores from hollow <b>90314</b> (Structure 2) and stone spread <b>90396</b> .....	Appx 4
311	The potential reasons for the discard of the analysed cores exhibiting a reduction stage from hollow <b>90314</b> (Structure 2) and stone spread <b>90396</b> .....	Appx 4
312	Tuff multi-platform core from layer <b>90327</b> .....	Appx 4
313	Tuff single-platform flake core from the <i>Stabilised land surface</i> .....	Appx 4
314	The extent of platform edge worked on the analysed single-platform tuff cores from Sample Area 7 ....	Appx 4
315	Shapes of the analysed tuff cores exhibiting a reduction stage, from Sample Area 7 .....	Appx 4
316	The potential reasons for the discard of the analysed tuff cores exhibiting a reduction stage, from Sample Area 7.....	Appx 4
317	Pitchstone single-platform bladelet core from the <i>Mesolithic overbank alluvium</i> .....	Appx 4
318	Brown-flint cores from the <i>Mesolithic overbank alluvium</i> filling the <i>Backwater channel</i> .....	Appx 4
319	The extent of platform edge worked on the analysed single-platform brown-flint cores from Sample Areas 10 and 11 .....	Appx 4
320	Shapes of the analysed brown-flint cores exhibiting a reduction stage, from Sample Areas 10 and 11	Appx 4
321	The potential reasons for the discard of the analysed brown-flint cores exhibiting a reduction stage, from Sample Areas 10 and 11 .....	Appx 4
322	Shapes of the analysed tuff cores exhibiting a reduction stage from the <i>Principal palaeochannel</i> .....	Appx 4
323	The potential reasons for the discard of the analysed tuff cores exhibiting a reduction stage from the <i>Principal palaeochannel</i> .....	Appx 4
324	Tuff core-trimming blade with plunging termination at the distal end, and pebble-flint semi-crested blade, from the <i>Basal sands and gravels</i> .....	Appx 4
325	The analysed core-dressing pieces from the <i>Basal sands and gravels</i> , by reduction stage .....	Appx 4
326	The analysed core-dressing blades and flakes from the <i>Stabilised land surface</i> , struck from platform edges and removed from the core face .....	Appx 4
327	SSUC core-trimming flake from the <i>Stabilised land surface</i> .....	Appx 4
328	The analysed core-dressing blades from the <i>Stabilised land surface</i> , by length/breadth ratios.....	Appx 4
329	The analysed core-dressing flakes from the <i>Stabilised land surface</i> , by length/breadth ratios.....	Appx 4
330	Chert, SSUC, grey flint, brown flint, pebble flint, and tuff core-trimming blades and flakes from the <i>Mesolithic overbank alluvium</i> .....	Appx 4
331	The analysed core-dressing flakes from the <i>Mesolithic overbank alluvium</i> , by length/breadth ratios..	Appx 4
332	The analysed core-dressing pieces from the <i>Mesolithic overbank alluvium</i> , by reduction stage .....	Appx 4
333	The analysed core-dressing blades and flakes from hollow <b>90314</b> (Structure 2), struck from platform edges and removed from the core face .....	Appx 4
334	The analysed core-dressing pieces from hollow <b>90314</b> (Structure 2), by reduction stage .....	Appx 4
335	The analysed core-dressing blades and flakes from stone spread <b>90396</b> , struck from platform edges and removed from the core face .....	Appx 4
336	Tuff core-rejuvenation tablet from the <i>Stabilised land surface</i> .....	Appx 4
337	The analysed tuff core-dressing pieces from Sample Area 7, by reduction stage .....	Appx 4
338	Pitchstone crested blade from the <i>Stabilised land surface</i> .....	Appx 4
339	Brown-flint core-rejuvenation tablet from the <i>Mesolithic overbank alluvium</i> in the <i>Backwater channel</i> ....	Appx 4
340	The analysed brown-flint core-dressing blades and flakes from Sample Areas 10 and 11, struck from platform edges and removed from the core face .....	Appx 4
341	Brown-flint semi-crested blade from the <i>Mesolithic overbank alluvium</i> in the <i>Backwater channel</i> ....	Appx 4
342	The analysed brown-flint core-dressing blades from Sample Areas 10 and 11, by length/breadth ratios.....	Appx 4
343	The analysed core-dressing blades and flakes from the <i>Principal palaeochannel</i> , struck from platform edges and removed from the core face .....	Appx 4
344	The analysed core-dressing pieces from the <i>Principal palaeochannel</i> , by reduction stage .....	Appx 4
345	Blade chips, narrow blades, and broad blades .....	Appx 4
346	Regular flakes, irregular flakes, and a chunk .....	Appx 4

347	The fragmentation record of the analyseddebitage from <i>Basal sands and gravels 90039</i> , by survival attribute .....	Appx 4
348	The fragmentation record of the analyseddebitage from <i>Stabilised land surface 90206</i> , by survival attribute .....	Appx 4
349	The fragmentation record of the analyseddebitage from the <i>Mesolithic overbank alluvium</i> , by survival attribute .....	Appx 4
350	The fragmentation record of the analyseddebitage from hollow <b>90314</b> (Structure 2), by survival attribute .....	Appx 4
351	The fragmentation record of the analyseddebitage from stone spread <b>90396</b> , by survival attribute....	Appx 4
352	The fragmentation record of the analysed tuffdebitage from Sample Area 7, by survival attribute....	Appx 4
353	The fragmentation record of the analysed pitchstonedebitage from Sample Area 7, by survival attribute .....	Appx 4
354	The fragmentation record of the analysed brown-flintdebitage from Sample Areas 10 and 11, by type and survival attribute .....	Appx 4
355	The fragmentation record of the analysed SSUCdebitage from Sample Area 5, by type and survival attribute .....	Appx 4
356	The fragmentation record of the analyseddebitage from the <i>Principal palaeochannel</i> , by survival attribute .....	Appx 4
357	The numbers of brown/grey-flint blades and flakes associated with each stage of the reduction sequence .....	Appx 4
358	Sub-classification types for the brown/grey-flintdebitage .....	Appx 4
359	Brown/grey-flint blade types associated with each stage of the reduction sequence.....	Appx 4
360	The number of brown/grey-flint flakes associated with each stage of the reduction sequence.....	Appx 4
361	Occurrence of brown/grey-flint lithic types, across all sample areas containing this raw material .....	Appx 4
362	The number of negative dorsal scars on the brown/grey-flint blade and flakedebitage by reduction sequence .....	Appx 4
363	The number of negative dorsal scars on brown/grey-flint blade and flakedebitage from Sample Areas 10 and 11.....	Appx 4
364	Negative dorsal-scar directions on brown/grey-flint blade and flakedebitage, by reduction sequence.....	Appx 4
365	The length/breadth ratios of the brown/grey-flint blades and flakes .....	Appx 4
366	Platform types of the brown/grey-flint primary, secondary, and inner blades and flakes.....	Appx 4
367	Platform features on the brown/grey-flint primary, secondary, and inner blades and flakes .....	Appx 4
368	Bulb-of-percussion types on the brown/grey-flint primary, secondary, and inner blades and flakes.....	Appx 4
369	Platform preparation type on brown/grey-flint primary, secondary, and inner blades and flakes .....	Appx 4
370	The numbers of pebble-flint blades and flakes associated with each stage of the reduction sequence.....	Appx 4
371	Refitting sequence for pebble flints 82961.1078 and 82961.1079 from the <i>Mesolithic overbank alluvium</i> .....	Appx 4
372	The various types of platform preparation recorded for the pebble-flint blades and flakes.....	Appx 4
373	Sub-classification types for the pebble-flintdebitage .....	Appx 4
374	Pebble-flint blade types associated with each stage of the reduction sequence.....	Appx 4
375	The number of pebble-flint flakes associated with each stage of the reduction sequence.....	Appx 4
376	Pebble-flintdebitage reduction sequences from the lithic sample areas.....	Appx 4
377	The number of negative dorsal scars on the pebble-flint blade and flakedebitage, by reduction sequence .....	Appx 4
378	The number of negative dorsal scars on pebble-flint blade and flakedebitage from Sample Areas 1 and 2 .....	Appx 4
379	Negative dorsal-scar directions on pebble-flint blade and flakedebitage by reduction sequence.....	Appx 4
380	The length/breadth ratios of the pebble-flint blades and flakes .....	Appx 4
381	Termination types of the pebble-flint primary, secondary, and inner blades and flakes .....	Appx 4
382	Platform types of the pebble-flint primary, secondary, and inner blades and flakes.....	Appx 4
383	Platform features on the pebble-flint primary, secondary, and inner blades and flakes .....	Appx 4
384	Bulb of percussion types on the pebble-flint primary, secondary, and inner blades and flakes ....	Appx 4
385	Platform-preparation type on the pebble-flint primary, secondary, and inner blades and flakes.....	Appx 4
386	The numbers of chert blades and flakes associated with each stage of the reduction sequence ....	Appx 4
387	Platform-preparation type on the chert primary, secondary, and inner blades and flakes.....	Appx 4
388	Sub-classification types for the chertdebitage .....	Appx 4
389	Chert blade types associated with each stage of the reduction sequence .....	Appx 4
390	The number of chert flakes associated with each stage of the reduction sequence .....	Appx 4
391	Chertdebitage reduction sequences from the lithic sample areas .....	Appx 4

392	The number of negative dorsal scars on the chert blade and flake debitage by reduction sequence....	Appx 4
393	The number of negative dorsal scars on the chert blade and flake debitage from Sample Areas 1 and 2....	Appx 4
394	Negative dorsal-scar directions on the chert blade and flake debitage, by reduction sequence ....	Appx 4
395	The length/breadth ratios of the chert blades and flakes.....	Appx 4
396	Termination types of the chert primary, secondary, and inner blades and flakes.....	Appx 4
397	Platform types of the chert primary, secondary, and inner blades and flakes.....	Appx 4
398	Platform features on the chert primary, secondary, and inner blades and flakes.....	Appx 4
399	Bulb-of-percussion types on the chert primary, secondary, and inner blades and flakes.....	Appx 4
400	Platform-preparation types on the chert primary, secondary, and inner blades and flakes.....	Appx 4
401	The numbers of SSUC blades and flakes associated with each stage of the reduction sequence ...	Appx 4
402	Sub-classification types for the SSUC debitage.....	Appx 4
403	SSUC blade types associated with each stage of the reduction sequence.....	Appx 4
404	The number of SSUC flakes associated with each stage of the reduction sequence.....	Appx 4
405	SSUC debitage reduction sequences from the lithic sample areas.....	Appx 4
406	The number of negative dorsal scars on the SSUC blade and flake debitage, by reduction sequence ....	Appx 4
407	The number of negative dorsal scars on the SSUC blade and flake debitage from Sample Areas 1, 2, and 5 .....	Appx 4
408	Negative dorsal-scar directions on the SSUC blade and flake debitage, by reduction sequence ...	Appx 4
409	The length/breadth ratios of the SSUC blades and flakes.....	Appx 4
410	Termination types of the SSUC primary, secondary, and inner blades and flakes.....	Appx 4
411	Platform types of the primary, secondary, and inner SSUC blades and flakes.....	Appx 4
412	Platform features on the SSUC primary, secondary, and inner blades and flakes .....	Appx 4
413	Bulb-of-percussion types on the SSUC primary, secondary, and inner blades and flakes.....	Appx 4
414	Platform-preparation type on the SSUC primary, secondary, and inner blades and flakes.....	Appx 4
415	The numbers of tuff blades and flakes associated with each stage of the reduction sequence.....	Appx 4
416	Sub-classification types for the tuff debitage in Sample Area 1.....	Appx 4
417	Tuff blade-types associated with each stage of the reduction sequence.....	Appx 4
418	The number of tuff flakes associated with each stage of the reduction sequence.....	Appx 4
419	The number of negative dorsal scars on the tuff blade and flake debitage, by reduction sequence .....	Appx 4
420	Negative dorsal-scar directions on the tuff blade and flake debitage, by reduction sequence.....	Appx 4
421	The length/breadth ratios of the tuff blades and flakes.....	Appx 4
422	Termination types of the tuff primary, secondary, and inner blades and flakes.....	Appx 4
423	Platform types of the tuff primary, secondary, and inner blades and flakes.....	Appx 4
424	Platform features on the tuff primary, secondary, and inner blades and flakes .....	Appx 4
425	Bulb-of-percussion types on the tuff primary, secondary, and inner blades and flakes.....	Appx 4
426	Platform-preparation type on the tuff primary, secondary, and inner blades and flakes .....	Appx 4
427	The numbers of pitchstone blades and flakes associated with each stage of the reduction sequence .....	Appx 4
428	Sub-classification types for the pitchstone debitage in Sample Area 1.....	Appx 4
429	Pitchstone blade-types associated with each stage of the reduction sequence .....	Appx 4
430	The number of pitchstone flakes associated with each stage of the reduction sequence.....	Appx 4
431	Negative dorsal-scar directions on the pitchstone blade and flake debitage by reduction sequence ...	Appx 4
432	The length/breadth ratios of the pitchstone blades and flakes .....	Appx 4
433	Termination types of the pitchstone primary, secondary, and inner blades and flakes .....	Appx 4
434	Platform types of the pitchstone primary, secondary, and inner blades and flakes.....	Appx 4
435	Pebble-flint and brown-flint backed bladelets from the <i>Mesolithic overbank alluvium</i> .....	Appx 5
436	Chert and pebble-flint crescents from the <i>Stabilised land surface</i> , stone spread <b>90396</b> , and the <i>Mesolithic overbank alluvium</i> .....	Appx 5
437	Pebble-flint and chert fine points from the <i>Mesolithic overbank alluvium</i> , tree-throw <b>90262</b> , and stone spread <b>90396</b> .....	Appx 5
438	Chert and pebble-flint isosceles triangles from the <i>Stabilised land surface</i> and <i>Mesolithic overbank alluvium</i> ...	Appx 5
439	SSUC, pebble-flint, and chert <i>lamelles à cran</i> /microburins from the <i>Stabilised land surface</i> and <i>Mesolithic overbank alluvium</i> .....	Appx 5
440	Pebble-flint, chert, and 'cannot determine' miscellaneous microlith forms from the <i>Stabilised land surface</i> , <i>Mesolithic overbank alluvium</i> , and <i>Colluvium</i> .....	Appx 5
441	Grey-flint, chert, and pebble-flint obliquely blunted blades from the <i>Basal sands and gravels</i> , the <i>Stabilised land surface</i> , and <i>Mesolithic overbank alluvium</i> .....	Appx 5
442	Pebble-flint rhomboid from tree-throw <b>90262</b> .....	Appx 5
443	Chert, pebble-flint, and SSUC rods from the <i>Stabilised land surface</i> , <i>Mesolithic overbank alluvium</i> , and tree-	



	throw <b>90262</b> .....	Appx 5
444	Scatter plot of all complete scalene triangles, by width and length .....	Appx 5
445	Pebble-flint scalene triangles from the <i>Stabilised land surface</i> , stone spread <b>90396</b> , and <i>Mesolithic overbank alluvium</i> .....	Appx 5
446	Pebble-flint trapezoids from the <i>Earlier Neolithic organic deposit</i> and <i>Stabilised land surface</i> .....	Appx 5
447	The microlith classifications from the sample areas, by quantity.....	Appx 5
448	Pebble-flint and ‘cannot determine’ edge-retouched pieces from the <i>Stabilised land surface</i> and <i>Mesolithic overbank alluvium</i> .....	Appx 5
449	All retouched blade, chunk, core, and flake classifications, by raw material .....	Appx 5
450	Chert, pebble-flint, and brown-flint scrapers from the <i>Stabilised land surface</i> , tree-throw <b>90526</b> , <i>Mesolithic overbank alluvium</i> , and Burnt Mound 1 .....	Appx 5
451	Brown-flint and pebble-flint awls/borers from the <i>Mesolithic alluvium</i> , <i>Stabilised land surface</i> , and <i>Mesolithic overbank alluvium</i> .....	Appx 5
452	Brown-flint, chert, and ‘cannot determine’ notches from the <i>Stabilised land surface</i> , stone spread <b>90396</b> , and <i>Mesolithic overbank alluvium</i> .....	Appx 5
453	Grey-flint, brown-flint, and pebble-flint knife forms from the <i>Stabilised land surface</i> and <i>Mesolithic overbank alluvium</i> .....	Appx 5
454	Pebble-flint, brown-flint, and chert burins from the <i>Stabilised land surface</i> and <i>Mesolithic overbank alluvium</i> .....	Appx 5
455	Pebble-flint denticulates from the <i>Mesolithic overbank alluvium</i> .....	Appx 5
456	Pebble-flint, chert, brown-flint, and ‘cannot determine’ invasively flaked blanks from the <i>Mesolithic overbank alluvium</i> and the <i>Stabilised land surface</i> .....	Appx 5
457	Grey-flint, pebble-flint, brown-flint, and chert leaf points from tree-throw <b>90522</b> , the <i>Stabilised land surface</i> , <i>Mesolithic overbank alluvium</i> , <i>Earlier Neolithic organic deposit</i> , Burnt Mound 1, and the subsoil .....	Appx 5
458	Grey-flint, brown-flint, and pebble-flint transverse arrowheads from the <i>Earlier Neolithic alluvium</i> , <i>Stabilised land surface</i> , and tree-throw <b>90526</b> .....	Appx 5
459	Pebble-flint barbed-and-tanged arrowhead from land-drain <b>90033</b> .....	Appx 5
460	Stainton West in relation to the primary and secondary sources of chert identified.....	Appx 6
461	Locations of the chert specimens sampled for analysis .....	Appx 6
462	163Dy and 7Li concentrations in cherts from Stainton West.....	Appx 6
463	7Li and 88Sr concentrations in the cherts from IG1.....	Appx 6
464	Charted data from a previous analysis of geological cherts from northern England, overlaid with data from Stainton West .....	Appx 6
465	Dendrogram showing the archaeological and geological membership of the three clusters .....	Appx 6
466	The location of geological sources and their cluster membership.....	Appx 6
467	REE patterns and values for the archaeological samples from Stainton West and Orton .....	Appx 6
468	Areas in the <i>Grid-square area</i> relevant to the chert-sourcing study .....	Appx 6
469	Calcium and iron values for grey and brown flint from Stainton West .....	Appx 6
470	Discriminant function-analysis plot.....	Appx 6
471	Burnt flake 83771.18 and its chemical read-out, compared to an unburnt pitchstone sample.....	Appx 6
472	A comparative percentage plot of niobium in the Stainton West pitchstone, the geological samples, and pitchstone from other sites, showing apparent clustering within <i>Mesolithic overbank alluvium</i> <b>90181</b> , at Stainton West .....	Appx 6
473	Pitchstone outcrops on Arran defined in relation to the likelihood that they were the source of the Stainton West and other Cumbrian pitchstone artefacts .....	Appx 6
474	Niobium versus zirconium pXRF reading averages for the tuff study and control samples.....	Appx 6
475	Rubidium versus strontium pXRF reading averages for the tuff study and control samples .....	Appx 6
476	Aluminium versus potassium pXRF reading averages for the tuff study and control samples.....	Appx 6
477	Microwear classification scheme .....	Appx 7
478	Partial TIC chromatogram highlighting the diagnostic constituents present on the leaf-shaped arrowhead .....	Appx 8
479	The distribution of brown/grey flint from the main stratigraphic units in the <i>Grid-square area</i> .....	Appx 9
480	Late Mesolithic activity areas in the <i>Grid-square area</i> .....	Appx 9
481	The extents of Lithic Entities 1-4 in the Habitation Area .....	Appx 9
482	The spatial distribution of brown/grey flint debitage across the Habitation Area .....	Appx 9
483	The spatial distribution of all pebble-flint flaked lithics across the Habitation Area .....	Appx 9
484	The spatial distribution of chert cores and debitage across the Habitation Area.....	Appx 9
485	The spatial distribution of SSUC microliths across the Habitation Area .....	Appx 9



486	The spatial distributions of pitchstone debitage and flaked tuff across the Habitation Area .....	Appx 9
487	Distribution of ochre across the Habitation Area.....	Appx 9
488	The spatial distributions of all flaked-lithic types associated with Structure 6 and its immediate environs.....	Appx 9
489	The distribution of microliths associated with Structure 6 and its immediate environs .....	Appx 9
490	Flaked lithics from the Habitation Area exhibiting different types of microwear .....	Appx 9
491	Distribution of coarse-stone tools and stone implements across the Habitation Area.....	Appx 9
492	The extents of Lithic Entities 6-10, within the Tool-production Area .....	Appx 9
493	The spatial distribution of brown/grey-flint debitage across the Tool-production Area.....	Appx 9
494	The spatial distribution of all pebble-flint cores and debitage across the Tool-production Area...	Appx 9
495	The spatial distribution of pebble-flint microliths across the Tool-production Area .....	Appx 9
496	The spatial distribution of non-microlithic pebble-flint retouched tools across the Tool-production Area.....	Appx 9
497	The spatial distribution of chert cores and debitage across the Tool-production Area .....	Appx 9
498	The spatial distribution of chert microliths across the Tool-production Area.....	Appx 9
499	The spatial distribution of non-microlithic chert retouched tools across the Tool-production Area .....	Appx 9
500	The spatial distribution of SSUC debitage across the Tool-production Area .....	Appx 9
501	The spatial distribution of pitchstone debitage across the Tool-production Area.....	Appx 9
502	The spatial distribution of tuff cores and debitage across the Tool-production Area .....	Appx 9
503	Distribution of ochre across the Tool-production Area, in relation to unworn cobbles .....	Appx 9
504	Flaked lithics from the Tool-production area exhibiting different types of microwear.....	Appx 9
505	The coarse-stone tools, stone implements, and flaked tuff from the Tool-production Area .....	Appx 9
506	The spatial distribution of all flaked lithics from the Tool-production Area.....	Appx 9
507	Archaeological and natural features, and Lithic Entities 11-13, in the Hide-working Area.....	Appx 9
508	The spatial distribution of brown/grey-flint cores and debitage across the Hide-working Area...	Appx 9
509	The spatial distribution of pebble-flint cores and debitage across the Hide-working Area.....	Appx 9
510	The spatial distribution of pebble-flint microliths across the Hide-working Area .....	Appx 9
511	The distribution of microliths in the spread of pebble flint from grid-squares 791-3, 819-21, and 847-9 ..	Appx 9
512	The spatial distribution of chert cores and debitage across the Hide-working Area .....	Appx 9
513	The spatial distribution of chert microliths across the Hide-working Area .....	Appx 9
514	The spatial distribution of SSUC debitage across the Hide-working Area .....	Appx 9
515	The spatial distribution of SSUC microliths across the Hide-working Area .....	Appx 9
516	The spatial distribution of pitchstone debitage across the Hide-working Area.....	Appx 9
517	The spatial distribution of tuff cores and debitage, and polished-axe fragments, across the Hide-working Area.....	Appx 9
518	Distribution of ochre across the Hide-working Area .....	Appx 9
519	The flaked-lithic types from tree-throw <b>90262</b> , by raw material .....	Appx 9
520	Distribution of flaked lithics from the Hide-working Area exhibiting different types of microwear ...	Appx 9
521	Distribution of coarse-stone tools from the Hide-working Area.....	Appx 9
522	Archaeological and natural features, and Lithic Entities 14-17, in the Butchery Area .....	Appx 9
523	The spatial distribution of brown/grey-flint debitage across the Butchery Area.....	Appx 9
524	The spatial distribution of pebble-flint cores and debitage across the Butchery Area .....	Appx 9
525	The spatial distribution of pebble-flint microliths across the Butchery Area .....	Appx 9
526	The spatial distribution of chert cores and debitage across the Butchery Area.....	Appx 9
527	The spatial distribution of chert microliths across the Butchery Area.....	Appx 9
528	The spatial distribution of SSUC debitage across the Butchery Area .....	Appx 9
529	The spatial distribution of pitchstone debitage, flaked tuff, and stone implements in the Butchery Area	Appx 9
530	Distribution of ochre in the Butchery Area .....	Appx 9
531	Radiocarbon-dated Late Mesolithic tree-throws from the Butchery Area .....	Appx 9
532	Distribution of flaked lithics exhibiting different types of microwear in the Butchery Area .....	Appx 9
533	Distribution of coarse-stone tools in the Butchery Area .....	Appx 9
534	Archaeological and natural features, and Lithic Entities 18-20, in the Midden Area.....	Appx 9
535	The spatial distribution of brown/grey-flint cores and debitage across the Midden Area.....	Appx 9
536	The spatial distribution of burnt brown/grey flint across the <i>Grid-square area</i> .....	Appx 9
537	The spatial distribution of pebble-flint cores and debitage across the Midden Area .....	Appx 9
538	The spatial distribution of pebble-flint microliths across the Midden Area .....	Appx 9
539	The distribution of microliths in the spread of pebble flint in the vicinity of tree-throw <b>90526</b> .....	Appx 9
540	The distribution of microliths in the spread of pebble flint in the vicinity of hollow <b>90314</b> .....	Appx 9

541	The spatial distribution of non-microlithic pebble-flint retouched tools across the Midden Area ....	Appx 9
542	The spatial distribution of burnt pebble flint across the <i>Grid-square area</i> .....	Appx 9
543	The spatial distribution of chert cores and debitage across the Midden Area .....	Appx 9
544	The spatial distribution of chert microliths across the Midden Area.....	Appx 9
545	The spatial distribution of non-microlithic chert retouched tools across the Midden Area.....	Appx 9
546	Grid-squares in the Midden Area associated with chert knapping groups.....	Appx 9
547	The spatial distribution of burnt chert within the <i>Grid-square area</i> .....	Appx 9
548	The spatial distribution of SSUC debitage across the Midden Area .....	Appx 9
549	The spatial distribution of SSUC microliths across the Midden Area .....	Appx 9
550	The spatial distribution of tuff cores and debitage, and stone implements, within the Midden Area..	Appx 9
551	Distribution of ochre within the Midden Area.....	Appx 9
552	Distribution of flaked lithics exhibiting different types of microwear across the Midden Area.....	Appx 9
553	Distribution of coarse-stone tools in the Midden Area .....	Appx 9
554	The spatial distribution of all flaked lithics across the Midden Area .....	Appx 9
555	Archaeological and natural features, and Lithic Entities 21-6, in the Peripheral Area.....	Appx 9
556	The spatial distribution of brown/grey-flint debitage across the Peripheral Area.....	Appx 9
557	The spatial distribution of pebble-flint cores and debitage across the Peripheral Area.....	Appx 9
558	The spatial distribution of chert cores and debitage across the Peripheral Area .....	Appx 9
559	The spatial distribution of SSUC debitage across the Peripheral Area.....	Appx 9
560	The spatial distribution of tuff cores, debitage, and pitchstone across the Peripheral Area .....	Appx 9
561	Distribution of ochre within the Peripheral Area .....	Appx 9
562	The spatial distribution of all flaked-lithic types forming a horseshoe-shape (Structure 1) in the Peripheral Area.....	Appx 9
563	The distribution of microliths around Structure 1 in the Peripheral Area .....	Appx 9
564	The spatial distribution of ‘cannot determine’ burnt lithics around Structure 1 in the Peripheral Area...	Appx 9
565	The spatial distribution of all flaked-lithic types within tree-throw <b>90208</b> and its environs.....	Appx 9
566	Distribution of coarse-stone tools across the Peripheral Area .....	Appx 9
567	Archaeological and natural features, and Lithic Entities 27-37, in the Axe-working Area.....	Appx 9
568	The spatial distribution of brown/grey-flint cores and debitage across the Axe-working Area.....	Appx 9
569	The spatial distribution of pebble-flint cores and debitage across the Axe-working Area.....	Appx 9
570	The spatial distribution of pebble-flint microliths across the Axe-working Area.....	Appx 9
571	The spatial distribution of chert cores and debitage across the Axe-working Area .....	Appx 9
572	The spatial distribution of chert microliths across the Axe-working Area .....	Appx 9
573	The spatial distribution of SSUC debitage across the Axe-working Area.....	Appx 9
574	The spatial distribution of pitchstone debitage across the Axe-working Area.....	Appx 9
575	The spatial distribution of tuff cores and debitage, and stone implements, across the Axe-working Area..	Appx 9
576	Distribution of ochre in the Axe-working area.....	Appx 9
577	The flaked lithics from beneath Burnt Mound 2 .....	Appx 9
578	Distribution of coarse-stone tools in the Axe-working area .....	Appx 9
579	Distribution of flaked lithics and coarse-stone tools in the Lithic-free Activity Area .....	Appx 9
580	The spatial relationships of the IG2 (Scottish Southern Uplands Chert) knapping groups .....	Appx 9
581	Neolithic tree-throws <b>90508</b> , <b>90522</b> , <b>90531</b> , and <b>90262</b> in the northern part of the <i>Grid-square area</i> ....	Appx 9
582	Distribution of possible Neolithic flaked-lithic diagnostic tool types and cores from the northern part of the <i>Grid-square area</i> .....	Appx 9
583	Distribution of possible Neolithic debitage from the northern part of the <i>Grid-square area</i> .....	Appx 9
584	Distribution of possible diagnostic Neolithic and Early Bronze Age flaked-lithic implements from the southern part of the <i>Grid-square area</i> .....	Appx 9
585	Distribution of possible Neolithic cores from the southern part of the <i>Grid-square area</i> .....	Appx 9
586	Distribution of possible Neolithic debitage from the southern part of the <i>Grid-square area</i> .....	Appx 9
587	The distribution of flaked lithics and coarse-stone tools from Mesolithic-age deposits in the <i>Principal palaeochannel</i> .....	Appx 9
588	The distribution of coarse-stone tools, stone implements, unworked cobbles, and flaked lithics probably deriving from Neolithic-age deposits in the <i>Principal palaeochannel</i> .....	Appx 9
589	The distribution of coarse-stone tools and flaked lithics from Chalcolithic and Bronze Age deposits .....	Appx 9
590	Distribution of flaked lithics beneath Burnt Mound 1 .....	Appx 9
591	The spatial distribution of selected flaked lithics in the retention pond area.....	Appx 9
592	The proposed spread of Mesolithic narrow-blade technology across northern Britain.....	Appx 10
593	The distribution of backed bladelets in the <i>Grid-square area</i> .....	Appx 10

594	The distribution of rods in the <i>Grid-square area</i> .....	Appx 10
595	The distribution of scalene triangles and fine points in the <i>Grid-square area</i> .....	Appx 10
596	The distribution of coarse-stone tools in the <i>Grid-square area</i> .....	Appx 10
597	The distribution of the stone implements in the <i>Grid-square area</i> .....	Appx 10
598	The distribution of pitchstone, polished-axe fragments, the axe/adze, and leaf-shaped arrowheads in the <i>Grid-square area</i> .....	Appx 10
599	The distribution of ochre, and a selection of coarse-stone tools, which could have been associated with its processing/use .....	Appx 10
600	The structure of the Mesolithic encampment .....	Appx 10
601	The possible source areas for the worked stone at Stainton West .....	Appx 10
602	Earlier Neolithic activity in the <i>Principal palaeochannel</i> and <i>Grid-square area</i> .....	Appx 10
603	Rim sherd of a Carinated Bowl, in Fabric 1 .....	Appx 11
604	Possible profile of Carinated Bowl (Pot 4), with the areas represented by the sherds highlighted .....	Appx 11
605	The distribution of Early Neolithic pottery of the Carinated Bowl tradition in north-west England, south-west Scotland, and the Isle of Man .....	Appx 11
606	Base and joining sherds from a Grooved Ware vessel from the <i>Principal palaeochannel</i> .....	Appx 11
607	Rim fragment of the Fabric 4 vessel from alluvial layer <b>70120</b> .....	Appx 11
608	Rim of the Fabric 5 vessel from pit <b>100026</b> .....	Appx 11
609	Rim of the Fabric 5 vessel from pit <b>32004</b> .....	Appx 11
610	Flat-topped rim of the Fabric 5 vessel from posthole <b>32093</b> .....	Appx 11
611	Beads 1-4 .....	Appx 12
612	The recorded waterlogged wood from Stainton West .....	Appx 13
613	Timber <b>76271</b> .....	Appx 13
614	Oak debris <b>76243-6</b> .....	Appx 13
615	Structure <b>75935</b> and Wooden Structure 1 .....	Appx 13
616	Wooden Structures 2 and 3 .....	Appx 13
617	Stakes, roundwood, timber, and debris in the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
618	Deposits of wood and worked wood in the <i>Later Neolithic organic deposit</i> .....	Appx 13
619	Trident 1 .....	Appx 13
620	Trident 2 .....	Appx 13
621	Paddle <b>75706</b> .....	Appx 13
622	Carved dowel <b>75826</b> .....	Appx 13
623	Chop-and-tear worked ends, roundwood <b>76031</b> , <b>76219</b> , and <b>76831</b> .....	Appx 13
624	Comparable tridents from Ehenside Tarn, Cumbria, Co Armagh, Co Wicklow, Co Sligo, and Co Galway .....	Appx 13
625	Relative abundance of wood taxa from the <i>Mesolithic organic deposit</i> .....	Appx 13
626	Relative abundance of wood taxa from the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
627	Relative abundance of wood taxa from the <i>Later Neolithic organic deposit</i> .....	Appx 13
628	Diameter of the wood from the <i>Mesolithic organic deposit</i> .....	Appx 13
629	Diameter of the wood from the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
630	Diameter of the wood from the <i>Later Neolithic organic deposit</i> .....	Appx 13
631	The number and size of burnt oak pieces from the <i>Principal palaeochannel</i> .....	Appx 13
632	The proportions of aquatic taxa of Coleoptera from the <i>Mesolithic organic deposit</i> .....	Appx 14
633	The proportions of Coleoptera associated with woodlands from the <i>Mesolithic organic deposit</i> .....	Appx 14
634	The proportions of Coleoptera associated with open ground and pasture from the <i>Mesolithic organic deposit</i> .....	Appx 14
635	The proportions of aquatic taxa of Coleoptera from the <i>Mesolithic alluvium</i> and <i>Mesolithic/Neolithic alluvium</i> .....	Appx 14
636	The proportions of Coleoptera associated with woodlands from the <i>Mesolithic alluvium</i> and <i>Mesolithic/Neolithic alluvium</i> .....	Appx 14
637	The proportions of Coleoptera associated with animal dung from deposits in the <i>Principal palaeochannel</i> .....	Appx 14
638	The proportions of Coleoptera associated with woodlands from the <i>Later Neolithic organic deposit</i> , Burnt Mound 6, and the <i>Chalcolithic alluvium</i> .....	Appx 14
639	Proportions of leaf-feeding insects from a range of Mesolithic and Neolithic sites in the UK .....	Appx 14
640	The abundance of microfossils from the samples analysed .....	Appx 15
641	Pollen monoliths analysed from Stainton West .....	Appx 16
642	Pollen percentage diagram for monolith 70222/71155, Bay B .....	Appx 16
643	Non-pollen palynomorph percentage diagram for monolith 70222/71155, Bay B .....	Appx 16



644	Pollen percentage diagram for monolith 70225/71158, Bay B .....	Appx 16
645	Non-pollen palynomorph percentage diagram for monolith 70225/71158, Bay B.....	Appx 16
646	Pollen and non-pollen palynomorph percentage diagram for monolith 70219, Bay B.....	Appx 16
647	Pollen percentage diagram for monolith 70296, Bay D.....	Appx 16
648	Non-pollen palynomorph percentage diagram for monolith 70296, Bay D .....	Appx 16
649	Pollen percentage diagram for monolith 70240, Bay D.....	Appx 16
650	Pollen percentage diagram for monolith 70250, Bay F.....	Appx 16
651	Non-pollen palynomorph percentage diagram for monolith 70250, Bay F .....	Appx 16
652	Pollen percentage diagram for monolith 70252, Bay F.....	Appx 16
653	Non-pollen palynomorph percentage diagram for monolith 70252, Bay F .....	Appx 16
654	Pollen percentage diagram for monolith 70507, Bay O.....	Appx 16
655	Non-pollen palynomorph percentage diagram for monolith 70507, Bay O .....	Appx 16
656	Pollen percentage diagram for monolith 70513, Bay O.....	Appx 16
657	Pollen percentage diagram for monolith 70235, Burnt Mound 2 .....	Appx 16
658	Deadwood and dung beetles, with fungal spores .....	Appx 16
659	Pollen percentage diagram for monolith 32046, ditch <b>32131</b> , Parcel 32.....	Appx 16
660	Pollen percentage diagram for monolith 50013, ditch <b>50081</b> , Knockupworth.....	Appx 16
661	Pollen percentage diagram for monolith 50000, buried soil <b>50072</b> , Knockupworth.....	Appx 16
662	Pollen percentage diagram for monolith 250007, soil <b>200106</b> , henge monument .....	Appx 16
663	The analysed samples of waterlogged-plant remains from Stainton West .....	Appx 17
664	Relative percentages of waterlogged plant remains from Stainton West.....	Appx 17
665	Actual counts of waterlogged plant remains from Stainton West.....	Appx 17
666	Charcoal taxa from the burnt mounds at Stainton West.....	Appx 18
667	Analysed soil monoliths at Stainton West.....	Appx 19
668	The dating positions of the four tree-ring samples from Cluster 1 .....	Appx 20
669	The dating positions of the 16 dated tree-ring samples from Cluster 2, and their interpretations ..	Appx 20
670	The dating positions of the two tree-ring samples from Cluster 3.....	Appx 20
671	The dating positions of the two tree-ring samples from Cluster 4.....	Appx 20
672	The dating positions of the three tree-ring samples from Cluster 5.....	Appx 20
673	Probability distributions of dates from timber <b>76426</b> .....	Appx 20
674	Probability distributions of dates from timber <b>76503</b> .....	Appx 20
675	Probability distributions of dates from timber <b>75854</b> .....	Appx 20
676	Probability distributions of the last measured ring (150) from timber <b>75854</b> .....	Appx 20
677	Probability distributions of dates from timber <b>76422</b> .....	Appx 20
678	The structure of the OxCal chronological model for Stainton West.....	Appx 20
679	Bays V/B deposit models .....	Appx 20
680	Bays X/D deposit models.....	Appx 20
681	Bay X/F deposit models .....	Appx 20
682	Posterior-density estimates for the Mesolithic deposits within the <i>Principal palaeochannel</i> , prior to 'Mesolithic/Neolithic alluvium II' phase, at Stainton West .....	Appx 20
683	Posterior-density estimates and dendrochronological measurements for the 'Mesolithic/Neolithic alluvium II' phase, at Stainton West.....	Appx 20
684	Posterior-density estimates for the Mesolithic deposits within the <i>Grid-square area</i> , prior to 'Mesolithic/Neolithic alluvium II' phase, at Stainton West .....	Appx 20
685	Posterior-density estimates for key Mesolithic parameters, at Stainton West.....	Appx 20
686	Posterior-density estimates for earlier Neolithic deposits/features within the <i>Principal palaeochannel</i> at Stainton West .....	Appx 20
687	Posterior-density estimates for later Neolithic deposits/features within the <i>Principal palaeochannel</i> at Stainton West .....	Appx 20
688	Posterior-density estimates for key earlier Neolithic parameters from the <i>Principal palaeochannel</i> , at Stainton West.....	Appx 20
689	Posterior-density estimates for Neolithic dryland activity at Stainton West.....	Appx 20
690	Posterior-density estimates for key Neolithic parameters from the dryland area at Stainton West....	Appx 20
691	Posterior-density estimates for Chalcolithic and Bronze Age activity at Stainton West.....	Appx 20
692	Posterior-density estimates for key Chalcolithic and Bronze Age parameters, at Stainton West ....	Appx 20
693	Posterior-density estimates for the Parcel 42 early medieval settlement.....	Appx 20
694	The duration of the Parcel 42 early medieval settlement .....	Appx 20



## Plates

1	The new road bridge over the River Eden, from the east .....	1
2	The CNDR, looking south, with Stainton West under excavation .....	2
3	The CNDR stripped, on the south side of the River Eden, looking south-west .....	5
4	Recording fluvial and alluvial deposits during the trench evaluation at Stainton West .....	11
5	Observing topsoil stripping during the watching brief .....	13
6	The new road bridge over the River Eden under construction, looking north .....	14
7	Excavating Hadrian's Wall, at Knockupworth, in the winter of 2008/9 .....	15
8	The plant and infrastructure required to excavate a section across the Vallum ditch at Knockupworth .....	15
9	Flood-relief culverts installed under the road embankment at Stainton West .....	16
10	The initial exposure of the palaeochannel deposits and lithic scatter at Stainton West during the strip-and-record exercise .....	17
11	Large numbers of lithic items, indicative of a later Mesolithic technology, in Test Pit 4 at Stainton West.....	18
12	Stainton West, looking north-east, with whole-earth samples being collected from the <i>Grid-square area</i> ..	20
13	The sieving plant running at full capacity .....	20
14	Stainton West, with the <i>Grid-square area</i> in the foreground and <i>Principal palaeochannel</i> under excavation	21
15	Stainton West, looking north, during excavation of the <i>Principal palaeochannel</i> .....	22
16	Stainton West, looking north, during hand excavation to remove the baulks between the 'bays' .....	23
17	Work on the huge lithic assemblage from Stainton West .....	25
18	Stainton West under excavation, with the River Eden terraces and palaeochannels, looking south .....	43
19	Stainton West under excavation, looking east-north-east.....	43
20	The third palaeochannel, looking south-east.....	44
21	The levée between the <i>Principal palaeochannel</i> and the third channel, looking south-east .....	45
22	Stainton West, looking north-east, with the site of the henge monument on Terrace 1 .....	64
23	Hearth <b>90452</b> .....	66
24	Pit <b>90473</b> .....	66
25	Pit <b>90314</b> , containing stone-filled hearth/cooking pit <b>90593</b> .....	69
26	The <i>Principal palaeochannel</i> , with the <i>Mesolithic organic deposit</i> exposed, looking north-east .....	70
27	Section through the <i>Mesolithic organic deposit</i> overlying the <i>Basal sands and gravels</i> in Bay V .....	70
28	Photomicrograph showing the erosive curved junction between sandy deposit <b>71028</b> and microlaminated deposit <b>71026</b> .....	71
29	Photomicrograph showing an iron-stained humic silt <b>71089</b> .....	72
30	Wood within the Mesolithic channel .....	72
31	An oak bough or trunk ( <b>76436</b> ) from the beaver dam, displaying the water-eroded evidence for gnawing ....	73
32	The timbers of the beaver dam exposed during the excavation of the <i>Mesolithic organic deposit</i> .....	74
33	The beaver lodge, looking west .....	74
34	Claw marks from a large animal, perhaps a young bear, on oak trunk <b>76454</b> .....	83
35	The hazel scrub environment that fringed the <i>Principal palaeochannel</i> .....	88
36	Oak trunk <b>76430</b> used in the beaver dam, showing evidence of charring .....	88
37	Burnt and worked wood <b>76474</b> , from the <i>Mesolithic organic deposit</i> in the <i>Principal palaeochannel</i> .....	90
38	Burnt and worked wood <b>76425</b> , from the <i>Mesolithic organic deposit</i> in the <i>Principal palaeochannel</i> .....	90
39	Burnt wood <b>76422</b> , from the <i>Mesolithic organic deposit</i> in the <i>Principal palaeochannel</i> .....	91
40	Worked wood from the <i>Mesolithic organic deposit</i> in the <i>Principal palaeochannel</i> .....	91
41	Oak trunk <b>76271</b> in the beaver lodge, with possible evidence for ring barking.....	92
42	Possible burr-wood blanks for bowls or dishes .....	93
43	A scalene-triangle microlith and a side scraper from the <i>Mesolithic organic deposit</i> .....	94
44	East-facing section of tree-throw <b>90208</b> .....	96
45	Lithics from tree-throw <b>90208</b> .....	97
46	Tree-throw <b>90163</b> , looking east.....	100
47	Knapping group 44, made from Scottish chert.....	107
48	Highly reduced pitchstone core, and crescent microlith, probably made from amethyst .....	107
49	Mesolithic coarse-stone tools: ground stone and incised rhyolite cobble .....	109
50	Retouched tool made from the lateral edge of a Group VI axe, compared with an Early Neolithic example, also in Group VI.....	110
51	Group VI axe fragment, reworked into a core.....	110
52	Adze/axe made from dacite tuff .....	110
53	Tuff axe fragments .....	112
54	Ochre pieces: striated lump and lump.....	112

55	Stone beads .....	112
56	Stakeholes <b>90337</b> and <b>90354</b> in Structure 4, and <b>90332</b> in Structure 5 .....	118
57	Burnt stones in hearth <b>90456</b> .....	118
58	Burnt stones in hearth/pit <b>90258</b> .....	119
59	The ochre blade .....	121
60	Striated ochre lump, with pinkish-white kaolin residue .....	124
61	Burnt stones in hearth <b>90190</b> .....	127
62	Axe fragments: andesitic tuff and Group XI tuff .....	134
63	Burnt stones in pit <b>90469</b> .....	138
64	Burnt stone spread <b>90396</b> .....	139
65	Mesolithic coarse-stone tools: sandstone anvil and dacite tuff fishing weight .....	141
66	A hand-held grinder from the Mesolithic encampment, used to polish or sharpen tuff-stone tools ...	156
67	<i>A View of the Indians of Tierra del Fuego in their hut</i> by Francesco Bartolozzi, c 1769 .....	157
68	The possible fishing weight from the Mesolithic encampment .....	159
69	Late Mesolithic microliths: scalene and isosceles triangles .....	165
70	An unfinished scalene triangle .....	165
71	Flaked lithics made from Scottish chert .....	167
72	Flaked lithics made from Yorkshire flint .....	167
73	Pitchstone tools from the Mesolithic encampment .....	170
74	A complete tuff axe/adze head from the Mesolithic encampment, similar to the Mesolithic axes from Ireland .....	183
75	The <i>Mesolithic/Neolithic alluvium</i> and <i>Mesolithic alluvium</i> in Bay C .....	188
76	The partially excavated <i>Principal palaeochannel</i> , looking south .....	191
77	Pointed or eroded oak <b>76237</b> .....	197
78	Pointed oak <b>76065</b> , possibly shaped with an axe .....	197
79	The potential Mesolithic Irish-style tuff adze from Holbeck Park .....	214
80	Sampson's Bratfull, a presumed Early Neolithic long cairn on Stockdale Moor, in the Lake District ...	217
81	The Long Meg stone circle, with the potential Early Neolithic enclosure partially beneath .....	217
82	The Early Neolithic pit-defined enclosure at Plasketlands, visible as a cropmark .....	219
83	The axe-production sites in Great Langdale .....	220
84	Neolithic artefacts from Ehenside Tarn .....	222
85	The embanked stone circle at Long Meg .....	229
86	Stone circles on Burnmoor, in the Lake District .....	231
87	Wooden structure <b>75935</b> , looking south-east .....	238
88	The loose lattice of timber forming a rudimentary platform over Mesolithic trunks .....	241
89	The stake line forming part of Wooden Structure 1, looking north .....	243
90	Axe-cut stakes <b>76029</b> , <b>76030</b> , and <b>76031</b> .....	244
91	The setting of horizontal timbers in Wooden Structure 1 .....	244
92	The excavation of Wooden Structure 2 .....	244
93	Sharpened stakes <b>70128</b> , <b>76192</b> , and <b>76071</b> in Wooden Structure 3 .....	245
94	Beaver-gnawed piece <b>76142</b> .....	246
95	Sharpened stakes <b>76221</b> , <b>76224</b> , and <b>76242</b> .....	248
96	Beaver-gnawed pieces <b>75681</b> , <b>75891</b> , <b>76263</b> , and <b>76267</b> .....	249
97	Paddle <b>75706</b> , <i>in situ</i> on trunk <b>76014</b> and opposite tuff core 70327.10 .....	250
98	Wooden artefact <b>76232</b> .....	251
99	Oak debris <b>75831</b> .....	251
100	Radially split oak timber <b>76076</b> .....	252
101	Tree-felling debris, apparently intentionally placed .....	252
102	Trimmed and coppiced roundwood <b>75534</b> , above plank <b>75544</b> .....	253
103	Carved dowel <b>75826</b> .....	253
104	Trident 1 <i>in situ</i> .....	254
105	Worked wood in the platform in Bay B .....	255
106	Worked wood in Bay A associated with Mesolithic oak-trunks <b>76065</b> and <b>76154</b> .....	256
107	Plank <b>76118</b> ; elm debris <b>76067</b> ; charred debris <b>76087</b> ; and roundwood hazel <b>76063</b> and <b>76088</b> .....	257
108	Plank <b>76503</b> .....	257
109	Worked and unworked volcanoclastic stones within the low-energy <i>Earlier Neolithic organic deposit</i> ..	258
110	Worked coarse stones from the <i>Principal palaeochannel</i> : wedge-shaped tools .....	260
111	Worked coarse stones from the <i>Principal palaeochannel</i> : flake knife 70259.2 .....	261

112	Worked coarse stones from the <i>Principal palaeochannel</i> : pounder/grinder 70090.60 .....	261
113	Worked coarse stones from the <i>Principal palaeochannel</i> : anvils 70094.10 and 70134.10.....	262
114	The complete <i>polissoir</i> from Ehenside Tarn .....	262
115	Axehead 70353.30.....	265
116	Axehead 70325.41.....	266
117	Knapping group 116, a chert nodule, smashed and apparently discarded in association with Trident 1...	268
118	Broad blades from the Neolithic deposits in the <i>Principal palaeochannel</i> .....	269
119	Arrowheads from the Neolithic deposits in the <i>Principal palaeochannel</i> .....	270
120	Trident 2 .....	273
121	Axehead 70403.14.....	274
122	The timber platform in Bay C, looking north-west.....	277
123	Tree-throw <b>90262</b> .....	281
124	Deposit sequence within grid-square 988 .....	284
125	A Khanty community visiting the shrine of their local protector spirit .....	310
126	A girdled tree.....	312
127	North-facing section through henge ditch <b>200108</b> .....	325
128	Late Neolithic waterlogged wood in the <i>Later Neolithic organic deposit</i> in Bay A .....	332
129	Stake <b>75533</b> , and oak-debris <b>75532</b> and <b>75916</b> .....	337
130	Charred alder debris <b>76223</b> .....	337
131	Alder debris <b>75649</b> , hazel stake <b>75495</b> , alder stake <b>75497</b> , and oak debris <b>75496</b> .....	338
132	Axehead 70326.4.....	339
133	The three <i>polissoir</i> fragments .....	340
134	Burnt Mound 1, following partial excavation, with the crescent of charcoal visible.....	346
135	Burnt Mound 1, prior to excavation, with stone spread <b>70191</b> .....	348
136	The successive layers forming stone spread <b>70191</b> , Burnt Mound 1 .....	348
137	Deposits backfilling pit <b>70456</b> .....	349
138	<i>Chalcolithic alluvium</i> overlying stone spread <b>70191</b> , Burnt Mound 1.....	349
139	Burnt deposit <b>70079</b> and pit <b>70350</b> , forming Burnt Mound 5.....	352
140	Grooved Ware vessel from the <i>Principal palaeochannel</i> .....	356
141	Grooved Ware sherds from Bay A of the <i>Principal palaeochannel</i> .....	357
142	Driven stake <b>75854</b> , <i>in situ</i> .....	357
143	Driven stake <b>76239</b> , <i>in situ</i> .....	358
144	Burnt Mound 6, looking south-west .....	386
145	Trough <b>70287</b> , and the overlying burnt spread, Burnt Mound 2, following partial excavation .....	388
146	Trough <b>70287</b> , Burnt Mound 2, following half-sectioning, looking west .....	389
147	Trough <b>70287</b> , Burnt Mound 2, following half-sectioning, and postholes <b>70355</b> and <b>70337</b> .....	389
148	The spread of burnt stone and charcoal-rich soil defining Burnt Mound 4, prior to excavation.....	390
149	Troughs <b>70348</b> and <b>70375</b> , Burnt Mound 4, cut into infilled tree-throw <b>70367</b> , looking south-west.....	391
150	Stakehole <b>70189</b> and posthole <b>70249</b> , looking south-east.....	392
151	Burnt Mound 3, following partial excavation, looking south-west.....	393
152	Ring-gully <b>100031</b> , following excavation .....	395
153	Pit <b>100026</b> , looking north-west.....	398
154	Hearth <b>100050</b> , half-sectioned .....	398
155	Trough <b>70155</b> , looking south-east.....	399
156	Pit <b>70278</b> , half-sectioned, looking north-east .....	400
157	Bronze Age House 1, looking east.....	405
158	Section across posthole <b>21341</b> , with the post-pipe visible as a darker soil stain .....	407
159	Ditch <b>21378</b> .....	408
160	Burnt material in pit <b>41014</b> , following half-sectioning.....	411
161	House 4, looking north-east .....	413
162	Hearth <b>42163/42165</b> , looking east .....	416
163	House 6, looking north.....	416
164	Hearth <b>90217</b> , following half-sectioning.....	420
165	The spread of burnt stone and charcoal-rich soil defining Burnt Mound 4.....	429
166	<i>In-situ</i> possible hurdle panels, Burnt Mound 6, under fire-cracked stone <b>70247</b> .....	431
167	Ring-gully <b>100031</b> , with hearth <b>100020</b> , a possible sauna .....	431
168	A Native North American (Sioux) sweat lodge, in 1898 .....	435
169	Bronze Age House 2, looking east.....	441

170	House 5, looking south-east .....	443
171	Burnt material in a section through segmented ditch <b>41003</b> , Parcel 41 .....	444
172	Roasting pit <b>21099</b> , half-sectioned, Parcel 21 North.....	444
173	Section through boundary ditch <b>21096</b> , Parcel 21 North .....	445
174	The entrance of the large multivallate Iron Age settlement at Hayknowes Farm, Annan.....	447
175	Knockupworth, with the River Eden, and the line of the Vallum on its southern bank .....	453
176	Laminated earth and turf deposits of the levelled Turf Wall with the foundation for the Stone Wall .....	455
177	The tail of the Turf Wall, looking north-west, showing homogeneous deposit <b>50082</b> .....	456
178	Stone lining <b>50109</b> at the northern end of ditch/drain <b>50081</b> , looking north.....	457
179	Ditch/drain <b>50081</b> , looking north-east, with stone lining <b>50109</b> at its north-eastern end.....	457
180	The Stone Wall, looking north-west, showing its position relative to the tail of the levelled Turf Wall.....	459
181	The poorly preserved north-western fragment of the Stone Wall, looking south-east .....	459
182	The flagged footing for the south face of the Stone Wall, showing distinctive cracking .....	460
183	The Stone Wall, looking east, showing the settling of the facing stones over ditch/drain <b>50081</b> .....	461
184	The four collapsed capstones of drain <b>50081</b> within the Wall core, looking north .....	461
185	Inserting box-shoring into the deep drainage trench to facilitate excavation of the Vallum ditch.....	463
186	Groundwater and collapse of the fills of the primary Vallum ditch ( <b>50150</b> ) in the drainage-trench ....	464
187	Laminated turf block, deposited within the primary Vallum ditch, looking south-east .....	466
188	The best-preserved section of the north mound of the Vallum.....	468
189	The denuded Turf Wall, looking south-east, with the Stone Wall directly above .....	472
190	Flag foundation <b>50110</b> underlying the south face of the Stone Wall, looking north.....	475
191	Stone Wall drain <b>50109</b> , looking north-west .....	477
192	Turf-block <b>51026</b> in the primary Vallum ditch, looking south-east .....	478
193	The Turf Wall, sectioned at High House in 1927, looking west .....	479
194	Building 1, looking north-west .....	499
195	The eastern end of Building 2, looking north-west.....	500
196	Post-pit <b>42457</b> , following half-sectioning, looking north-west.....	501
197	Late Iron Age to early medieval beads from Stainton West .....	506
198	Ditch <b>32014</b> , following partial excavation, looking south-east .....	508
199	Ditch <b>32131</b> , looking north-east .....	509
200	The sandstone fragment from Trench 47.1, seemingly a quiver .....	528
201	The CNDR crossing the River Eden, with Hadrian's Wall to the south, and Stainton West.....	530
202	The partially excavated <i>Principal palaeochannel</i> and Mesolithic encampment at Stainton West.....	531
203	An anastomosed river system (Waimakariri River) in the South Island of New Zealand .....	532
204	Beaver-gnawed wood from the <i>Principal palaeochannel</i> .....	534
205	Probable brown bear or lynx claw marks on an oak trunk from the <i>Principal palaeochannel</i> .....	534
206	Salmon migrating up-river .....	536
207	Great Langdale, looking south.....	540
208	Excavating a Cluster 2 oak timber in Bay C, Stainton West .....	542
209	Fish-trap <b>75935</b> , Stainton West .....	543
210	The Early Neolithic timber platform within the <i>Principal palaeochannel</i> .....	545
211	Stakes forming elements of a fenceline (Structure 1) within the <i>Principal palaeochannel</i> .....	545
212	Trident 2, with the broken tine beneath .....	545
213	The two polished-stone axeheads from the <i>Earlier Neolithic organic deposit</i> .....	546
214	Early Neolithic tree-throw <b>90262</b> in the <i>Grid-square area</i> , following excavation.....	547
215	One of the species of dung beetle in the Neolithic deposits in the <i>Principal palaeochannel</i> .....	548
216	Burnt Mounds 2-4, on either side of the <i>Principal palaeochannel</i> , Stainton West .....	554
217	An idealised reconstruction of a later prehistoric roundhouse comparable to House 1 at Parcel 9.....	556
218	The CNDR under construction, looking south.....	568
219	A brown-flint flaked lithic, retaining an area of cortex .....	Appx 3
220	Brown-flint items from knapping groups 53 and 83 .....	Appx 3
221	Grey-flint blade and flake debitage from knapping group 65 .....	Appx 3
222	Grey pebble-flint blade, flake, and chunk debitage comprising knapping group 79.....	Appx 3
223	A black-chert chunk, and core fragments from knapping group 36.....	Appx 3
224	Black-chert chunks from knapping group 49 .....	Appx 3
225	Black-chert blades from knapping group 51.....	Appx 3
226	Grey-chert regular flakes from knapping group 1.....	Appx 3
227	Grey-chert regular flakes from knapping group 3.....	Appx 3



228	Grey-chert core, core fragment, and blade and flake debitage from knapping group 54.....	Appx 3
229	Brown-chert blades and flakes from knapping group 9 .....	Appx 3
230	Brown-chert core, core fragments, and blade and flake debitage from knapping group 52.....	Appx 3
231	Brown-chert cores, core fragments, flakes, and chunks comprising knapping group 116 .....	Appx 3
232	GQB/chert core-trimming pieces, blade and flake debitage, and a microlith fragment, from knapping group 42.....	Appx 3
233	SSUC blade, flake, and chunk debitage, from knapping group 44 .....	Appx 3
234	Complete and broken chalcedony/agate blades.....	Appx 3
235	Worked tuff, exhibiting both fresh and corticated surface conditions .....	Appx 3
236	Worked pitchstone.....	Appx 3
237	Worked quartz.....	Appx 3
238	Pebble-flint and brown-flint backed bladelets.....	Appx 5
239	Pebble-flint and chert crescents .....	Appx 5
240	Pebble-flint and chert fine points.....	Appx 5
241	Pebble-flint and chert isosceles triangles.....	Appx 5
242	Pebble-flint, chert, and SSUC <i>lamelles à cran</i> and microburins .....	Appx 5
243	Pebble-flint and ‘cannot determine’ miscellaneous microlith forms.....	Appx 5
244	Pebble-flint and chert obliquely blunted blades .....	Appx 5
245	Pebble-flint and chert obliquely blunted blades with basal retouch.....	Appx 5
246	Pebble-flint, chert, and SSUC rods .....	Appx 5
247	Pebble-flint scalene triangles .....	Appx 5
248	The pebble-flint trapezoids.....	Appx 5
249	Pebble-flint edge-retouched pieces.....	Appx 5
250	Pebble-flint, brown-flint, and chert scrapers.....	Appx 5
251	Pebble-flint and brown-flint awls/borers.....	Appx 5
252	Brown-flint, chert, and ‘cannot determine’ notches .....	Appx 5
253	Grey-flint, pebble-flint, and brown-flint knife forms .....	Appx 5
254	Pebble-flint and chert burins .....	Appx 5
255	Pebble-flint denticulates.....	Appx 5
256	Pebble-flint, chert, and ‘cannot determine’ invasively flaked blanks.....	Appx 5
257	The grey-flint, brown-flint, and pebble-flint leaf points .....	Appx 5
258	The grey-flint, brown-flint, and pebble-flint transverse arrowheads.....	Appx 5
259	The pebble-flint barbed-and-tanged arrowhead .....	Appx 5
260	Axehead 70326.4.....	Appx 6
261	Axehead 70353.30.....	Appx 6
262	Axehead 70403.14.....	Appx 6
263	Axehead 70325.41.....	Appx 6
264	Micrograph of pebble-flint backed bladelet, with microwear interpreted as the result of butchery .....	Appx 7
265	Micrograph of pebble-flint microlith fragment, with microwear suggesting the cutting of meat or hide .....	Appx 7
266	Micrograph of chert burin, with microwear suggesting it was used for hide piercing.....	Appx 7
267	Micrograph of pebble-flint awl/borer, with microwear suggesting it was used for scraping dry hide .....	Appx 7
268	Micrograph of pebble-flint fine point, with microwear suggesting butchery, perhaps fish descaling or preparation .....	Appx 7
269	Micrograph of pebble-flint edge-retouched blade, with microwear associated with soft wood/plant working .....	Appx 7
270	Micrograph of pebble-flint backed bladelet, with microwear produced by cutting dry hides.....	Appx 7
271	Thin-section photomicrograph of Stainton West Sample 1A, showing inclusions of granitic igneous rock.....	Appx 11
272	Thin-section photomicrograph of Stainton West Sample 1B, showing inclusions of quartz and feldspar .....	Appx 11
273	Thin-section photomicrograph of Stainton West Sample 2A, showing inclusions of granitic igneous rock.....	Appx 11
274	Thin-section photomicrograph of Stainton West Sample 2B, showing inclusions of granitic igneous rock.....	Appx 11
275	Thin-section photomicrograph of Stainton West Sample 3A, showing an inclusion of sandstone and fragments of crushed pottery or ‘grog’-temper .....	Appx 11
276	Thin-section photomicrograph of Stainton West Sample 3B, showing a fragment of crushed pottery or ‘grog’-temper fragment.....	Appx 11
277	Thin-section photomicrograph of Stainton West Sample 4A, showing a large altered inclusion of weathered volcanic rock.....	Appx 11

278	Thin-section photomicrograph of Stainton West Sample 4B, showing natural heterogeneity in the clay matrix.....	Appx 11
279	Roundwood <b>76381</b> from the <i>Mesolithic organic deposit</i> .....	Appx 13
280	Timber <b>76271</b> immediately prior to lifting .....	Appx 13
281	<i>In-situ</i> timber <b>76422</b> .....	Appx 13
282	The notched section of timber <b>76424</b> after lifting and cutting.....	Appx 13
283	Timber <b>76437</b> following lifting and cutting, with three potential bear-claw marks .....	Appx 13
284	Possible charred felling-debris <b>76425</b> .....	Appx 13
285	<i>In-situ</i> items <b>76244-6</b> .....	Appx 13
286	<i>In-situ</i> timber <b>76065</b> .....	Appx 13
287	<i>In-situ</i> timbers forming Neolithic Structure <b>75935</b> .....	Appx 13
288	Line of roundwood stakes, associated with Wooden Structure 1 .....	Appx 13
289	Horizontal roundwood <b>75906-15</b> .....	Appx 13
290	<i>In-situ</i> roundwood <b>76075</b> , with the area where the bark has been removed visible as a linear strip.....	Appx 13
291	<i>In-situ</i> stake <b>76242</b> .....	Appx 13
292	Roundwood <b>76505</b> .....	Appx 13
293	<i>In-situ</i> timber <b>75527</b> .....	Appx 13
294	Timber <b>75853</b> after lifting.....	Appx 13
295	Timber-debris <b>76503</b> after lifting .....	Appx 13
296	<i>In-situ</i> groove-and-split debris <b>76024</b> .....	Appx 13
297	Wood chip <b>75531</b> after lifting .....	Appx 13
298	Wood chip <b>75608</b> after lifting .....	Appx 13
299	<i>In-situ</i> stake <b>75533</b> .....	Appx 13
300	Vertically driven timber <b>75854</b> .....	Appx 13
301	Timber-debris <b>75496</b> .....	Appx 13
302	Split-timber <b>76232</b> .....	Appx 13
303	Naked barley from pit <b>21099</b> .....	Appx 18
304	Scan of M70229B, Bay B/V, boundary between <b>70078</b> and overlying <b>70317</b> .....	Appx 19
305	Photomicrograph of M70255C, <i>Principal palaeochannel</i> Bay F, <b>70153</b> .....	Appx 19
306	Photomicrograph of M70223C, <i>Principal palaeochannel</i> Bay B/V, <b>70225</b> over <b>70226</b> .....	Appx 19
307	Photomicrograph of M71157B, <i>Principal palaeochannel</i> Bay V, <b>71129</b> .....	Appx 19
308	Detail of M71157B, <i>Principal palaeochannel</i> Bay V, base of <b>71089</b> .....	Appx 19
309	Photomicrograph of M71157A, <i>Principal palaeochannel</i> Bay V, <b>71089</b> .....	Appx 19
310	SEM/EDS X-ray backscatter image of M71157A, <i>Principal palaeochannel</i> Bay V, <b>71089</b> .....	Appx 19
311	Photomicrograph of M71157A, <i>Principal palaeochannel</i> Bay V, <b>71131</b> .....	Appx 19
312	Scan of M71174B, Bay X, showing turbated <b>71028</b> , and erosive boundary to <b>71026</b> .....	Appx 19
313	Photomicrograph of M71174B, Bay X, with the erosive junction between <b>71028</b> and <b>71026</b> .....	Appx 19
314	Photomicrograph of M70218B, <i>Principal palaeochannel</i> Bay B/V, <b>70059</b> .....	Appx 19
315	Scan of M70223C, <i>Principal palaeochannel</i> Bay B/V, <b>70225</b> over <b>70226</b> .....	Appx 19
316	Photomicrograph of M70255C, <i>Principal palaeochannel</i> Bay F, <b>70323</b> .....	Appx 19
317	Photomicrograph of M70255B, <i>Principal palaeochannel</i> Bay F, <b>70323</b> , with buds attached to twig Appx 19	
318	Photomicrograph of M70255B, <i>Principal palaeochannel</i> Bay F, <b>70323</b> .....	Appx 19
319	Photomicrograph of the laminated junction between <b>70078</b> and <b>70317</b> .....	Appx 19
320	Photomicrograph of M70229A, <i>Principal palaeochannel</i> Bay B/V, <b>70317</b> .....	Appx 19
321	Scan of M70223B, <i>Principal palaeochannel</i> Bay B/V, <b>70308</b> over <b>70317</b> .....	Appx 19
322	Photomicrograph of M70223B, <i>Principal palaeochannel</i> Bay B/V, <b>70308</b> over <b>70317</b> .....	Appx 19
323	Photomicrograph of M70218A, <i>Principal palaeochannel</i> Bay B/V, <b>70308</b> .....	Appx 19
324	Photomicrograph of M70255A, <i>Principal palaeochannel</i> Bay F, <b>70154</b> .....	Appx 19
325	Photomicrograph of M70241A, <i>Principal palaeochannel</i> Bay D, <b>70314</b> .....	Appx 19
326	Photomicrograph of M70241A, <i>Principal palaeochannel</i> Bay D, <b>70314</b> , with charred plant material. Appx 19	
327	EDS X-ray backscatter image of humified woody remains in M70223A.....	Appx 19
328	Scan of M70512, <i>Principal palaeochannel</i> Bay O, <b>70484</b> .....	Appx 19
329	Scan of M70461B, Burnt Mound 1, trough fill <b>70439</b> .....	Appx 19
330	Photomicrograph of M70461B, Burnt Mound 1, trough fill <b>70439</b> .....	Appx 19
331	Photomicrograph of M70461A, Burnt Mound 1, trough fill <b>70430</b> .....	Appx 19
332	Photomicrograph of M70220A, Burnt Mound 2, trough fill <b>70283</b> .....	Appx 19
333	Photomicrograph of M70220A, Burnt Mound 2, trough fill <b>70283</b> ; woody-root mixing .....	Appx 19

334	Scan of M70329B, Burnt Mound 4, trough fill <b>70347</b> over fill <b>70377</b> .....	Appx 19
335	Photomicrograph of M70329B, Burnt Mound 4, trough fill <b>70347</b> .....	Appx 19
336	Photomicrograph of M70329A, Burnt Mound 4, trough fill <b>70347</b> .....	Appx 19
337	Photomicrograph of M70347B, Burnt Mound 4, trough fill <b>70373</b> .....	Appx 19
338	Scan of M70347A, Burnt Mound 4, trough fill <b>70371</b> .....	Appx 19
339	Photomicrograph of M70347A, Burnt Mound 4, trough fill <b>70371</b> .....	Appx 19
340	Photomicrograph of M70180B, fill <b>70265</b> , pit <b>70155</b> : burned rock .....	Appx 19
341	Photomicrograph of M70180B, fill <b>70265</b> , pit <b>70155</b> : rock-protected humic remains .....	Appx 19
342	Photomicrograph of M90262B, <i>Basal sands and gravels</i> <b>90039</b> .....	Appx 19
343	Photomicrograph of M90038A, <i>Stabilised land surface</i> <b>90206</b> .....	Appx 19
344	Photomicrograph of M90262B, junction of <i>Stabilised land surface</i> <b>90206</b> and <i>Basal sands and gravels</i> <b>90039</b> .....	Appx 19
345	Photomicrograph of M90196B, fill <b>90283</b> .....	Appx 19
346	Photomicrograph of M90196A, fill <b>90283</b> .....	Appx 19
347	Photomicrograph of M90038B, junction of <b>90264</b> and underlying <i>Basal sands and gravels</i> <b>82876</b> .....	Appx 19
348	Photomicrograph of M51023B, lowermost part of ditch fill <b>50126</b> .....	Appx 19
349	Scan of M51023A, ditch fill <b>50126</b> .....	Appx 19
350	M51023A: rooted-grass litter layer .....	Appx 19
351	Photomicrograph of M51023A, ditch fill <b>50126</b> .....	Appx 19
352	Scan of M51051D2, lowermost part of ditch fill <b>51041</b> .....	Appx 19
353	Photomicrograph of M51051C, ditch fill <b>51039</b> .....	Appx 19
354	Scan of M51051C, ditch fill <b>51039</b> .....	Appx 19
355	Scan of M51051B, ditch fill <b>51023</b> .....	Appx 19
356	Photomicrograph of M51051B, ditch fill <b>51023</b> .....	Appx 19
357	Photomicrograph of M70229B, <i>Principal palaeochannel</i> Bay B/V, <b>70078</b> .....	Appx 19
358	Scan of M70223C, <i>Principal palaeochannel</i> Bay B/V, <b>70225</b> over <b>70226</b> .....	Appx 19
359	Photomicrograph of M70255B, <i>Principal palaeochannel</i> Bay F, <b>70323</b> .....	Appx 19
360	Photomicrograph of M71157A, <i>Principal palaeochannel</i> Bay V, <b>71089</b> , under OIL .....	Appx 19
361	Scan of M70255B, <i>Principal palaeochannel</i> Bay F, <b>70323</b> .....	Appx 19
362	Photomicrograph of M70218A, <i>Principal palaeochannel</i> Bay B/V, <b>70308</b> .....	Appx 19
363	Photomicrograph of M70512, <i>Principal palaeochannel</i> Bay O, <b>70484</b> .....	Appx 19
364	Photomicrograph of M70223B, <i>Principal palaeochannel</i> Bay B/V, <b>70308</b> over <b>70317</b> .....	Appx 19
365	Insect remains in M70329A .....	Appx 19
366	Photomicrograph of M70461A, Burnt Mound 1, trough fill <b>70430</b> .....	Appx 19
367	Photomicrograph of M90158, <i>Stabilised land surface</i> <b>90003</b> .....	Appx 19
368	Photomicrograph of M90196B, fill <b>90283</b> .....	Appx 19
369	Scan of M90038B: diffuse junction between <b>90264</b> and underlying <i>Basal sands and gravels</i> <b>82876</b> ....	Appx 19
370	Photomicrograph of M51023B, lowermost part of ditch fill <b>50126</b> .....	Appx 19
371	Photomicrograph of M51051D2, lowermost part of ditch fill <b>51041</b> .....	Appx 19

## Tables

1	Summary of the archaeological investigations along the CNDR road scheme .....	3
2	Significant archaeological sites investigated along the CNDR .....	12
3	Archaeological periods and date ranges .....	31
4	Chronological framework for the terrace sequence in the Stainton meander .....	41
5	Concordance of stratigraphical and lithological units .....	46
6	Summary of the main stratigraphical units at Stainton West.....	46
7	Mesolithic Phase I radiocarbon dates from the <i>Grid-square area</i> .....	69
8	Key Mesolithic Phase I parameters .....	69
9	Mesolithic Phase II radiocarbon dates from Stainton West .....	78
10	Key Mesolithic Phase II parameters .....	82
11	Key Mesolithic Phase III parameters .....	104
12	Summary of the various activity areas within both phases of the Mesolithic encampment .....	113
13	Mesolithic Phase III radiocarbon dates from Stainton West.....	142
14	The Cluster 2 measurable oak ( <i>Quercus</i> sp) dendrochronological samples .....	195
15	Hiatus Phase radiocarbon dates .....	200
16	Key Hiatus Phase parameters .....	203

17	Radiocarbon dates from the Early Neolithic timber house/hall at Lockerbie Academy.....	210
18	Early Neolithic radiocarbon dates from Holbeck Park and Stainton Quarry.....	212
19	Early Neolithic radiocarbon dates from the enclosure beneath Long Meg.....	217
20	Early Neolithic radiocarbon dates from Site 98, Langdale.....	224
21	The contrasting characteristics of the wood within the <i>Mesolithic/Neolithic alluvium</i> and the <i>Earlier Neolithic organic deposit</i> .....	239
22	Raw materials and flaked-lithic artefacts from the <i>Principal palaeochannel</i> .....	267
23	Quantification of the broad blades in the later palaeochannel deposits.....	269
24	Depositional zones within the Early Neolithic phase of the <i>Principal palaeochannel</i> .....	277
25	Early Neolithic Phase radiocarbon dates from Stainton West.....	292
26	Key Early Neolithic Phase parameters.....	298
27	Key Early Neolithic Phase environmental parameters.....	300
28	Late Neolithic Phase radiocarbon dates from the <i>Principal palaeochannel</i> .....	330
29	Late Neolithic Phase radiocarbon dates from the dryland area.....	343
30	Late Neolithic radiocarbon dates from the Kirkhill burnt mound.....	354
31	Chalcolithic and Bronze Age chronologies, terminology, and dating of artefact and settlement types.....	362
32	The Chalcolithic and earlier Bronze Age stratigraphic sequence at Stainton West.....	367
33	Chalcolithic and earlier Bronze Age radiocarbon dates from Stainton West.....	369
34	Bronze Age radiocarbon dates from Stainton West.....	384
35	Other Bronze Age radiocarbon dates from Stainton West.....	396
36	Chalcolithic and Bronze Age radiocarbon dates from Parcels 9, 21 North, 32, 41, and 42.....	403
37	Later Bronze Age radiocarbon dates from Stainton West.....	422
38	Later Bronze Age radiocarbon dates from Parcel 32.....	425
39	Radiocarbon dates from the early medieval settlement in Parcel 42.....	498
40	Early medieval and medieval radiocarbon dates from Parcels 21 North, 32, and the henge monument....	506
41	Post-medieval radiocarbon dates from the <i>Grid-square area</i> , Stainton West.....	525
42	Quantities of worked stone from Stainton West, by lithic category and site area.....	Appx 1
43	The Stainton West flaked-lithic analysis sample areas.....	Appx 1
44	The coarse-stone tools by type and stratigraphic entity, or feature/deposit type.....	Appx 2
45	The coarse-stone tool assemblage by type and raw material.....	Appx 2
46	The coarse-stone tool assemblage from the <i>Principal palaeochannel</i> , by type and raw material.....	Appx 2
47	The coarse-stone tool assemblage from the <i>Grid-square area</i> , by type and raw material.....	Appx 2
48	The coarse-stone tool assemblage from the <i>Backwater channel</i> , by type and raw material.....	Appx 2
49	Stone implement types and classifications by stratigraphic entity.....	Appx 2
50	Ochre and haematite classifications by entity.....	Appx 2
51	The analysed flaked lithics, by type and raw material.....	Appx 3
52	The flaked lithics subjected to assessment only, by type and raw material.....	Appx 3
53	The typological values and definitions used during the assessment of the flaked lithics from Stainton West.....	Appx 3
54	The technological attribute values and definitions for cores used during the analysis of the flaked lithics.....	Appx 3
55	The technological attribute values and definitions for the debitage and core-dressing blades and flakes...	Appx 3
56	The technological attribute values and definitions for the microliths, and other retouched and edge-utilised pieces.....	Appx 3
57	The common attributes shared by the core, debitage, and retouched lithic analysis recording forms.....	Appx 3
58	The flaked-lithic assemblage by type and raw material.....	Appx 3
59	Knapping groups.....	Appx 3
60	The whole and flaked pebbles only assessed, by stratigraphic entity and raw material.....	Appx 4
61	The analysed whole and flaked pebbles, by type, raw material, and sample area.....	Appx 4
62	The analysed whole and flaked pebbles, by area, entity, context, sample area, and raw material	Appx 4
63	Cores and core fragments assessed only, by classification and raw material.....	Appx 4
64	Cores and fragments assessed only, by classification and stratigraphic entity.....	Appx 4
65	Cores and fragments assessed only, by raw material and stratigraphic entity.....	Appx 4
66	The average measurements for core classifications, and the percentage of cores with and without cortex.	Appx 4
67	Cores and fragments analysed from <i>Basal sands and gravels 90039</i> , by classification, raw material, and sample area.....	Appx 4
68	Platform classification, preparation, and features for all analysed cores from the <i>Basal sands and gravels</i> , by reduction stage.....	Appx 4



69	Blade and flake negative scars for all analysed cores from the <i>Basal sands and gravels</i> , by reduction stage ....	Appx 4
70	Negative flake-scar length/breadth ratio for all analysed cores from the <i>Basal sands and gravels</i> , by reduction stage .....	Appx 4
71	Negative blade-scar types for all analysed cores from the <i>Basal sands and gravels</i> , by reduction stage.....	Appx 4
72	Percentage of cortex left for all analysed cores from the <i>Basal sands and gravels</i> , by reduction stage.	Appx 4
73	Average dimensions and weight for the analysed cores from the <i>Basal sands and gravels</i> .....	Appx 4
74	Analysed cores and fragments from <i>Stabilised land surface 90206</i> , by classification, raw material, and sample area .....	Appx 4
75	Platform preparation, features, and classification for all analysed cores from the <i>Stabilised land surface</i> , by reduction stage .....	Appx 4
76	Blade and flake negative scars for all analysed cores from the <i>Stabilised land surface</i> , by reduction stage.....	Appx 4
77	Negative blade-scar types for all analysed cores from the <i>Stabilised land surface</i> , by reduction stage ...	Appx 4
78	Average dimensions and weight for the analysed cores from the <i>Stabilised land surface</i> .....	Appx 4
79	Percentage of cortex left for all analysed cores from the <i>Stabilised land surface</i> .....	Appx 4
80	Analysed cores and fragments from the <i>Mesolithic overbank alluvium</i> , by classification, raw material, deposit, and sample area .....	Appx 4
81	Blade and flake negative scars for all analysed cores from the <i>Mesolithic overbank alluvium</i> , by reduction stage .....	Appx 4
82	Platform preparation, classifications, and features for all analysed cores from the <i>Mesolithic overbank alluvium</i> , by reduction stage .....	Appx 4
83	Negative blade-scar types for all analysed cores from the <i>Mesolithic overbank alluvium</i> , by reduction stage	Appx 4
84	Negative flake-scar length/breadth ratio for all analysed cores from the <i>Mesolithic overbank alluvium</i> , by reduction stage .....	Appx 4
85	Average dimensions and weight for the analysed cores from the <i>Mesolithic overbank alluvium</i> ....	Appx 4
86	Percentage of cortex left for all analysed cores from the <i>Mesolithic overbank alluvium</i> .....	Appx 4
87	Average dimensions and weight for the analysed cores from archaeological and natural features in the <i>Grid-square area</i> .....	Appx 4
88	Percentage of cortex left for all analysed cores from hollow <b>90314</b> (Structure 2) and stone spread <b>90396</b> .....	Appx 4
89	Platform preparation, classifications, and features for all analysed cores from hollow <b>90314</b> (Structure 2) and stone spread <b>90396</b> , by reduction stage .....	Appx 4
90	Blade and flake negative scars for all analysed cores from hollow <b>90314</b> (Structure 2) and stone spread <b>90396</b> , by reduction stage.....	Appx 4
91	Analysed cores and fragments from stone spread <b>90396</b> , by classification, raw material, and deposit..	Appx 4
92	Negative blade-scar type for all analysed cores from stone spread <b>90396</b> , by reduction stage .....	Appx 4
93	Negative flake-scar length/breadth ratio for all analysed cores from stone spread <b>90396</b> , by reduction stage .....	Appx 4
94	Analysed tuff cores and fragments from Sample Area 7, by classification, raw material, and entity/deposit .....	Appx 4
95	Platform preparation and classification for all analysed tuff cores from Sample Area 7, by reduction stage .....	Appx 4
96	Blade and flake negative scars for all analysed tuff cores from Sample Area 7, by reduction stage ....	Appx 4
97	Negative blade-scar type for all analysed tuff cores from Sample Area 7, by reduction stage.....	Appx 4
98	Average dimensions and weight for the analysed tuff cores from Sample Area 7 .....	Appx 4
99	Percentage of cortex left for all analysed tuff cores from Sample Area 7, by reduction stage .....	Appx 4
100	Analysed brown-flint cores and fragments from Sample Areas 10 and 11, by classification, raw material, and entity/feature.....	Appx 4
101	Platform classifications and preparation for all analysed brown-flint cores from Sample Areas 10 and 11, by reduction stage.....	Appx 4
102	Blade and flake negative scars for all analysed brown-flint cores from Sample Areas 10 and 11, by reduction stage .....	Appx 4
103	Negative blade-scar types for all analysed brown-flint cores from Sample Areas 10 and 11, by reduction stage .....	Appx 4
104	Negative flake-scar length/breadth ratio for all analysed brown-flint cores from Sample Areas 10 and 11, by reduction stage.....	Appx 4
105	Average dimensions and weight for the analysed brown-flint cores from Sample Areas 10 and 11 ....	Appx 4
106	Percentage of cortex left for all analysed brown-flint cores from Sample Areas 10 and 11.....	Appx 4
107	Analysed cores and fragments from the <i>Principal palaeochannel</i> , by classification, raw material, and deposit .....	Appx 4

108	Platform classifications, preparation, and features for all analysed cores from the <i>Principal palaeochannel</i> , by reduction stage.....	Appx 4
109	Blade and flake negative scars for all analysed cores from the <i>Principal palaeochannel</i> , by reduction stage ..	Appx 4
110	Negative flake-scar length/breadth ratio for all analysed cores from the <i>Principal palaeochannel</i> , by reduction stage .....	Appx 4
111	Percentage of cortex left for all analysed cores from the <i>Principal palaeochannel</i> .....	Appx 4
112	Average dimensions and weight for the analysed cores from the <i>Principal palaeochannel</i> .....	Appx 4
113	Core rejuvenation, core trimming, and crested pieces assessed, by stratigraphic entity, classification, and raw material.....	Appx 4
114	Core rejuvenation, core trimming, and crested pieces assessed, by type, classification, and raw material.....	Appx 4
115	The analysed core-dressing pieces from the <i>Basal sands and gravels</i> , by classification, raw material, and sample area .....	Appx 4
116	The analysed core-dressing pieces from the <i>Basal sands and gravels</i> , by classification and lithic type .....	Appx 4
117	The analysed core-trimming blades and flakes from the <i>Basal sands and gravels</i> , by dorsal-face morphology, dorsal negative-scar direction, distal-termination type, bulb-of-percussion type, and platform type ..	Appx 4
118	The average dimensions of the analysed core-dressing pieces, from the <i>Basal sands and gravels</i> ...	Appx 4
119	The analysed core-dressing pieces from the <i>Stabilised land surface</i> , by classification, raw material, and sample area .....	Appx 4
120	The analysed core-dressing pieces from the <i>Stabilised land surface</i> , by classification and lithic type .....	Appx 4
121	The analysed core-dressing blades and flakes from the <i>Stabilised land surface</i> , by dorsal negative-scar direction, number of dorsal scars, distal-termination type, bulb-of-percussion type, and platform type.....	Appx 4
122	The average dimensions of the analysed core-dressing pieces from the <i>Stabilised land surface</i> .....	Appx 4
123	The analysed core-dressing pieces from the <i>Mesolithic overbank alluvium</i> , by classification, raw material, deposit, and sample area .....	Appx 4
124	The analysed core-dressing pieces from the <i>Mesolithic overbank alluvium</i> , by classification and lithic type .....	Appx 4
125	The analysed core-dressing blades and flakes from the <i>Mesolithic overbank alluvium</i> , by dorsal-face morphology, number of dorsal scars, and dorsal negative-scar direction.....	Appx 4
126	The average dimensions of the analysed core-dressing pieces, from the <i>Mesolithic overbank alluvium</i> .....	Appx 4
127	The analysed core-dressing blades and flakes from hollow <b>90314</b> (Structure 2), by dorsal-face morphology, distal-termination type, and platform type .....	Appx 4
128	The average dimensions of the analysed core-dressing pieces from hollow <b>90314</b> (Structure 2)...	Appx 4
129	The analysed core-dressing pieces from stone spread <b>90396</b> , by classification, raw material, and deposit .....	Appx 4
130	The analysed core-dressing pieces from stone spread <b>90396</b> , by classification and lithic type .....	Appx 4
131	The analysed core-dressing pieces from stone spread <b>90396</b> , by dorsal-face morphology .....	Appx 4
132	The analysed tuff core-dressing pieces from Sample Area 7, by classification and stratigraphic entity/deposit .....	Appx 4
133	The analysed tuff core-dressing pieces from Sample Area 7, by classification and lithic type ...	Appx 4
134	The analysed tuff core-dressing blades and flakes from Sample Area 7, by dorsal-face morphology, distal-termination type, bulb-of-percussion type, and platform type .....	Appx 4
135	The analysed brown-flint core-dressing pieces from Sample Areas 10 and 11, by classification, entity/deposit, and sample area .....	Appx 4
136	The analysed brown-flint core-dressing pieces from Sample Areas 10 and 11, by classification and lithic type.....	Appx 4
137	The analysed brown-flint core-dressing pieces from Sample Areas 10 and 11, by dorsal-face morphology .....	Appx 4
138	The average dimensions of the analysed brown-flint core-dressing pieces (Sample Areas 10 and 11) and tuff core-dressing pieces (Sample Area 7) .....	Appx 4
139	The analysed SSUC core-dressing pieces from Sample Area 5, by classification and lithic type ...	Appx 4
140	The analysed SSUC core-dressing pieces from Sample Area 5, by dorsal-face morphology .....	Appx 4
141	Analysed core-dressing pieces from the <i>Principal palaeochannel</i> , by classification, raw material, and stratigraphic entity/deposit .....	Appx 4
142	The analysed core-dressing pieces from the <i>Principal palaeochannel</i> , by classification and lithic type.....	Appx 4
143	The analysed core-dressing pieces from the <i>Principal palaeochannel</i> , by dorsal-face morphology .....	Appx 4
144	The average dimensions of the analysed core-dressing pieces from the <i>Principal palaeochannel</i> ....	Appx 4
145	The analysed blade, flake, and chunk unmodifieddebitage, by type and raw material .....	Appx 4

146	All assessed blade types, by raw material and stratigraphic entity .....	Appx 4
147	Assessed unmodified flake debitage, by type, raw material, and stratigraphic entity .....	Appx 4
148	Assessed unmodified chunk debitage, by raw material and stratigraphic entity .....	Appx 4
149	Assessed small-flake debitage, by raw material and stratigraphic entity .....	Appx 4
150	All assessed blade types by raw material and stratigraphic entity .....	Appx 4
151	Assessed unmodified flake debitage, by type, raw material, and stratigraphic entity .....	Appx 4
152	Assessed unmodified chunk debitage, by raw material and stratigraphic entity .....	Appx 4
153	Assessed small-flake debitage, by raw material, and stratigraphic entity .....	Appx 4
154	The analysed flaked-lithic debitage from <i>Basal sands and gravels 90039</i> , by type, raw material, and sample area .....	Appx 4
155	Average dimensions of the analysed debitage types from the <i>Basal sands and gravels</i> .....	Appx 4
156	The analysed flaked-lithic debitage from <i>Stabilised land surface 90206</i> , by type, raw material, and sample area .....	Appx 4
157	Average dimensions of the analysed debitage types from the <i>Stabilised land surface</i> .....	Appx 4
158	The analysed flaked-lithic debitage from the <i>Mesolithic overbank alluvium</i> , by type, raw material, and sample area .....	Appx 4
159	Average dimensions of the analysed debitage types from the <i>Mesolithic overbank alluvium</i> .....	Appx 4
160	The analysed flaked-lithic debitage from hollow <b>90314</b> (Structure 2), by type, raw material, and fill .....	Appx 4
161	Average dimensions of the analysed debitage types from hollow <b>90314</b> (Structure 2) .....	Appx 4
162	The analysed flaked-lithic debitage from stone spread <b>90396</b> , by type, raw material, and deposit .....	Appx 4
163	Average dimensions of the analysed debitage types from stone spread <b>90396</b> .....	Appx 4
164	The analysed tuff flaked-lithic debitage from Sample Area 7, by type, tuff type, entity/feature, and deposit/fill .....	Appx 4
165	Average dimensions of the analysed tuff debitage types from Sample Area 7 .....	Appx 4
166	The analysed pitchstone flaked-lithic debitage from Sample Area 7, by type, entity/feature, and deposit/fill .....	Appx 4
167	Average dimensions of the analysed pitchstone debitage types from Sample Area 7 .....	Appx 4
168	The analysed brown-flint flaked-lithic debitage from Sample Areas 10 and 11, by type, entity/feature, deposit/fill, and sample area .....	Appx 4
169	Average dimensions of the analysed brown-flint debitage types from Sample Areas 10 and 11 .....	Appx 4
170	The analysed SSUC flaked-lithic debitage from Sample Area 5, by type and entity/feature .....	Appx 4
171	The analysed flaked-lithic debitage from the <i>Principal palaeochannel</i> , by type, raw material, and entity/deposit .....	Appx 4
172	Average dimensions of the analysed debitage types from the <i>Principal palaeochannel</i> .....	Appx 4
173	The analysed flaked-lithic debitage from the retention pond, by type, raw material, and feature/deposit .....	Appx 4
174	Average dimensions of the analysed debitage types from the retention pond .....	Appx 4
175	Average dimensions of the brown/grey-flint primary, secondary, and inner blades and flakes .....	Appx 4
176	Average dimensions of the pebble-flint primary, secondary, and inner blades and flakes .....	Appx 4
177	Average dimensions of the chert primary, secondary, and inner blades and flakes .....	Appx 4
178	Average dimensions of the SSUC primary, secondary, and inner blades and flakes .....	Appx 4
179	Average dimensions of the tuff primary, secondary, and inner blades and flakes .....	Appx 4
180	Average dimensions of the pitchstone primary, secondary, and inner blades and flakes .....	Appx 4
181	The classifications and quantities of all microliths .....	Appx 5
182	The average dimensions of selected microlith classifications .....	Appx 5
183	The microliths from beyond the sample areas, by classification and raw material .....	Appx 5
184	The microliths from beyond the sample areas, by classification and stratigraphic entity .....	Appx 5
185	The microliths from beyond the sample areas, by raw material and stratigraphic entity .....	Appx 5
186	Microlith classifications from <i>Basal sands and gravels 90039</i> within the sample areas, by raw material and sample area .....	Appx 5
187	Microlith classifications from the <i>Stabilised land surface</i> , by raw material, deposit, and sample area .....	Appx 5
188	Microlith classifications from the <i>Mesolithic overbank alluvium</i> , by raw material, deposit, and sample area .....	Appx 5
189	Microlith classifications from the archaeological/natural features within the sample areas, by raw material and feature/deposit/fill .....	Appx 5
190	Tuff microlith classifications within Sample Area 7, by entity/feature/deposit .....	Appx 5
191	Brown-flint microlith classifications within Sample Areas 10 and 11, by entity/deposit and sample area .....	Appx 5
192	Microlith classifications from the <i>Principal palaeochannel</i> within the sample area, by raw material and entity/deposit .....	Appx 5



193	The non-microlithic retouched items from beyond the sample areas, by classification and raw material...	Appx 5
194	The non-microlithic retouched items from beyond the sample areas, by classification and stratigraphic entity .....	Appx 5
195	The non-microlithic retouched items from beyond the sample areas, by raw material and stratigraphic entity .....	Appx 5
196	Retouched blade, chunk, core, and flake classifications from the sample areas .....	Appx 5
197	Retouched blade, chunk, core, and flake classifications from <i>Basal sands and gravels 90039</i> within the sample areas, by raw material .....	Appx 5
198	Retouched blade, chunk, core, and flake classifications from the <i>Stabilised land surface</i> within the sample areas, by raw material and deposit .....	Appx 5
199	Retouched blade, chunk, core, and flake classifications from the <i>Mesolithic overbank alluvium</i> within the sample areas, by raw material and deposit.....	Appx 5
200	Retouched blade, chunk, core, and flake classifications from archaeological/natural features within the sample areas, by raw material and feature/deposit.....	Appx 5
201	Tuff and pitchstone retouched blade, chunk, core, and flake classifications from Sample Area 7, by raw material and entity/feature/deposit.....	Appx 5
202	Brown-flint retouched blade, chunk, core, and flake classifications from Sample Areas 10 and 11, by entity/feature/deposit .....	Appx 5
203	Retouched blade, chunk, core, and flake classifications from the <i>Principal palaeochannel</i> , by raw material and entity/deposit.....	Appx 5
204	The assessed edge-utilised blades, chunks, and flakes, by type and raw material.....	Appx 5
205	The assessed edge-utilised blades, chunks, and flakes, by type and stratigraphic entity .....	Appx 5
206	The assessed edge-utilised blades, chunks, and flakes, by raw material and stratigraphic entity ....	Appx 5
207	Location of geological samples recovered during fieldwork for the regional chert-sourcing study.....	Appx 6
208	Knapping-group associations and connections between chert groups .....	Appx 6
209	The lithics subjected to geochemical analysis, and the results of this elemental analysis .....	Appx 6
210	Cluster membership of archaeological and geological samples .....	Appx 6
211	The knapping groups assigned to IG1 and its sub-groups, IG3, and IG4, that match with the Cluster 1 geological samples .....	Appx 6
212	The knapping groups assigned to IG1 and its sub-groups, and IG2, that match with the Cluster 2 geological samples .....	Appx 6
213	The knapping groups assigned to IG1, sub-group 3, and IG2, that match with the Cluster 3 geological samples .....	Appx 6
214	The archaeological brown- and grey-flint samples from Stainton West examined during the pXRF study.	Appx 6
215	The relative percentages of calcium and iron from the Stainton West samples .....	Appx 6
216	Discriminant function analysis .....	Appx 6
217	The flaked-lithic items submitted for pitchstone analysis .....	Appx 6
218	Percentages of elements in the geological samples from Arran subjected to pXRF pitchstone analysis...	Appx 6
219	Frequency of geological samples appearing above and below the minimum level of elemental composition of Cumbrian lithics .....	Appx 6
220	The probability of the geological outcrops on Arran having provided artefactual material for the pitchstone at Stainton West, and other Cumbrian lithic sites .....	Appx 6
221	Microscopic identifications and descriptions of the Stainton West PTS study sample, and comparisons with a sample of reference material .....	Appx 6
222	The typical composition of Group VI PTS in the Stainton West sample .....	Appx 6
223	Elements measured, along with concentrations found, in the control samples .....	Appx 6
224	The Stainton West samples measured by pXRF .....	Appx 6
225	pXRF measurements of the Stainton West samples.....	Appx 6
226	Petrographic and geochemical datasets .....	Appx 6
227	Microscopic identifications and descriptions of the Stainton West coarse-stone tool PTS study sample of material other than tuff .....	Appx 6
228	Population and sample sizes of each lithic classification included in all stages of the microwear-sampling procedure .....	Appx 6
229	The frequencies of worked materials associated with the microliths, indicated by microwear analysis..	Appx 7
230	The frequencies of worked materials associated with non-microlithic retouched items and debitage, as indicated by microwear analysis .....	Appx 7
231	The frequency of worked materials across the sample areas .....	Appx 7
232	The percentage of worked materials in each sample area .....	Appx 7



233	Microliths with and without impact damage, by sample area .....	Appx 7
234	Flaked-lithic types and classifications with potential residues.....	Appx 8
235	The analysed flaked lithics with residues adhering .....	Appx 8
236	Defining characteristics of the Habitation Area .....	Appx 9
237	Lithic entities within the Habitation Area.....	Appx 9
238	Defining characteristics of the Tool-production Area .....	Appx 9
239	Lithic entities within the Tool-production Area.....	Appx 9
240	Defining characteristics of the Hide-working Area .....	Appx 9
241	Lithic entities within the Hide-working Area.....	Appx 9
242	Defining characteristics of the Butchery Area .....	Appx 9
243	Lithic entities within the Butchery Area.....	Appx 9
244	Defining characteristics of the Midden Area .....	Appx 9
245	Lithic entities within the Midden Area.....	Appx 9
246	Defining characteristics of the Peripheral Area .....	Appx 9
247	Lithic entities within the Peripheral Area .....	Appx 9
248	Defining characteristics of the Axe-working Area .....	Appx 9
249	Lithic entities within the Axe-working Area .....	Appx 9
250	Neolithic/earlier Bronze Age lithic entities .....	Appx 9
251	The frequency of coarse-stone tools, flaked lithics, and stone implements from each stratigraphic phase in the <i>Principal palaeochannel</i> .....	Appx 9
252	The distribution of coarse-stone tools, flaked lithics, and stone implements within the depositional zones in the <i>Earlier Neolithic organic deposit</i> , the <i>Earlier Neolithic alluvium</i> , and the <i>Later Neolithic alluvium</i> .....	Appx 9
253	The average dimensions of the coarse-stone tools from Neolithic-age deposits in the <i>Principal palaeochannel</i> ..	Appx 9
254	Quantification of flaked-lithic types from the Neolithic deposits in the <i>Principal palaeochannel</i> , by raw-material type.....	Appx 9
255	Quantification of the flaked lithics from the retention pond area .....	Appx 9
256	Distribution of prehistoric pottery between sites, by sherd count and weight .....	Appx 11
257	Distribution of prehistoric pottery between excavated features, by sherd count and weight .....	Appx 11
258	The prehistoric ceramic assemblage by fabric group, according to context .....	Appx 11
259	Prehistoric pottery sherds from Stainton West petrographically analysed.....	Appx 11
260	Romano-British pottery fabrics from the CNDR.....	Appx 11
261	Romano-British pottery distribution.....	Appx 11
262	Modified and structural wood from Stainton West.....	Appx 13
263	Scale used to describe the condition of modified waterlogged wood .....	Appx 13
264	Modified wood from the <i>Mesolithic organic deposit</i> .....	Appx 13
265	Modified from the <i>Mesolithic/Neolithic alluvium</i> .....	Appx 13
266	Unworked roundwood forming Structure 75935 within the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
267	Roundwood from Wooden Structure 1, within the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
268	Roundwood from Wooden Structure 2, within the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
269	Roundwood associated with Wooden Structure 3, within the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
270	<i>In-situ</i> roundwood stakes associated with possible structures in the <i>Earlier Neolithic organic deposit</i> ..	Appx 13
271	Modified roundwood from the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
272	Timber from the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
273	Timber debris from the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
274	Other types of debris from the <i>Earlier Neolithic organic deposit</i> .....	Appx 13
275	Modified roundwood from the <i>Later Neolithic organic deposit</i> .....	Appx 13
276	Timber debris originating from the <i>Later Neolithic organic deposit</i> .....	Appx 13
277	Other types of debris from the <i>Later Neolithic organic deposit</i> .....	Appx 13
278	Possible cleave-felling debris .....	Appx 13
279	Comparative dimensions of the Cumbrian and Irish tridents.....	Appx 13
280	Aquatic and waterside insects from the <i>Mesolithic organic deposit</i> .....	Appx 14
281	Woodland insects from the <i>Mesolithic organic deposit</i> .....	Appx 14
282	Terrestrial and other insects, not assigned to an ecological code, from the <i>Mesolithic organic deposit</i> ..	Appx 14
283	Aquatic and waterside insects from the <i>Mesolithic alluvium</i> and <i>Mesolithic/Neolithic alluvium</i> .....	Appx 14
284	Woodland insects from the <i>Mesolithic alluvium</i> and <i>Mesolithic/Neolithic alluvium</i> .....	Appx 14
285	Terrestrial and other insects, not assigned to an ecological code, from the <i>Mesolithic alluvium</i> and <i>Mesolithic/Neolithic alluvium</i> .....	Appx 14
286	Aquatic and waterside insects from the <i>Earlier Neolithic organic deposit</i> and the <i>Earlier Neolithic alluvium</i> ..	Appx 14

287	Woodland insects from the <i>Earlier Neolithic organic deposit</i> and the <i>Earlier Neolithic alluvium</i> .....	Appx 14
288	Terrestrial and other insects, not assigned to an ecological code, from the <i>Earlier Neolithic organic deposit</i> and the <i>Earlier Neolithic alluvium</i> .....	Appx 14
289	Aquatic and waterside insects from the <i>Later Neolithic organic deposit</i> , Burnt Mound 6, and the <i>Chalcolithic alluvium</i> .....	Appx 14
290	Woodland insects from the <i>Later Neolithic organic deposit</i> , Burnt Mound 6, and the <i>Chalcolithic alluvium</i> ...	Appx 14
291	Terrestrial and other insects, not assigned to an ecological code, from the <i>Later Neolithic organic deposit</i> , Burnt Mound 6, and the <i>Chalcolithic alluvium</i> .....	Appx 14
292	The proportions of the ecological groupings of Coleoptera from deposits in the <i>Principal palaeochannel</i> ...	Appx 14
293	Samples examined for microfossils.....	Appx 15
294	Diatom enumeration (valves).....	Appx 15
295	Sub-samples analysed for pollen from the <i>Principal palaeochannel</i> .....	Appx 16
296	Sub-samples analysed for pollen from Parcel 32, Knockupworth, and the henge monument.....	Appx 16
297	Correlation of the pollen superzones at Stainton West.....	Appx 16
298	Radiocarbon dates for pollen superzone CNDR 1.....	Appx 16
299	Radiocarbon dates for pollen superzone CNDR 2.....	Appx 16
300	Radiocarbon dates for pollen superzone CNDR 3.....	Appx 16
301	Continuous stratigraphy for monoliths 70222 and 71155, Bays B and V, Stainton West .....	Appx 16
302	Continuous stratigraphy for monoliths 70225 and 71158, Bays B and V, Stainton West .....	Appx 16
303	Stratigraphy for monolith 70219, Bay B, Stainton West .....	Appx 16
304	Stratigraphy for monolith 70296, Bay D, Stainton West.....	Appx 16
305	Stratigraphy for monolith 70250, Bay F, Stainton West.....	Appx 16
306	Stratigraphy for monolith 70252, Bay F, Stainton West .....	Appx 16
307	Stratigraphy for monolith 70507, Bay O, Stainton West.....	Appx 16
308	Stratigraphy for monolith 70513, Bay O, Stainton West.....	Appx 16
309	Stratigraphy for monolith 70235, Burnt Mound 2, Stainton West .....	Appx 16
310	Percentage values of selected fungal spores in monolith 70222/71155, Bay B.....	Appx 16
311	Pollen counts from sample 51023, deposit <b>51026</b> , Knockupworth .....	Appx 16
312	The age and characteristics of the pollen superzones, Stainton West.....	Appx 16
313	Mesolithic-age deposits analysed for waterlogged plant remains, Stainton West.....	Appx 17
314	Waterlogged plants and other remains from the <i>Mesolithic organic deposit</i> , Stainton West.....	Appx 17
315	Waterlogged plants and other remains from the <i>Mesolithic alluvium</i> and <i>Mesolithic/Neolithic alluvium</i> .....	Appx 17
316	Neolithic-age deposits analysed for waterlogged plant remains, Stainton West.....	Appx 17
317	Waterlogged plants and other remains from the <i>Earlier Neolithic organic deposit</i> and <i>Earlier Neolithic alluvium</i> .....	Appx 17
318	Waterlogged plants and other remains from the <i>Later Neolithic organic deposit</i> .....	Appx 17
319	Chalcolithic-age deposits analysed for waterlogged plant remains .....	Appx 17
320	Waterlogged plants and other remains from Burnt Mound 6 and the <i>Chalcolithic alluvium</i> .....	Appx 17
321	Deposits analysed for waterlogged plant remains, Knockupworth .....	Appx 17
322	Waterlogged plants and other remains from the Vallum ditch, Knockupworth .....	Appx 17
323	Deposits and features analysed for charcoal at Stainton West.....	Appx 18
324	Deposits and features analysed for charred plant remains and/or charcoal, Parcels 9, 21 North, 32, 41, and 42.....	Appx 18
325	Habitat codings .....	Appx 18
326	Features from the <i>Grid-square area</i> at Stainton West containing charcoal.....	Appx 18
327	Charcoal counts from the burnt mounds at Stainton West .....	Appx 18
328	Charcoal counts from the dryland features at Stainton West.....	Appx 18
329	Charcoal counts from the <i>Principal palaeochannel</i> , Stainton West.....	Appx 18
330	Counts of charred plant remains from Bronze Age features in Parcels 9, 21 North, 32, and 42 ...	Appx 18
331	Charcoal counts from Bronze Age and medieval features in Parcels 9, 21 North, 32, 41, and 42.....	Appx 18
332	Counts of charred plant remains from early and later medieval features in Parcels 32 and 42....	Appx 18
333	The monoliths, thin sections, and associated bulk samples analysed from the <i>Principal palaeochannel</i> .....	Appx 19
334	The monoliths, thin sections, and associated bulk samples analysed from the burnt mounds and associated features, Stainton West.....	Appx 19
335	The monoliths, thin sections, and associated bulk samples analysed from the <i>Grid-square area</i> ..	Appx 19
336	The monoliths, thin sections, and bulk samples analysed from Knockupworth/Hadrian's Wall....	Appx 19
337	The soil types and counts for organic materials in the micromorphology samples from the <i>Basal sands and gravels</i> , Stainton West .....	Appx 19

338	The counts for other materials, pedofeatures, and burrows in the soil micromorphology samples from the <i>Basal sands and gravels</i> , Stainton West .....	Appx 19
339	The soil types and counts for organic materials in the micromorphology samples from the <i>Mesolithic organic deposit</i> , Stainton West.....	Appx 19
340	The counts for other materials, pedofeatures, burrows, and excrements in the soil micromorphology samples from the <i>Mesolithic organic deposit</i> , Stainton West .....	Appx 19
341	SEM/EDS analysis of sample M71157A lower from Stainton West.....	Appx 19
342	SEM/EDS analysis of sample M71174A from Stainton West.....	Appx 19
343	The soil types and counts for organic materials in the micromorphology samples from the <i>Mesolithic alluvium</i> , Stainton West .....	Appx 19
344	The counts for other materials, pedofeatures, burrows, and excrements in the soil micromorphology samples from the <i>Mesolithic alluvium</i> , Stainton West.....	Appx 19
345	The soil types and counts for organic materials in the micromorphology samples from the <i>Mesolithic/ Neolithic alluvium</i> , Stainton West.....	Appx 19
346	The soil types and counts for organic materials in the micromorphology samples from the <i>Earlier Neolithic organic deposit</i> , Stainton West.....	Appx 19
347	The counts for other materials, pedofeatures, burrows, and excrements in the soil micromorphology samples from the <i>Earlier Neolithic organic deposit</i> , Stainton West .....	Appx 19
348	The soil types and counts for organic materials and pedofeatures in the soil micromorphology sample from the <i>Earlier Neolithic alluvium</i> , Stainton West .....	Appx 19
349	The soil types and counts for organic materials in the micromorphology samples from the <i>Later Neolithic organic deposit</i> , Stainton West.....	Appx 19
350	The counts for pedofeatures, burrows, and excrements in the soil micromorphology samples from the <i>Later Neolithic organic deposit</i> , Stainton West .....	Appx 19
351	The soil types and counts for materials in the micromorphology sample from the <i>Chalcolithic alluvium</i> , Stainton West .....	Appx 19
352	SEM/EDS analysis on sample M70223A upper from Stainton West.....	Appx 19
353	The soil types and counts for organic materials, pedofeatures, and burrows, from the micromorphology sample from the Chalcolithic reactivation channel, Stainton West .....	Appx 19
354	The soil types and counts for charred organic materials and coarse components in the micromorphology sample from the <i>Bronze Age alluvium</i> , Stainton West.....	Appx 19
355	The counts for pedofeatures and burrows in the soil micromorphology sample from the <i>Bronze Age alluvium</i> , Stainton West .....	Appx 19
356	The soil types and counts for organic materials and coarse components in the micromorphology samples from Burnt Mound 1, Stainton West .....	Appx 19
357	The counts for other materials, pedofeatures, and burrows in the soil micromorphology samples from Burnt Mound 1, Stainton West.....	Appx 19
358	The soil types and counts for organic materials and coarse components in the micromorphology samples from Burnt Mound 2, Stainton West .....	Appx 19
359	The counts for pedofeatures and burrows in the soil micromorphology sample from Burnt Mound 2, Stainton West .....	Appx 19
360	The soil types and counts for organic materials and coarse components in the micromorphology samples from Burnt Mound 4, Stainton West .....	Appx 19
361	The counts for other materials, pedofeatures, and burrows in the soil micromorphology samples from Burnt Mound 4, Stainton West.....	Appx 19
362	SEM/EDS analysis of sample M70329B upper from Stainton West.....	Appx 19
363	The soil types and counts for organic materials and coarse components in the micromorphology samples from pit/trough <b>70155</b> , Stainton West .....	Appx 19
364	The counts for other materials, pedofeatures, and burrows in the soil micromorphology samples from pit/trough <b>70155</b> , Stainton West.....	Appx 19
365	The soil types and counts for organic materials in the micromorphology samples from the <i>Basal sands and gravels</i> , Stainton West .....	Appx 19
366	The counts for other materials, pedofeatures, and burrows in the soil micromorphology samples from the <i>Basal sands and gravels</i> , Stainton West .....	Appx 19
367	The soil types and counts for organic materials in the micromorphology samples from the <i>Stabilised land surface</i> , Stainton West.....	Appx 19
368	The counts for other materials, pedofeatures, and burrows in the soil micromorphology samples from the <i>Stabilised land surface</i> , Stainton West .....	Appx 19



369	The soil types and counts for organic materials in the micromorphology samples from tree-throw <b>90262</b> , Stainton West.....	Appx 19
370	The counts for pedofeatures and burrows in the soil micromorphology samples from tree-throw <b>90262</b> , Stainton West.....	Appx 19
371	The counts for other materials, pedofeatures, and burrows in the soil micromorphology samples from hearth <b>90263</b> , Stainton West.....	Appx 19
372	The soil types and counts for organic materials in the micromorphology samples from hearth <b>90263</b> , Stainton West.....	Appx 19
373	SEM/EDS analysis on sample M90038B upper from Stainton West.....	Appx 19
374	Stainton West particle-size data.....	Appx 19
375	Stainton West LOI, phosphate, and magnetic-susceptibility data.....	Appx 19
376	The soil types and counts for organic materials in the micromorphology samples from the primary Vallum ditch, Knockupworth/Hadrian's Wall .....	Appx 19
377	The counts for other materials, pedofeatures, burrows, and excrements in the soil micromorphology samples from the primary Vallum ditch, Knockupworth/Hadrian's Wall .....	Appx 19
378	The soil types and counts for organic materials and coarse components in the micromorphology samples from the recut Vallum ditch, Knockupworth/Hadrian's Wall .....	Appx 19
379	The counts for pedofeatures from the soil micromorphology samples in the recut Vallum ditch, Knockupworth/Hadrian's Wall .....	Appx 19
380	The counts for burrows, excrements, and dung in the soil micromorphology samples from the recut Vallum ditch, Knockupworth/Hadrian's Wall.....	Appx 19
381	SEM/EDS analysis on sample M51015B ( <b>51023</b> ) from the recut Vallum ditch, Knockupworth/Hadrian's Wall .....	Appx 19
382	LOI and phosphate data from the Vallum ditch, Knockupworth .....	Appx 19
383	Radiocarbon dates from the <i>Mesolithic organic deposit</i> in the <i>Principal palaeochannel</i> , Stainton West....	Appx 20
384	Radiocarbon dates from the <i>Mesolithic alluvium</i> in the <i>Principal palaeochannel</i> , Stainton West.....	Appx 20
385	Radiocarbon dates from the <i>Mesolithic/Neolithic alluvium</i> in the <i>Principal palaeochannel</i> , Stainton West..	Appx 20
386	Radiocarbon dates from the <i>Earlier Neolithic organic deposit</i> , associated structures, and Trident 1 in the <i>Principal palaeochannel</i> , Stainton West.....	Appx 20
387	Radiocarbon dates from the <i>Earlier Neolithic alluvium</i> and Trident 2 in the <i>Principal palaeochannel</i> , Stainton West.....	Appx 20
388	Radiocarbon dates from the <i>Later Neolithic organic deposit</i> , tree-throw <b>70129</b> , and the Grooved Ware vessel in the <i>Principal palaeochannel</i> , Stainton West .....	Appx 20
389	Radiocarbon dates from the <i>Chalcolithic alluvium</i> , Burnt Mound 6, and the reactivation channel in the <i>Principal palaeochannel</i> , Stainton West.....	Appx 20
390	Radiocarbon dates from the <i>Bronze Age alluvium</i> in the <i>Principal palaeochannel</i> , Stainton West....	Appx 20
391	$\chi^2$ tests on the duplicate radiocarbon assays from plant macrofossils, charcoal, and short-lived wood, from identical sample locations within the <i>Principal palaeochannel</i> , Stainton West.....	Appx 20
392	$\chi^2$ tests on the duplicate radiocarbon assays from plant macrofossils and sediment samples, from identical sample locations within the <i>Principal palaeochannel</i> , Stainton West.....	Appx 20
393	Radiocarbon dates from the <i>Grid-square area</i> , Stainton West.....	Appx 20
394	$\chi^2$ tests on the duplicate radiocarbon assays from charcoal and charred plant samples, from identical contexts/features from the <i>Grid-square area</i> , Stainton West.....	Appx 20
395	Statistically consistent dates from select features/deposits from the <i>Grid-square area</i> , Stainton West.....	Appx 20
396	Radiocarbon dates from the dryland burnt mounds, Stainton West .....	Appx 20
397	$\chi^2$ tests on the duplicate radiocarbon assays from identical contexts/features associated with the dryland burnt mounds at Stainton West .....	Appx 20
398	Radiocarbon dates from ring-gully <b>100031</b> and a prehistoric ceramic vessel, Stainton West .....	Appx 20
399	Radiocarbon dates from Parcels 9, 21 North, 32, 41, and 42, Knockupworth/Hadrian's Wall, and the henge monument.....	Appx 20
400	$\chi^2$ tests on the duplicate radiocarbon assays from charcoal and charred plant samples, from identical features in Parcels 9, 21 North, 32, and 42, and the henge monument .....	Appx 20
401	Statistically consistent dates from the Bronze Age and early medieval settlements in Parcel 42.....	Appx 20
402	The 47 measurable oak ( <i>Quercus</i> sp) dendrochronological samples.....	Appx 20
403	The t-values between the four matched samples forming Cluster 1.....	Appx 20
404	The t-values between the 16 matched and dated samples forming Cluster 2 .....	Appx 20
405	Example of t-values between the composite sequence constructed from Cluster 2 and oak-reference data.....	Appx 20



406	The t-value between the two matched samples forming Cluster 3 .....	Appx 20
407	The t-value between the two matched samples forming Cluster 4 .....	Appx 20
408	The t-values between the three matched samples forming Cluster 5 .....	Appx 20
409	Radiocarbon results from timbers <b>76426</b> , <b>76503</b> , <b>75854</b> , and <b>76422</b> , obtained during the programme of wiggle-matching .....	Appx 20
410	Modelled radiocarbon dates from monolith 71158 in Bay V in the <i>Principal palaeochannel</i> .....	Appx 20
411	Modelled radiocarbon dates from monolith 70222 in Bay B in the <i>Principal palaeochannel</i> .....	Appx 20
412	Modelled radiocarbon dates from monoliths 71175 in Bay X and 70240 in Bay D in the <i>Principal palaeochannel</i> .....	Appx 20
413	Modelled radiocarbon dates from monolith 70296 in Bay D in the <i>Principal palaeochannel</i> .....	Appx 20
414	Modelled radiocarbon dates from monolith 70252 in Bay F in the <i>Principal palaeochannel</i> .....	Appx 20
415	Modelled radiocarbon dates from Mesolithic deposits in monoliths 70225 and 70254 in the <i>Principal palaeochannel</i> .....	Appx 20
416	Modelled radiocarbon dates from Mesolithic dryland features and deposits.....	Appx 20
417	Modelled radiocarbon dates from monolith 70254 and individually selected wood/plant macrofossils from the <i>Principal palaeochannel</i> .....	Appx 20
418	Modelled radiocarbon dates from Neolithic structures and artefacts from the <i>Principal palaeochannel</i> ..	Appx 20
419	Modelled radiocarbon dates from Neolithic dryland features and deposits.....	Appx 20
420	Modelled radiocarbon dates from Chalcolithic and Bronze Age features and deposits .....	Appx 20
421	Order analysis on the key Mesolithic parameters from Stainton West.....	Appx 20
422	Order analysis on the key earlier Neolithic parameters from Stainton West .....	Appx 20
423	Order analysis on the key later Neolithic parameters from Stainton West.....	Appx 20
424	Order analysis on the Bronze Age dates from CNDR.....	Appx 20

# Abbreviations

AHRC	Arts and Humanities Research Council
AMS	Accelerator Mass Spectrometry
ASDU	Archaeological Services Durham University
ASUD	Archaeological Services University of Durham
BL	Blue Light
BVG	Borrowdale Volcanic Group
CAU	Carlisle Archaeological Unit
CBM	Ceramic Building Material
CCCHES	Cumbria County Council's Historic Environment Service
CNDR	Carlisle Northern Development Route
CPR	Charred Plant Remains
DEFRA	Department for Environment, Food, and Rural Affairs
EBR	Ennerdale Banded Rhyolite
ED	Elm Decline
EDD	Elm Decline Demise
GC-MS	Gas Chromatography-Mass Spectrometry
GIS	Geographic Information System
GQB/chert	Good-quality brown/chert
HGL	Hunter-Gatherer Laboratory
ICP-MS	Inductively coupled plasma mass spectroscopy
ICP-OES	Inductively coupled plasma optical emission spectroscopy
IG	Initial Groups
IPG	Implement Petrology Group
LIDAR	Light Detection Aperture Radar
LMRL	Lithic Microwear Research Laboratory
LOI	Loss-on-Ignition
LUAU	Lancaster University Archaeological Unit
MFTs	Microfacies Types

MGC	Museums and Galleries Commission
MYA	Million Years Ago
NGR	National Grid Reference
NPP	Non-Pollen Palynomorph
NWWS	North West Wetlands Survey
OA	Oxford Archaeology
OD	Ordnance Datum
OIL	Oblique Incident Light
OS	Ordnance Survey
PCRG	Prehistoric Ceramic Research Group
PPL	Plane Polarised Light
PTS	Polished Thin Section
pXRF	Portable X-Ray fluorescence
QUB	Queen's University Belfast
RCAHMS	Royal Commission on the Ancient and Historical Monuments of Scotland
REE	Rare Earth Elements
RSL	Relative Sea Level
SEM/EDS	Scanning Electron Microscopes/Energy-Dispersive X-Ray Spectrometry
ScARF	Scottish Archaeological Research Framework
SFF	Seathwaite Fell Formation
SMFTs	Soil-Microfabric Types
SPSS	Statistical Package for the Social Sciences
SSUC	Scottish Southern Uplands Chert
SUERC	Scottish Universities Environmental Research Centre
TIC	Total Ion Current
WCCHEAS	Worcestershire County Council Historic Environment and Archaeological Services
WPR	Waterlogged Plant Remains
XPL	Crossed Polarised Light
XRF	X-Ray Fluorescence

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# Summary

The Carlisle Northern Development Route (CNDR) is a new road in the north-west of England, which extends for 8.5 km around the western and northern sides of Carlisle (between NY 3945 5990 and NY 3731 5365). During its construction, a major programme of archaeological excavation was undertaken by Oxford Archaeology between May 2008 and April 2011, focused on the archaeological remains along the scheme, dating from the Mesolithic to the early modern periods. These included a section of Hadrian's Wall and the Vallum, part of the *Frontiers of the Roman Empire: Hadrian's Wall World Heritage Site*, which had to be crossed to allow the construction of a new bridge carrying the road across the River Eden.

Almost all of the earliest evidence from the scheme (Mesolithic and Neolithic periods) came from Stainton West, a site situated on the floodplain north of the River Eden, where various later Mesolithic domestic features (pits, hearths, and stakehole structures) were preserved on an island between two palaeochannels. These were associated with an *in-situ* flaked-lithic assemblage of over 300,000 pieces, retrieved from an area of just under 900 m<sup>2</sup>, mainly by wet sieving. The assemblage was dominated by geometric, narrow blade, or bladelet technology, microlithic in character.

Analysis of the lithic distribution identified various zones of activity, demonstrating the persistent and conservative use of space over repeated visitations. The site seems to have been the seasonal aggregation encampment of a hunter-gatherer band or clan, perhaps taking advantage of the spring salmon migration. Radiocarbon dating suggests that intermittent activity started c 6000 cal BC, intensified around the middle of the fifth millennium cal BC, and ended c 4300 cal BC, possibly coincident with a period of increased alluviation that buried the encampment.

A wide range of lithic raw-material types was utilised, including beach-pebble flint, from the beaches of the Solway Firth or the West Cumbrian coast, and cherts, from the Eden Valley or its tributary valleys. These dominated the assemblage, and their landscape distribution appears to equate with the habitual range of the hunter-gatherer community. There were also other raw-material types from more remote sources, pointing to a wider network of social connections, and perhaps further-ranging patterns of mobility. These included cherts, with probable sources in the Southern Scottish Uplands and the Pennines; flint from east Yorkshire, probably Flamborough Head; central Lake District tuff; and pitchstone from the Isle of Arran. There was also a large coarse-stone assemblage, including utilised ochre, an incised pebble, and tools, such as a fishing weight, hammerstones, grinding stones, and polished-stone adzes/axes. The latter included stratigraphically well-provenanced examples of Group VI tuff (*sensu stricto*), associated with fifth millennium cal BC radiocarbon dates, which hint at the direct exploitation of the central Lakeland fells for stone procurement at this early date, such as those surrounding Great Langdale.

Waterlogged deposits of organic sediment, in the main palaeochannel defining the western edge of the island, contained a wealth of palaeoenvironmental evidence and some cultural material, which radiocarbon dating suggested related to the earlier part of the period in which the encampment was occupied. Episodes of fluvial erosion had, however, seemingly removed any deposits contemporary with the later, more intensive, phases of settlement. Large quantities of waterlogged wood formed a beaver lodge and dam, which also made use of burnt wood, as well as a tree that had been girdled using a stone axe. Subsequently, human activity, represented by flaked lithics and wooden chips produced by stone axes, also focused on the beaver-built structures. Overall, the palaeoenvironmental remains suggested relatively undisturbed hazel, oak, and elm-dominated woodland.

The alluviation that buried the encampment during the final quarter of the fifth millennium cal BC also transported numerous large oak trunks and boughs into the main channel. Dendrochronological analysis suggested the last of these trees died in the autumn/winter of 4144 cal BC. There was some limited lithic and radiocarbon-dating evidence that the site may have been frequented during the latter part of the fifth millennium and earlier part of the fourth millennium cal BC, but it seems to have been marginal to activity elsewhere.

Between c 3800 cal BC and 3700 cal BC, when drier conditions had returned to the channel, there was a marked resumption in activity. Tree-throws indicated that large trees on, or adjacent to, its banks were felled, and a rudimentary wooden platform was constructed on the edge of the channel, along with other stake settings and fences, and various materials and objects were deposited into it. These included foundational deposits of the wooden debris associated with the felling, and splitting into planks, of ancient oak and elm trees, and crude coarse-stone tools, which could also have been associated with this practice. There were also numerous large pebbles of tuff, sometimes partially flaked, that were not native to the site. A paddle and a fork-like 'trident', both carved from oak planks, were also deposited in association with the platform. There may then have been

further secondary phases of deposition, including polished-stone axes and arrowheads, referencing the platform. Other implements, such as flake tools and blades, possibly for butchery or dismemberment, followed the line of the active stream, whereas hammers, anvils, and grinding stones lined the banks. These assemblages probably related to activities undertaken in association with the channel, rather than being in secondary depositional contexts, and provided some evidence for axehead polishing/sharpening. That deposition continued for at least a century or two was demonstrated by later radiocarbon dates retrieved from a second trident, associated with Carinated Bowl-ware pottery and a polished-stone axehead.

Palaeoenvironmental remains in the channel provided evidence for changes to the environment during the intervening period between the deposition of the two tridents. These included an elm decline, evidence for vegetational disturbance, the appearance of cereal-type pollen, and a sharp rise in the numbers of dung beetles. Together, these proxies suggest that herding and small-scale arable farming were practised locally for the first time.

After a period of several centuries where the evidence for activity was slight, during the first half of the third millennium cal BC, activity seems to have resumed, focused on the now-silted main channel, and two burnt mounds subsequently accumulated. Significantly, it is likely that this activity was linked to a henge monument some 150 m to the north-east of the Stainton West site, on a gravel terrace within the Eden's meander.

The burnt-mound activity continued until approximately 1600 cal BC. A small, presumably associated, structure nearby, defined by a ring-gully, with a central hearth, was radiocarbon dated to the latter part of the second millennium cal BC. Other pits in the area were associated with Middle Bronze Age Deverel Rimbury-type pottery.

Several other sites along the scheme provided evidence for settlement and agriculture, dating between the twenty-third and the ninth centuries cal BC. The earliest settlement (dating to the twenty-third to twentieth centuries cal BC) comprised two successively occupied oval post-built buildings, for which there are no parallels in the immediate area. Other, slightly later, Early- to Middle Bronze Age settlements in the scheme were also unenclosed, comprising one or two post-built roundhouses, the latter indicating a developing vernacular tradition. Several ditches appear to have formed boundaries, but there were no enclosed field systems. A single Late Bronze Age settlement, associated with post-Deverel Rimbury pottery and charred cereal grain, was dated to the eleventh to ninth centuries cal BC. No domestic structures were identified, but scatters of pits and postholes defined a palisaded enclosure, with a funnelling entrance, within which were pens for animals. Beyond the enclosure was a single four-post structure. Perhaps surprisingly, no Iron Age activity was identified.

Excavations at Knockupworth, where the road and bridge cut through the Roman frontier, identified the initial, Hadrianic, phase of Turf Wall, the subsequent slighting of both this and the Vallum earthworks to the south, and the creation of a causeway across the Vallum ditch, probably coinciding with the abandonment of the Hadrianic frontier and the advance to the Forth-Clyde isthmus in the reign of Antoninus Pius. Later, the Stone Wall was constructed, probably around AD 158-60, when the Hadrianic frontier was reoccupied. The Vallum ditch was also recut, destroying the causeway. Apart from the Hadrian's Wall frontier, surprisingly little evidence for Roman activity was identified in the rest of the CNDR. A buried pottery vessel was found at Stainton West, and also two possibly late Iron Age or Romano-British annular glass beads, perhaps suggesting that votive activity was still taking place there.

Five apparently near-contemporary rectangular posthole buildings were revealed near the Cargo road. These were dated to the early eighth- to the middle of the tenth century AD, and probably formed a small agricultural settlement. Repairs to the buildings suggest that occupation persisted for some time.

There was stratigraphic evidence for medieval agricultural activity, including boundary ditches, dated by pottery, and a single tenth- to mid-twelfth-century radiocarbon date. These formed elements of land-allotment systems associated with a settlement, known from aerial photographs, perhaps the antecedent of the present-day hamlet of Stainton. Radiocarbon dating suggests that the bank associated with the henge near Stainton West was either deliberately slighted, or was eroded and destabilised by ploughing during this period. The silted recut of the Vallum ditch also seems to have been used as a droveway for moving livestock.

Most of the post-medieval remains comprised ditches and drains connected with enclosure, crop cultivation, drainage, and other forms of land management. Land drains for an eighteenth-century formal garden were associated with Kingmoor House, and a fragment of statuary, and sherds of eighteenth-century pottery, also probably related to this. At Knockupworth, evidence for the Carlisle Canal and the later Carlisle and Silloth railway survived, and remnants of the 1847 railway that linked Carlisle with Glasgow and Edinburgh were also revealed.



# Acknowledgements

The archaeological investigations undertaken along the CNDR owe their success to many individuals and also to the close cooperation of the different organisations involved with the project. Oxford Archaeology (OA) would like to thank Birse Civils Ltd for commissioning the archaeological work, Cumbria County Council, and Connect Roads: CNDR, which administered the PFI concession. A special debt of gratitude is extended to Steve Bullass (formerly of Birse Civils Ltd), Philip Bent (Connect Roads), and Martin Hardman (Cumbria County Council), who provided advice and immense support for the archaeological programme throughout its long gestation. Other Birse Civils Ltd staff who worked closely with OA throughout the project included Dave Curry, Andy Moore, Chris Smart, Wayne Foster, Bob Gibson, Dave Holding, Peter Barker, John Greensmith, Mark Wilkinson, Wendy Thompson, Chris Scurr, John Melia Senior, John Melia Junior, John Hart, and Mike Holt-Bains, whilst Malcolm Findlay and Nigel Blackbee from Connect Roads also provided assistance. Geoff Holden, formerly of Cumbria County Council, is thanked for his interest in the archaeological process and tolerance of the complications that occasionally arose from it.

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The project would not have been possible without the hard work of the fieldwork team, who braved some difficult conditions and some of the worst weather that Cumbria could throw at them. The fieldwork was managed by Fraser Brown, while Carl Champness provided geoarchaeological input and supervision, and, on site, Paul Clark, aided by Caroline Raynor, ably directed the fieldwork team, which comprised Peter Aherne, Gary Baddeley, Paul Beers, Steve Black, Dave Bonner, Bradley Brooker, Ric Buckle, Caroline Bulcock, Pete Burge, Clare Burke, Ged Callaghan, Sarah Cattell, Katy Chalmers, Mark Chesterman, Steve Clarke, Liz Collison, Steve Collison, Phil Cooke, Alistair Cross, Tim Christian, Paul Dunn, Claire Dunscombe, Catherine Edwards, Christina Elcok, Vicky Fackrell, Andrew Frudd, Diane Gorman, John Griffiths, Sam Grimmer, Katherine Hamilton, Anthony Haskins, Anna Hodgkinson, Dan Heale, Yvonne Heath, Vickie Jamieson, Nate Jepson, Sean Johnson, Gemma Jones, Mathilde Jourdan, Lindsey Kemp, Michal Kempski, Nadia Khalaf, Rupert Lotherington, Sarah Lynchehaun, Lisa McCaig, Clionadh McGarry, Iain McIntyre, Sean McPhillips, Michelle Maguire, Dave Maron, David Molnar, Dennis Morgan, Sam Oates, Desmond O'Donoghue, Des O'Leary, Jon Onraet, Ken Owen, Aidan Parker, Kevin Paton, Christina Robinson, Dan Sausins, Carl Savage, Luke Severn, Dave Shaw, Katie Sludden, Rachel Stebbings, Fraser Stewart, Lewis Stitt, Marc Storey, Steve Tamburello, Julian Thorley, Toni Walford, Samantha Walsh, Liann Waring, Becky Wegiel, Matt Weightman, Ailsa Westgarth, Chris Wild, and Berber Wouda. Aidan Pratt undertook fieldwork on site as a volunteer. The translation of the fieldwork archive into a digital record was undertaken by Paul Clark, Caroline Bulcock, Andrew Frudd, Anthony Haskins, Anna Hodgkinson, and Gemma Jones.

The post-excavation analysis and publication was also managed by Fraser Brown, and has benefited from the work of many individuals. These include numerous members of OA, who undertook the analysis of the site stratigraphy, the plant and pollen remains, and unworked waterlogged wood, as well as several categories of artefacts, including the technological and typological classification of the massive assemblage of struck lithics, together with ceramics, and other miscellaneous objects. During this stage of work, the palaeoenvironmental samples from the archaeological excavations were processed by Rachel Fosberry, Ross Lilley, Graeme Clarke, James Fairbairn, Stephen Morgan, and Helen Stocks at Oxford Archaeology in Cambridge, whilst the struck lithics were initially characterised by Mike Donnelly, from the Oxford office, and then assessed and analysed by a team in Lancaster consisting of David Bonner, Pascal Eloy, Anthony Haskins, and Aidan Parker, supervised by

Antony Dickson and Ann Clarke. The palaeoecological analyses benefited from two seminars, which examined cross-discipline synergies, and were attended by Jeff Blackford, Mark Brennand, Fraser Brown, Paul Clark, Gordon Cook, Denise Druce, Seren Griffiths, Allan Hall, Elizabeth Huckerby, Jacqui Huntley, Jim Innes, Richard Macphail, Rachel Newman, Mairead Rutherford, David Smith, Sue Stallibrass, and Ian Tyers.

In addition to staff from OA, during the post-excavation process, a large team of external specialists, many based in UK universities and museums, has also been instrumental in the analysis of elements of the palaeoenvironmental and artefactual assemblages from Stainton West. These include study of the worked wood, insects, foraminifera, ostracods, and diatoms, lithic raw materials and lithic microwear, prehistoric ceramics, soil micromorphology and chemistry, as well as the chronometric data derived from an extensive programme of radiocarbon dating and dendrochronology. As part of this work, Kevin Reeves (University College London) is thanked for facilitating the scanning electron microscopy/energy-dispersive X-Ray spectrometry as part of the soil analyses; Torben Bjarke Ballin generously provided geological pitchstone samples from Arran; Morag Clement from Kendal Museum and Judith Clarke from Penrith and Eden Museum kindly lent samples from the museum collections for the pitchstone and chert raw-materials analysis, which also benefited from the assistance of Jennifer Readman in the use of the portable X-Ray fluorescence equipment (pXRF) at the University of Central Lancashire (UCLan); Connor McDermott (University College Dublin) provided details and references for several Irish wooden tridents; Historic Scotland kindly loaned the pXRF equipment used in the petrological identification of the volcanoclastic (tuff) axes; whilst English Heritage (now Historic England) generously funded the radiocarbon wiggle matching of four dendrochronological sequences.

Some of the historical maps used in this volume are held by the Carlisle Archive Centre (Figs 247-9 and 252) and the assistance of the staff at the centre is gratefully acknowledged. Other images in this volume have been supplied by the National Library of Australia (Pl 67), Peter Jordan (Pl 125), the Denver Museum of Nature and Science (Pl 168), Richard Gregory (Pl 174), and the Cumberland and Westmorland Antiquarian and Archaeological Society (Pl 193).

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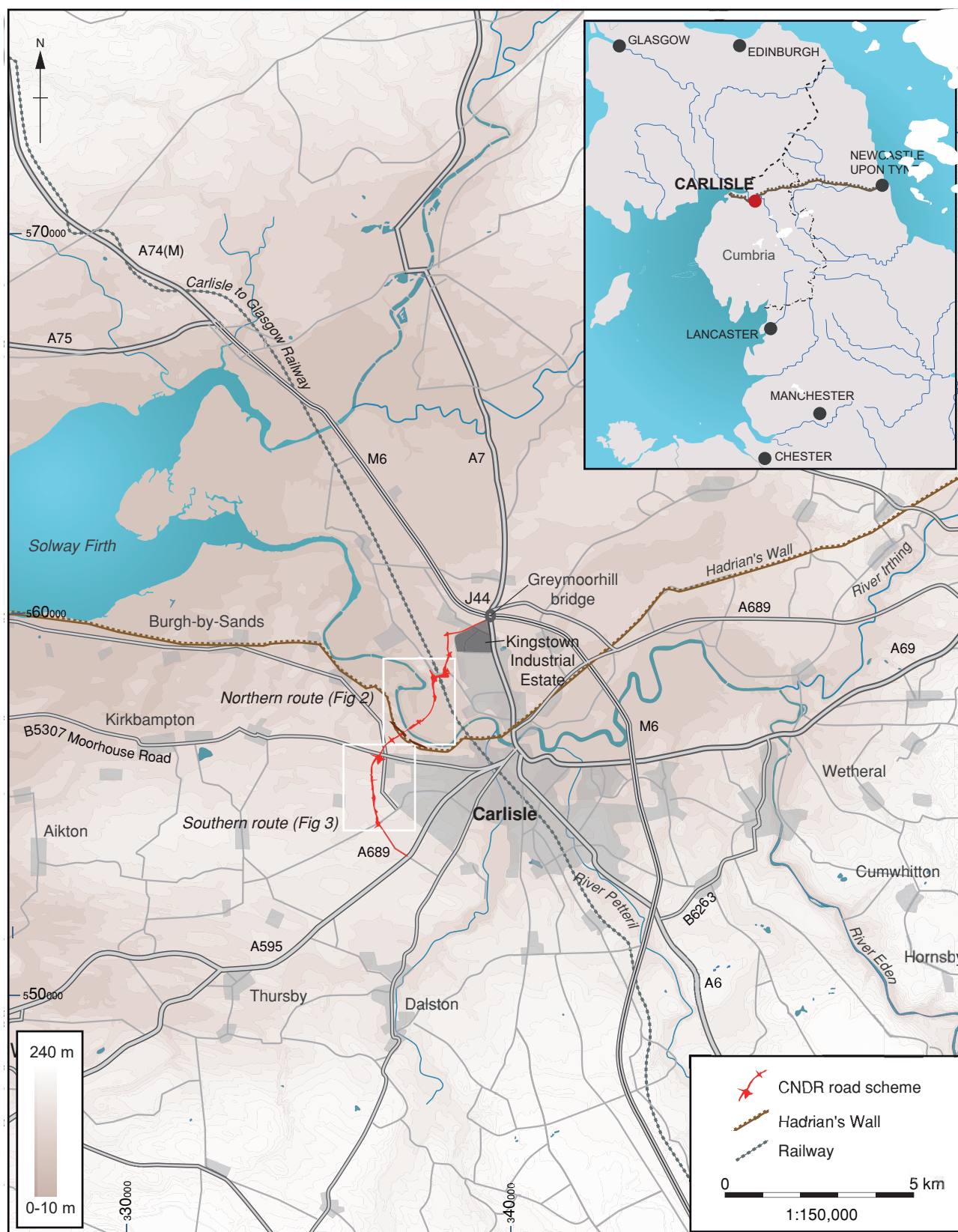


Figure 1: Location of the Carlisle Northern Development Route (CNDR) (Contains OS OpenData © Crown Copyright [and database right] (2022))