



Society of Antiquaries
of Scotland

Culduthel

An Iron Age Craftworking Centre in North-East Scotland

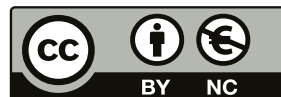
Candy Hatherley and Ross Murray

ISBN: 978-1-908332-19-6 (hardback) • 978-1-908332-20-2 (PDF)

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

Hatherley, C & Murray, R 2021 *Culduthel: An Iron Age Craftworking Centre in North-East Scotland*. Edinburgh: Society of Antiquaries of Scotland.
<https://doi.org/10.9750/9781908332202>

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



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

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

INDEX

Numbers in *italic* denote pages with figures, those in **bold** are subjects of chapters.

- abandonment layer (1671) 74–5, 75
fragment, copper alloy 194
?pounder 137
querns 126, 135
ring, copper alloy 74, 75, 190, 193
sharpening stone 138
sheet, lead 194, 196
smoother/polisher 75, 137
strips, coiled lead 194, 194
weight, lead 194, 196
whetstone/working surface/pounder 138
- aerial photographs 2, 2, 6
- Aldclune (Perthshire) 85
- alloys 106, 108–9, 108, 113, 190–1
- animal bone 10
- arable weeds 61, 62, 81, 83
- Ardifuar (Argyll) 128
- ardmarks, Early Iron Age 26
- Ashkirkshiel (Scottish Borders) 181
- Balblair (Highland) 225
- Baleshare, North Uist (Comhairle nan Eilean Siar) 128
- Balloan Park (Highland) 6, 7, 17, 29
- Balloch Hill (Argyll) 172
- barley 61, 62, 81, 83
- Battersea (London) 181
- beads *see* ornaments, beads
- Bellfield Farm, North Kessock (Highland) 85, 85, 226, 227
- Birnie (Moray) 84, 113, 132–3, 166–7, 176, 226, 228, 229
- blacksmiths 222
- Bronze Age period
Beaker pottery 91–2, 93, 95
cists 6, 7
lithics 122
settlement 6, 7
- bronze-workers 222, 223, 229
- bronze-working *see* copper alloy production
- Broxmouth (East Lothian) 17, 29, 87
- Burghead (Moray) 225
- burnt daub *see* fired clay
- casting alloys 106, 108–9, 108, 113, 190–1
- Castlehill (Ayrshire) 201
- cellars 84
- Chalcolithic period, radiocarbon date 14, 16, 17
- charcoal 10, 63, 147, 223
- chronology 13
- Clarkly Hill (Moray) 226, 228
- clearance cairn (295) 22, 23
- clearance cairn (2671) 22, 23
- clearance cairn (4234) 22, 23, 25–6
radiocarbon date 14, 16, 17
slag 164
- Clickhimin (Shetland) 200
- cobble surface (1679), bolt 81, 173, 181
- cobbled surface (227) 68, 80
fired clay 102
iron objects 177
radiocarbon date 15, 16
reaping hook 80, 168, 175, 178
slag 161, 163
tuyère 114, 116
- cobbled surface (793) 23, 24
- cobbled surface (1945/2130) 54, 57, 68, 77, 79, 80
iron working waste 183
nail 79, 80, 182
offcuts, iron 80, 174, 175, 183
rove 79, 80, 173, 181
slag 161, 163
sword hilt guard 79, 80, 184, 185–6, 186, 192–3
- cobbled surface (2982) 80
pottery 92, 95
- cobbled surface (3651) 22, 26
flint tool 26
pottery 26, 93, 93, 94
- coins 72, 74, 188–90, 188, 192, 222
- copper alloy
alloys 106, 108–9, 108, 113, 190–1
deposition 191
fragments 194
- copper alloy objects **183–93**
bar 45, 46, 190, 193–4
brooch 74, 75, 185, 188, 192
coins 72, 74, 188–90, 188, 192, 222
dumb-bell toggle 185, 188, 188, 192
harness strap mount 74, 75, 184, 185–6, 187, 192
?mount 77, 189, 193
ring-headed pin 72, 74, 185–6, 186, 188, 192

CULDUTHEL

- ring 74, 75, 190, 193
- ring-shaped casting 80, 189, 194
- rivet 54, 193
- rod 54, 59, 194
- sword hilt guard 79, 80, 184, 185–6, 186, 192–3
- vessel ?patch 77, 189, 190, 193
- working/casting debris 193–4
- copper alloy production
 - craftspeople 222, 223, 229
 - discussion 220
 - excavated evidence 54, 55–8, 57–8, 65–6
 - manufacture and resources 65–7
 - scale of 223
 - significance of assemblage 89
- Covesea caves (Moray) 226, 226
- craftspeople 222, 223, 229
- craftworking centre, Middle Iron Age **31–67**, 32
 - chronology 31, 33
 - discussion 62–7
 - environmental analysis 58, 61–2
 - glass and copper alloy production 54, 55–8, 57–8
 - introduction 31
 - iron production 62–5, 63
 - iron-smelting workshops 39, 40–54, 41, 43, 46–8, 50–1, 53–4
 - post-ring roundhouses 33, 33–8, 35–6, 38
 - preservation 31
 - radiocarbon dates 14–17, 16, 33
 - workshops 38–9
- craftworking centre, later Middle Iron Age 68, **69–87**
 - abandonment 80, 81–2, 86–7
 - chronology 69, 71
 - cobbled yards 77, 79, 80
 - discussion 83–7, 84–5
 - environmental analysis 81, 83
 - introduction 69
 - pits 80
 - radiocarbon dates 15, 16
 - ring-ditch 77, 77–8
 - ring-groove roundhouses 69–71, 71–2, 73, 74–5, 77
- Crawcwellt, (Wales) 223
- cropmarks 2, 2, 6
- crucibles 100, 104–6, 105, 109–11, 113
 - see also* casting alloys
- Culbin (Moray) 200, 224
- Culduthel (Highland) **1–11**
 - archaeological background 4–7, 5–6
 - deposition and taphonomy 7
 - discovery 2–4, 2–3
 - excavation methods 8–9, 8
 - introduction *xvi*, 1–2, 1–2
 - landscape setting 4
 - post-excavation analysis 9–10
 - publication 11
 - topography *xvi*, 4
- Culduthel (Highland), discussion **219–30**
 - conclusions 229–30
 - exchange networks 223–4
 - imports and exports 221–2
 - introduction 219
 - living and working in 219–20
 - production, scale of 222–3
 - settlement pattern 224–9, 224, 226–7
 - status and society 220–1
- Culhawk Hill, (Angus) 85
- Dalladies (Aberdeenshire) 84
- Deskford (Moray) 225–6
- domestic occupation 220
 - see also* post-ring roundhouses
- Douglasmuir (Fife) 84
- Dryburn Bridge (East Lothian) 17
- Dubton Farm East (Angus) 84
- Dun Ardtreck, Skye (Highland) 174
- Dun Beag (Highland) 128
- Dun Bharabhat (Comhaile nan Eilean Siar) 200
- Dun Glashan (Argyll) 200
- Dunadd, (Argyll and Bute) 106
- Dunagoil (Bute) 201
- Early Iron Age period **20–30**, 22
 - ardmarks 26
 - chronology 21
 - clearance cairns 23, 26
 - cobbled surface 26
 - environmental summary 26
 - hillwash 26
 - House 3 22–3, 24, 29–30
 - House 5 22, 23, 29, 30
 - palisade enclosure 3, 26, 27–8, 28–9, 219
 - radiocarbon dates 14, 16, 17
 - settlement 28–30
 - stakeholes 26
- East Beechwood (Highland) 226, 226
- East Cruchie (Aberdeenshire) 128
- enamelling 66
- enclosures *see* mortuary enclosures; palisade enclosures
- environmental analysis 10, 58, 61–2, 81, 83
- excavation methods 8–9, 8
- Fairy Knowe (Stirlingshire) 113, 174, 175, 176–7
- finds assemblage 89–90
- fire, evidence for 77, 84
- fired clay **96–104**
 - condition 96, 98
 - discussion 104
 - distribution 101–4
 - fabrics 96
 - furnace/hearth rim fragments 97, 98
 - furnace relining 98–9
 - shaped fragments 98
 - wattle impressions 99, 99–100, 101
- fired clay artefacts **104–21**
 - crucibles 100, 104–6, 105, 109–11, 113
 - moulds 106, 107, 109, 112, 113
 - petrographic analysis 118–21, 120

INDEX

- spindle whorl 53, 96
 tuyères 63, 113–17, 115–16
 fixtures and fittings 173, 174, 175, 181
 bar, iron 81, 175, 181
 bar terminal, iron 81, 175, 181
 bolt head 81, 173, 174, 181
 bolt 81, 173, 181
 holdfasts 80, 81, 173, 174, 181
 ring, copper alloy 74, 75, 190, 193
 ring, iron 181
 rivet, copper alloy 54, 193
 rove 79, 80, 173, 181
 strap with a nail in situ 33, 34, 181
 strapping fragment 175, 181
 food 61–2, 81, 83
 furnaces *see* iron-smelting furnaces

 Garton Slack, (East Yorkshire) 222
 glass analysis **205–17**
 blue glass 200–1, 203–4, 208, 211–12, 213–14, 215
 clear glass 203, 208, 213–14, 215
 conclusions 216–17
 discussion 211, 214, 216, 217
 methods 199, 205–7, 205
 other glass 199, 201, 203, 214
 red glass 199, 209, 210, 211
 results 201, 206–7, 208, 209
 yellow glass 198–9, 201, 204, 210, 212, 213
 glass objects **199–204**, 200–4
 beads 60, 198, 199–200, 201–3, 201–2
 dumb-bell toggle 60, 198, 200, 203
 glassworking in Scotland 201
 vessels 217, 221–2
 working debris 197, 199, 199, 203–4, 203–4
 glass production
 discussion 201, 220, 223–4
 excavated evidence 54, 55–8, 57–8, 65–6
 manufacture and resources 65–7
 significance of assemblage 89
 glassworkers 222, 224, 229
 Grantown Road, Forres (Moray) 226, 227
 ground surface (447) 23, 26
 ground surface (674) 41

 Headland Phases 7 & 8 (Highland) 7, 17, 20, 166
 Headland Phase 9 (Highland) 20, 21
 hearth [26] 32, 55, 57, 65–6
 ?blade tip 180
 casting debris 193
 crucible 57, 109
 iron objects 177
 nail 57, 182
 see also spread (2102)
 hearth [2166] 32, 55–7, 57, 59, 65–6
 crucibles 57, 59, 109
 fired clay 103
 offcut, iron 57, 183

 querns 56, 57, 125, 128, 132, 136
 radiocarbon date 14, 16
 slag 162
 stone artefacts 131
 tuyère 114, 116
 hearth [2434] 32, 54, 55–6, 57, 59, 65–6
 casting waste, copper alloy 54, 193
 crucibles 54, 59, 100, 105, 109, 110, 111
 fired clay 102–3
 fragments, copper alloy 194
 glassworking debris 54, 197, 199, 199, 203–4
 moulds 54, 59, 107, 109, 112
 radiocarbon date 14, 16, 33
 rod, copper alloy 54, 59, 194
 slag 160
 see also post-holes ([2541/2549/2547/2543]); spread (2187)
 hearth pit [2226] 51, 52, 53
 hillwash (2101) 80
 bar, iron 182
 casting debris 193
 crucibles 109, 110, 111
 ?embossing tool 168, 170, 179
 iron item, unfinished 174, 182
 offcuts, iron 183
 quern 135
 tack 182
 hillwash (3720) 22, 26
 bead 129, 130, 139–40
 slag 162
 House 3 22–3, 22, 24, 29–30
 fired clay 101
 grinding surface 23, 24, 123, 130, 138
 pounder/grinder 23, 24, 123, 124, 138
 querns 23, 24, 123, 124, 125, 134
 radiocarbon date 14, 16, 17
 rubbing stones 23, 24, 125, 128, 134
 slag 164
 stone artefacts 131, 132
 whetstone 23, 24, 123, 138
 see also spread (796)
 House 4 68, 75, 76–8, 77, 86
 copper alloy objects 184
 discussion 83–4, 86, 220
 environmental analysis 81, 83
 file 168, 170, 179
 fired clay 102
 grinding stone 76, 130, 138
 iron objects 177
 ?mount, copper alloy 77, 189, 193
 offcut, iron 77, 78, 175, 182
 quern 126, 137
 radiocarbon date 15, 16
 slag 163–4
 smoother/polisher 130, 137
 stone artefacts 131
 strips and sheets, copper alloy 77, 78, 189, 193, 194
 tool, iron 77, 169, 178
 vessel ?patch, copper alloy 77, 189, 190, 193

CULDUTHEL

- House 5 22, 22–3, 29
 radiocarbon date 14, 16
 slag 164
- House 7 32–4, 33
 bead 33, 34, 60, 198, 200, 200, 203
 dagger 33, 34, 65, 171, 172, 180
 iron objects 177
 radiocarbon date 14, 16
 slag 165, 166
 strap 33, 34, 181
- House 9 32, 33, 34, 35
 bead 34, 35, 60, 198, 200, 202
 crucibles 34, 35, 109
 fired clay 102
 iron objects 177
 radiocarbon date 14, 16
 ?scriber 34, 35, 168, 170, 179
 slag 165, 166
 tack 34, 35, 182
- House 10 35–6, 35–6, 220, 221
- House 10/1 32, 36, 36–7
 environmental analysis 61
 fired clay 103
 radiocarbon date 14, 16, 17
 slag 164
- House 10/2 32, 36–7, 38
 environmental analysis 61
 fired clay 103
 quern 37, 38, 125
 radiocarbon date 15, 16
 slag 164
- House 10/3 36, 68–71, 71–2, 73–4, 74–5, 86
 bar, iron 182
 beads 60, 72, 74, 74, 198, 202, 202
 brooch 74, 75, 185, 188, 192
 casting debris 193
 cobble tools 137
 coins 72, 74, 188–90, 188, 192, 222
 copper alloy objects 184
 cylinder, lead 72, 74, 196
 discussion 83–6, 84
 environmental analysis 81
 fired clay 97, 98, 103
 flint 72
 fragment, lead 194, 195, 196
 glassworking debris 204
 grinder 74, 74, 132, 137
 harness strap mount 74, 75, 184, 185–6, 187, 192
 holdfast 173, 174, 181
 iron fitting, unfinished 174, 182
 iron objects 177
 lead artefacts 74–5, 75, 194
 linchpin 72, 74, 172, 173, 181
 miniature axe 74, 75, 168, 169, 178
 nail 75, 175, 181
 nail/working waste 72, 74, 183
 offcut, ?joiner's dog 174, 183
 palette 72, 74, 127, 130, 140
 pivot stone 72, 74, 130, 132, 139
 pottery 94
 pounders 75, 137
 ?punch 72, 74, 168, 169, 179
 querns 72, 74, 74–5, 124, 126, 132, 135, 136
 radiocarbon date 15, 16
 ring-headed pin 72, 74, 185–6, 186, 188, 192
 sickle 72, 74, 168, 170, 179
 slag 161, 162–4
 smoother/polishers 72, 74, 137
 smoother/pounder/grinder 72, 138
 ?smoother 74, 74, 130, 139
 smoother/working surface 138
 spindle whorl 72, 74, 129, 130, 140
 stone artefacts 131, 132
 tuyères 114, 115, 115, 117
 vessel glass 74, 74, 217, 221–2
 working surfaces 72, 130, 139
see also abandonment layer (1671); occupation deposit (2470); post-abandonment deposit (1681); spread (798/1680–1)
- House 17 32, 38, 38
 casting debris 193
 copper alloy objects 184
 fired clay 102
 mould 109
 quern 38, 38, 136
 radiocarbon date 14, 16
 slag 165
 stone artefacts 131
- Howe (Orkney) 176–7, 200
- Hurly Hawkin (Angus) 172, 181
- Iron Age period
 pottery 92–4, 93, 95
 unenclosed settlements 6, 7
see also craftworking centres; Early Iron Age period
- iron manufacturing 62–5, 63, 142–67, 222–3
 chemical composition 152, 152–5, 154, 156
 comparanda 166–7
 discussion 167
 distribution 65, 156, 158–67
 duration of 64
 fuel 147
 furnaces 62–4, 63, 158
 hammerscale 145, 150–1, 150–1, 154, 155, 156, 167
 introduction 142–3
 metal microstructure and slag inclusions 156, 156–7
 methodology 143–4, 167
 micromorphological analysis 147–52, 147–52
 production 63–4, 63
 products 65, 167
 resources 62–3, 223
 reuse of slags 166
 scale of 64, 222–3
 significance of assemblage 89
 slag classifications 144–7

INDEX

- slag morphology 167
- slags 142–3, 145–6, 147–9, 147–9, 151–2, 151–3
- smithing hearth 14, 53–4, 64, 158
- smithing pan 151, 151
- vitrified ceramic linings 146, 149, 150, 154, 154
- workshop morphology 64–5
- see also* iron smelting furnaces
- iron objects **167–83**
 - assemblages 168, 172, 174
 - comparanda 177–9
 - distribution 175–6
 - fixtures and fittings 173, 174, 175, 181
 - ironworking debris 174, 174–5, 175, 182–3
 - nails and tacks 173, 174, 176, 181–2
 - ornaments 171, 172, 180–1
 - raw materials 174–5
 - tools 168, 169–71, 172, 178–80
 - transport 172, 173, 181
 - weapons 171, 172, 180
- iron ore 63, 89, 223
- iron-smelting furnace [681] 39, 40–1, 41
 - fired clay 97, 98–9, 101
 - radiocarbon date 15, 16
 - slag 160
 - tuyères 40, 41, 114, 115, 116
- iron-smelting furnace [2246] 48, 49
 - fired clay 102
 - querns 48, 49, 128, 132, 135
 - radiocarbon date 14, 16
 - slag 160
- iron-smelting furnace [3050] 41, 42–3
 - bead 30, 41, 42, 198, 202
 - fired clay 102
 - radiocarbon date 14, 16
 - slag 160
- iron-smelting furnace [3127] 50, 51, 160
- iron-smelting furnace [3790] 42, 43, 44
 - beads 42, 43, 60, 198, 200, 203
 - fired clay 102
 - fragment, copper alloy 42, 43, 191
 - glass droplet 43, 204, 204
 - ingot, iron 42, 43, 182
 - radiocarbon date 15, 16
 - slag 160
 - stone artefacts 131, 139
- iron-smelting furnace [4147] 46–8, 47, 103
 - radiocarbon date 14, 16
 - slag 160, 162
- iron-smelting furnace [4262] 46–8, 47
 - fired clay 97, 98, 103
 - radiocarbon date 15, 16
 - slag 160, 162
- iron-smelting furnace [4355] 46–8, 47
 - fired clay 103
 - radiocarbon date 15, 16
 - slag 160, 162
- iron-smelting furnaces 158, 220, 222
 - see also* iron manufacturing
- iron smithing hearth [4273] 32, 53–4, 64, 158
 - radiocarbon date 14, 16
 - slag 161
- ironsmiths 222
- ironworking debris 174, 174–5, 175, 182–3
 - bars, iron 182
 - ingot 42, 43, 182
- Kintore (Aberdeenshire) 20
- lead isotopes 195, 196
- lead objects 72, 74–5, 74–5, 194–6, 194
- leatherworking 85
- Lochlee (Ayrshire) 128, 172
- medieval period, metalworking site 6, 7
- metal-detecting 8–9, 80
- metalworking ceramics *see* crucibles; moulds
- Middle Iron Age period *see* craftworking centres
- Milton of Leys (Highland) 226–7, 226
- Mine Howe (Orkney) 176–7, 220
- Moray Firth (Highland) 4, 224–8, 224, 226
 - archaeological record 224, 225–6
- mortuary enclosures 20, 21
- moulds
 - fired clay 106, 107, 109, 112, 113
 - stone ingot mould 57, 59, 125, 127, 128, 135
 - see also* casting alloys
- mounts *see* ornaments, mounts
- nails and tacks 34, 35, 80, 173, 174, 176, 181–2
- Neolithic period
 - discussion 20
 - lithics 122
 - pits 6, 7, 19, 20
 - pottery 20, 91, 92, 94
 - radiocarbon dates 14, 16, 17
- oat (cf. *Avena* sp.) 61, 62, 81, 83
- oblong forts 225
- occupation deposit (1896) 58
 - bead 60, 198, 202
 - blacksmith's set 168, 169, 178
 - fired clay 104
 - perforated stones 139
 - slag 162
- occupation deposit (2225) 52, 53
 - beads 53, 60, 198, 201, 201, 202
- occupation deposit (2470) 74
 - pottery 74, 93, 93, 95
- occupation deposit (2495), rod, iron 182
- orientation of workshops 65
- ornaments
 - bead, shale 129, 130, 139–40
 - beads, glass 60, 198, 199–200, 201–3, 201–2
 - brooch 74, 75, 185, 188, 192
 - harness strap mount 74, 75, 184, 185–6, 187, 192
 - hooked mounts, iron 50, 50, 80, 81, 171, 172, 180–1

CULDUTHEL

- ?mount 77, 189, 193
- pin shank, iron 180
- ring-headed pin, copper alloy 72, 74, 185–6, 186, 188, 192
- ring-headed pin, iron 80, 81, 171, 172, 180
- toggle, copper alloy 185, 188, 188, 192
- toggle, glass 60, 198, 200, 203
- Orton Meadows (Cambridgeshire) 181
- overburden (1777), nail 181

- palisade enclosure
 - discussion 17, 28–9, 219, 224, 225
 - excavation 3, 22, 26, 27–8
 - pottery 93, 95
 - radiocarbon date 14, 16, 17
 - slag 164
- Parc Bryn Cegin, Bangor (Wales) 201
- paving 72, 73
 - pivot stone 72, 74, 130, 132, 139
- petrographic analysis 118–21, 120
- Phantassie (East Lothian) 181
- pins *see* ornaments, pins
- pit [97] 19, 20
 - pottery 91, 94
- pit [140], pottery 93, 94
- pit [153] 19, 20
 - pottery 91, 92, 94, 95
- pit [185] 68, 80
 - slag 80, 160
- pit [200] 68, 80
 - slag 164
- pit [316], environmental analysis 68, 83
- pit [344], pottery 93
- pit [401] 19, 20
 - pottery 91–2, 93, 95
- pit [428] 19, 20
 - pottery 92, 95
- pit [431] 19
 - pottery 93, 94–5
- pit [451], slag 164
- pit [1615] 68, 80
 - environmental analysis 83
 - nail 80, 181
 - whetstone 80, 129, 130, 138
- pit [1863] 32, 35
 - environmental analysis 58, 61
 - fired clay 99, 101
 - smoother/polisher 137
- pit [2143] 58
 - slag 161
- pit [2172] 19, 20
 - pottery 91, 92, 94
- pit [2238] 48, 49
- pit [2457] 50, 50
 - hooked mount 50, 50, 171, 172, 181
- pit [2539] 70, 74
 - vessel glass 74, 74, 217
- pit [2730] 56, 57
 - tang 180
- pit [2777] 56, 57
 - crucibles 57, 59, 111
 - radiocarbon date 14, 16
- pit [3217] 42, 46
 - bead 42, 46, 60, 201, 202
- pit [3564] 57
- pit [3599] 68, 80
 - radiocarbon date 15
 - rubbing stone 80, 134
 - slag 80
- pit [3744] 42, 46
 - fired clay 102
- pit [3756] 42, 43
- pit [3792] 42, 46
- pit [3811] 42, 46
 - radiocarbon date 15, 16
- pit [3816] 42, 43
- pit [3835] 42, 43
- pit [4179] 42, 43
- pit [4273] 53–4
- pit [4369] 47
 - fired clay 103
- plant remains 58, 61–2, 81, 83
- Pool, Sanday (Orkney) 175
- post-hole [85]
 - pottery 93
 - pound 137
- post-hole [254], strapping fragmen 175, 181
- post-hole [600], grinding surface 130, 139
- post-hole [740], pottery 94, 95
- post-hole [1726], pottery 94
- post-hole [2167], pottery 94
- post-hole [2416] 50, 51
 - bead 50, 51, 60, 198, 200, 201, 203
 - crucible 109
 - dagger 50, 51, 65, 171, 172, 180
 - radiocarbon date 15, 16
- post-holes [2541/2549/2547/2543] 54, 59
 - bead 60, 203, 203, 213
 - cast artefact 54, 59, 194
 - crucibles 54, 59
 - file 54, 168, 170, 179
 - glass rod 199, 203
 - glassworking debris 203, 203
 - mould 54, 59, 109, 112
 - rivet 54, 193
 - vessel glass 217
- post-hole [2815], pottery 94, 95
- post-holes [3531 and 3532], fired clay 99–100, 101
- post-hole [3635]
 - pottery 94
 - tuyère 114, 117
- post-hole [3655], working surface 139
- post-hole [3714], quern 136
- post-hole [3740], ?blade tip 180
- post-hole [4001], tuyère 114, 115, 116
- post-hole [4089], smoother/polisher 130, 137
- post-hole [4107], tacks 174, 182

INDEX

- post-hole [4287], knife tip 175, 180
- post-ring roundhouses 29
see also Houses 7, 9, 10/1, 10/2 and 17; Workshops 2, 6, 8, 12, 13, 15, 16, 18, 19 and 22
- pottery **91–5**
 Beaker 91–2, 93, 95
 carinated bowls 91, 92, 94
 later prehistoric 92–4, 93, 95
 Roman 95
see also petrographic analysis
- promontory forts 225, 226
- radiocarbon dates **13–17**
 results 14–15, 16–17, 16
 sample selection 13, 16
- recycling of materials 64, 66, 174
- Redcastle (Angus) 172
- reuse of quernstones 127, 128
- reuse of slags 166
- ring-bank roundhouses 29
- ring-ditches 70, 72, 77–8, 84
- ring-groove roundhouses 29, 30, 83–6, 84–5, 221
see also Houses 3, 4 and 10/3
- ritual sites 225–6
see also structured deposition
- Roman
 artefacts 188
 coins 72, 74, 188–90, 188, 192, 222
 imports and exports 221–2
 pottery 95
- Romancamp Gate, Fochabers (Moray) 226, 226
- roundhouses 29, 30
see also post-ring roundhouses; ring-groove roundhouses
- Rudston, (East Yorkshire) 222
- rye (cf. *Secale Cereale*) 61
- sampling strategy 9
- Seafield Road West, Inverness (Highland) 84, 166, 226, 226, 227
- settlement pattern 224–9, 224, 226–7
- silver 108–9, 108, 113
- Slackbuie (Highland) 7, 226–7, 226
- Slacknamarnock Quarry (Highland) 6, 7
- slags
 chemical composition 152, 152–5, 154, 156
 classifications 144–7
 comparanda 166–7
 discussion 167
 distribution 156, 158–67
 introduction 142–3
 micromorphological analysis 147–52, 147–52
 morphology 167
- smelters 222
- Sorte Muld, Bornholm (Denmark) 179
- souterrains 84, 224
- spindle whorls
 ceramic 53, 96
 stone 72, 74, 129, 130, 140
- spread (674) 41
- spread (796) 23, 24
 grinder 23, 24, 137
 quern 23, 24, 133
 saddle/trough quern 23, 24, 123, 124, 125, 133
- spread (798/1680–1) 80, 81–2
 awl 80, 168, 169, 178
 bar, pewter 80, 194
 bar terminal 81, 175, 181
 bolt head 81, 173, 174, 181
 casting debris and waste 80, 81, 189, 190, 191, 193, 194
 crucibles 80, 81, 109, 110
 fired clay 99, 101
 holdfast 80, 81, 173, 174, 181
 hooked mount 80, 81, 171, 172, 181
 iron items, unfinished 174, 182
 iron working waste 183
 nails 80, 173, 181
 needle 81, 168, 169, 178
 offcuts, iron 80, 81, 182
 pin shank 180
 pottery 94, 95
 querns 81, 125, 127, 134–5
 ring-headed pin 80, 81, 171, 172, 180
 ring-shaped casting, copper alloy 80, 189, 194
 ?scriber 180
 slag 162, 166
 strengthening bar 81, 175, 181
 tuyères 114, 117
- spread (1978), crucibles 109, 110, 113
- spread (2100) 57–8, 80
 crucibles 105, 109–11, 113
 enamelling or glass making waste 57, 204, 204
 graver 168, 169, 179
 ?metalworking tracer 168, 178–9
 nail 182
 offcut, iron 183
 ring 181
 slag 164
 triple-toothed tool 168, 169, 178
 tuyère 114, 117
- spread (2102)
 bar, iron 182
 crucibles 109, 110, 113
 knife blade 57, 175, 178
 offcut, iron 182–3
 slag 162
 tuyères 114, 117
- spread (2165) 58, 59
 casting debris 193
 crucible 100, 109, 110
 moulds 59, 107, 109, 112
 working surface? 139
- spread (2186) 58
 slag 161
- spread (2187) 58
 blade, curved 168, 180
 casting debris 193

CULDUTHEL

- crucibles 109, 110
- ?decorative terminal, iron 54, 174, 183
- iron item, unfinished 174, 175, 182
- mould 107, 109, 112
- nail 182
- offcut, iron 183
- peg or bolt, iron 54, 183
- slag 162
- triple-toothed tool 168, 171, 180
- spread (2435) 54
 - copper-alloy waste 54, 191
 - crucibles 54, 109
 - scissor-shears/snips 54, 168, 171, 179
- St Blane's, Bute (Argyll and Bute) 128
- stake-holes, Early Iron Age 26
- stone artefacts **122–41**
 - basin 57, 58, 124, 140
 - bead, shale 129, 130, 139–40
 - chronology and contextual analysis 131–2
 - cobble tools 127, 128, 130, 137–8, 139
 - comparanda 132–3
 - conclusions 133
 - grinding and working surfaces 130, 137, 138–9
 - ingot mould 57, 59, 125, 127, 128, 135
 - lithics 122
 - lithologies 140–1
 - palette 72, 74, 127, 130, 140
 - perforated stones 139
 - pivot stone 130, 139
 - querns 123, 124, 125, 126–7, 128, 133–4, 134–7
 - querns, deposition of 29–30
 - rubbing stones 134
 - sharpening stone 138
 - smoothers/polishers 130, 137
 - spindle whorl 72, 74, 129, 130, 140
 - weights 130
 - whetstones 129, 130, 138
- structured deposition 65, 86–7, 176, 221
- surfaces *see* cobbled surfaces; ground surfaces; paving; spreads

- tacks *see* nails and tacks
- Tarras Farm, Forres (Moray) 226, 227
- textile production 85
 - see also* spindle whorls
- Thainstone (Aberdeenshire) 200
- tools, iron 168, 169–71, 172, 178–80
 - awl 80, 168, 169, 178
 - blacksmith's sets 168, 169, 171, 178, 179–80
 - blade, curved 168, 180
 - ?blade tips 180
 - ?embossing tool 168, 170, 179
 - files 54, 168, 170, 179
 - graver 168, 169, 179
 - knife blades/tips 57, 175, 178, 180
 - miniature axe 74, 75, 168, 169, 178
 - needle 81, 168, 169, 178
 - ?punch 72, 74, 168, 169, 179
 - reaping hoo 80, 168, 175, 178
 - scissor-shears/snips 54, 168, 171, 179
 - ?scribers 34, 35, 168, 170, 179, 180
 - sickle 72, 74, 168, 170, 179
 - tang 180
 - ?tracer, metalworking 168, 178–9
 - triple-toothed tools 168, 169, 171, 179, 180
 - unident. iron tools 66, 77, 168, 169–70, 178, 179
- transport, linchpin 72, 74, 172, 173, 181
- Traprain (East Lothian) 174, 176–7
- Tulloch Wood (Moray) 226, 226
- turf-and-earthwalled roundhouses 29
- tuyères 63, 113–17, 115–16
- Tweedsmuir (Peebleshire) 128

- undated features 3, 10
- unenclosed settlements 224, 226–8, 226–7
- unexcavated structures 9, 9, 51
- unfinished iron items 174, 182
- unstratified material
 - blacksmith's set 168, 171, 179–80
 - pottery 91, 92, 92, 94, 95
 - querns 134
 - stone artefacts 131
 - tuyère 114, 117

- weapons
 - daggers 33, 34, 50, 51, 65, 171, 172, 180
 - deposition of 86–7
 - spearhead 51, 51, 65, 172, 175, 177, 180
 - sword hilt guard 79, 80, 184, 185–6, 186, 192–3
- wheat sp. (*Triticum* sp.) 61, 81, 83
- Whelphill (South Lanarkshire) 20
- Whitekirk (East Lothian) 128
- woodworking 85
- Workshop 2 32, 39, 40, 41
 - bead 39, 40, 198, 199–200, 203
 - fired clay 101
 - radiocarbon dates 15, 16
 - slag 39, 160, 164
 - stone artefacts 131
 - see also* iron-smelting furnace [681]
- Workshop 6 32, 51, 51
 - fired clay 51, 102
 - radiocarbon date 14, 16
 - slag 161, 164
 - spearhead 51, 51, 65, 172, 175, 177, 180
- Workshop 8 32–3, 53, 53
 - radiocarbon date 14, 16
 - slag 165, 166
- Workshop 11 32, 55, 57–8, 58
 - basin 57, 58, 124, 140
 - bead 57, 60, 200, 200, 203
 - crucibles 57, 100, 105, 109, 110, 111
 - ingot mould 57, 59, 125, 127, 128, 135
 - iron objects 177
 - knife blade 180
 - moulds 57, 107, 109, 112
 - offcut, iron 174, 183

INDEX

- querns 57, 58, 125, 136
- radiocarbon date 15, 16
- slag 162–4
- stone artefacts 131
- tuyères 114, 116–17, 116
- unident. iron tool 66, 168, 170, 179
 - see also* hearths [2166], [2434]; spreads (2100), (2187)
- Workshop 12 32, 51, 52, 53
 - bead 60, 198, 200, 202–3
 - fired clay 102
 - iron objects 177
 - radiocarbon date 15, 16
 - slag 165, 166
 - whetstone/sharpening stone/pounder 129, 138
- Workshop 13 32, 41, 42–4, 43, 46
 - casting debris 193
 - discussion 64
 - environmental analysis 61–2
 - fired clay 102
 - iron objects 177
 - radiocarbon dates 14, 15, 16
 - rubbing stone 41, 42, 134
 - slag 161, 164
 - stone artefacts 131
 - working surface 41, 42, 139
 - see also* iron-smelting furnaces [3050], [3790]
- Workshop 15 32, 44–8, 46–7
 - bar, copper alloy 45, 46, 190, 193–4
 - beads 45, 46, 60, 198–9, 199, 200, 202
 - copper alloy objects 184
 - dumb-bell toggle, glass 45, 46, 60, 198, 200, 201, 203
 - environmental analysis 62
 - fired clay 103
 - iron objects 177
 - perforated stone 130, 139
 - querns 45, 47, 136–7
- radiocarbon dates 14, 15, 16
- slag 46–7, 161, 165
- stone artefacts 131
 - see also* iron-smelting furnaces [4147], [4262], [4355]
- Workshop 16 32, 47–8, 49, 50
 - bead 48, 60, 198, 202
 - casting debris 193
 - copper alloy objects 184, 194
 - dumb-bell toggle, copper alloy 185, 188, 188, 192
 - fired clay 102
 - querns 48, 49, 50, 125, 136
 - radiocarbon dates 14, 16
 - slag 165
 - stone artefacts 131, 132
 - working surface 48, 49, 139
 - see also* iron-smelting furnace [2246]
- Workshop 18 32, 53, 54
 - fired clay 102
 - radiocarbon date 15, 16
 - slag 165
 - stone artefacts 131, 134
 - see also* pit [3599]
- Workshop 19 32, 50–1, 50
 - bead 60, 198, 200, 203
 - fired clay 102
 - iron objects 177
 - slag 165
 - see also* iron-smelting furnace [3127]; pit [2457]; posthole [2416]
- Workshop 22 32, 53
 - glass spiral/cable 198, 203, 203
 - slag 164
 - spindle whorl 53, 96
- workshops 38–9, 64–5, 219–20
- X-ray fluorescence analysis (XRF) 106, 108–9, 108, 190–1